Government of the People's Republic of Bangladesh
Ministry of Road Transport and Bridges (MoRTB)
Roads and Highways Department (RHD)

Sylhet-Charkhai-Sheola Highway Improvement Project

Geotechnical Investigation Report (Part-2)

May, 2022

GOVERNMENT OF
THE PEOPLE'S REPUBLIC OF BANGLADESH
MINISTRY OF ROAD TRANSPORT AND BRIDGES
ROADS AND HIGHWAYS DEPARTMENT

ADB LOAN 3295 - BAN
FEASIBILITY STUDY, DETAILED DESIGN AND
TENDERING SUPPORT OF TECHNICAL ASSISTANCE FOR
SUB REGIONAL ROAD TRANSPORT PROJECT PREPARATORY FACILITY-II

ROAD 04: SYLHET - CHARKHAI - SHEOLA - SUTARKANDI

FINAL DETAILED DESIGN REPORT

APPENDIX H-1: GEOTECHNICAL INVESTIGATION REPORT (PART - 02)

MAY 2022

HIFAB International AB, Sweden

In association with

Oriental Consultants Global Co. Ltd., Japan (JV)
BCL Associates Ltd., Bangladesh (Sub-consultant)
Development Design Consultants Ltd., Bangladesh (Sub-consultant)

TABLE OF CONTENTS

LIST OF FIGURE

LIST OF APPENDIX

List of Term Used

General

ASTM	=	American Society for Testing and Materials			
BH	=	Borehole			

$NaPo_3$	=	Sodium hexametaphosphate
USA	=	Unites States of America

Drilling and Sampling

			SPT	=	Standard Penetration Test
FVT	=	Field Vane Shear Test	SS	=	Split Spoon
GWL	=	Groundwater Level	ST	=	Shelby Tube
			UD	=	Undisturbed
			WO	=	Wash Out
PS	=	Piston Sampler			

Cohesionless Soil

Stiffness Defination	SPT N Value	
Very Loose	N =	0 - 4
Loose	N =	5 - 10
Medium Dense	N =	11 - 30
Dense	N =	31 - 50
Very Dense	N =	Over 50

Soil Properties

Gs	=	Specific Gravity	PI	=	Plasticity Index
LI	=	Liquidity Index	PL	=	Plastic Limit
LL	=	Liquid Limit	SPT - N	=	Standard Penetration Resistance
NP	=	Nonplastic	Wc	=	Natural Water Content
N-Values	=	Standard Penetration Resistance Values	γ_t	=	Total Unit Weight

Cohesive Soil

Stiffness Definition	Cu (kPa)		SPT N Value
Very Soft	< 12	or	0 - 2
Soft	12 - 25	or	3 - 4
Firm	25 - 50	or	5 - 8
Stiff	50 - 100	or	9 -15
Very Stiff	100 - 200	or	15 - 30
Hard	> 200	or	> 30

Soil Classification

CH	=	Fat Clay	OH	=	Organic Clay/Organic Silt (liquid limit less than 50)
CL	=	Lean Clay	OL	=	Organic Clay/Organic Silt (liquid limit more than 50)
D10, D30, D50, D60	=	Particle-size diameter corresponding to 10, 30, 50 and 60%, respectively, passing on the cumulative particle size distribution curve.	SM	=	Silty Sand
MH	=	Elastic Silt	SP	=	Poorly graded Sand
ML	=	Silt	SP-SM	=	Poorly graded Sand with Silt
			SC	=	Clayey Sand

Grain Classification

Grain Definition	Grain Size
Gravel	> 4.750mm
Coarse Sand	4.750 - 2.000 mm
Medium Sand	2.000 - 0.425 mm
Fine Sand	0.425 - 0.075 mm
Silt	0.075 - 0.002 mm
Clay	< 0.002 mm

List of Term Used (Cont'd)

ASTM Standards

D 422	=	Grain Size Analysis	D 2435	=	Consolidation Test	D 4767	=	Unit Weight
D 854	=	Specific Gravity	D 2487	=	Classification of Soil for Engineering Purpose			
D 1586	=	Standard Penetration Test	D 2488	=	Description and Identification of Soil (Visual Manual Procedure)			
D 2216	=	Natural Moisture Content	D 2850	=	Unconsolidated-undrainedtriaxial test			
D 2166	=	Unconfined Compression Test	D 4318	=	Atterberg Limit			

Calculation

B	=	Width of Base	K	=	Coefficient of lateral earth pressure	q_{pu}	=	Ultimate end bearing capacity
C	=	Cohesion	L	=	Length of Base	q_c	=	Cone resistance
C_c	=	Coefficient of curveture	N	=	Newton	t_{50}	=	Time at 50 percent consolidation
C_u	=	Uniformity coefficient	N'	=	SPT corrected for overberden pressure	t_{90}	=	Time at 90 percent consolidation
FS	=	Factor of Safety	N"	=	SPT corrected for overberden pressure &dilatancy	γ	=	unit weight
f_s	=	Skin resistance of pile	N_c&N_q	=	Bearing capacity factors	α	=	Adhesion factor
f_{su}	=	Ultimate skin friction	P_0'	=	Submersed soil vertical stress due to acting on a horizontal plane at some depth	d	=	Effective friction angle between soil and pile material

1.0 INTRODUCTION

The Government of Bangladesh has received a loan from the Asian Development Bank (ADB) for additional financing for the already in motion Sub-regional Transport Project Preparatory Facility and intends to apply a portion of proceedings to prepare the feasibility study and detailed engineering design for upgrading of selected portion of national highways, regional highways and district roads with minimum provision of 4 lane with Slow Moving Vehicular Traffic (SMVT) lane on both sides.

In this context, seven road portions were chosen as a priority for improvement under the Sub-regional Transport Project Preparatory Facility (SRTPPF-II). As a part of contractual obligation, the consultant took initiatives to carry out sub-soil investigation to provide adequate information on sub-surface and surface conditions for the foundations and other sub-structures for the proposed project, leading to their economical and safe designs.

In March, 2018 the consultant submitted proposal for carrying out SRTPPF-II Geotechnical Investigation under the Project SRTPPF-II, Roads & Highways Department (RHD). Based on the proposal and discussion with technical wing of RHD initiative was taken from the consultant's side to commence with sub-soil investigation for the project roads. Ehan Foundation Consultants were engaged for carrying out the Geotechnical Investigation work for Sylhet – Sutarkandi Road. According to the sub-soil investigation program 2 rigs were mobilized in Sylhet - Sutarkandi road and the field activities and laboratory tests were carried out during the period of August & September as per terms & condition of the contract in accordance with ASTM/AASHTO/BS and other relevant National & International standards.

This report has been prepared as per terms and conditions of the contract and the field and laboratory testing's were carried out in accordance with ASTM/AASHTO/BS International Standard. All information together our comments and recommendations have been included in this report.

This Geotechnical investigation work includes execution of eleven (11) boreholes were drilled, seven (7) boreholes were drilled at bridge locations and four (4) boreholes were drilled at embankment extending to a various depth of 12.0 m – 49.5 m.

2.0 LOCATION

The project road traverses through Sylhet District. Based on seismic zoning map BNBC 2017 the region falls under Zone -IV having a seismic zone co-efficient of 0.36. The seismic zoning Map is shown in Figure 1. The Borehole layout plan & Bore logs are shown in **Appendix – A** of this report.


Seismic Zone
Bangladesh
INDIA
INDIA
INDIA
Z = 0.36
Z = 0.28
Z = 0.20
Z = 0.12
Z = 0.28
Z = 0.28
Bay of Bengal
Legend
District boundary
River
Seismic Zone
Zone-I
Zone-II
Zone-III
Zone-IV
km
0 35 70 140
Scale : 1:3,000,000
Data Source : BNBC

3.0 PURPOSE OF STUDY

The purpose of this geotechnical investigation was to determine the properties and distribution of geotechnical sub-surface materials and ground water levels within the project area.

4.0 SCOPE OF WORKS

The scope of works as stipulated in the ToR is summarized as follows.

1. Mobilization and demobilization of 4 drilling rigs, necessary equipment and personnel to the project site.
2. Drilling and sampling of 37 boreholes as specified. To carry out Field Standard Penetration Test (S.P.T - 63.5 kg hammer having a free fall of 760mm) to determine the natural bearing resistance of the subsoil for the purpose of design.
3. Full time field supervision of drilling and sampling work during the course of the field works and prepare bore log.
4. To obtain disturbed and undisturbed soil samples for carrying out the laboratory tests to determine the natural and relevant physical properties of the subsoil pertaining to the site for the purpose of design.
5. To ascertain the type of substrata and their characteristics.
6. Explore the suitable foundation of proposed project and evaluate the bearing capacity for foundations of the structures.
7. Preparing a factual report in accordance with the requirement of ToR specification

5.0 EQUIPMENT

Percussion drilling rigs were mobilized at this site to drill the boreholes of this project. Care was taken to avoid any utilities in borehole locations. Split spoon sampler and Shelby tubes were used for disturbed and undisturbed sampling. Laboratory testing was conducted using standard equipment for the respective laboratory testing in accredited laboratory.

6.0 FIELD INVESTIGATION

According to terms of reference (TOR), proposed investigations are classified as field investigation and laboratory tests and analysis of such test results have been carried out according to ASTM/ AASHTO/ any other equivalent code of practice.

During the period on 11th August, 2018 to 18th August, 2018 eleven (11) boreholes were drilled at different locations shown layout plan in the presence of the consultant.

Borehole locations were set out by EFS operation team and a representative from the consultant.

The boreholes information's are summarized in the following table.

Table-1: Summary of borehole information

Bridge No.	Chainage (km)	Borehole No.	Stating Date	Completion Date	R.L
BR-1	34+600	01	13-08-2018	14-08-2018	(-)6.80 m
		02	13-08-2018	14-08-2018	(-)6.30 m
		03	15-08-2018	16-08-2018	(-)10.0 m
BR-2	36+917	01	15-08-2018	16-08-2018	(-)7.60 m
		02	16-08-2018	17-08-2018	(-)9.40 m
BR-3	42+895	01	11-08-2018	12-08-2018	(-)2.20 m
		02	11-08-2018	12-08-2018	(-)6.00 m
Embankment		01	12-08-2018	12-08-2018	(-)1.10 m
		02	18-08-2018	18-08-2018	(-)1.51 m
		03	17-08-2018	17-08-2018	(-)1.40 m
		04	17-08-2018	17-08-2018	(-)2.80 m

R.L were taken with respect to top of bridge deck slab and existing road centre line.

6.1 Field Works for Exploratory Boreholes

Percussion boring have been done including recording of soil stratification, execution of SPT, collection of disturbed and undisturbed soil samples from significant cohesive and non-cohesive zone. Drilling was advanced using percussion wash boring technique and terminated at depths varying from 10.5m to 49.5m. Flush jointed casings with nominal diameter of 150 mm were used to stabilize and prevent collapse of the borehole walls to a depth of 12m. Tripod Drag bits (90mm) were used to advance the borehole and water was used as the flushing medium. Bentonite was added to the water when it was necessary to stabilize uncased sections of borehole of where running sands were encountered.

Sampling was performed at specified depths over the depth drilled as instructed by the Client. Undisturbed soil samples were recovered by means of the Shelby Tubes by pushing through hydraulic pressure.

SPT's were performed to determine the relative density or consistency of soils and to obtain soil samples for visual classification and subsequent laboratory test as per schedule provided. A standard split spoon sampler of 50 mm outer diameter was lowered to the bottom of the borehole on drill rods. The Sampler was then driven 450 mm into the soil by a 63.5 kg self-tripping hammer free falling a height of 760 mm. SPTs were conducted at 1.5 m depth interval as per contract specification.

The blow counts required to advance the final 300 mm of a 450 mm sampler drive was recorded on the borehole logs as SPT 'N' values. In dense strata where it was difficult to drive the sampler to the full 450 mm, the penetration achieved with 50 blows of the hammer was recorded instead. SPTs >50 blows were considered refusal. All works conducted as per ASTM D1586.

All the SPT samples were extruded at site for necessary inspection and identification of the soils encountered. Field bore logs were prepared during drilling and testing and are presented in

Appendix A. All samples were photographed with necessary identification; e.g. site name, borehole, and depth and SPT numbers. The photographs are presented in Appendix F.

6.2 Storage and transportation of sample

After inspection, the recovered SPT samples were placed in double polythene bags and plastic bottles for soil identification. Undisturbed samples were preserved within Shelby tubes with proper waxing and were kept in cool environment and were later transported to the Laboratory in Dhaka for extrusion. Upon extrusion, the samples were cut into pieces and wrapped with several layers polyethylene wrap and finally with aluminium foil.

6.3 Measurement of Ground Water

Ground Water Table was measured by manually at each borehole points. The measurements are taken after 24 hours of drilling and depth of ground water below the existing ground surface are summarized in the following table.

Table-2: Summary of ground water table

BH No.	Type of Structure	Ground Water Level (m)	Completion Date	GWL Recording Date
01	Bridge No. 01	(-) 0.50	14.08.2018	15.08.2018
02		(-) 1.05	14.08.2018	15.08.2018
03		(-) 2.80	16.08.2018	17.08.2018
01	Bridge No. 02	(-) 4.40	16.08.2018	17.08.2018
02		(-) 2.60	17.08.2018	18.08.2018
01	Bridge No. 03	(-) 2.70	12.08.2018	13.08.2018
02		(-)1.20	12.08.2018	12.08.2018
01	Embankment	(-) 0.50	12.08.2018	13.08.2018
02		(-) 1.00	18.08.2018	18.08.2018
03		(-) 0.70	17.08.2018	18.08.2018
04		(-) 0.70	17.08.2018	18.08.2018

7.0 LABORATORY TESTING WORK

The laboratory tests schedules are provided by client geotechnical Engineer's. The items and quantity of laboratory tests are listed below.

All the test works were performed according to their respective ASTM / AASHTO standards.

Table-3: List of laboratory tests quantity information

Laboratory Testing:	Quantity
a) Grain Size Analysis (Hydro & Sieve) AASHTO T-127 & T-11/ ASTM D-422	39
b) Natural Moisture Content AASHTO T-265	35

c) Atterberg Limits and Plasticity Index ASTM D423-66	21
d) Direct Shear Test ASTM D3080-98	07
e) Unconfined Compression Strength ASTM D2487	11
f) 1-D Consolidation Test	04
g) Unit Weight	30

All samples were examined by a soil technician and checked against the laboratory test results before final description.

7.1 Test Methodology

Test methodology in brief is presented in following sub-sections.

The summary of laboratory test results and detail laboratory test results of soil samples are presented at Appendix-C and D.

7.1.1 Water Content and Unit Weight determination

The natural water contents of undisturbed samples were measured. Unit weights of UD samples were determined via trimming the sample to a standard of 38mm diameter and length of 76 mm. the unit weights of the disturbed samples were calculated based on the weight and dimension of the soil.

7.1.2 Atterberg Limits

Atterberg limits were performed on all cohesive (clay and some silt) soil samples. The liquid limit is determined by Casagrande cup method and the plastic limits are determined via “rolling Thread” method. For liquid limit determination, three water contents with blow counts between 15 and 30 are adopted. As for plastic limit, two (2) measurements were made for each sample. Tests were performed in accordance with ASTM D 4318 standards.

7.1.3 Wet Sieve Analysis

Wet sieving was conducted to determine the percentage of coarse and fine grained material. A small but representative soil sample was allowed to be dried in the oven at 1050C for a period of 24 hours. The dry soil was weighed and washed through No. 200 sieve (75µm), and then the soil retained is collected and oven-dried. After drying, the soil is sieved through No. ¾” to No. 200 sieves. The proportion of soil retained on each sieve was noted, and the grain size distribution curve was plotted. Hydrometer tests were performed on soil samples passing No. 200 sieve and the quantity collected samples were 40g. Hydrometer type 152H was used. Sodium hexametaphosphate (NaPo3) was used as dispersing agent.

7.1.4 Specific Gravity

Specific gravity tests were conducted on representative samples. A 50-100 gram of dry soil was placed in a 500 cc volumetric flask; the flask was then filled with clean water. Afterwards filled flask was boiled for a period of 30 minutes to remove air from the mixture. The flask was topped with water up to the 500 cc mark whenever necessary. Once the evacuation was completed, the flask with the soil mixture was weighed and the specific gravity was then calculated based on the equivalent weight of water together with flask at the temperature. The test was usually carried out at temperature of 29 to 30°C; therefore, the reported specific gravity was also given in this temperature range. Tests were performed in accordance with ASTM D 854 standards.

7.1.5 Unconfined Compression Tests

Unconfined compression tests were carried out on the undisturbed samples. The UD sample is trimmed to a size of 35.5 mm diameter and a length of 71.1 mm. The sample is sheared in compression mode, where the axial displacement and vertical load are measured during the test by means of dial gauge and proving ring. The rate of shearing is about 1 % per minute. After shearing, the sample is oven-dried to determine its water content. Unconfined Compression Tests were performed in accordance with ASTM D 2166 standard.

Tests were performed in accordance with ASTM D 2435 standard.

7.1.6 Direct Shear Test

Unconsolidated Undrained Direct shear tests were performed on cohesionless disturbed soil samples obtained from borings of bridges, embankment, and station buildings and borrow pits. Square box, single shear device was used. The shearing area of the box was 25.40cm^2 with a volume of 51.489 cm^3. Shearing was done under three vertical loads, 35.03 N, 70.05 N and 105.08 N.

7.1.7 1-D Consolidation Test

1-D Consolidation test were carried out on the undisturbed samples. Settlement observations are recorded at various times after the application of each load level. When testing most clay soils are tested, each load is left in place for 24 hours. After the maximum pressure has been applied, the load acting on the soil specimen is unloaded in four decrements (e.g., down from 64,000 psf to 16,000 psf to 4000 psf). When a suitably low pressure is reached, the rest of the remaining load is removed in a single step and the apparatus is dismantled rapidly to minimize any additional moisture taken in by the soil.

8.0 SITE GEOLOGY

The surface geology of Bangladesh is dominated by young (Helocene) alluvial and deltaic sediments deposited within last 6000 to 10000 years. Surface sediments in the north include coarse grained mountain front alluvial fan deposits. Sediments in much of lowland central Bangladesh are alluvial sands and silts, where present site of investigation is located, while in the South closer to the coast, sediments are predominatly deltaic silts and clays. An extract from „Geological Map of Bangladesh" showing the geology of the project area is presented on Figure 1 (Ref. Geological Map of Bangladesh –by Geological Survey of Bangladesh). This geological map indicates that the soil type of the site is categorized as paludal deposits. Geologically there is no significant variation in the process of soil formation of our studied areas. Our study confirms deposition of silt and clay underlain by sand.

Figure: Geological Map of Bangladesh

9.0 RESULTS AND DISCUSSION

The summary of laboratory test results and details laboratory test results are displayed at Appendix-C and D.

The subsurface soil stratification of the location may be broadly categorized into the following layers:

Bridge No. 01

At Borehole-01, the uppermost layer (0-21)m is very soft to stiff silty CLAY layer underlain by loose to medium dense clayey SAND layer (21-25.5)m followed by very dense silty SAND layer (40.5-49.5)m. An intermittent layer of stiff to very stiff silty CLAY is encountered at depth (40.5-49.5)m.

At Borehole-02, the uppermost layer (0-6)m is soft to firm silty CLAY layer underlain by very soft clayey SILT (6-10.5)m followed by dense to very dense silty SAND layer (33-45)m. An intermittent layer of very soft to very stiff silty CLAY is encountered at depth (10.5-33)m.

At Borehole-03, the uppermost layer (0-25.5)m is very soft to very stiff silty CLAY layer underlain by medium dense SAND (25.5-28.5)m followed by dense to very dense silty SAND layer (33-49.5)m. An intermittent layer of stiff silty CLAY layer is encountered at depth (28.5-33)m.

Bridge No. 02

At Borehole-01, the uppermost layer (0-21)m is very soft to stiff silty CLAY layer underlain by medium dense silty SAND layer (21-24)m followed by medium dense to very dense silty SAND layer (34.5-49.5)m. An intermittent layer of firm to very stiff clayey SILT is encountered at depth (24-34.5)m.

At Borehole-02, the uppermost layer (0-21)m is very soft to firm silty CLAY layer followed by medium dense to very dense silty SAND layer (21-49.5)m.

Bridge No. 03

At Borehole-01, the uppermost layer (0-18)m is very soft to firm silty CLAY layer underlain by medium dense silty SAND layer (18-21)m followed by very dense silty SAND layer (34.5-42)m. An intermittent layer of firm to stiff silty CLAY is encountered at depth (21-27)m, Another intermittent layer of medium dense silty SAND layer is encountered at depth 28.5m, stiff to very stiff silty CLAY layer is encountered at depth 30.0m.

At Borehole-02, the uppermost layer (0-15)m is soft to firm silty CLAY layer underlain by very loose to medium dense sandy SILT (15-21)m followed by medium dense to very dense silty SAND layer (27-39)m. An intermittent layer of firm to stiff silty CLAY is encountered at depth (21-27)m.

Embankment Borehole

At RB-01, the uppermost layer (0-15)m is very soft to firm silty CLAY.

At RB-02, the uppermost layer (0-6)m is soft to firm silty CLAY layer underlain by medium dense silty SAND (6-12)m

At RB-03, the uppermost layer (0-3)m is soft to firm silty CLAY layer underlain by soft to stiff clayey SILT (6-18)m

At RB-04, the uppermost layer (0-9)m is soft to firm silty CLAY layer underlain by medium dense silty SAND (6-15)m

10.0 CONCLUSION AND RECOMMENDATION

The summary of laboratory test results and details laboratory test results are displayed at Appendix-B and C. Pile Capacity Calculations are demonstrated at Appendix-D. Photographs of the field investigation has been incorporated in Appendix- E.

The objective of the subsurface investigation is to design a suitable foundation for the proposed bridge, whose substructure would transmit the structural loads into the ground safely. However, unit toe and skin soil resistance were estimated for bored cast-in-situ pile— as described in this report. These values will have to be used judiciously; especially in case of estimating the toe resistance of bored pile constructed under bentonite slurry without base grouting. Pile diameter may be picked out considering vertical and lateral load concentration; however, diameter 1000mm and 1200mm has been considered suitable for the structures.

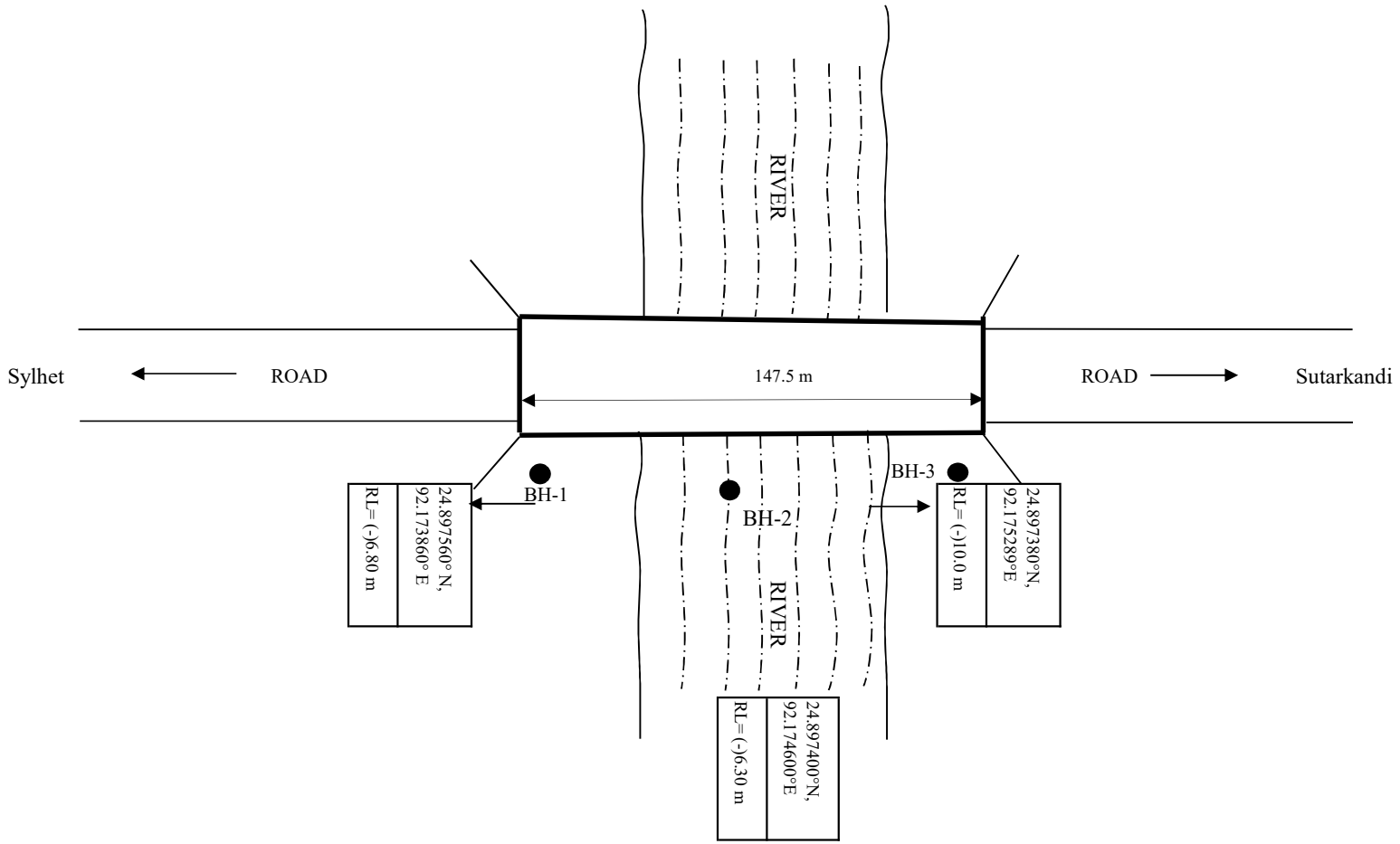
Suggestion is made for construction of pilot piles before commencement of service piles, to verify the estimated pile capacity based on soil investigation report. Carrying capacity may be checked —either by Static Axial Compression Pile Load Test or the High Strain Dynamic Pile Test. Apart from that during the investigation it was evident that drilling boreholes at the exact foundation location was not possible as there was some protection work as well as encroachment along the bank-line and in some cases the proposed bridge was outside of RHD's acclaimed land. With that being said it may be added that it is recommended to carry out confirmatory boring at each foundation location during the construction phase of the project to get a better understanding of the ground conditions after land acquisition and site clearance.

In case of bored pile constructed by percussion method under bentonite slurry and pile toe resting on very dense sand with high elastic modulus, designers are often deceived and use higher toe resistance and high ultimate capacity as well, for piles constructed without base grouting.

APPENDIX A

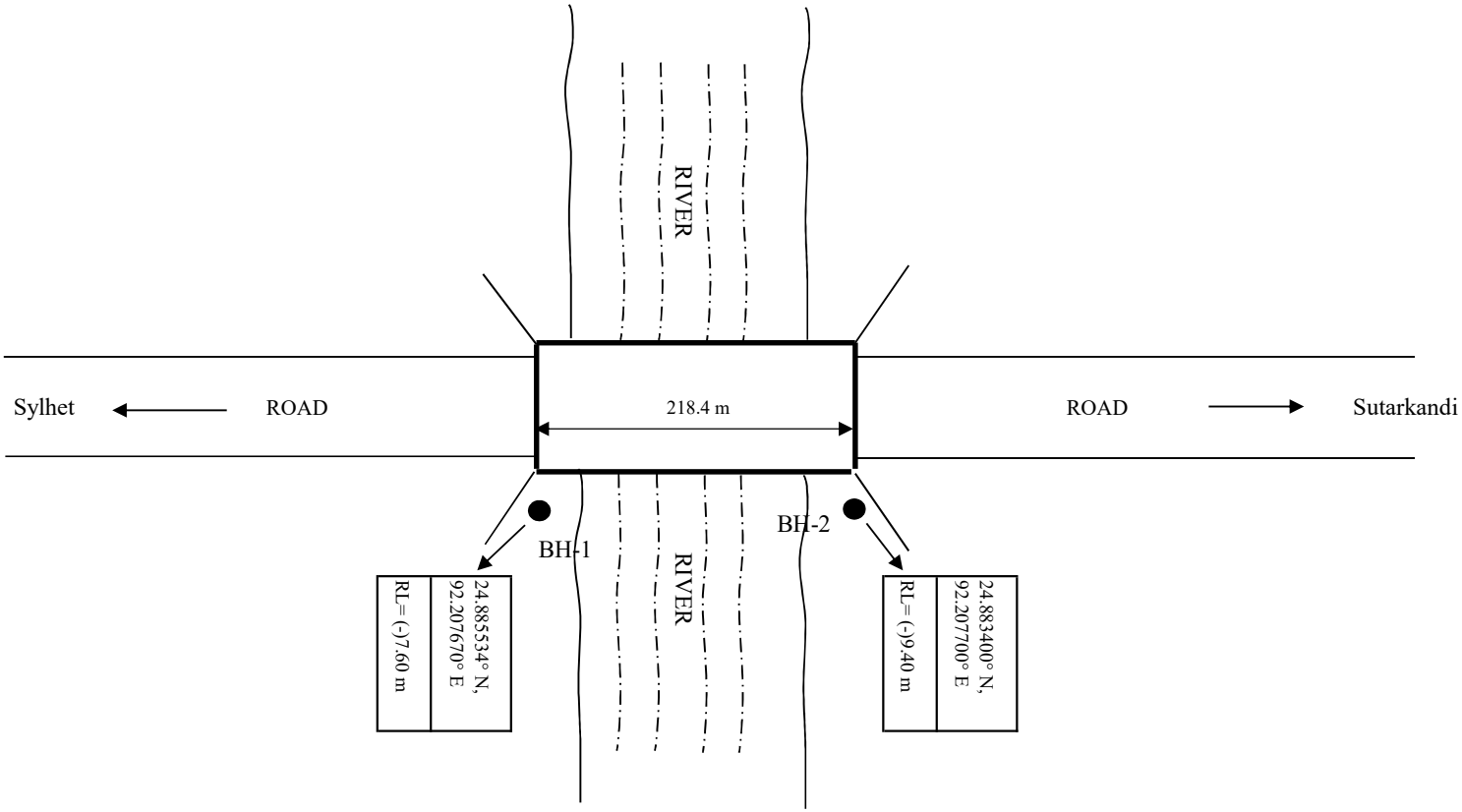
Boreholes Layout Plan

HIFAB INTERNATIONAL AB	**LOCATION OF BORE HOLE** **(NOT TO SCALE)**	CLIENT : Roads and Highways Department (RHD) PROJECT : Geotechnical Investigation for SRTPPF-II. SITE : Bridge No. 01, Sylhet – Sutarkandi Road.



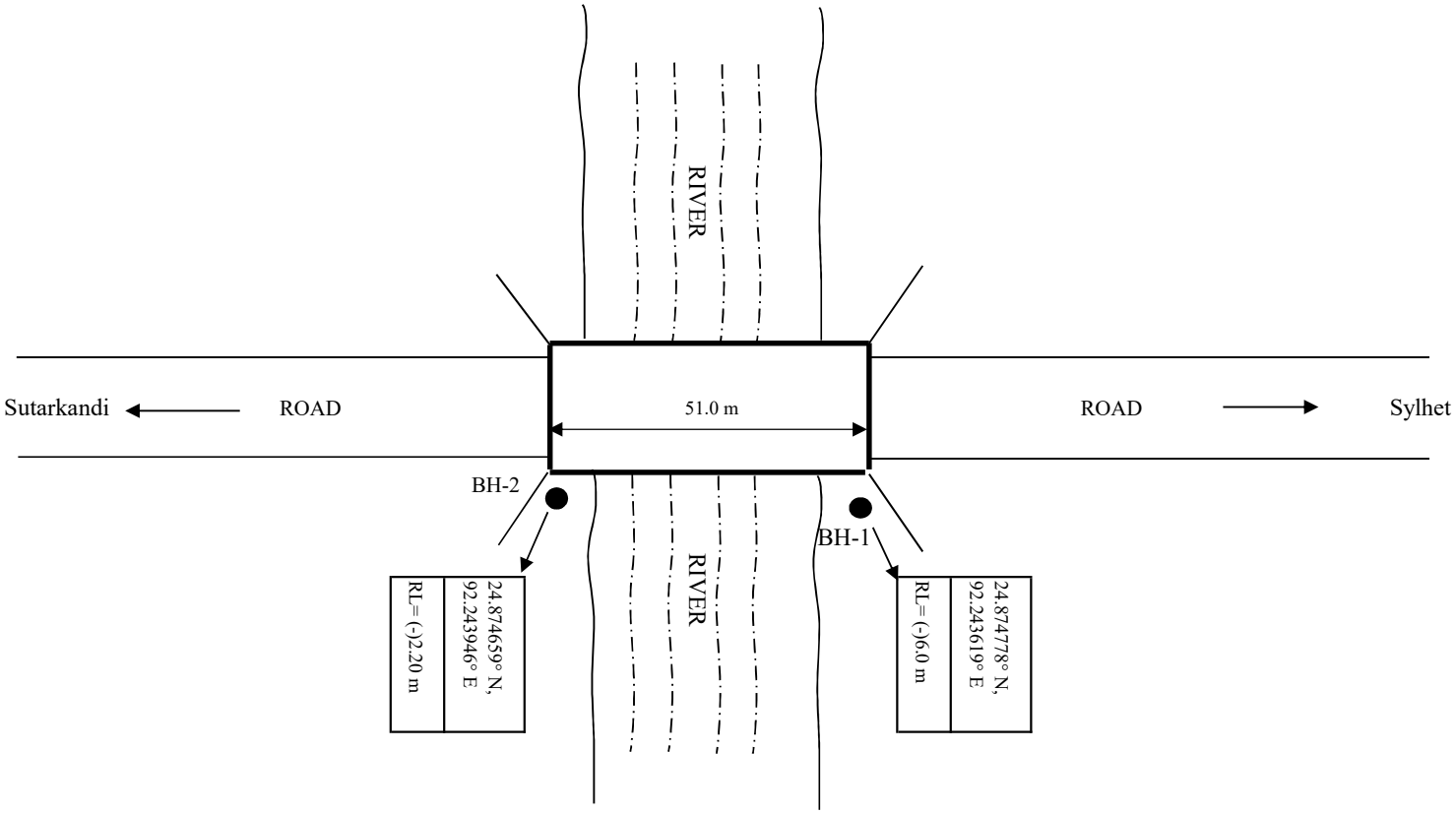
Drawn by : Checked by : SHEET 1 OF 1 ATTACHMENT - I

HIFAB INTERNATIONAL AB	**LOCATION OF BORE HOLE** **(NOT TO SCALE)**	**CLIENT : Roads and Highways Department (RHD)** **PROJECT : Geotechnical Investigation for SRTPPF-II** **SITE : Bridge No. 02, Sylhet – Sutarkandi Road.**



Drawn by : Checked by : SHEET 1 OF 1 ATTACHMENT - I

HIFAB INTERNATIONAL AB	**LOCATION OF BORE HOLE** **(NOT TO SCALE)**	**CLIENT : Roads and Highways Department (RHD)** **PROJECT : Geotechnical Investigation for SRTPPF-II** **SITE : Bridge No. 03, Sylhet – Sutarkandi Road.**



Drawn by : Checked by : SHEET 1 OF 1 ATTACHMENT - I

APPENDIX B

Borehole Logs

Hifab International AB

Client	: Roads and Highways Department (RHD)
Project	: Sub-Regional Road Transportation Project (SRTPPF-II)
Road	: Sylhet- Sutarkandi.

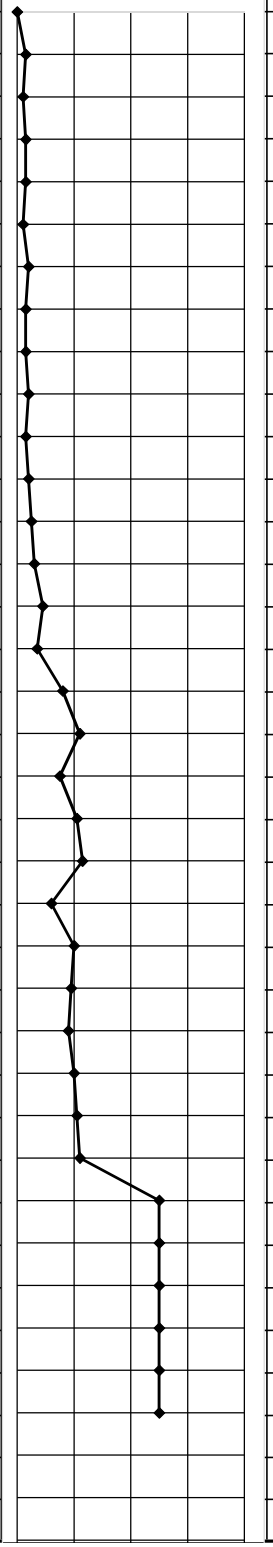
BORE HOLE NO : 01	Location : BR-01	METHOD OF BORING : WASH BORING	DATE OF STARTING : 13.08.2018
BORE DEPTH : 49.5 m	Northing : 24.897560	DIAMETER OF BORING : 100mm	DATE OF COMPLETION : 14.08.2018
R.L. : (-) 6.80 m	Easting : 92.173860	INCLINATION : VERTICAL	GROUND WATER LEVEL : (-) 0.50 m

Sample No.	Type of Sample	Depth (m)	Layer Thickness (m)	Description of Strata Materials	Log	USCS	Blows on spoon per 6" penetration N_1= 6"	N_2= 6"	N_3= 6"	N= N_2+N_3	Remarks
D-1		1.5	21.0	Gray very soft to stiff clayey SILT, trace sand		ML	1	1	2	**3**	
D-2		3.0					1	1	1	**2**	UD-1 (3.60-4.05)m
D-3		4.5					1	1	2	**3**	
D-4		6.0					1	1	2	**3**	
D-5		7.5					1	1	1	**2**	
D-6		9.0					1	2	2	**4**	
D-7		10.5					1	1	2	**3**	
D-8		12.0					1	1	2	**3**	
D-9		13.5					1	2	2	**4**	
D-10		15.0					1	1	2	**3**	
D-11		16.5					1	2	2	**4**	
D-12		18.0					2	2	3	**5**	
D-13		19.5					2	2	4	**6**	
D-14		21.0					3	4	5	**9**	
D-15		22.5	4.5	Gray loose to medium dense clayey SAND		SC	3	3	4	**7**	
D-16		24.0					5	7	9	**16**	
D-17		25.5					6	9	13	**22**	
D-18		27.0	16.5	Gray stiff to very stiff silty CLAY, trace sand		CL	4	6	9	**15**	
D-19		28.5					7	9	12	**21**	
D-20		30.0					7	9	14	**23**	
D-21		31.5					4	5	7	**12**	
D-22		33.0					7	9	11	**20**	
D-23		34.5					7	8	11	**19**	
D-24		36.0					4	8	10	**18**	
D-25		37.5					5	8	12	**20**	
D-26		39.0					6	9	12	**21**	
D-27		40.5					6	10	12	**22**	
D-28		42.0	9.0	Gray very dense silty SAND		SM	22	40	10	**50**	
D-29		43.5					24	45	5	**50**	
D-30		45.0					26	42	8	**50**	
D-31		46.5					30	50	-	**50**	
D-32		48.0					28	50	-	**50**	
D-33		49.5					30	50	-	**50**	

Standard penetration resistance (S P T)

Blows per 0.30m/1ft

0 20 40 60 80



Sample Index

Disturbed

Undisturbed

Hifab International AB

Client	: Roads and Highways Department (RHD)
Project	: Sub-Regional Road Transportation Project (SRTPPF-II)
Road	: Sylhet- Sutarkandi.

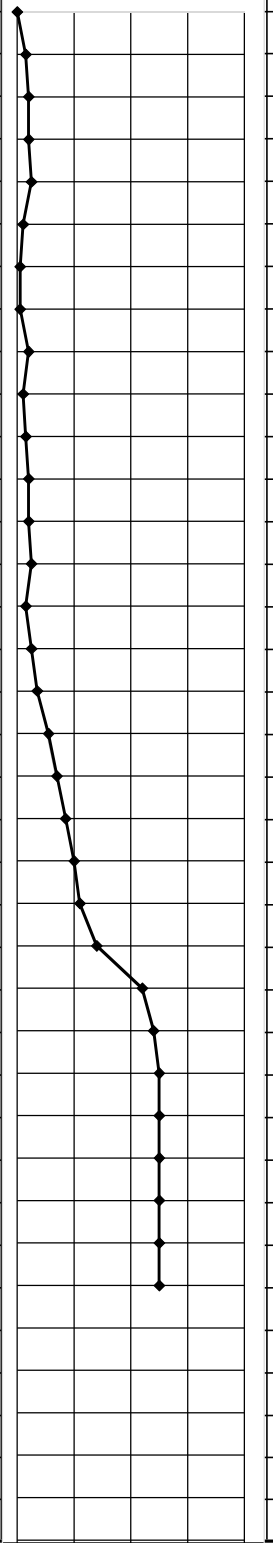
BORE HOLE NO : 02	Location : BR-01	METHOD OF BORING : WASH BORING	DATE OF STARTING : 13.08.2018
BORE DEPTH : 45.0 m	Northing : 24.897400	DIAMETER OF BORING : 100mm	DATE OF COMPLETION : 14.08.2018
R.L. : (-) 6.30 m	Easting : 92.174600	INCLINATION : VERTICAL	GROUND WATER LEVEL : (+) 1.05 m

Sample No.	Type of Sample	Depth (m)	Layer Thickness (m)	Description of Strata Materials	Log	USCS	Blows on spoon per 6" penetration N_1= 6"	N_2= 6"	N_3= 6"	N= N_2+N_3	Remarks
D-1		1.5					1	1	2	**3**	
D-2		3.0	6.0	Brownish soft to firm silty CLAY		CL	1	2	2	**4**	UD-1 (2.05-2.55)m
D-3		4.5					1	2	2	**4**	
D-4		6.0					1	2	3	**5**	
D-5		7.5					1	1	1	**2**	
D-6		9.0	4.5	Gray very soft clayey SILT, little sand		ML	1	0	1	**1**	
D-7		10.5					1	0	1	**1**	
D-8		12.0	1.5	Brownish soft silty CLAY		CL	2	2	2	**4**	
D-9		13.5					1	1	1	**2**	
D-10		15.0					1	1	2	**3**	
D-11		16.5					1	2	2	**4**	
D-12		18.0					2	2	2	**4**	
D-13		19.5					1	2	3	**5**	
D-14		21.0					1	1	2	**3**	
D-15		22.5					2	2	3	**5**	
D-16		24.0	21.0	Gray very soft to very stiff silty CLAY, trace sand		CL	2	3	4	**7**	
D-17		25.5					3	5	6	**11**	
D-18		27.0					5	7	7	**14**	
D-19		28.5					4	7	10	**17**	
D-20		30.0					5	10	10	**20**	
D-21		31.5					5	9	13	**22**	
D-22		33.0					7	12	16	**28**	
D-23		34.5					18	20	24	**44**	
D-24		36.0					18	23	25	**48**	
D-25		37.5					20	30	20	**50**	
D-26		39.0	12.0	Gray dense to very dense silty SAND		SM	22	38	12	**50**	
D-27		40.5					25	40	10	**50**	
D-28		42.0					26	45	5	**50**	
D-29		43.5					28	50	-	**50**	
D-30		45.0					30	50	-	**50**	

Standard penetration resistance (S P T)

Blows per 0.30m/1ft

0 20 40 60 80



Sample Index

Disturbed

Undisturbed

Hifab International AB

Client	: Roads and Highways Department (RHD)
Project	: Sub-Regional Road Transportation Project (SRTPPF-II)
Road	: Sylhet- Sutarkandi.

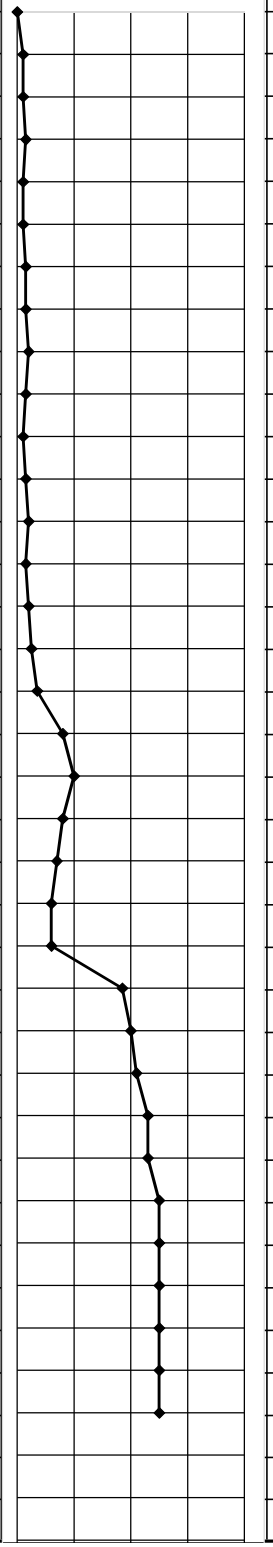
BORE HOLE NO : 03	Location : BR-01	METHOD OF BORING : WASH BORING	DATE OF STARTING : 15.08.2018
BORE DEPTH : 49.5 m	Northing : 24.897380	DIAMETER OF BORING : 100mm	DATE OF COMPLETION : 16.08.2018
R.L. : (-) 10.0 m	Easting : 92.175289	INCLINATION : VERTICAL	GROUND WATER LEVEL : (-) 2.80 m

Sample No.	Type of Sample	Depth (m)	Layer Thickness (m)	Description of Strata Materials	Log	USCS	Blows on spoon per 6" penetration N_1= 6"	N_2= 6"	N_3= 6"	N= N_2+N_3	Remarks
D-1		1.5					1	1	1	**2**	
D-2		3.0					1	1	1	**2**	UD-1 (3.60-4.05)m
D-3		4.5					1	1	2	**3**	
D-4		6.0					1	1	1	**2**	
D-5		7.5					1	1	1	**2**	
D-6		9.0					1	1	2	**3**	
D-7		10.5					1	1	2	**3**	
D-8		12.0					1	2	2	**4**	
D-9		13.5	25.5	Gray very soft to very stiff silty CLAY, little sand		CL	1	1	2	**3**	
D-10		15.0					1	1	1	**2**	
D-11		16.5					1	1	2	**3**	
D-12		18.0					1	2	2	**4**	
D-13		19.5					1	1	2	**3**	
D-14		21.0					1	2	2	**4**	
D-15		22.5					1	2	3	**5**	
D-16		24.0					2	3	4	**7**	
D-17		25.5					4	6	10	**16**	
D-18		27.0	3.0	Gray medium dense SAND		SM	5	7	13	**20**	
D-19		28.5					2	7	9	**16**	
D-20		30.0					4	6	8	**14**	
D-21		31.5	4.5	Gray stiff silty CLAY, trace sand		CL	4	6	6	**12**	
D-22		33.0					3	5	7	**12**	
D-23		34.5					12	17	20	**37**	
D-24		36.0					14	18	22	**40**	
D-25		37.5					15	20	22	**42**	
D-26		39.0					18	22	24	**46**	
D-27		40.5					17	21	25	**46**	
D-28		42.0	16.5	Gray dense to very dense silty SAND		SM	20	24	26	**50**	
D-29		43.5					22	28	22	**50**	
D-30		45.0					24	30	20	**50**	
D-31		46.5					27	35	15	**50**	
D-32		48.0					25	33	17	**50**	
D-33		49.5					30	50	-	**50**	

Standard penetration resistance (S P T)

Blows per 0.30m/1ft

0 20 40 60 80



Sample Index

Disturbed

Undisturbed

Hifab International AB

Client	: Roads and Highways Department (RHD)
Project	: Sub-Regional Road Transportation Project (SRTPPF-II)
Road	: Sylhet- Sutarkandi.

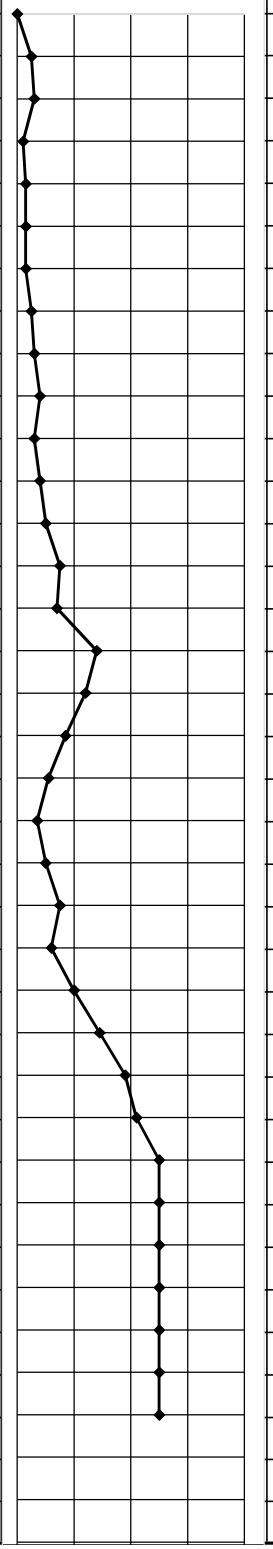
BORE HOLE NO : 01	Location : BR-02	METHOD OF BORING : WASH BORING	DATE OF STARTING : 15.08.2018
BORE DEPTH : 49.5 m	Northing : 24.885534	DIAMETER OF BORING : 100mm	DATE OF COMPLETION : 16.08.2018
R.L. : (-) 7.60 m	Easting : 92.207670	INCLINATION : VERTICAL	GROUND WATER LEVEL : (-) 4.40 m

Sample No.	Type of Sample	Depth (m)	Layer Thickness (m)	Description of Strata Materials	Log	USCS	Blows on spoon per 6" penetration N_1= 6"	N_2= 6"	N_3= 6"	N= N_2+N_3	Remarks
D-1		1.5	12.0	Brownish very soft to firm silty CLAY, trace sand		CL	2	2	3	**5**	
D-2		3.0					2	3	3	**6**	UD-1 (2.05-2.55)m
D-3		4.5					1	1	1	**2**	
D-4		6.0					1	1	2	**3**	
D-5		7.5					1	1	2	**3**	
D-6		9.0					1	1	2	**3**	
D-7		10.5					2	2	3	**5**	
D-8		12.0					2	3	3	**6**	
D-9		13.5	9.0	Gray firm to stiff silty CLAY, trace sand		CL	2	4	4	**8**	
D-10		15.0					2	3	3	**6**	
D-11		16.5					3	4	4	**8**	
D-12		18.0					4	4	6	**10**	
D-13		19.5					5	7	8	**15**	
D-14		21.0					5	6	8	**14**	
D-15		22.5	3.0	Gray medium dense silty SAND		SM	8	12	16	**28**	
D-16		24.0					7	10	14	**24**	
D-17		25.5	10.5	Gray firm to very stiff clayey SILT, little sand		CL	5	7	10	**17**	
D-18		27.0					3	5	6	**11**	
D-19		28.5					2	3	4	**7**	
D-20		30.0					2	4	6	**10**	
D-21		31.5					4	7	8	**15**	
D-22		33.0					4	5	7	**12**	
D-23		34.5					6	10	10	**20**	
D-24		36.0	15.0	Gray medium dense to very dense silty SAND		SM	9	17	12	**29**	
D-25		37.5					10	18	20	**38**	
D-26		39.0					12	20	22	**42**	
D-27		40.5					18	20	30	**50**	
D-28		42.0					25	40	10	**50**	
D-29		43.5					28	45	5	**50**	
D-30		45.0					35	50	-	**50**	
D-31		46.5					40	50	-	**50**	
D-32		48.0					38	50	-	**50**	
D-33		49.5					28	50	-	**50**	

Standard penetration resistance (S P T)

Blows per 0.30m/1ft

0 20 40 60 80



Sample Index

Disturbed

Undisturbed

Hifab International AB

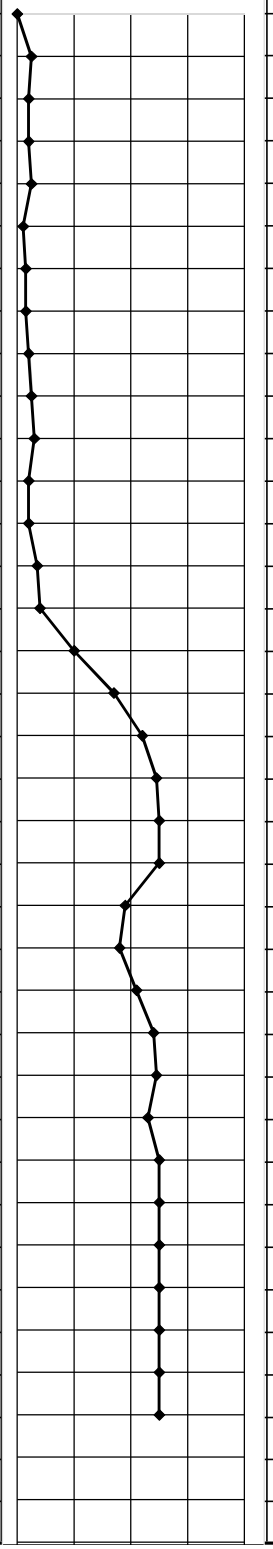
Client	: Roads and Highways Department (RHD)
Project	: Sub-Regional Road Transportation Project (SRTPPF-II)
Road	: Sylhet- Sutarkandi.

BORE HOLE NO : 02	Location : BR-02	METHOD OF BORING : WASH BORING	DATE OF STARTING : 16.08.2018
BORE DEPTH : 49.5 m	Northing : 24.883400	DIAMETER OF BORING : 100mm	DATE OF COMPLETION : 17.08.2018
R.L. : (-) 9.40 m	Easting : 92.207700	INCLINATION : VERTICAL	GROUND WATER LEVEL : (-) 2.60 m

Sample No.	Type of Sample	Depth (m)	Layer Thickness (m)	Description of Strata Materials	Log	USCS	Blows on spoon per 6" penetration N_1= 6"	N_2= 6"	N_3= 6"	N= N_2+N_3	Remarks
D-1		1.5	6.0	Brownish soft to firm silty CLAY, trace sand		CL	1	2	3	**5**	
D-2		3.0					1	2	2	**4**	
D-3		4.5					1	2	2	**4**	UD-1 (5.05-5.55)m
D-4		6.0					2	2	3	**5**	
D-5		7.5	15.0	Gray very soft to firm silty CLAY, trace sand		CL	1	1	1	**2**	
D-6		9.0					1	1	2	**3**	
D-7		10.5					1	1	2	**3**	
D-8		12.0					1	2	2	**4**	
D-9		13.5					2	2	3	**5**	
D-10		15.0					2	3	3	**6**	
D-11		16.5					1	2	2	**4**	
D-12		18.0					2	2	2	**4**	
D-13		19.5					2	3	4	**7**	
D-14		21.0					2	3	5	**8**	
D-15		22.5	6.0	Gray medium dense to dense silty SAND		SM	5	8	12	**20**	
D-16		24.0					9	15	19	**34**	
D-17		25.5					11	20	24	**44**	
D-18		27.0					15	23	26	**49**	
D-19		28.5	3.0	Brownish very dense silty SAND		SM	21	27	23	**50**	
D-20		30.0					18	25	25	**50**	
D-21		31.5	3.0	Gray dense silty SAND		SM	12	17	21	**38**	
D-22		33.0					13	16	20	**36**	
D-23		34.5	16.5	Brownish dense to very dense silty SAND		SM	17	20	22	**42**	
D-24		36.0					20	24	24	**48**	
D-25		37.5					19	23	26	**49**	
D-26		39.0					20	21	25	**46**	
D-27		40.5					22	26	24	**50**	
D-28		42.0					24	30	20	**50**	
D-29		43.5					23	32	18	**50**	
D-30		45.0					25	40	10	**50**	
D-31		46.5					26	45	5	**50**	
D-32		48.0					26	50	-	**50**	
D-33		49.5					15	30	20	**50**	

Standard penetration resistance (S P T)

Blows per 0.30m/1ft



Sample Index
Disturbed
Undisturbed

Hifab International AB

Client	: Roads and Highways Department (RHD)
Project	: Sub-Regional Road Transportation Project (SRTPPF-II)
Road	: Sylhet- Sutarkandi.

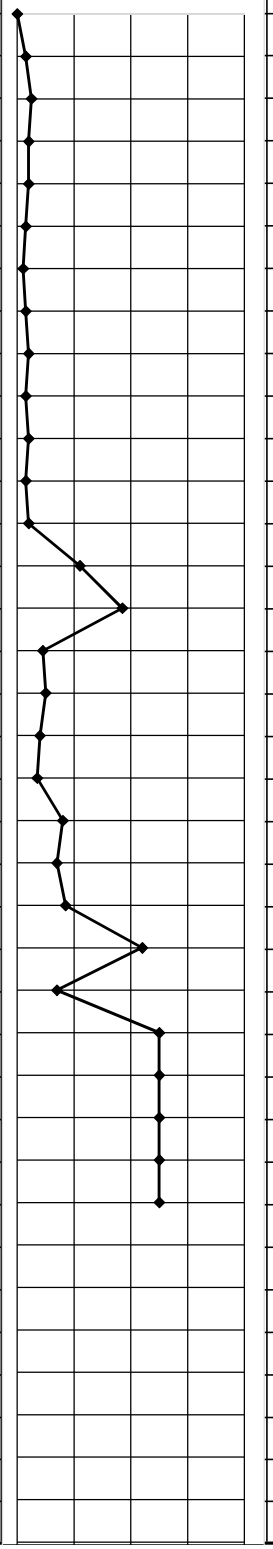
BORE HOLE NO : 01	Location : BR-03	METHOD OF BORING : WASH BORING	DATE OF STARTING : 11.08.2018
BORE DEPTH : 42.0 m	Northing : 24.874659	DIAMETER OF BORING : 100mm	DATE OF COMPLETION : 12.08.2018
R.L. : (-) 2.20 m	Easting : 92.243946	INCLINATION : VERTICAL	GROUND WATER LEVEL : (-) 2.70 m

Sample Index: Disturbed; Undisturbed

Sample No.	Type of Sample	Depth (m)	Layer Thickness (m)	Description of Strata Materials	Log	USCS	Blows on spoon per 6" penetration N_1= 6"	N_2= 6"	N_3= 6"	N= N_2+N_3	Remarks
D-1		1.5	9.0	Brownish very soft to firm silty CLAY, trace sand		CL	1	1	2	**3**	
D-2		3.0					2	2	3	**5**	UD-1 (2.05-2.55)m
D-3		4.5					1	2	2	**4**	
D-4		6.0					1	2	2	**4**	
D-5		7.5					1	1	2	**3**	
D-6		9.0					1	1	1	**2**	
D-7		10.5	9.0	Gray soft silty CLAY, trace sand		CL	1	1	2	**3**	
D-8		12.0					1	2	2	**4**	
D-9		13.5					1	1	2	**3**	
D-10		15.0					1	2	2	**4**	
D-11		16.5					1	1	2	**3**	
D-12		18.0					1	2	2	**4**	
D-13		19.5	3.0	Gray medium dense to dense silty SAND		SM	6	10	12	**22**	
D-14		21.0					12	17	20	**37**	
D-15		22.5	6.0	Gray firm to stiff silty CLAY		CL	3	4	5	**9**	
D-16		24.0					3	4	6	**10**	
D-17		25.5					2	3	5	**8**	
D-18		27.0					2	3	4	**7**	
D-19		28.5	1.5	Gray medium dense silty SAND		SM	4	6	10	**16**	
D-20		30.0	3.0	Gray stiff to very stiff silty CLAY, trace sand		CL	4	6	8	**14**	
D-21		31.5					4	8	9	**17**	
D-22		33.0	1.5	Gray dense silty SAND		SM	16	20	24	**44**	
D-23		34.5	1.5	Gray stiff silty CLAY		CL	3	6	8	**14**	
D-24		36.0	7.5	Gray very dense silty SAND		SM	24	50	-	**50**	
D-25		37.5					26	46	4	**50**	
D-26		39.0					30	50	-	**50**	
D-27		40.5					20	37	13	**50**	
D-28		42.0					17	43	7	**50**	

Standard penetration resistance (S P T)

Blows per 0.30m/1ft



Hifab International AB

Client	: Roads and Highways Department (RHD)
Project	: Sub-Regional Road Transportation Project (SRTPPF-II)
Road	: Sylhet- Sutarkandi.

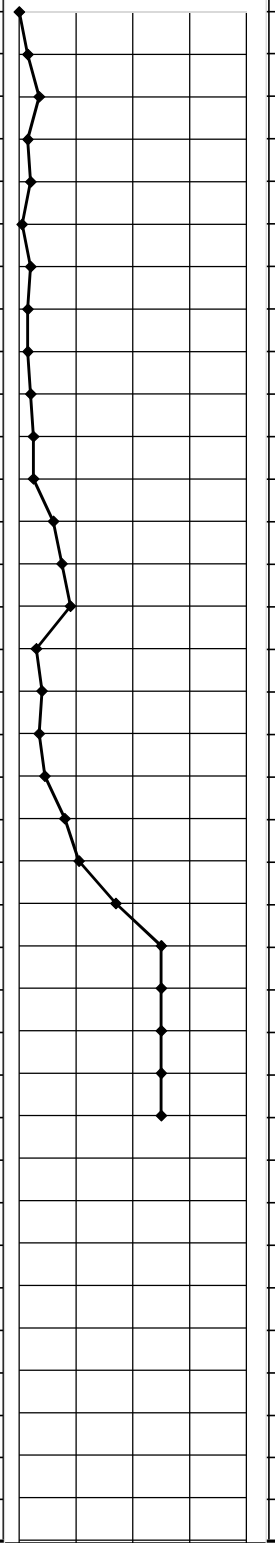
BORE HOLE NO : 02	Location : BR-03	METHOD OF BORING : WASH BORING	DATE OF STARTING : 11.08.2018
BORE DEPTH : 39.0 m	Northing : 24.874778	DIAMETER OF BORING : 100mm	DATE OF COMPLETION : 12.08.2018
R.L. : (-) 6.0 m	Easting : 92.243619	INCLINATION : VERTICAL	GROUND WATER LEVEL : (+) 1.20 m

Sample Index: Disturbed; Undisturbed

Sample No.	Type of Sample	Depth (m)	Layer Thickness (m)	Description of Strata Materials	Log	USCS	Blows on spoon per 6" penetration N_1= 6"	N_2= 6"	N_3= 6"	N= N_2+N_3	Remarks
D-1		1.5	3.0	Brownish soft to firm silty CLAY		CL	1	1	2	**3**	
D-2		3.0					2	3	4	**7**	
D-3		4.5	12.0	Gray soft to firm silty CLAY, trace sand		CL	1	1	2	**3**	UD-1 (3.60-4.05)m
D-4		6.0					1	2	2	**4**	
D-5		7.5					1	0	1	**1**	
D-6		9.0					2	2	2	**4**	
D-7		10.5					1	2	1	**3**	
D-8		12.0					1	1	2	**3**	
D-9		13.5					1	2	2	**4**	
D-10		15.0					1	2	3	**5**	
D-11		16.5	6.0	Gray loose to medium dense sandy SILT		SM	2	2	3	**5**	
D-12		18.0					3	5	7	**12**	
D-13		19.5					4	6	9	**15**	
D-14		21.0					4	7	11	**18**	
D-15		22.5	6.0	Gray firm to stiff silty CLAY, trace sand		CL	2	2	4	**6**	
D-16		24.0					2	3	5	**8**	
D-17		25.5					2	3	4	**7**	
D-18		27.0					3	3	6	**9**	
D-19		28.5	12.0	Gray medium dense to dense silty SAND		SM	4	6	10	**16**	
D-20		30.0					5	9	12	**21**	
D-21		31.5					12	15	19	**34**	
D-22		33.0					17	22	28	**50**	
D-23		34.5					23	35	15	**50**	
D-24		36.0					27	38	12	**50**	
D-25		37.5					22	40	10	**50**	
D-26		39.0					25	39	11	**50**	

Standard penetration resistance (S P T)

Blows per 0.30m/1ft



Hifab International AB

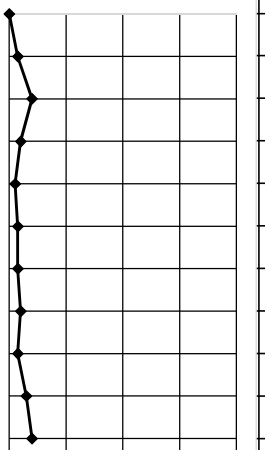
Client	: Roads and Highways Department (RHD)
Project	: Sub-Regional Road Transportation Project (SRTPPF-II)
Road	: Sylhet- Sutarkandi.

BORE HOLE NO : 01	Location : RB	METHOD OF BORING : WASH BORING	DATE OF STARTING : 12.08.2018
BORE DEPTH : 15.0 m	Northing : 24.897380	DIAMETER OF BORING : 100mm	DATE OF COMPLETION : 12.08.2018
R.L. : (-) 1.10 m	Easting : 92.175289	INCLINATION : VERTICAL	GROUND WATER LEVEL : (-) 0.50 m

Sample No.	Type of Sample	Depth (m)	Layer Thickness (m)	Description of Strata Materials	Log	USCS	Blows on spoon per 6" penetration N_1= 6"	N_2= 6"	N_3= 6"	N= N_2+N_3	Remarks
D-1		1.5	3.0	Brown soft to firm silty CLAY, little sand		CL	1	1	2	**3**	
D-2		3.0					1	3	5	**8**	UD-1 (2.05-2.55)m
D-3		4.5	12.0	Gray very soft to firm silty CLAY, trace sand		CL	1	2	2	**4**	
D-4		6.0					1	1	1	**2**	
D-5		7.5					1	1	2	**3**	
D-6		9.0					1	1	2	**3**	
D-7		10.5					1	2	2	**4**	
D-8		12.0					1	1	2	**3**	
D-9		13.5					2	3	3	**6**	
D-10		15.0					2	3	5	**8**	

Standard penetration resistance (S P T)

Blows per 0.30m/1ft



Sample Index

Disturbed

Undisturbed

Hifab International AB

Client	: Roads and Highways Department (RHD)
Project	: Sub-Regional Road Transportation Project (SRTPPF-II)
Road	: Sylhet- Sutarkandi.

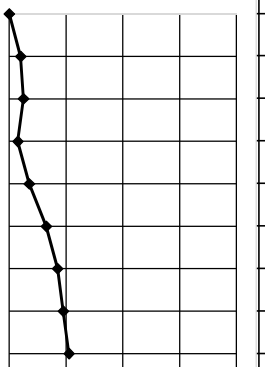
BORE HOLE NO : 02	Location : RB	METHOD OF BORING : WASH BORING	DATE OF STARTING : 18.08.2018
BORE DEPTH : 12.0 m	Northing : 24.893108	DIAMETER OF BORING : 100mm	DATE OF COMPLETION : 18.08.2018
R.L. : (-) 1.51 m	Easting : 92.119766	INCLINATION : VERTICAL	GROUND WATER LEVEL : (-) 1.0 m

Sample No.	Type of Sample	Depth (m)	Layer Thickness (m)	Description of Strata Materials	Log	USCS	Blows on spoon per 6" penetration N_1= 6"	N_2= 6"	N_3= 6"	N= N_2+N_3	Remarks
D-1		1.5	1.5	Brown soft silty CLAY		CL	1	2	2	**4**	
D-2		3.0	4.5	Gray soft to firm silty CLAY, trace sand		CL	1	2	3	**5**	
D-3		4.5					1	1	2	**3**	UD-1 (3.60-4.05)m
D-4		6.0					2	3	4	**7**	
D-5		7.5	6.0	Gray medium dense silty SAND		SM	4	6	7	**13**	
D-6		9.0					4	8	9	**17**	
D-7		10.5					6	9	10	**19**	
D-8		12.0					7	10	11	**21**	

Standard penetration resistance (S P T)

Blows per 0.30m/1ft

0 20 40 60 80



Sample Index

Disturbed

Undisturbed

Hifab International AB

Client	: Roads and Highways Department (RHD)
Project	: Sub-Regional Road Transportation Project (SRTPPF-II)
Road	: Sylhet- Sutarkandi.

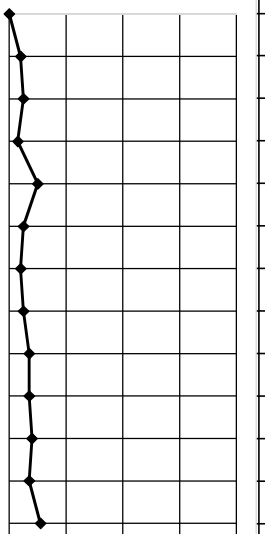
BORE HOLE NO : 03	Location : RB	METHOD OF BORING : WASH BORING	DATE OF STARTING : 17.08.2018
BORE DEPTH : 18.0 m	Northing : 24.881276	DIAMETER OF BORING : 100mm	DATE OF COMPLETION : 17.08.2018
R.L. : (-) 1.40 m	Easting : 92.225031	INCLINATION : VERTICAL	GROUND WATER LEVEL : (-) 0.70 m

Sample No.	Type of Sample	Depth (m)	Layer Thickness (m)	Description of Strata Materials	Log	USCS	Blows on spoon per 6" penetration N_1= 6"	N_2= 6"	N_3= 6"	N= N_2+N_3	Remarks
D-1		1.5	3.0	Brownish soft to firm silty CLAY, trace sand		CL	1	2	2	**4**	
D-2		3.0					1	2	3	**5**	UD-1 (2.05-2.55)m
D-3		4.5	15.0	Gray soft to stiff clayey SILT, little sand		ML	1	1	2	**3**	
D-4		6.0					3	4	6	**10**	
D-5		7.5					1	2	3	**5**	
D-6		9.0					1	2	2	**4**	
D-7		10.5					2	2	3	**5**	
D-8		12.0					2	3	4	**7**	
D-9		13.5					2	2	5	**7**	
D-10		15.0					2	3	5	**8**	
D-11		16.5					2	3	4	**7**	
D-12		18.0					3	5	6	**11**	

Standard penetration resistance (S P T)

Blows per 0.30m/1ft

0 20 40 60 80



Sample Index

Disturbed

Undisturbed

Hifab International AB

Client	: Roads and Highways Department (RHD)
Project	: Sub-Regional Road Transportation Project (SRTPPF-II)
Road	: Sylhet- Sutarkandi.

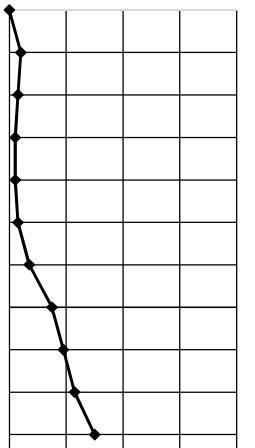
BORE HOLE NO : 04	Location : RB	METHOD OF BORING : WASH BORING	DATE OF STARTING : 17.08.2018
BORE DEPTH : 15.0 m	Northing : 24.897400	DIAMETER OF BORING : 100mm	DATE OF COMPLETION : 17.08.2018
R.L. : (-) 2.80 m	Easting : 92.174600	INCLINATION : VERTICAL	GROUND WATER LEVEL : (-) 0.70 m

Sample No.	Type of Sample	Depth (m)	Layer Thickness (m)	Description of Strata Materials	Log	USCS	Blows on spoon per 6" penetration N_1= 6"	N_2= 6"	N_3= 6"	N= N_2+N_3	Remarks
D-1		1.5	9.0	Gray very soft to firm silty CLAY, trace sand		CL	1	2	2	**4**	
D-2		3.0					1	1	2	**3**	UD-1 (2.05-2.55)m
D-3		4.5					1	1	1	**2**	
D-4		6.0					1	1	1	**2**	
D-5		7.5					1	1	2	**3**	
D-6		9.0					2	3	4	**7**	
D-7		10.5	6.0	Gray medium dense silty SAND		SM	3	6	9	**15**	
D-8		12.0					4	7	12	**19**	
D-9		13.5					4	8	15	**23**	
D-10		15.0					5	10	20	**30**	

Standard penetration resistance (S P T)

Blows per 0.30m/1ft

0 20 40 60 80



Sample Index

Disturbed

Undisturbed

APPENDIX C

Summery of Laboratory Test Results

SUMMARY OF TEST RESULTS

Project : Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi Road.

Client : Roads and Highways Department (RHD)

Borehole No. :			01 (BR-1)							
Sample No.			D-5	D-16	D-25	D-29	D-33	UD-1		
Depth, m		From	7.05	23.55	37.05	43.05	49.05	3.60		
		to	7.50	24.00	37.50	43.50	49.50	4.05		
Soil										
Moisture Content:		%	29.66	26.05		23.69		19.98		
Bulk Density		kN/m^3		17.54			18.27	18.85		
Dry Density		kN/m^3		13.91			14.98	15.71		
Atterberg Limits	Liquid Limit	%	43.00		35.00					
	Plastic Limit	%	27.00		24.00					
	Plasticity Index	%	16.00		11.00					
Grain Size Distribution	Gravel	%	0.00	0.00	0.00	0.00				
	Sand	%	6.13	70.74	6.66	71.28				
	Silt	%	86.26	29.26	77.16	28.72				
	Clay	%	7.61		16.18					
Specific Gravity/ Particle Density										
Unconfined Compression	Shear Strength	kPa						34.72		
	Compressive Strength	kPa						69.43		
Triaxial Comp. (UU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CIU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CID)	Cohesion	kPa								
	Phi angle	°								
Consolidation	Initial Void Ratio									
	Degree of Saturation	%								
	Re-compression Index, Cr									
	Compression Index, Cc									
Direct Shear	Cohesion	kPa					0.00			
	Phi angle	°					32.20			
Compaction	Maximum Dry Density	Mg/m3								
	Optimum MC	%								
Rock										
Point Load	Strength Index	Mpa								
UCT	Compressive Strength	Mpa								
Water										
	Ph									
	Chloride	mg/L								
	Sulphate	mg/L								

Legend: UC - Unconfined Compression
UU - Unconsolidated Undrained
CIU - Consolidated Isotropic Undrained
CID - Consolidated Isotropic Drained
OD- Direct Shear
OED - Oedometer

Remarks:

SUMMARY OF TEST RESULTS

Project : Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi Road.

Client : Roads and Highways Department (RHD)

Borehole No. :			02(BR-1)							
Sample No.			D-5	D-19	D-24	D-27	UD-1			
Depth, m		From	7.05	28.05	35.55	40.05	2.05			
		to	7.50	28.50	36.00	40.50	2.55			
Soil										
Moisture Content:		%	31.91		19.02		26.34			
Bulk Density		kN/m^3			18.87	18.32	19.19			
Dry Density		kN/m^3			15.85	15.03	15.19			
Atterberg Limits	Liquid Limit	%	39.00	42.00						
	Plastic Limit	%	28.00	22.00						
	Plasticity Index	%	11.00	20.00						
Grain Size Distribution	Gravel	%	0.00	0.00	0.00	0.00				
	Sand	%	16.12	8.18	71.34	91.57				
	Silt	%	76.57	76.97	28.66	8.430				
	Clay	%	7.31	14.85						
Specific Gravity/ Particle Density										
Unconfined Compression	Shear Strength	kPa					38.66			
	Compressive Strength	kPa					77.32			
Triaxial Comp. (UU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CIU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CID)	Cohesion	kPa								
	Phi angle	°								
Consolidation	Initial Void Ratio									
	Degree of Saturation	%								
	Re-compression Index, Cr									
	Compression Index, Cc									
Direct Shear	Cohesion	kPa				0.00				
	Phi angle	°				34.30				
Compaction	Maximum Dry Density	Mg/m3								
	Optimum MC	%								
Rock										
Point Load	Strength Index	Mpa								
UCT	Compressive Strength	Mpa								
Water										
	Ph									
	Chloride	mg/L								
	Sulphate	mg/L								

Legend: UC - Unconfined Compression
UU - Unconsolidated Undrained
CIU - Consolidated Isotropic Undrained
CID - Consolidated Isotropic Drained
OD- Direct Shear
OED - Oedometer

Remarks:

SUMMARY OF TEST RESULTS

Project : Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi Road.

Client : Roads and Highways Department (RHD)

Borehole No. :			03 (BR-1)							
Sample No.			D-7	D-13	D-18	D-20	D-26	D-31	UD-1	
Depth, m		From	10.05	19.05	26.55	29.55	38.55	46.05	3.60	
		to	10.50	19.50	27.00	30.00	39.00	46.50	4.05	
Soil										
Moisture Content:		%	31.59		22.32				28.81	
Bulk Density		kN/m^3			19.30			18.26	18.45	
Dry Density		kN/m^3			15.78			13.40	14.32	
Atterberg Limits	Liquid Limit	%	49.00			37.00				
	Plastic Limit	%	27.00			26.00				
	Plasticity Index	%	22.00			11.00				
Grain Size Distribution	Gravel	%		0.00	0.00	0.00	0.00	0.00		
	Sand	%		11.21	80.44	15.77	86.40	75.13		
	Silt	%		72.82	19.56	76.63	13.60	24.87		
	Clay	%		15.97		7.60				
Specific Gravity/ Particle Density										
Unconfined Compression	Shear Strength	kPa							35.63	
	Compressive Strength	kPa							71.25	
Triaxial Comp. (UU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CIU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CID)	Cohesion	kPa								
	Phi angle	°								
Consolidation	Initial Void Ratio									
	Degree of Saturation	%								
	Re-compression Index, Cr									
	Compression Index, Cc									
Direct Shear	Cohesion	kPa						0.00		
	Phi angle	°						31.70		
Compaction	Maximum Dry Density	Mg/m3								
	Optimum MC	%								
Rock										
Point Load	Strength Index	Mpa								
UCT	Compressive Strength	Mpa								
Water										
	Ph									
	Chloride	mg/L								
	Sulphate	mg/L								

Legend: UC - Unconfined Compression
UU - Unconsolidated Undrained
CIU - Consolidated Isotropic Undrained
CID - Consolidated Isotropic Drained
OD- Direct Shear
OED - Oedometer

Remarks:

SUMMARY OF TEST RESULTS

Project : Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi Road.

Client : Roads and Highways Department (RHD)

Borehole No. :			01 (BR-2)							
Sample No.			D-2	D-13	D-15	D-18	D-26	D-30	UD-1	
Depth, m		From	2.55	19.05	22.05	26.55	38.55	44.55	2.10	
		to	3.00	19.50	22.50	27.00	39.00	45.00	2.55	
Soil										
Moisture Content:		%	28.86		20.99		21.73		23.87	
Bulk Density		kN/m^3			19.18			19.07	19.49	
Dry Density		kN/m^3			15.85			13.41	15.74	
Atterberg Limits	Liquid Limit	%	36.00	43.00		39.00				
	Plastic Limit	%	19.00	21.00		28.00				
	Plasticity Index	%	17.00	22.00		11.00				
Grain Size Distribution	Gravel	%	0.00	0.00		0.00	0.00	0.00		
	Sand	%	9.55	3.77		13.66	57.74	90.27		
	Silt	%	78.14	82.81		76.18	42.26	9.73		
	Clay	%	12.31	13.42		10.16				
Specific Gravity/ Particle Density										
Unconfined Compression	Shear Strength	kPa							40.24	
	Compressive Strength	kPa							80.47	
Triaxial Comp. (UU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CIU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CID)	Cohesion	kPa								
	Phi angle	°								
Consolidation	Initial Void Ratio									
	Degree of Saturation	%								
	Re-compression Index, Cr									
	Compression Index, Cc									
Direct Shear	Cohesion	kPa						0.00		
	Phi angle	°						32.20		
Compaction	Maximum Dry Density	Mg/m3								
	Optimum MC	%								
Rock										
Point Load	Strength Index	Mpa								
UCT	Compressive Strength	Mpa								
Water										
	Ph									
	Chloride	mg/L								
	Sulphate	mg/L								

Legend: UC - Unconfined Compression
UU - Unconsolidated Undrained
CIU - Consolidated Isotropic Undrained
CID - Consolidated Isotropic Drained
OD- Direct Shear
OED - Oedometer

Remarks:

SUMMARY OF TEST RESULTS

Project : Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.

Client : Roads and Highways Department (RHD)

Borehole No. :			02 (BR-2)							
Sample No.			D-3	D-10	D-18	D-21	D-29	UD-1		
Depth, m		From	4.05	14.55	26.55	31.05	43.05	5.10		
		to	4.50	15.00	27.00	31.50	43.50	5.55		
Soil										
Moisture Content:		%	34.89		19.20	19.02		25.10		
Bulk Density		kN/m^3			18.06	18.62	19.72	18.74		
Dry Density		kN/m^3			15.15	15.65	15.68	14.98		
Atterberg Limits	Liquid Limit	%	46.00	47.00						
	Plastic Limit	%	21.00	20.00						
	Plasticity Index	%	25.00	27.00						
Grain Size Distribution	Gravel	%	0.00	0.00	0.00		0.00			
	Sand	%	6.81	4.12	82.47		90.78			
	Silt	%	75.86	76.26	17.53		9.220			
	Clay	%	17.33	19.62						
Specific Gravity/ Particle Density										
Unconfined Compression	Shear Strength	kPa						37.36		
	Compressive Strength	kPa						74.72		
Triaxial Comp. (UU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CIU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CID)	Cohesion	kPa								
	Phi angle	°								
Consolidation	Initial Void Ratio									
	Degree of Saturation	%								
	Re-compression Index, Cr									
	Compression Index, Cc									
Direct Shear	Cohesion	kPa					0.00			
	Phi angle	°					35.30			
Compaction	Maximum Dry Density	Mg/m3								
	Optimum MC	%								
Rock										
Point Load	Strength Index	Mpa								
UCT	Compressive Strength	Mpa								
Water										
	Ph									
	Chloride	mg/L								
	Sulphate	mg/L								

Legend: UC - Unconfined Compression
UU - Unconsolidated Undrained
CIU - Consolidated Isotropic Undrained
CID - Consolidated Isotropic Drained
OD- Direct Shear
OED - Oedometer

Remarks:

SUMMARY OF TEST RESULTS

Project : Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.

Client : Roads and Highways Department (RHD)

Borehole No. :			01 (BR-3)							
Sample No.			D-3	D-13	D-16	D-19	D-25	UD-1		
Depth, m		From	4.05	19.05	23.55	28.05	37.05	2.10		
		to	4.50	19.50	24.00	28.50	37.50	2.55		
Soil										
Moisture Content:		%	31.50	19.69		21.93		25.72		
Bulk Density		kN/m^3		18.78		18.63	18.80	18.83		
Dry Density		kN/m^3		15.69		15.28	13.05	14.98		
Atterberg Limits	Liquid Limit	%	46.00		44.00					
	Plastic Limit	%	21.00		19.00					
	Plasticity Index	%	25.00	0.00	25.00					
Grain Size Distribution	Gravel	%	0.00	0.00	0.00		0.00			
	Sand	%	5.68	65.93	8.18		85.09			
	Silt	%	68.58	34.07	73.56		14.91			
	Clay	%	25.74		18.26					
Specific Gravity/ Particle Density										
Unconfined Compression	Shear Strength	kPa						38.98		
	Compressive Strength	kPa						77.96		
Triaxial Comp. (UU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CIU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CID)	Cohesion	kPa								
	Phi angle	°								
Consolidation	Initial Void Ratio									
	Degree of Saturation	%								
	Re-compression Index, Cr									
	Compression Index, Cc									
Direct Shear	Cohesion	kPa					0.00			
	Phi angle	°					32.20			
Compaction	Maximum Dry Density	Mg/m3								
	Optimum MC	%								
Rock										
Point Load	Strength Index	Mpa								
UCT	Compressive Strength	Mpa								
Water										
	Ph									
	Chloride	mg/L								
	Sulphate	mg/L								

Legend: UC - Unconfined Compression
UU - Unconsolidated Undrained
CIU - Consolidated Isotropic Undrained
CID - Consolidated Isotropic Drained
OD- Direct Shear
OED - Oedometer

Remarks:

SUMMARY OF TEST RESULTS

Project : Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.

Client : Roads and Highways Department (RHD)

Borehole No. :			02 (BR-3)							
Sample No.			D-7	D-11	D-17	D-19	D-26	UD-1		
Depth, m		From	10.05	16.05	25.05	28.05	38.55	3.60		
		to	10.50	16.50	25.50	28.50	39.00	4.05		
Soil										
Moisture Content:		%	37.07	24.53		19.07		20.29		
Bulk Density		kN/m^3		19.49		18.99	19.64	19.38		
Dry Density		kN/m^3		15.65		15.95	13.63	16.11		
Atterberg Limits	Liquid Limit	%	45.00		37.00					
	Plastic Limit	%	21.00		25.00					
	Plasticity Index	%	24.00		12.00					
Grain Size Distribution	Gravel	%	0.00	0.00	0.00	0.00	0.00			
	Sand	%	7.97	41.44	9.81	76.61	88.39			
	Silt	%	76.98	58.56	77.15	23.39	11.61			
	Clay	%	15.05		13.04					
Specific Gravity/ Particle Density										
Unconfined Compression	Shear Strength	kPa						43.65		
	Compressive Strength	kPa						87.29		
Triaxial Comp. (UU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CIU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CID)	Cohesion	kPa								
	Phi angle	°								
Consolidation	Initial Void Ratio									
	Degree of Saturation	%								
	Re-compression Index, Cr									
	Compression Index, Cc									
Direct Shear	Cohesion	kPa					0.00			
	Phi angle	°					33.30			
Compaction	Maximum Dry Density	Mg/m3								
	Optimum MC	%								
Rock										
Point Load	Strength Index	Mpa								
UCT	Compressive Strength	Mpa								
Water										
	Ph									
	Chloride	mg/L								
	Sulphate	mg/L								

Legend: UC - Unconfined Compression
UU - Unconsolidated Undrained
CIU - Consolidated Isotropic Undrained
CID - Consolidated Isotropic Drained
OD- Direct Shear
OED - Oedometer

Remarks:

SUMMARY OF TEST RESULTS

Project : Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.

Client : Roads and Highways Department (RHD)

Borehole No. :			RB-01							
Sample No.			D-2	D-10	UD-1					
Depth, m		From	2.55	14.55	2.10					
		to	3.00	15.00	2.55					
Soil										
Moisture Content:		%	28.67		20.54					
Bulk Density		kN/m^3			19.90					
Dry Density		kN/m^3			16.51					
Atterberg Limits	Liquid Limit	%	43.00	46.00						
	Plastic Limit	%	21.00	22.00						
	Plasticity Index	%	22.00	24.00						
Grain Size Distribution	Gravel	%	0.00	0.00						
	Sand	%	10.09	7.58						
	Silt	%	75.37	73.47						
	Clay	%	14.54	18.95						
Specific Gravity/ Particle Density					2.70					
Unconfined Compression	Shear Strength	kPa			48.97					
	Compressive Strength	kPa			97.94					
Triaxial Comp. (UU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CIU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CID)	Cohesion	kPa								
	Phi angle	°								
Consolidation	Initial Void Ratio				1.085					
	Degree of Saturation	%			17.93					
	Re-compression Index, Cr				0.080					
	Compression Index, Cc				0.343					
Direct Shear	Cohesion	kPa								
	Phi angle	°								
Compaction	Maximum Dry Density	Mg/m3								
	Optimum MC	%								
Rock										
Point Load	Strength Index	Mpa								
UCT	Compressive Strength	Mpa								
Water										
	Ph									
	Chloride	mg/L								
	Sulphate	mg/L								

Legend: UC - Unconfined Compression
UU - Unconsolidated Undrained
CIU - Consolidated Isotropic Undrained
CID - Consolidated Isotropic Drained
OD- Direct Shear
OED - Oedometer

Remarks:

SUMMARY OF TEST RESULTS

Project : Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.

Client : Roads and Highways Department (RHD)

Borehole No. :			RB-02							
Sample No.			D-3	D-7	UD-1					
Depth, m		From	4.05	10.05	3.60					
		to	4.50	10.50	4.05					
Soil										
Moisture Content:		%	27.64	20.48	23.16					
Bulk Density		kN/m^3		18.76	16.69					
Dry Density		kN/m^3		15.57	13.47					
Atterberg Limits	Liquid Limit	%	42.00							
	Plastic Limit	%	21.00							
	Plasticity Index	%	21.00							
Grain Size Distribution	Gravel	%	0.00	0.00						
	Sand	%	8.58	62.72						
	Silt	%	78.19	37.28						
	Clay	%	13.23							
Specific Gravity/ Particle Density					2.70					
Unconfined Compression	Shear Strength	kPa			37.23					
	Compressive Strength	kPa			74.45					
Triaxial Comp. (UU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CIU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CID)	Cohesion	kPa								
	Phi angle	°								
Consolidation	Initial Void Ratio				1.108					
	Degree of Saturation	%			20.55					
	Re-compression Index, Cr				0.077					
	Compression Index, Cc				0.301					
Direct Shear	Cohesion	kPa								
	Phi angle	°								
Compaction	Maximum Dry Density	Mg/m3								
	Optimum MC	%								
Rock										
Point Load	Strength Index	Mpa								
UCT	Compressive Strength	Mpa								
Water										
	Ph									
	Chloride	mg/L								
	Sulphate	mg/L								

Legend: UC - Unconfined Compression
UU - Unconsolidated Undrained
CIU - Consolidated Isotropic Undrained
CID - Consolidated Isotropic Drained
OD- Direct Shear
OED - Oedometer

Remarks:

SUMMARY OF TEST RESULTS

Project : Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.

Client : Roads and Highways Department (RHD)

Borehole No. :			RB-03							
Sample No.			D-2	D-5	UD-1					
Depth, m		From	2.55	7.05	2.10					
		to	3.00	7.50	2.55					
Soil										
Moisture Content:		%	26.56		18.69					
Bulk Density		kN/m^3			19.72					
Dry Density		kN/m^3			16.63					
Atterberg Limits	Liquid Limit	%	46.00	36.00						
	Plastic Limit	%	20.00	25.00						
	Plasticity Index	%	26.00	11.00						
Grain Size Distribution	Gravel	%	0.00	0.00						
	Sand	%	3.64	13.24						
	Silt	%	75.47	77.34						
	Clay	%	20.89	9.42						
Specific Gravity/ Particle Density					2.71					
Unconfined Compression	Shear Strength	kPa			44.83					
	Compressive Strength	kPa			89.66					
Triaxial Comp. (UU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CIU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CID)	Cohesion	kPa								
	Phi angle	°								
Consolidation	Initial Void Ratio				0.962					
	Degree of Saturation	%			15.98					
	Re-compression Index, Cr				0.081					
	Compression Index, Cc				0.212					
Direct Shear	Cohesion	kPa								
	Phi angle	°								
Compaction	Maximum Dry Density	Mg/m3								
	Optimum MC	%								
Rock										
Point Load	Strength Index	Mpa								
UCT	Compressive Strength	Mpa								
Water										
	Ph									
	Chloride	mg/L								
	Sulphate	mg/L								

Legend: UC - Unconfined Compression
UU - Unconsolidated Undrained
CIU - Consolidated Isotropic Undrained
CID - Consolidated Isotropic Drained
OD- Direct Shear
OED - Oedometer

Remarks:

SUMMARY OF TEST RESULTS

Project : Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi Road.

Client : Roads and Highways Department (RHD)

Borehole No. :			RB-04							
Sample No.			D-3	D-8	UD-1					
Depth, m		From	4.05	11.55	2.10					
		to	4.50	12.00	2.55					
Soil										
Moisture Content:		%	34.89	21.85	21.62					
Bulk Density		kN/m^3		18.24	19.84					
Dry Density		kN/m^3		14.97	16.30					
Atterberg Limits	Liquid Limit	%	43.00							
	Plastic Limit	%	18.00							
	Plasticity Index	%	25.00							
Grain Size Distribution	Gravel	%	0.00	0.00						
	Sand	%	4.12	59.10						
	Silt	%	78.56	40.90						
	Clay	%	17.32							
Specific Gravity/ Particle Density					2.69					
Unconfined Compression	Shear Strength	kPa			35.27					
	Compressive Strength	kPa			70.53					
Triaxial Comp. (UU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CIU)	Cohesion	kPa								
	Phi angle	°								
Triaxial Comp. (CID)	Cohesion	kPa								
	Phi angle	°								
Consolidation	Initial Void Ratio				0.714					
	Degree of Saturation	%			19.01					
	Re-compression Index, Cr				0.046					
	Compression Index, Cc				0.182					
Direct Shear	Cohesion	kPa								
	Phi angle	°								
Compaction	Maximum Dry Density	Mg/m3								
	Optimum MC	%								
Rock										
Point Load	Strength Index	Mpa								
UCT	Compressive Strength	Mpa								
Water										
	Ph									
	Chloride	mg/L								
	Sulphate	mg/L								

Legend: UC - Unconfined Compression
UU - Unconsolidated Undrained
CIU - Consolidated Isotropic Undrained
CID - Consolidated Isotropic Drained
OD- Direct Shear
OED - Oedometer

Remarks:

APPENDIX D

Details Laboratory Test Results

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No:1 (BR-1)
Client: Roads and Highways Department (RHD)	Sample No: 5
Location: Sylhet- Sutarkandi Road.	Depth: 7.5 m
Sample Type: (Clayey SILT	Date: 11/09/18

Can No.	B	
Wt. of Can (g)	28.79	
Wt. of Can + wet soil (g)	114.13	
Wt. of Can + dry soil (g)	94.61	
Wt. of Moisture (g)	19.52	
Wt. of dry soil (g)	65.82	
Moisture Content, w (%)	29.66	
Average Moisture Content, w (%)	**29.66**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 1 (BR-1)
Client: Roads and Highways Department (RHD)	Sample No: 29
Location: Sylhet- Sutarkandi Road.	Depth: 43.5m
Sample Type: Silty Sand	Date: 11/09/18

Can No.	B	
Wt. of Can (g)	29.3	
Wt. of Can + wet soil (g)	134.67	
Wt. of Can + dry soil (g)	114.49	
Wt. of Moisture (g)	20.18	
Wt. of dry soil (g)	85.19	
Moisture Content, w (%)	23.69	
Average Moisture Content, w (%)	**23.69**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 02 (BR-1)
Client: Roads and Highways Department (RHD)	Sample No: 5
Location: Sylhet- Sutarkandi Road.	Depth: 7.5 m
Sample Type: (Clayey SILT	Date: 11/09/08

Can No.	11	
Wt. of Can (g)	33.28	
Wt. of Can + wet soil (g)	158.54	
Wt. of Can + dry soil (g)	128.24	
Wt. of Moisture (g)	30.3	
Wt. of dry soil (g)	94.96	
Moisture Content, w (%)	31.91	
Average Moisture Content, w (%)	**31.91**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 3 (BR-1)
Client: Roads and Highways Department (RHD)	Sample No: 7
Location: Sylhet- Sutarkandi Road.	Depth:10.5 m
Sample Type: Silty CLAY	Date: 12/09/18

Can No.	N	
Wt. of Can (g)	33.28	
Wt. of Can + wet soil (g)	158.24	
Wt. of Can + dry soil (g)	128.24	
Wt. of Moisture (g)	30	
Wt. of dry soil (g)	94.96	
Moisture Content, w (%)	31.59	
Average Moisture Content, w (%)	**31.59**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 1 (BR-2)
Client: Roads and Highways Department (RHD)	Sample No: 2
Location: Sylhet- Sutarkandi Road.	Depth: 3.0m
Sample Type: Silty CLAY	Date: 11/09/ 18

Can No.	K	
Wt. of Can (g)	29.85	
Wt. of Can + wet soil (g)	155.95	
Wt. of Can + dry soil (g)	127.71	
Wt. of Moisture (g)	28.24	
Wt. of dry soil (g)	97.86	
Moisture Content, w (%)	28.86	
Average Moisture Content, w (%)	**28.86**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 1 (BR-2)
Client: Roads and Highways Department (RHD)	Sample No: 26
Location: Sylhet- Sutarkandi Road.	Depth: 39.0 m
Sample Type: Silty Sand	Date: 12/09/08

Can No.	E	
Wt. of Can (g)	29.02	
Wt. of Can + wet soil (g)	159.97	
Wt. of Can + dry soil (g)	136.59	
Wt. of Moisture (g)	23.38	
Wt. of dry soil (g)	107.57	
Moisture Content, w (%)	21.73	
Average Moisture Content, w (%)	**21.73**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 2 (BR-2)
Client: Roads and Highways Department (RHD)	Sample No: 3
Location: Sylhet- Sutarkandi Road.	Depth:4.5 m
Sample Type: Silty CLAY	Date: 10/09/18

Can No.	I	
Wt. of Can (g)	29.39	
Wt. of Can + wet soil (g)	149.7	
Wt. of Can + dry soil (g)	118.58	
Wt. of Moisture (g)	31.12	
Wt. of dry soil (g)	89.19	
Moisture Content, w (%)	34.89	
Average Moisture Content, w (%)	**34.89**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 1 (BR-3)
Client: Roads and Highways Department (RHD)	Sample No: 3
Location: Sylhet- Sutarkandi Road.	Depth: 4.5m
Sample Type: Silty CLAY	Date: 10/09/ 18

Can No.	2	
Wt. of Can (g)	33.68	
Wt. of Can + wet soil (g)	138.38	
Wt. of Can + dry soil (g)	113.3	
Wt. of Moisture (g)	25.08	
Wt. of dry soil (g)	79.62	
Moisture Content, w (%)	31.50	
Average Moisture Content, w (%)	**31.50**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 2 (BR-3)
Client: Roads and Highways Department (RHD)	Sample No: 7
Location: Sylhet- Sutarkandi Road.	Depth: 10.5 m
Sample Type: Silty CLAY	Date: 10/09/08

Can No.	12	
Wt. of Can (g)	34.3	
Wt. of Can + wet soil (g)	128.26	
Wt. of Can + dry soil (g)	102.85	
Wt. of Moisture (g)	25.41	
Wt. of dry soil (g)	68.55	
Moisture Content, w (%)	37.07	
Average Moisture Content, w (%)	**37.07**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 01 (RB)
Client: Roads and Highways Department (RHD)	Sample No: 2
Location: Sylhet- Sutarkandi Road.	Depth: 3.0 m
Sample Type: Silty CLAY	Date: 11/09/18

Can No.	K	
Wt. of Can (g)	29.85	
Wt. of Can + wet soil (g)	155.95	
Wt. of Can + dry soil (g)	127.85	
Wt. of Moisture (g)	28.1	
Wt. of dry soil (g)	98	
Moisture Content, w (%)	28.67	
Average Moisture Content, w (%)	**28.67**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 02 (RB)
Client: Roads and Highways Department (RHD)	Sample No: 3
Location: Sylhet- Sutarkandi Road.	Depth: 4.5m
Sample Type: Silty CLAY	Date: 11/09/ 18

Can No.	13	
Wt. of Can (g)	33.08	
Wt. of Can + wet soil (g)	124.8	
Wt. of Can + dry soil (g)	104.94	
Wt. of Moisture (g)	19.86	
Wt. of dry soil (g)	71.86	
Moisture Content, w (%)	27.64	
Average Moisture Content, w (%)	**27.64**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 03 (RB)
Client: Roads and Highways Department (RHD)	Sample No: 2
Location: Sylhet- Sutarkandi Road.	Depth: 3.0 m
Sample Type: Silty CLAY	Date: 11/09/08

Can No.	M	
Wt. of Can (g)	29.28	
Wt. of Can + wet soil (g)	157.16	
Wt. of Can + dry soil (g)	130.32	
Wt. of Moisture (g)	26.84	
Wt. of dry soil (g)	101.04	
Moisture Content, w (%)	26.56	
Average Moisture Content, w (%)	**26.56**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No: 04 (RB)
Client: Roads and Highways Department (RHD)	Sample No: 3
Location: Sylhet- Sutarkandi Road.	Depth:4.5 m
Sample Type: Silty CLAY	Date: 10/09/18

Can No.	I	
Wt. of Can (g)	29.39	
Wt. of Can + wet soil (g)	149.7	
Wt. of Can + dry soil (g)	118.58	
Wt. of Moisture (g)	31.12	
Wt. of dry soil (g)	89.19	
Moisture Content, w (%)	34.89	
Average Moisture Content, w (%)	**34.89**	

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No:
Client: Roads and Highways Department (RHD)	Sample No:
Location: Sylhet- Sutarkandi Road.	Depth:
Sample Type:	Date:

Can No.		
Wt. of Can (g)		
Wt. of Can + wet soil (g)		
Wt. of Can + dry soil (g)		
Wt. of Moisture (g)		
Wt. of dry soil (g)		
Moisture Content, w (%)		
Average Moisture Content, w (%)		

MOISTURE CONTENT

Project: Sub-Regional Road Transportation Project (SRTPPF-ll)	BH No:
Client: Roads and Highways Department (RHD)	Sample No:
Location: Sylhet- Sutarkandi Road.	Depth:
Sample Type:	Date:

Can No.		
Wt. of Can (g)		
Wt. of Can + wet soil (g)		
Wt. of Can + dry soil (g)		
Wt. of Moisture (g)		
Wt. of dry soil (g)		
Moisture Content, w (%)		
Average Moisture Content, w (%)		

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi.			
Client:	Road and Highways Department			
Borehole No.	01 (BR-1)			
Sample number:	D16	Soil description:	Silty Sand	
Sample Depth:	24.0m	Bulk Soil Density:	17.54	KN/m3

Area=m2	0.00257
Ht. of Sample=mm	24.3
Volume=m3	0.000062451
Wt. of Can	28.77
Wt. of Can + Wet soil	140.4
Wt. of Can + Dry Soil	117.33
Mass of Water	23.07
Wt. of Dry Soil	88.56
NMC	26.0501355
Wt. of Soil (KN)	0.00109509
Bulk Soil Density=	17.53519239
Dry Soil Density=	13.91128405

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi.			
Client:	Road and Highways Department			
Borehole No.	02 (BR-1)			
Sample number:	D24	Soil description:	Silty Sand	
Sample Depth:	36.0m	Bulk Soil Density:	18.87	KN/m3

Area=m2	0.00257
Ht. of Sample=mm	24.5
Volume=m3	0.000062965
Wt. of Can	29.48
Wt. of Can + Wet soil	150.59
Wt. of Can + Dry Soil	131.23
Mass of Water	19.36
Wt. of Dry Soil	101.75
NMC	19.02702703
Wt. of Soil (KN)	0.001188089
Bulk Soil Density=	18.86903994
Dry Soil Density=	15.85273565

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi.			
Client:	Road and Highways Department			
Borehole No.	03 (BR-1)			
Sample number:	D18	Soil description:	Silty Sand	
Sample Depth:	27.0m	Bulk Soil Density:	19.30	KN/m3

Area=m2	0.00257
Ht. of Sample=mm	23.59
Volume=m3	6.06263E-05
Wt. of Can	29.72
Wt. of Can + Wet soil	148.99
Wt. of Can + Dry Soil	127.23
Mass of Water	21.76
Wt. of Dry Soil	97.51
NMC	22.31565993
Wt. of Soil (KN)	0.001170039
Bulk Soil Density=	19.29919358
Dry Soil Density=	15.77818702

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi.		
Client:	Road and Highways Department		
Borehole No.	01 (BR-2)		
Sample number:	D15	Soil description:	Silty Sand
Sample Depth:	22.5m	Bulk Soil Density:	19.18 KN/m3

Area=m2	0.00257
Ht. of Sample=mm	24.5
Volume=m3	0.000062965
Wt. of Can	29.48
Wt. of Can + Wet soil	152.59
Wt. of Can + Dry Soil	131.23
Mass of Water	21.36
Wt. of Dry Soil	101.75
NMC	20.99262899
Wt. of Soil (KN)	0.001207709
Bulk Soil Density=	19.18064163
Dry Soil Density=	15.85273565

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi.			
Client:	Road and Highways Department			
Borehole No.	02 (BR-2)			
Sample number:	D18	Soil description:	Silty Sand	
Sample Depth:	27.00m	Bulk Soil Density:	18.06	KN/m3

Area=m2	0.00257
Ht. of Sample=mm	24.4
Volume=m3	0.000062708
Wt. of Can	29.51
Wt. of Can + Wet soil	144.98
Wt. of Can + Dry Soil	126.38
Mass of Water	18.6
Wt. of Dry Soil	96.87
NMC	19.20099102
Wt. of Soil (KN)	0.001132761
Bulk Soil Density=	18.06405403
Dry Soil Density=	15.15428175

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi.		
Client:	Road and Highways Department		
Borehole No.	02 (BR-2)		
Sample number:	D21	Soil description:	Silty Sand
Sample Depth:	31.5m	Bulk Soil Density:	18.62 KN/m3

Area=m2	0.00257
Ht. of Sample=mm	24.5
Volume=m3	0.000062965
Wt. of Can	29.85
Wt. of Can + Wet soil	149.39
Wt. of Can + Dry Soil	130.29
Mass of Water	19.1
Wt. of Dry Soil	100.44
NMC	19.01632816
Wt. of Soil (KN)	0.001172687
Bulk Soil Density=	18.62443262
Dry Soil Density=	15.64863654

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi.		
Client:	Road and Highways Department		
Borehole No.	01 (BR-3)		
Sample number:	D13	Soil description:	Silty Sand
Sample Depth:	19.5m	Bulk Soil Density:	18.78 KN/m3

Area=m2	0.00257
Ht. of Sample=mm	21.25
Volume=m3	5.46125E-05
Wt. of Can	28.9
Wt. of Can + Wet soil	133.47
Wt. of Can + Dry Soil	116.27
Mass of Water	17.2
Wt. of Dry Soil	87.37
NMC	19.68639121
Wt. of Soil (KN)	0.001025832
Bulk Soil Density=	18.78382605
Dry Soil Density=	15.69420371

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi.		
Client:	Road and Highways Department		
Borehole No.	01 (BR-3)		
Sample number:	D19	Soil description:	Silty Sand
Sample Depth:	28.5 m	Bulk Soil Density:	18.63 KN/m3

Area=m2	0.00257
Ht. of Sample=mm	24.4
Volume=m3	0.000062708
Wt. of Can	29.07
Wt. of Can + Wet soil	148.16
Wt. of Can + Dry Soil	126.74
Mass of Water	21.42
Wt. of Dry Soil	97.67
NMC	21.93099212
Wt. of Soil (KN)	0.001168273
Bulk Soil Density=	18.63036455
Dry Soil Density=	15.27943325

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi.			
Client:	Road and Highways Department			
Borehole No.	02 (BR-3)			
Sample number:	D11	Soil description:	Silty Sand	
Sample Depth:	16.5m	Bulk Soil Density:	19.49	KN/m3

Area=m2	0.00257
Ht. of Sample=mm	24.4
Volume=m3	0.000062708
Wt. of Can	29.28
Wt. of Can + Wet soil	153.87
Wt. of Can + Dry Soil	129.33
Mass of Water	24.54
Wt. of Dry Soil	100.05
NMC	24.52773613
Wt. of Soil (KN)	0.001222228
Bulk Soil Density=	19.49078108
Dry Soil Density=	15.65175895

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi.			
Client:	Road and Highways Department			
Borehole No.	02 (BR-3)			
Sample number:	D19	Soil description:	Silty Sand	
Sample Depth:	28.5m	Bulk Soil Density:	18.99	KN/m3

Area=m2	0.00257
Ht. of Sample=mm	24.9
Volume=m3	0.000063993
Wt. of Can	29.28
Wt. of Can + Wet soil	153.16
Wt. of Can + Dry Soil	133.32
Mass of Water	19.84
Wt. of Dry Soil	104.04
NMC	19.06958862
Wt. of Soil (KN)	0.001215263
Bulk Soil Density=	18.99055834
Dry Soil Density=	15.94912569

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi.			
Client:	Road and Highways Department			
Borehole No.	RB-2			
Sample number:	D7	Soil description:	Silty Sand	
Sample Depth:	10.5m	Bulk Soil Density:	18.76	KN/m3

Area=m2	0.00257
Ht. of Sample=mm	24.25
Volume=m3	6.23225E-05
Wt. of Can	29.04
Wt. of Can + Wet soil	148.22
Wt. of Can + Dry Soil	127.96
Mass of Water	20.26
Wt. of Dry Soil	98.92
NMC	20.48119693
Wt. of Soil (KN)	0.001169156
Bulk Soil Density=	18.75977055
Dry Soil Density=	15.57070400

EHAN FOUNDATION SOLUTION

Project:	Sub-Regional Road Transportation Project (SRTPPF-ll), Sylhet- Sutarkandi.			
Client:	Road and Highways Department			
Borehole No.	RB-4			
Sample number:	D8	Soil description:	Silty Sand	
Sample Depth:	12.0m	Bulk Soil Density:	18.24	KN/m3

Area=m2	0.00257
Ht. of Sample=mm	24.85
Volume=m3	6.38645E-05
Wt. of Can	28.87
Wt. of Can + Wet soil	147.59
Wt. of Can + Dry Soil	126.3
Mass of Water	21.29
Wt. of Dry Soil	97.43
NMC	21.85158575
Wt. of Soil (KN)	0.001164643
Bulk Soil Density=	18.23615937
Dry Soil Density=	14.96587776

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-01**

Location: BR-1 — **Depth (m): 7.05-7.50 m**

Sample Type: Disturbed — **Date:** 13-09-18

Test Results

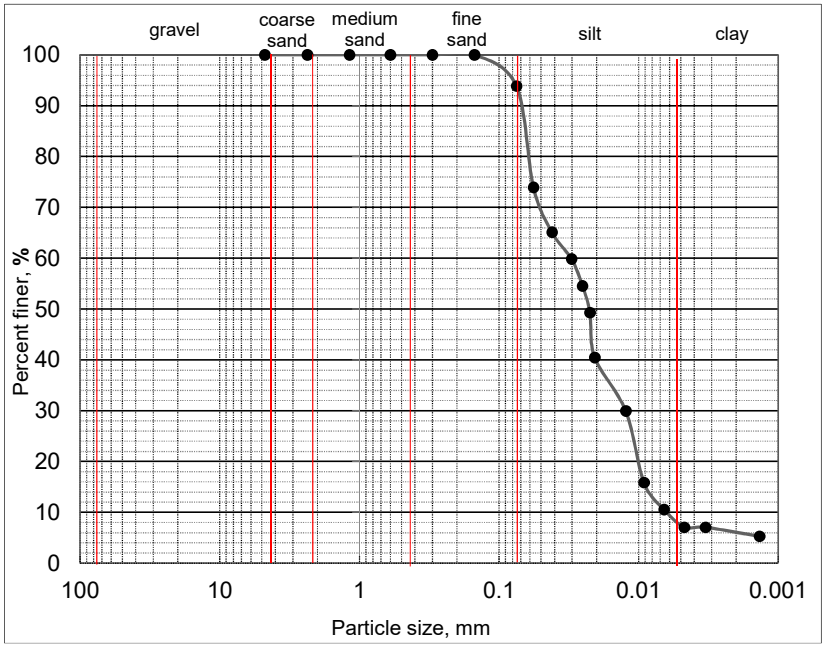
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	6.13	%
Silt size : 0.075 to 0.005 mm =	86.26	%
Clay size : smaller than 0.005 =	7.61	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.006	0.012	0.023	0.031	0.088	6.1	93.87	0.80	4.87			ML



Elapsed time (min)	Hydrometer reading
0.5	40
1	35
2	32
3	29
4	26
5	21
15	15
30	7
60	4
120	2
240	2
1440	1

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-01**

Location: BR-1 — **Depth (m): 37.05-37.50 m**

Sample Type: Disturbed — **Date:** 13-09-18

Test Results

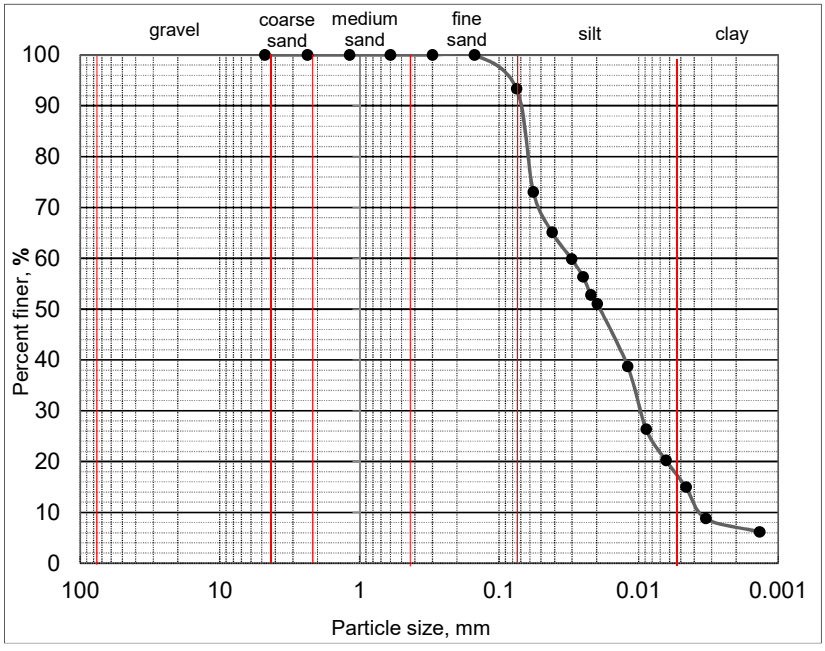
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	6.66	%
Silt size : 0.075 to 0.005 mm =	77.16	%
Clay size : smaller than 0.005 =	16.18	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.004	0.010	0.019	0.031	0.093	6.7	93.34	0.88	8.60			CL



Elapsed time (min)	Hydrometer reading
0.5	39.5
1	35
2	32
3	30
4	28
5	27
15	20
30	13
60	9.5
120	6.5
240	3
1440	1.5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-02**

Location: BR-1 — **Depth (m): 7.05-7.50 m**

Sample Type: Disturbed — **Date:** 13-09-18

Test Results

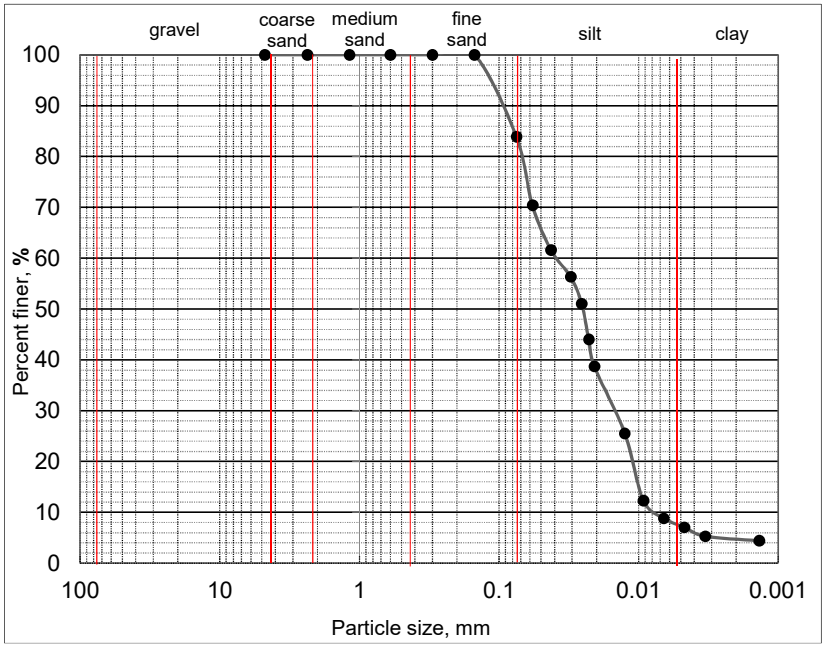
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	16.12	%
Silt size : 0.075 to 0.005 mm =	76.57	%
Clay size : smaller than 0.005 =	7.32	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.008	0.015	0.025	0.039	0.126	16.1	83.88	0.81	5.17			ML



Elapsed time (min)	Hydrometer reading
0.5	38
1	33
2	30
3	27
4	23
5	20
15	12.5
30	5
60	3
120	2
240	1
1440	0.5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-02**

Location: BR-1 — **Depth (m): 28.05-28.50 m**

Sample Type: Disturbed — **Date:** 13-09-18

Test Results

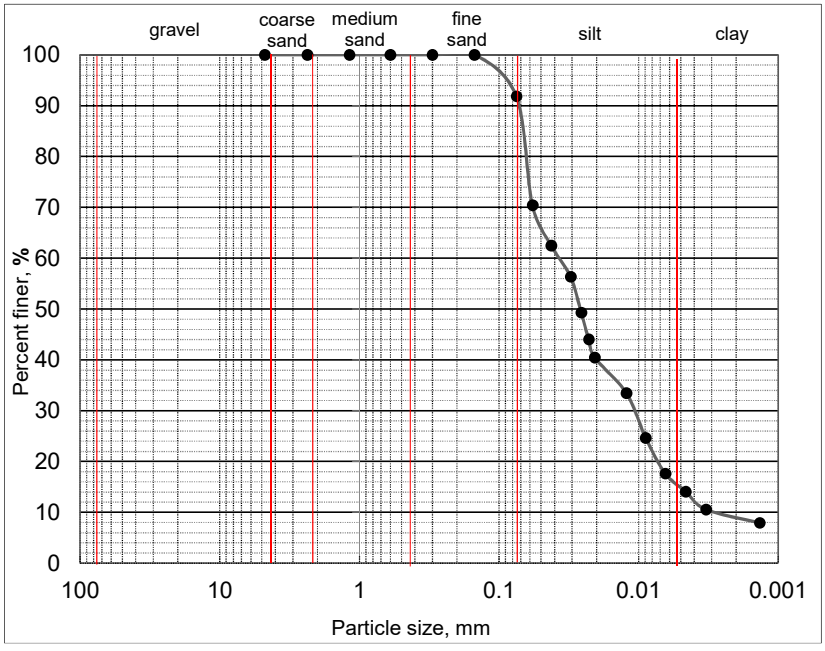
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	8.18	%
Silt size : 0.075 to 0.005 mm =	76.97	%
Clay size : smaller than 0.005 =	14.85	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.003	0.011	0.026	0.038	0.103	8.2	91.82	1.10	13.05			CL



Elapsed time (min)	Hydrometer reading
0.5	38
1	33.5
2	30
3	26
4	23
5	21
15	17
30	12
60	8
120	6
240	4
1440	2.5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-03**

Location: BR-1 — **Depth (m): 19.05-19.50 m**

Sample Type: Disturbed — **Date:** 13-09-18

Test Results

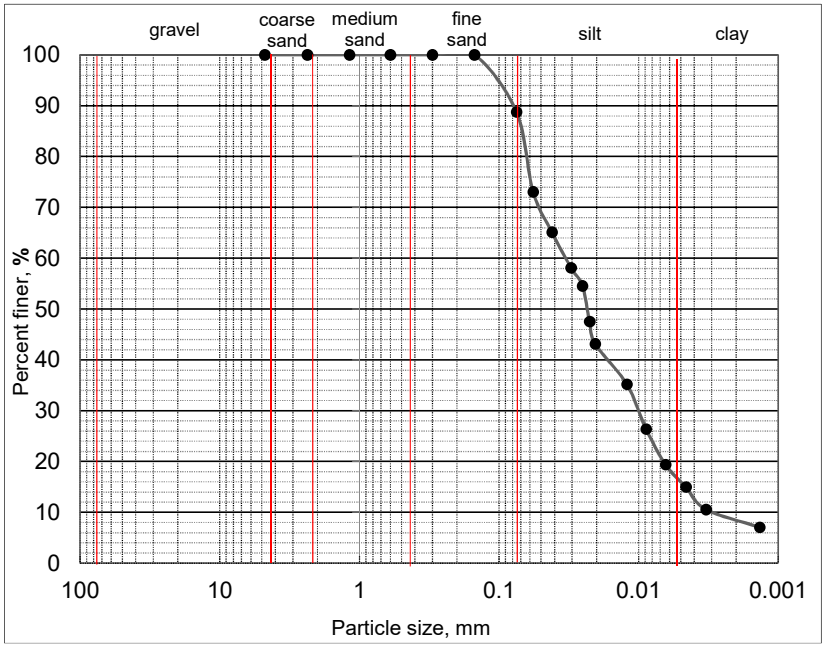
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	11.21	%
Silt size : 0.075 to 0.005 mm =	72.82	%
Clay size : smaller than 0.005 =	15.97	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.003	0.010	0.023	0.033	0.116	11.2	88.79	1.04	11.24			ML



Elapsed time (min)	Hydrometer reading
0.5	39.5
1	35
2	31
3	29
4	25
5	22.5
15	18
30	13
60	9
120	6.5
240	4
1440	2

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-03**

Location: BR-1 — **Depth (m): 29.55-30.0 m**

Sample Type: Disturbed — **Date:** 13-09-18

Test Results

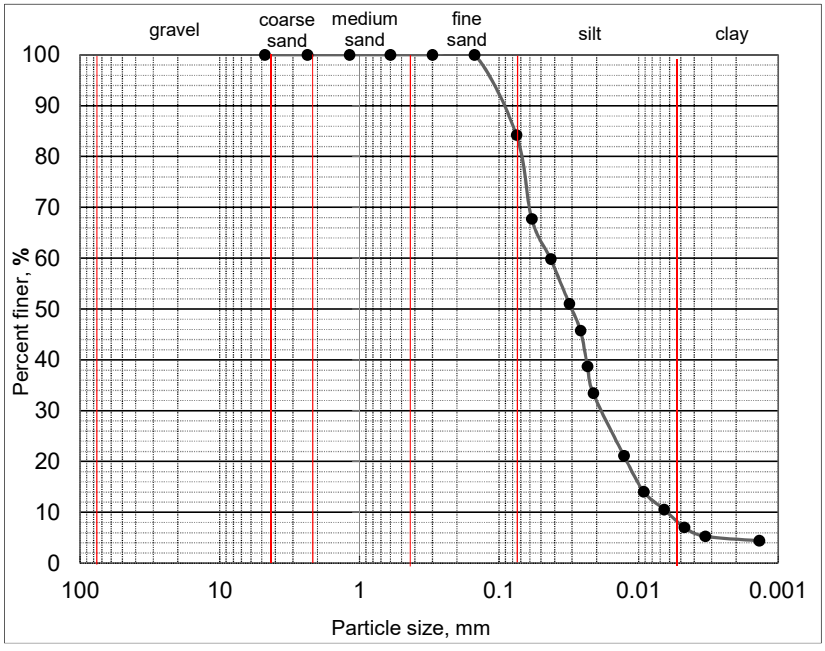
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	15.77	%
Silt size : 0.075 to 0.005 mm =	76.63	%
Clay size : smaller than 0.005 =	7.61	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.006	0.019	0.030	0.043	0.125	15.8	84.23	1.31	6.86			ML



Elapsed time (min)	Hydrometer reading
0.5	36.5
1	32
2	27
3	24
4	20
5	17
15	10
30	6
60	4
120	2
240	1
1440	0.5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-01**

Location: BR-2 — **Depth (m): 2.55-3.00 m**

Sample Type: Disturbed — **Date:** 15-09-18

Test Results

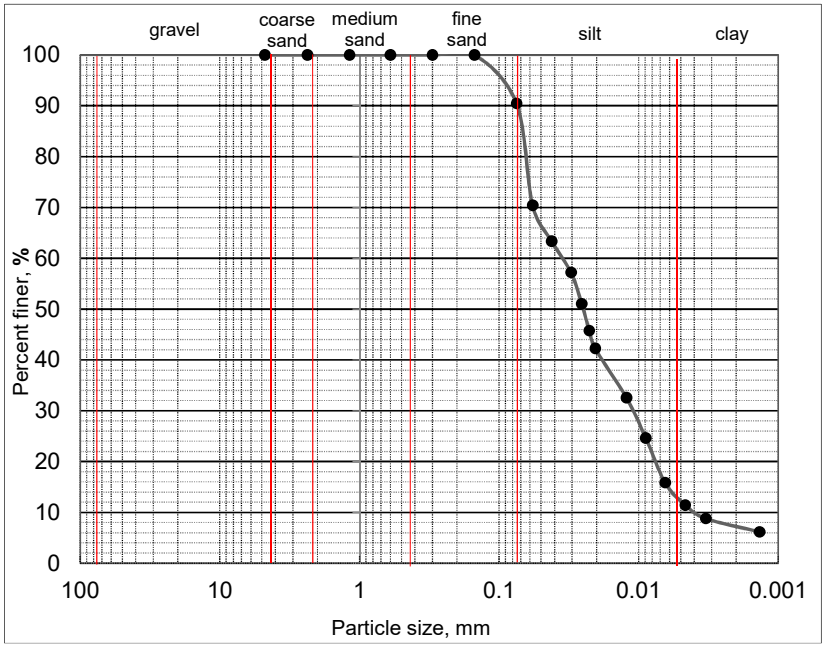
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	9.55	%
Silt size : 0.075 to 0.005 mm =	78.14	%
Clay size : smaller than 0.005 =	12.32	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.004	0.011	0.025	0.036	0.110	9.5	90.45	0.89	9.15			CL



Elapsed time (min)	Hydrometer reading
0.5	38
1	34
2	30.5
3	27
4	24
5	22
15	16.5
30	12
60	7
120	4.5
240	3
1440	1.5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-01**

Location: BR-02 — **Depth (m): 19.05-19.50 m**

Sample Type: Disturbed — **Date:** 15-09-18

Test Results

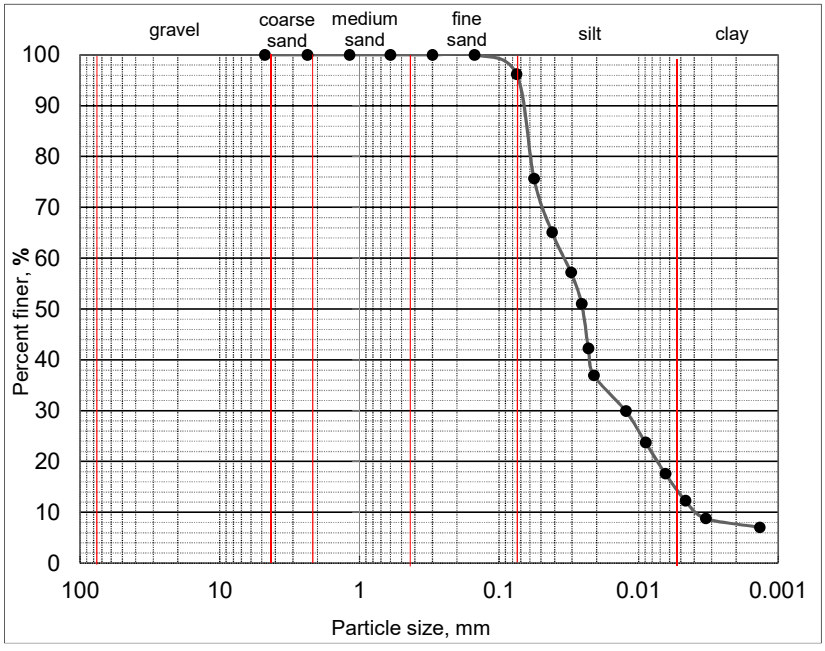
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	3.77	%
Silt size : 0.075 to 0.005 mm =	82.81	%
Clay size : smaller than 0.005 =	13.42	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.004	0.012	0.025	0.034	0.073	3.8	96.23	1.20	9.19			CL



Elapsed time (min)	Hydrometer reading
0.5	41
1	35
2	30.5
3	27
4	22
5	19
15	15
30	11.5
60	8
120	5
240	3
1440	2

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-01**

Location: BR-2 — **Depth (m): 26.55-27.0 m**

Sample Type: Disturbed — **Date:** 15-09-18

Test Results

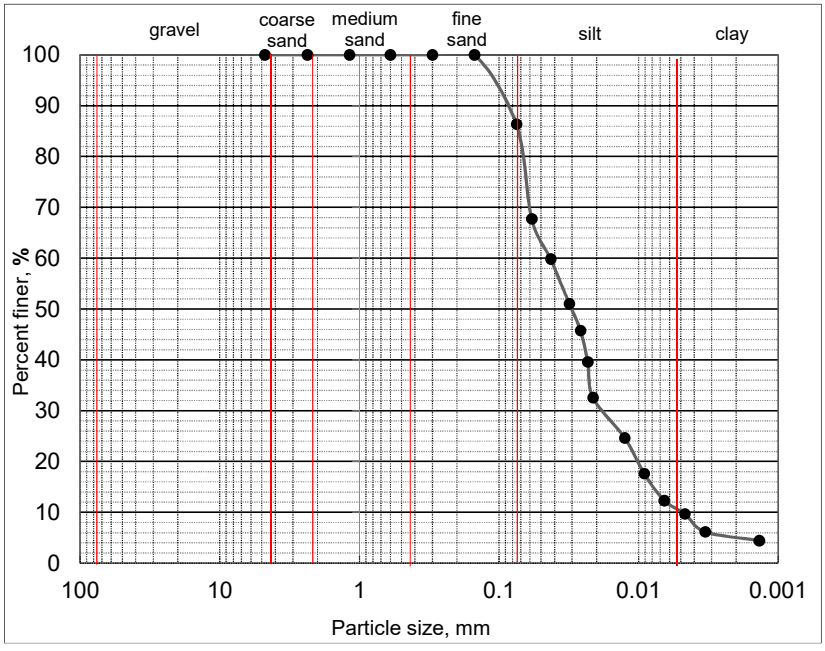
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	13.66	%
Silt size : 0.075 to 0.005 mm =	76.18	%
Clay size : smaller than 0.005 =	10.16	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.005	0.018	0.030	0.043	0.122	13.7	86.34	1.61	8.80			ML



Elapsed time (min)	Hydrometer reading
0.5	36.5
1	32
2	27
3	24
4	20.5
5	16.5
15	12
30	8
60	5
120	3.5
240	1.5
1440	0.5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-02**

Location: BR-02 — **Depth (m): 4.05-4.50 m**

Sample Type: Disturbed — **Date:** 15-09-18

Test Results

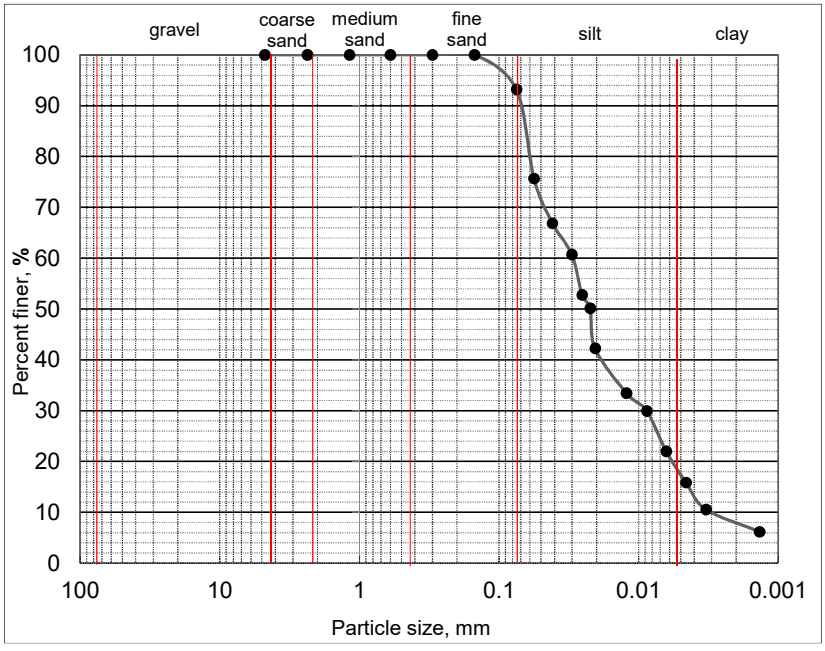
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	6.81	%
Silt size : 0.075 to 0.005 mm =	75.86	%
Clay size : smaller than 0.005 =	17.33	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.003	0.009	0.022	0.030	0.094	6.8	93.19	0.86	9.75			CL



Elapsed time (min)	Hydrometer reading
0.5	41
1	36
2	32.5
3	28
4	26.5
5	22
15	18
30	15
60	10.5
120	7
240	4
1440	1.5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-02**

Location: BR-02 — **Depth (m): 14.55-15.0 m**

Sample Type: Disturbed — **Date:** 15-09-18

Test Results

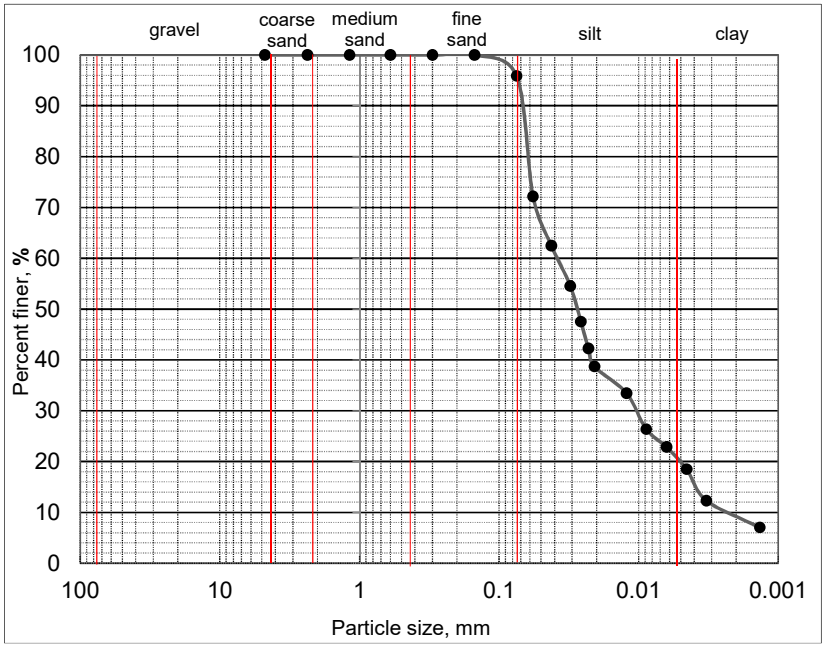
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	4.12	%
Silt size : 0.075 to 0.005 mm =	76.26	%
Clay size : smaller than 0.005 =	19.62	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.002	0.011	0.028	0.039	0.073	4.1	95.88	1.19	15.92			CL



Elapsed time (min)	Hydrometer reading
0.5	39
1	33.5
2	29
3	25
4	22
5	20
15	15.5
30	13
60	11
120	8.5
240	5
1440	2

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-01**

Location: BR-3 — **Depth (m): 4.05-4.50 m**

Sample Type: Disturbed — **Date:** 14-09-18

Test Results

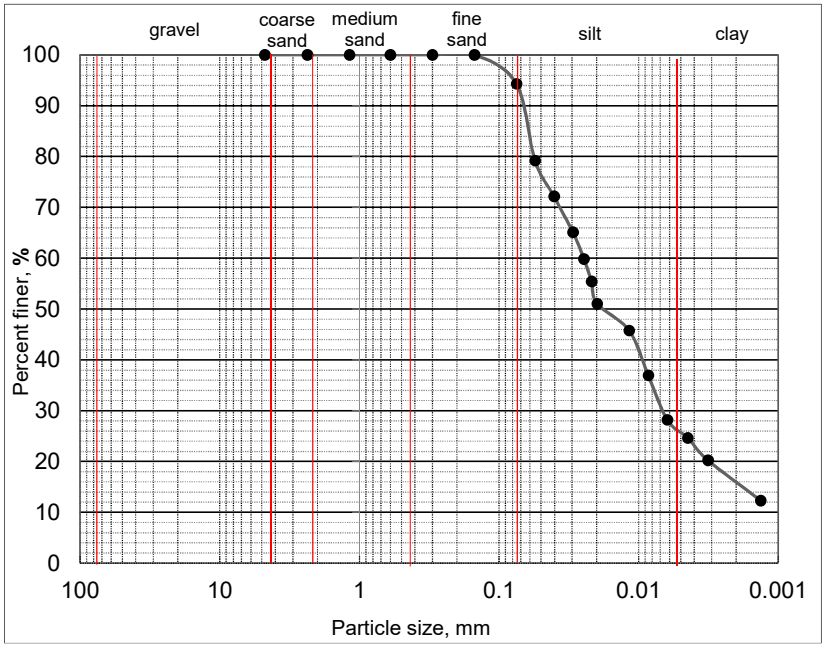
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	5.68	%
Silt size : 0.075 to 0.005 mm =	68.58	%
Clay size : smaller than 0.005 =	25.74	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
-	0.007	0.018	0.025	0.083	5.7	94.32	-	-			CL



Elapsed time (min)	Hydrometer reading
0.5	43
1	39
2	35
3	32
4	29.5
5	27
15	24
30	19
60	14
120	12
240	9.5
1440	5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-01**

Location: BR-3 — **Depth (m): 23.55-24.0 m**

Sample Type: Disturbed — **Date:** 14-09-18

Test Results

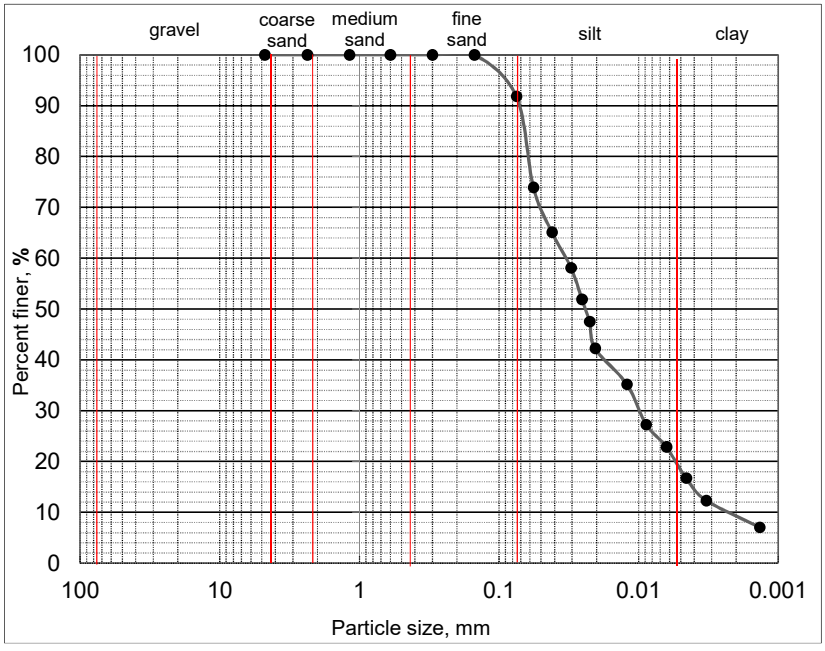
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	8.18	%
Silt size : 0.075 to 0.005 mm =	73.56	%
Clay size : smaller than 0.005 =	18.26	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.002	0.010	0.024	0.033	0.103	8.2	91.82	1.22	13.79			CL



Elapsed time (min)	Hydrometer reading
0.5	40
1	35
2	31
3	27.5
4	25
5	22
15	18
30	13.5
60	11
120	7.5
240	5
1440	2

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-02**

Location: BR-3 — **Depth (m): 10.05-10.50 m**

Sample Type: Disturbed — **Date:** 14-09-18

Test Results

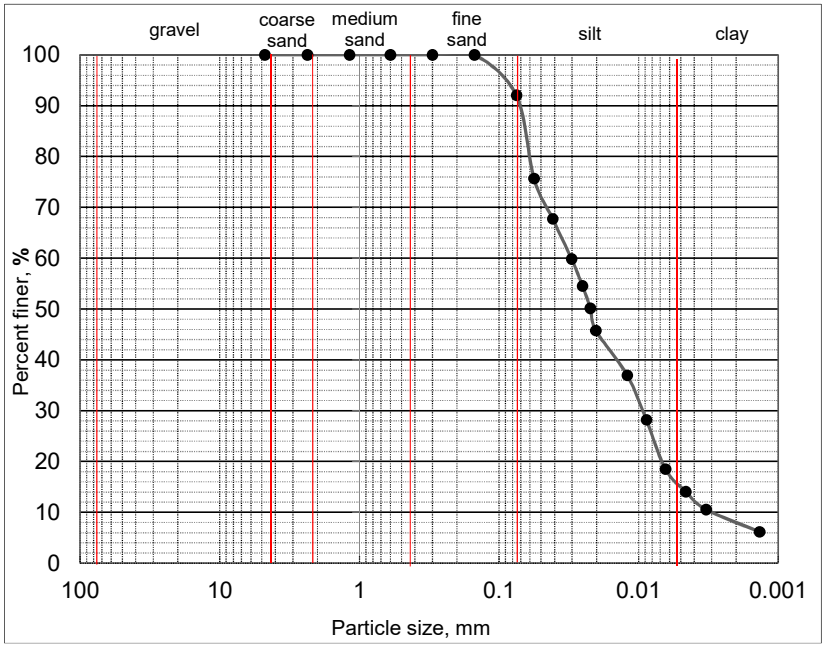
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	7.97	%
Silt size : 0.075 to 0.005 mm =	76.98	%
Clay size : smaller than 0.005 =	15.05	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.003	0.009	0.022	0.030	0.102	8.0	92.03	0.97	10.00			CL



Elapsed time (min)	Hydrometer reading
0.5	41
1	36.5
2	32
3	29
4	26.5
5	24
15	19
30	14
60	8.5
120	6
240	4
1440	1.5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: BH-02**

Location: BR-03 — **Depth (m): 25.05-25.50 m**

Sample Type: Disturbed — **Date:** 14-09-18

Test Results

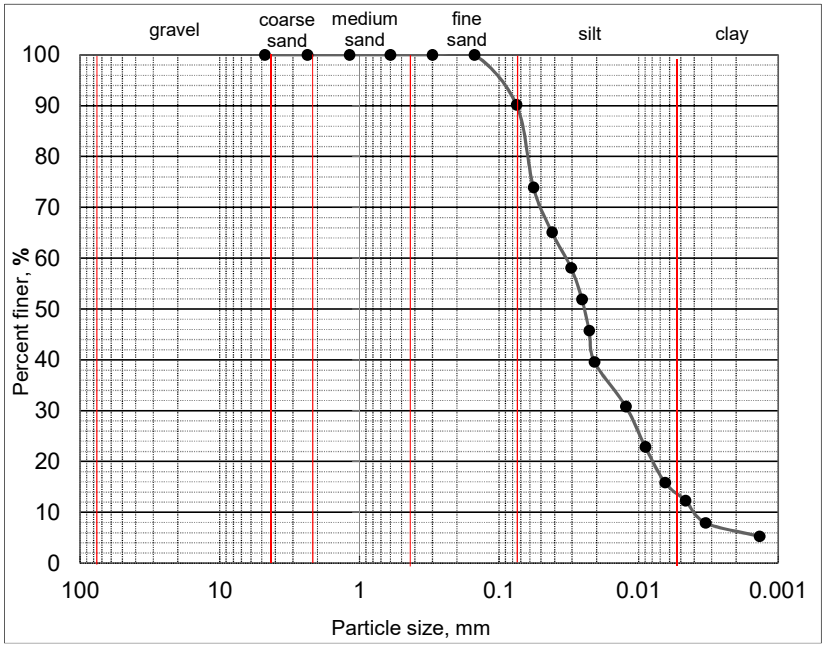
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	9.81	%
Silt size : 0.075 to 0.005 mm =	77.15	%
Clay size : smaller than 0.005 =	13.04	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.004	0.012	0.025	0.033	0.111	9.8	90.19	1.09	8.52			CL



Elapsed time (min)	Hydrometer reading
0.5	40
1	35
2	31
3	27.5
4	24
5	20.5
15	15.5
30	11
60	7
120	5
240	2.5
1440	1

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: RB-01**

Location: Sylhet- Sutarkandi Road — **Depth (m): 2.55-3.00 m**

Sample Type: Disturbed — **Date:** 14-09-18

Test Results

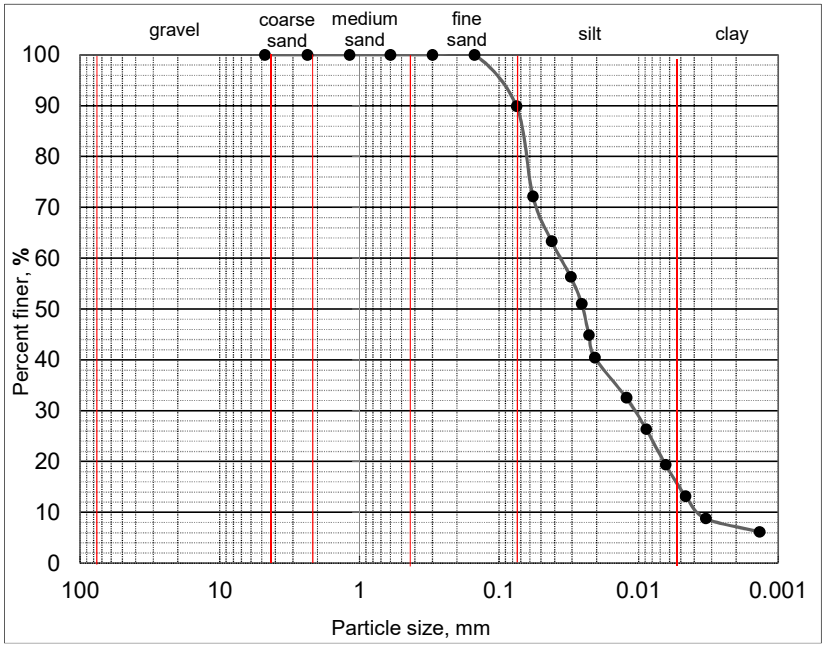
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	10.09	%
Silt size : 0.075 to 0.005 mm =	75.37	%
Clay size : smaller than 0.005 =	14.54	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.004	0.011	0.025	0.037	0.112	10.1	89.91	0.88	10.00			CL



Elapsed time (min)	Hydrometer reading
0.5	39
1	34
2	30
3	27
4	23.5
5	21
15	16.5
30	13
60	9
120	5.5
240	3
1440	1.5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: RB-01**

Location: Sylhet- Sutarkandi Road — **Depth (m): 14.55-15.0 m**

Sample Type: Disturbed — **Date:** 14-09-18

Test Results

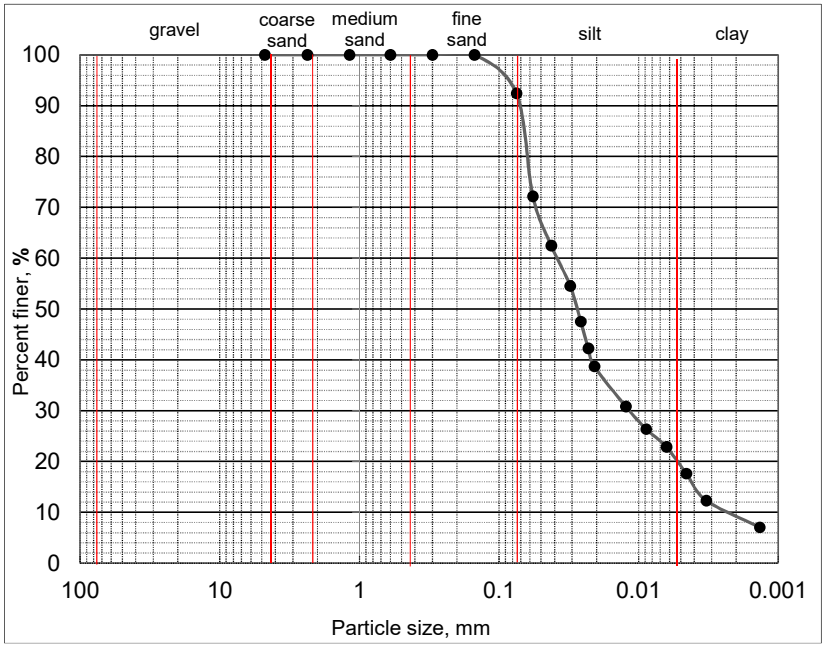
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	7.58	%
Silt size : 0.075 to 0.005 mm =	73.47	%
Clay size : smaller than 0.005 =	18.94	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.002	0.012	0.028	0.039	0.100	7.6	92.42	1.45	15.92			ML



Elapsed time (min)	Hydrometer reading
0.5	39
1	33.5
2	29
3	25
4	22
5	20
15	15.5
30	13
60	11
120	8
240	5
1440	2

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: RB-02**

Location: Sylhet- Sutarkandi Road — **Depth (m): 3.60-4.50 m**

Sample Type: Disturbed — **Date:** 14-09-18

Test Results

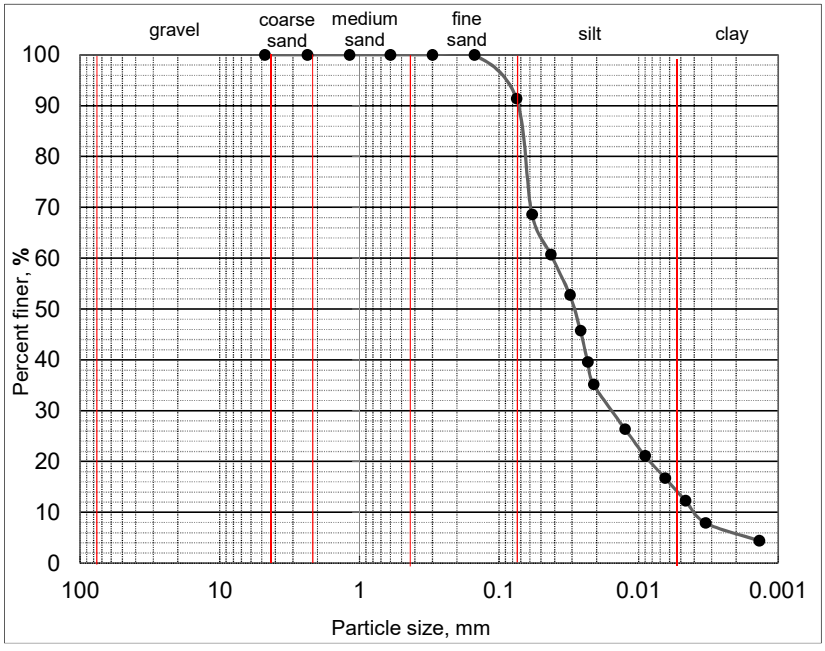
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	8.58	%
Silt size : 0.075 to 0.005 mm =	78.19	%
Clay size : smaller than 0.005 =	13.23	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.004	0.016	0.029	0.041	0.105	8.6	91.42	1.57	10.55			CL



Elapsed time (min)	Hydrometer reading
0.5	37
1	32.5
2	28
3	24
4	20.5
5	18
15	13
30	10
60	7.5
120	5
240	2.5
1440	0.5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: RB-03**

Location: Sylhet- Sutarkandi Road — **Depth (m): 2.55-3.00 m**

Sample Type: Disturbed — **Date:** 14-09-18

Test Results

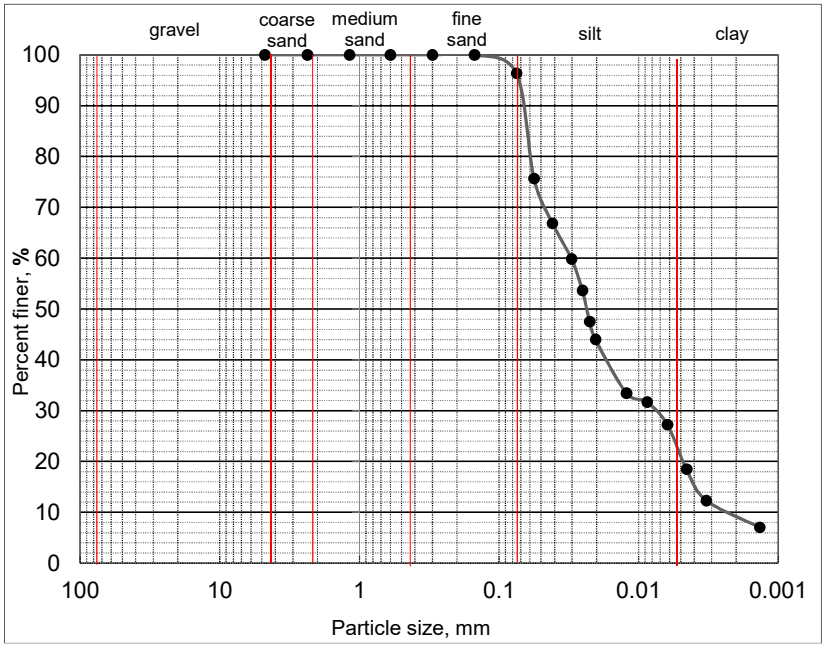
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	3.64	%
Silt size : 0.075 to 0.005 mm =	75.47	%
Clay size : smaller than 0.005 =	20.89	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.002	0.008	0.024	0.030	0.073	3.6	96.36	0.81	12.54			CL



Elapsed time (min)	Hydrometer reading
0.5	41
1	36
2	32
3	28.5
4	25
5	23
15	20.5
30	16
60	13.5
120	8.5
240	5
1440	2

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: RB-03**

Location: Sylhet- Sutarkandi Road — **Depth (m): 7.05-7.50 m**

Sample Type: Disturbed — **Date:** 14-09-18

Test Results

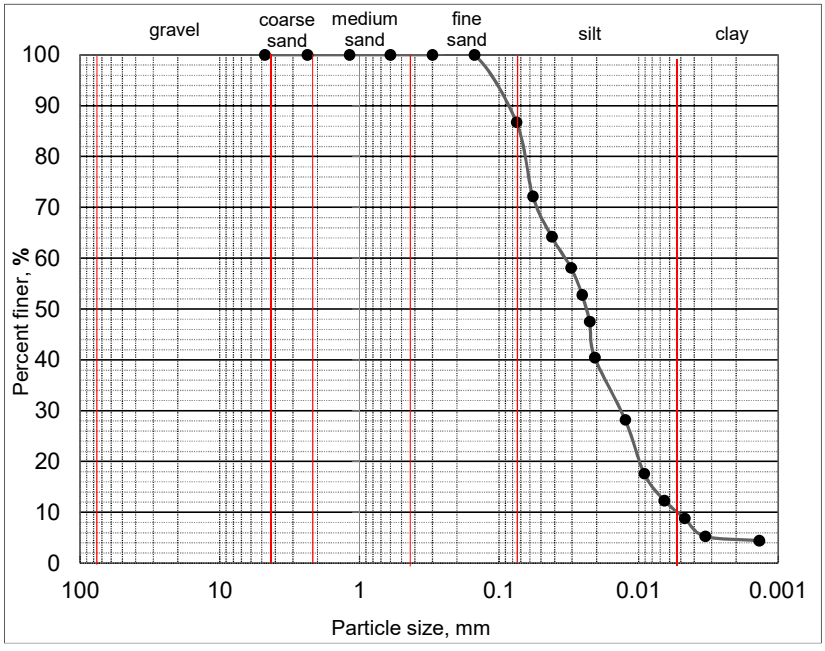
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	13.24	%
Silt size : 0.075 to 0.005 mm =	77.34	%
Clay size : smaller than 0.005 =	9.42	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.005	0.014	0.024	0.034	0.121	13.2	86.76	1.03	6.40			ML



Elapsed time (min)	Hydrometer reading
0.5	39
1	34.5
2	31
3	28
4	25
5	21
15	14
30	8
60	5
120	3
240	1
1440	0.5

PARTICLE SIZE ANALYSIS OF SOILS BY SIEVE & HYDROMETER

Project: Sub-Regional Road Transportation Project (SRTPPF-II)

Road : Sylhet- Sutarkandi Road.

Client: Roads and Highways Department — **BH No.: RB-04**

Location: Sylhet- Sutarkandi Road — **Depth (m): 4.05-4.50 m**

Sample Type: Disturbed — **Date:** 14-09-18

Test Results

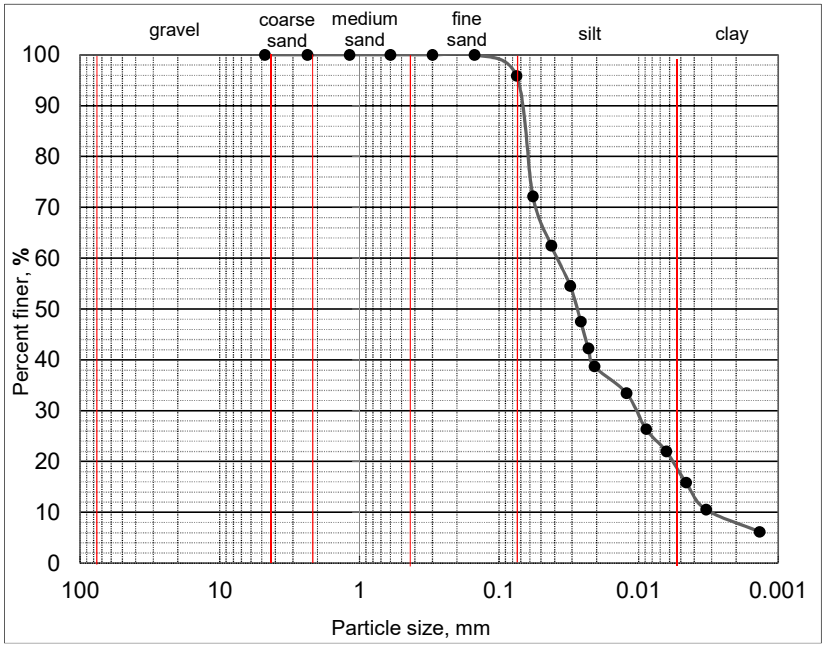
Size fractions

Gravel : 75.00 mm to 4.75 mm =	0.00	%
Coarse sand : 4.75 mm to 2.00 mm (Passing #4 and retained on #10) =	0.00	%
Medium sand : 2.00 mm to 0.425 mm (Passing #10 and retained on #40) =	0.00	%
Fine sand : 0.425 mm to 0.075 mm (Passing #40 and retained on #200) =	4.12	%
Silt size : 0.075 to 0.005 mm =	78.56	%
Clay size : smaller than 0.005 =	17.33	%
Colloid : smaller than 0.001 =	0.00	%
	100.0	

Visual classification: Silty Clay

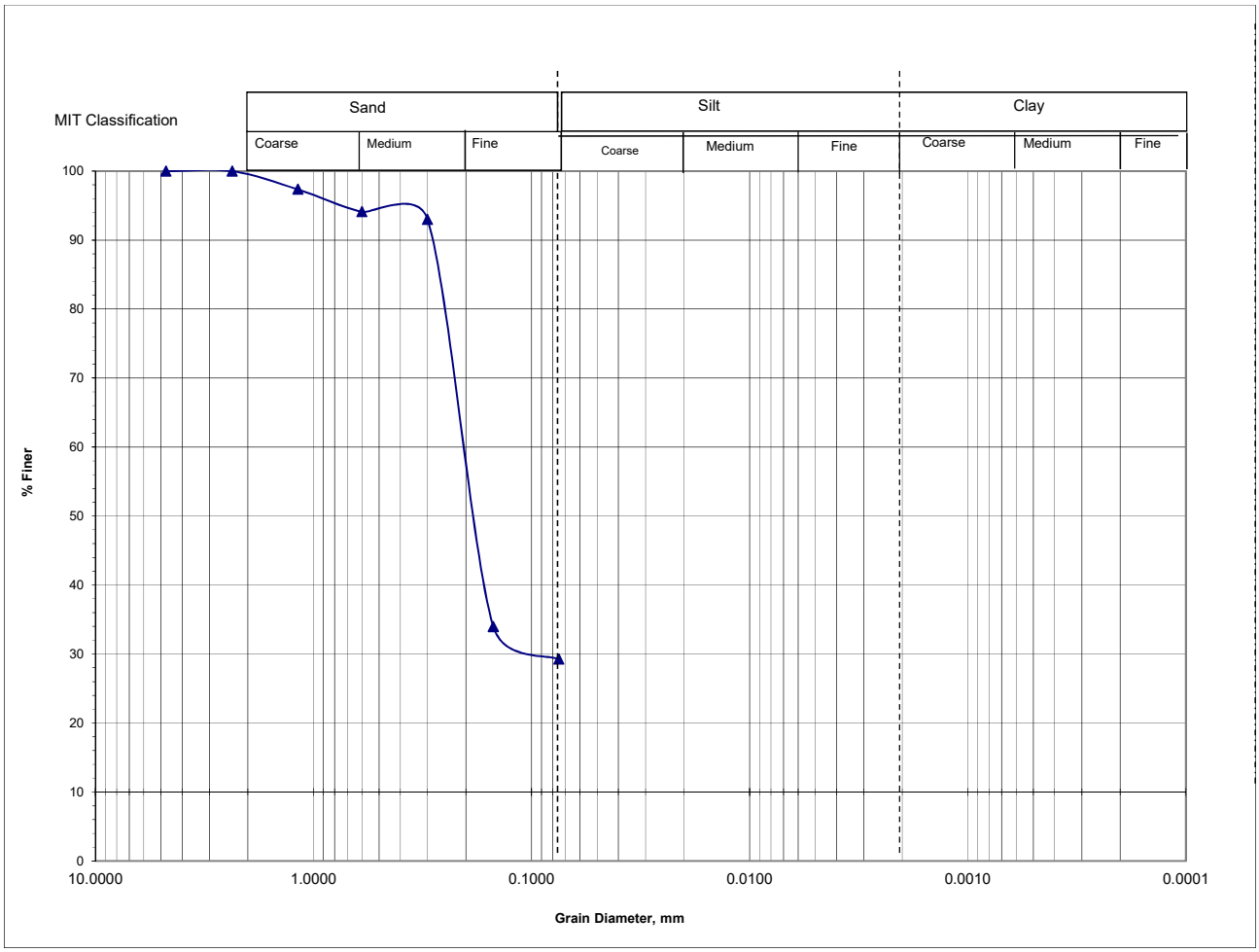
USCS classification: Sandy Silt with Clay

D10 (mm)	D30 (mm)	D50 (mm)	D60 (mm)	D95 (mm)	Sand (%)	Fines (%)	Cc	Cu	LL (%)	PI (%)	USCS
0.003	0.011	0.028	0.039	0.073	4.1	95.88	0.95	12.71			CL



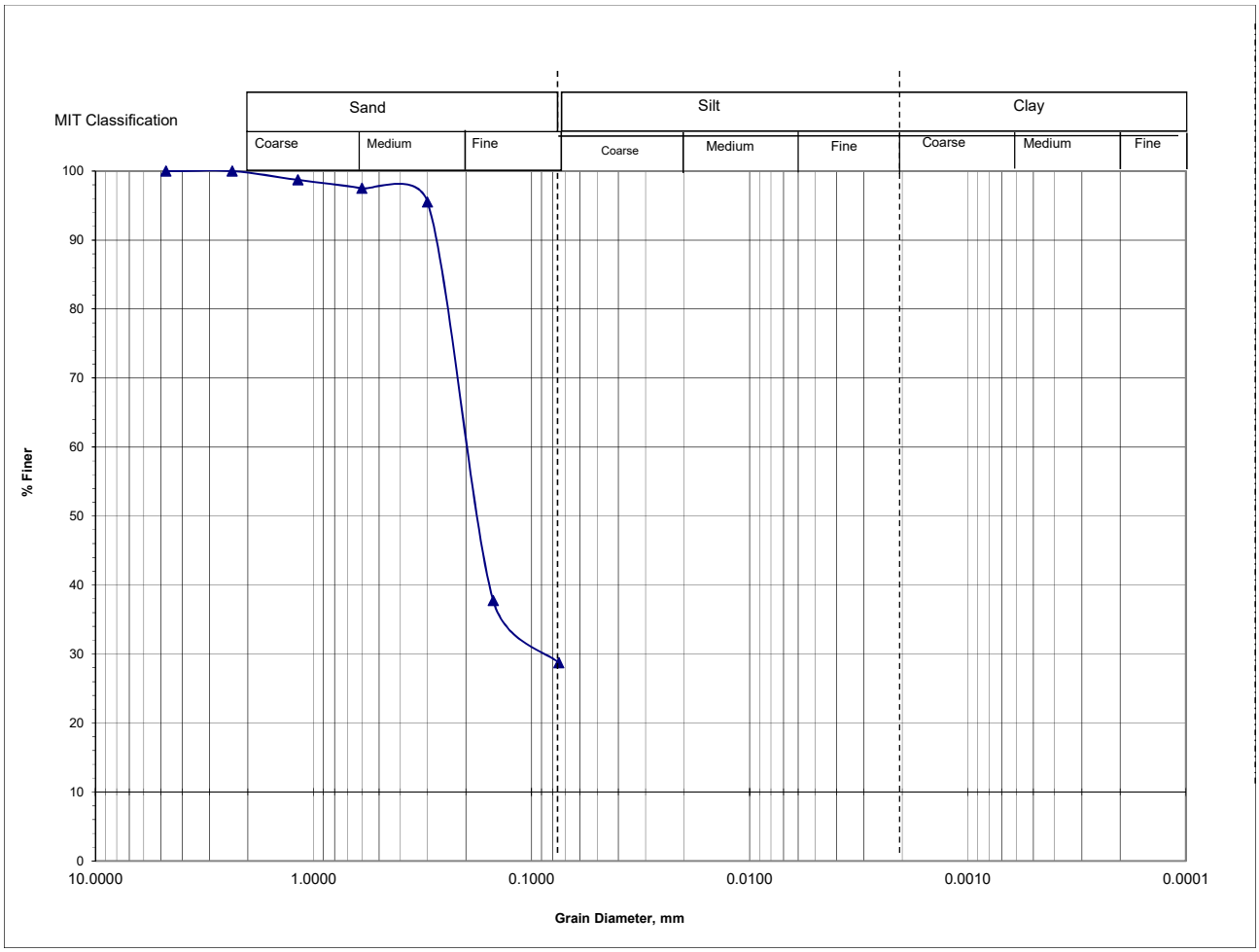
Elapsed time (min)	Hydrometer reading
0.5	39
1	33.5
2	29
3	25
4	22
5	20
15	15.5
30	13
60	10.5
120	7
240	4
1440	1.5

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**01 (BR-1)**



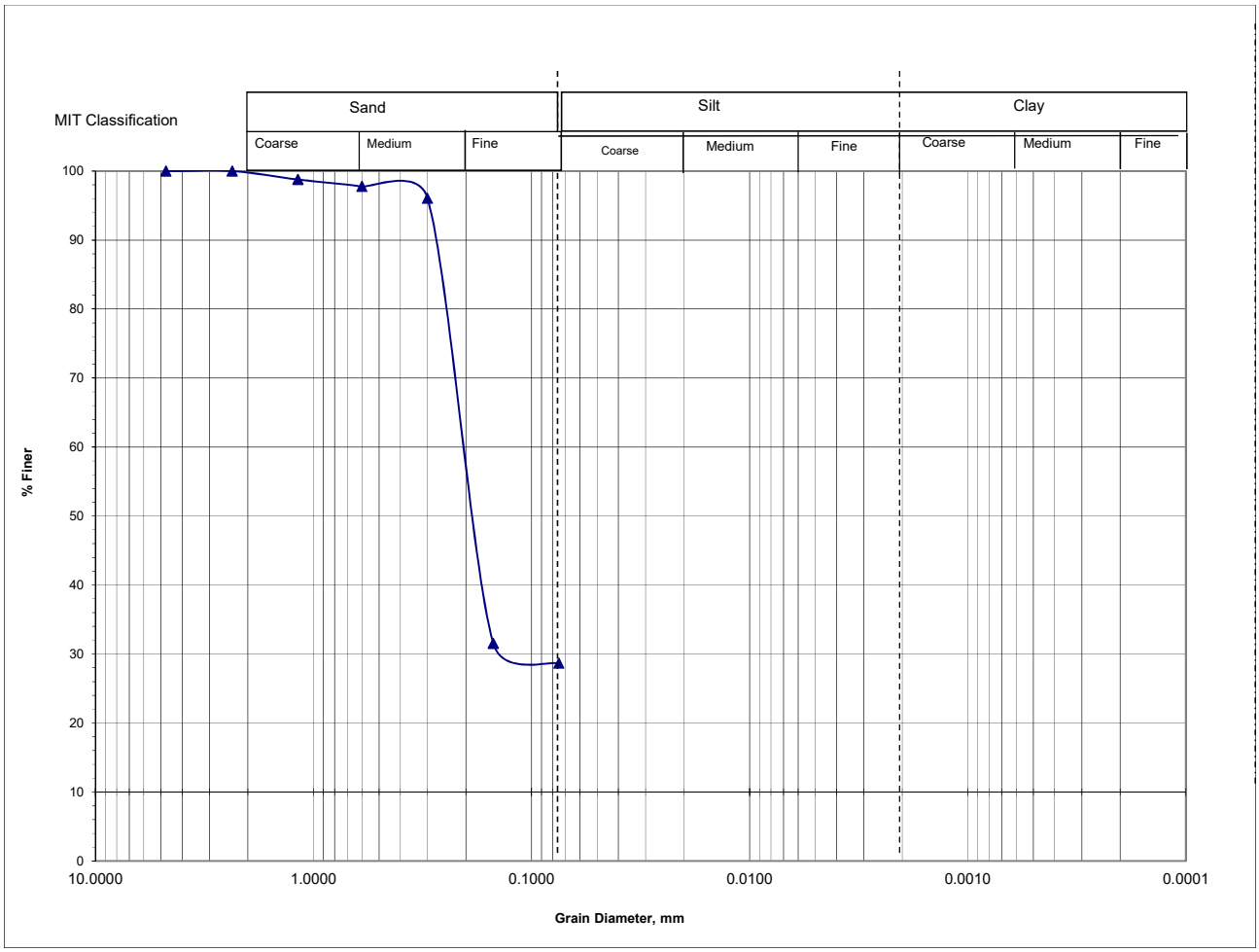
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
01 (BR-1)	24	0	70.73804055	29.26195945
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**01 (BR-1)**



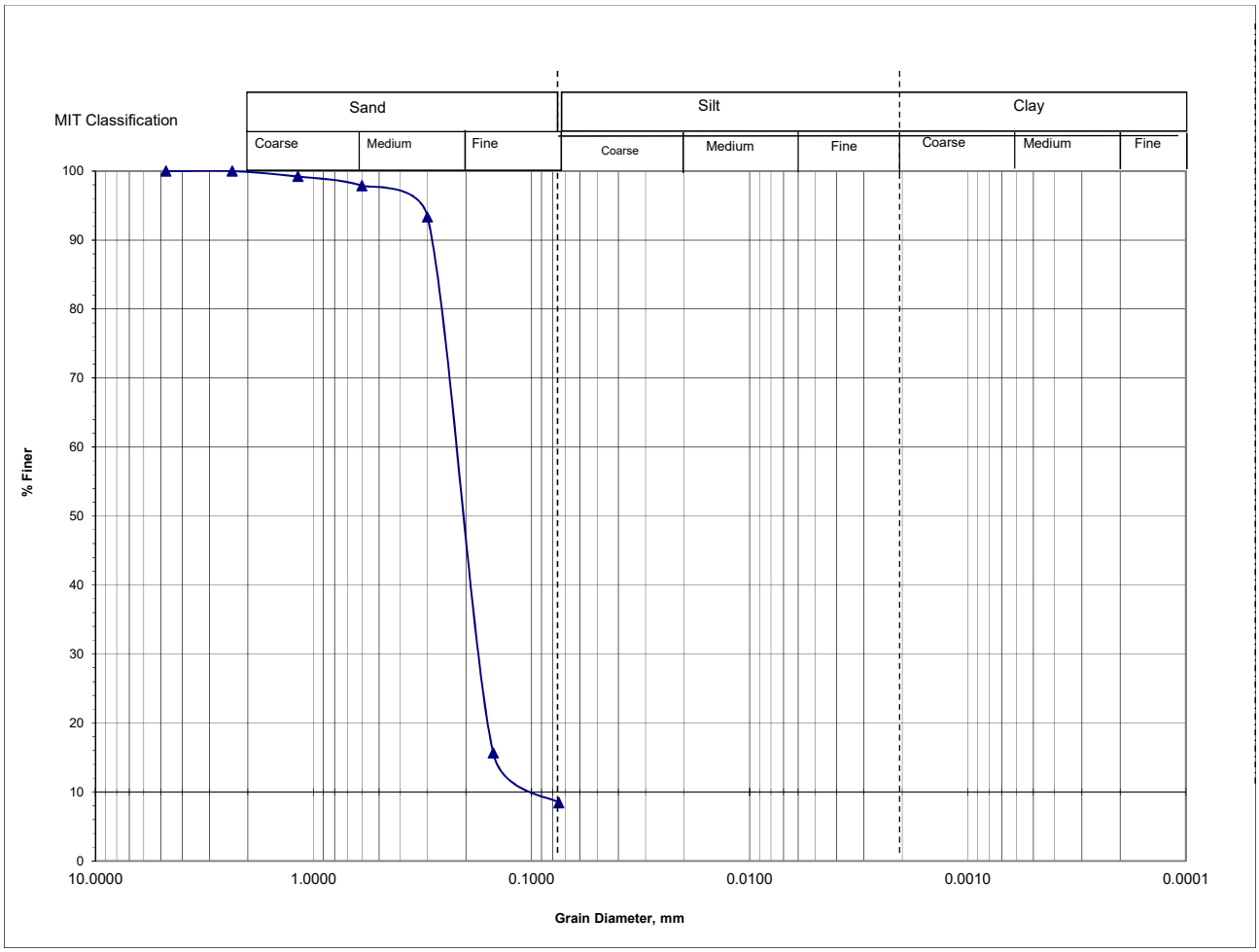
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
01 (BR-1)	43.5	0	71.28457834	28.71542166
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**02 (BR-1)**



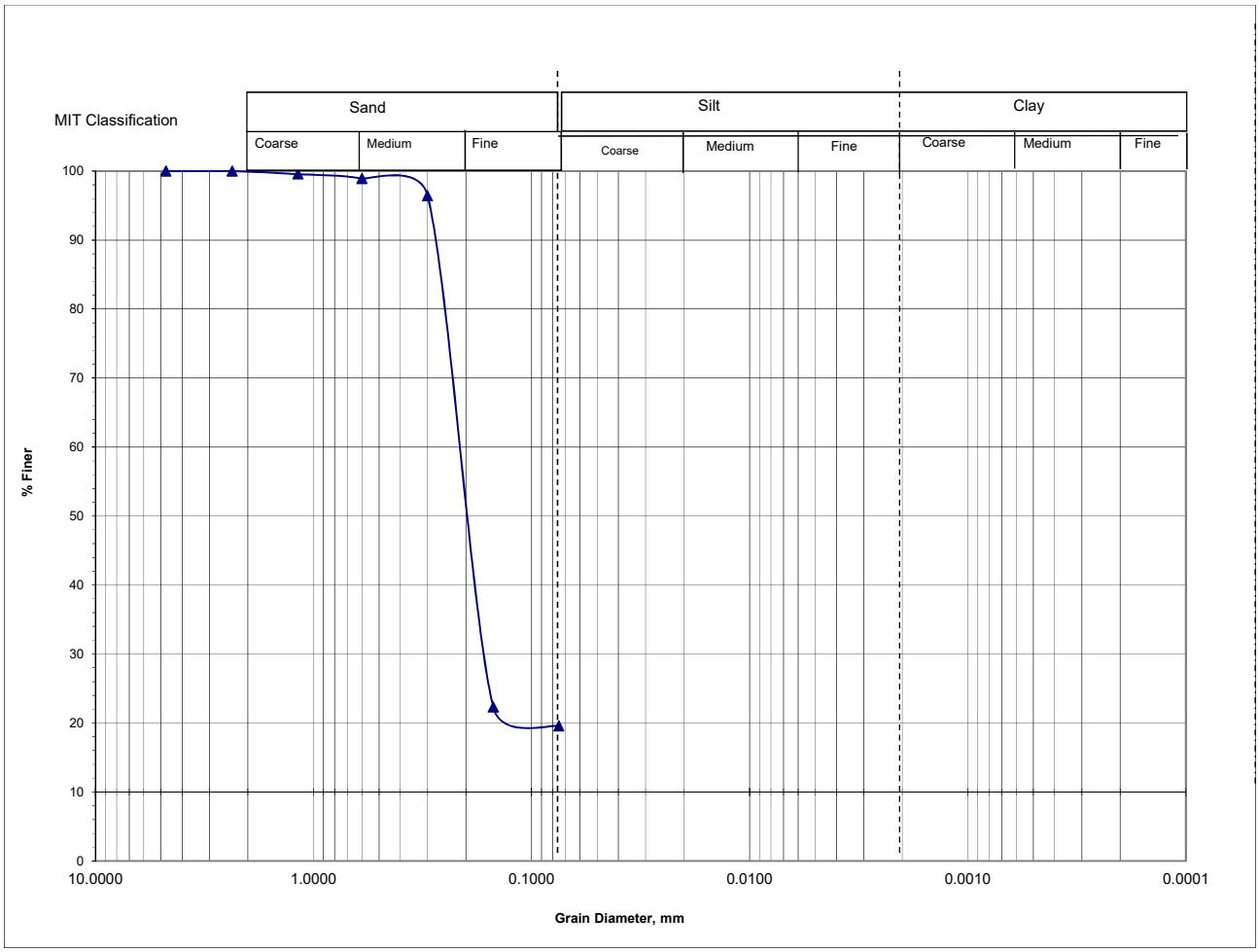
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
02 (BR-1)	36	0	71.34281201	28.65718799
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**02 (BR-1)**



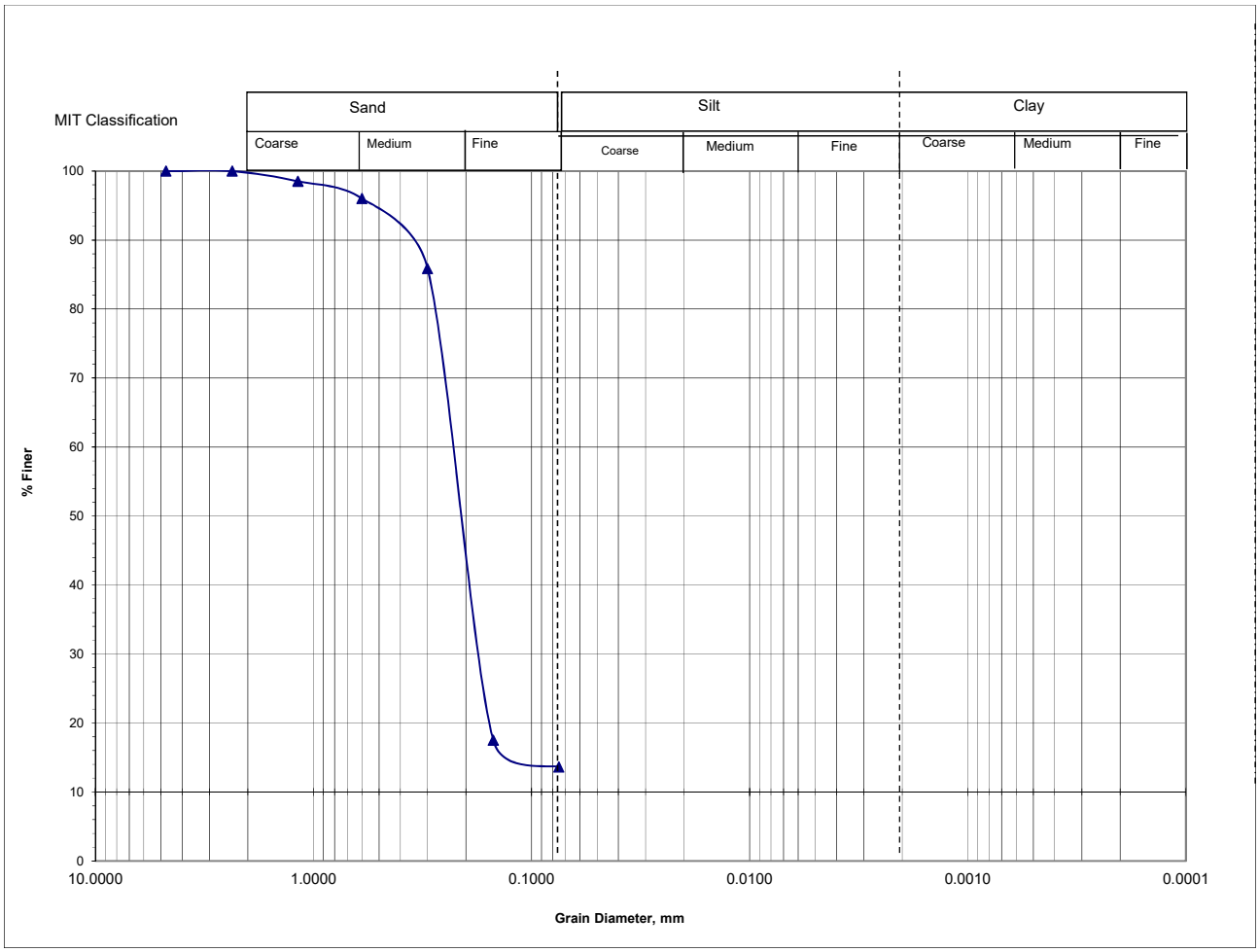
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
02 (BR-1)	40.5	0	91.56818908	8.431810923
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**03 (BR-1)**



Borehole No	Sample Depth	%Gravel	%Sand	%Fine
03 (BR-1)	27	0	80.44348296	19.55651704
	0	0	0	0
	0	0	0	0

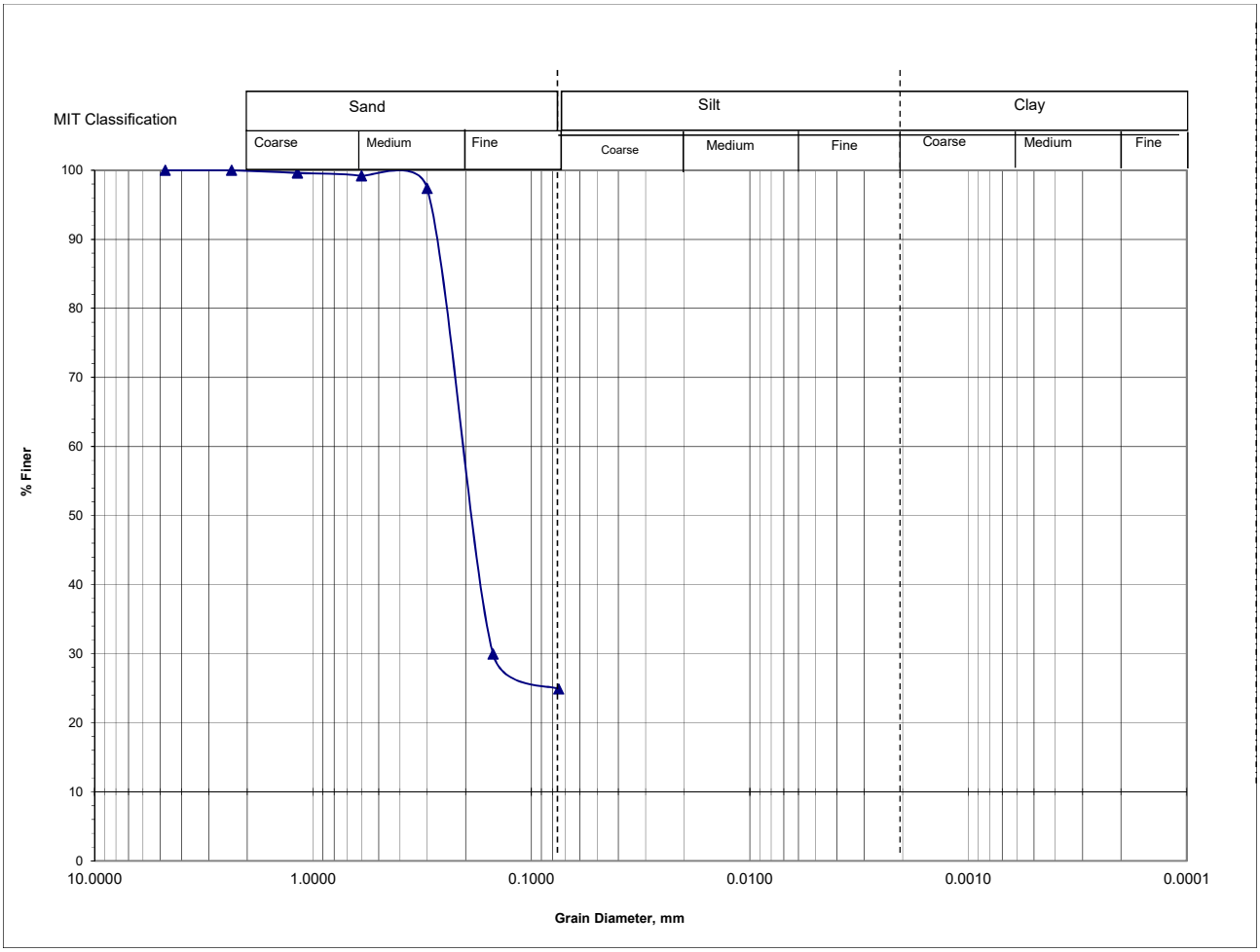
SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**03 (BR-1)**



Borehole No	Sample Depth	%Gravel	%Sand	%Fine
03 (BR-1)	39	0	86.40157094	13.59842906
	0	0	0	0
	0	0	0	0

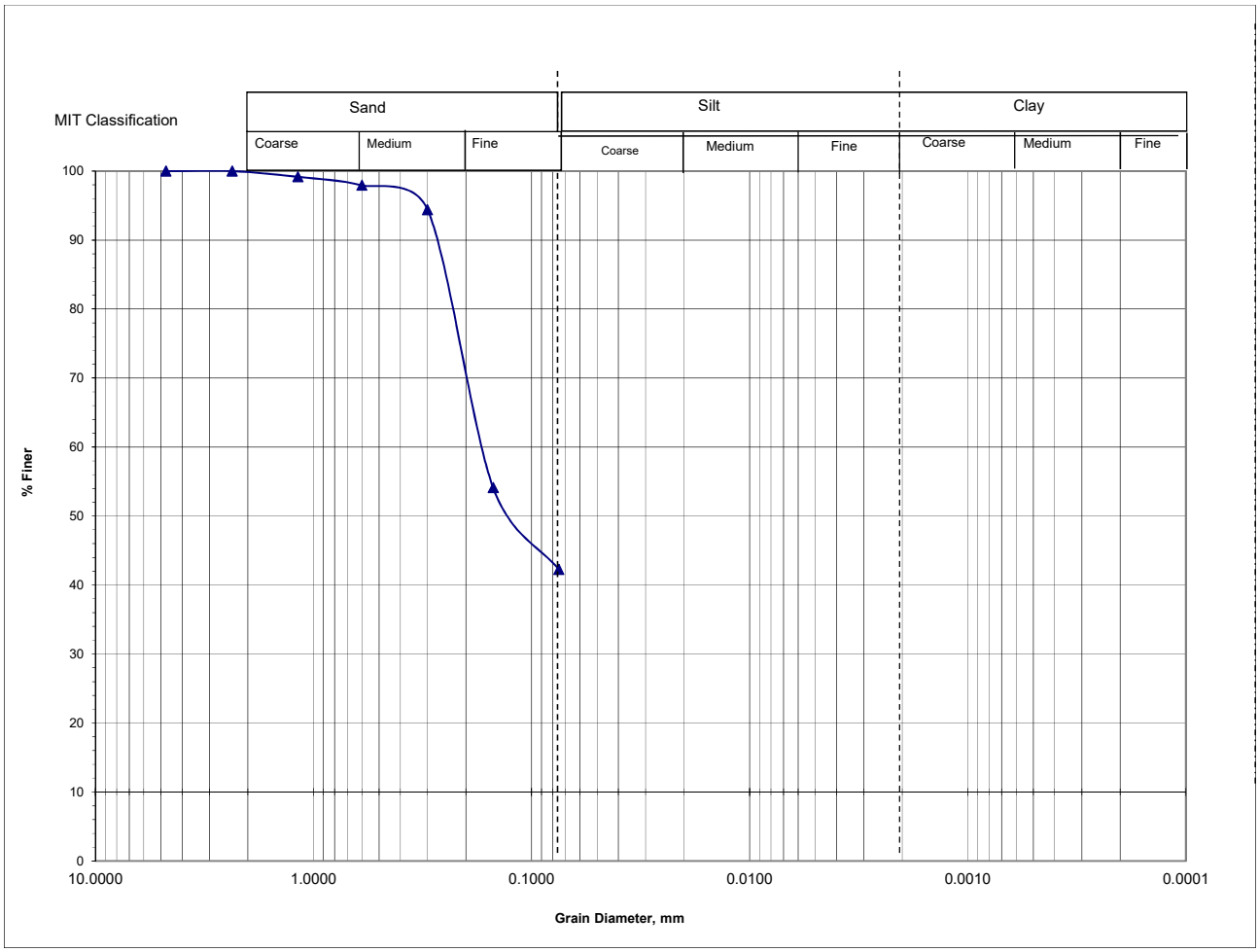
SIEVE ANALYSIS

Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**03 (BR-1)**



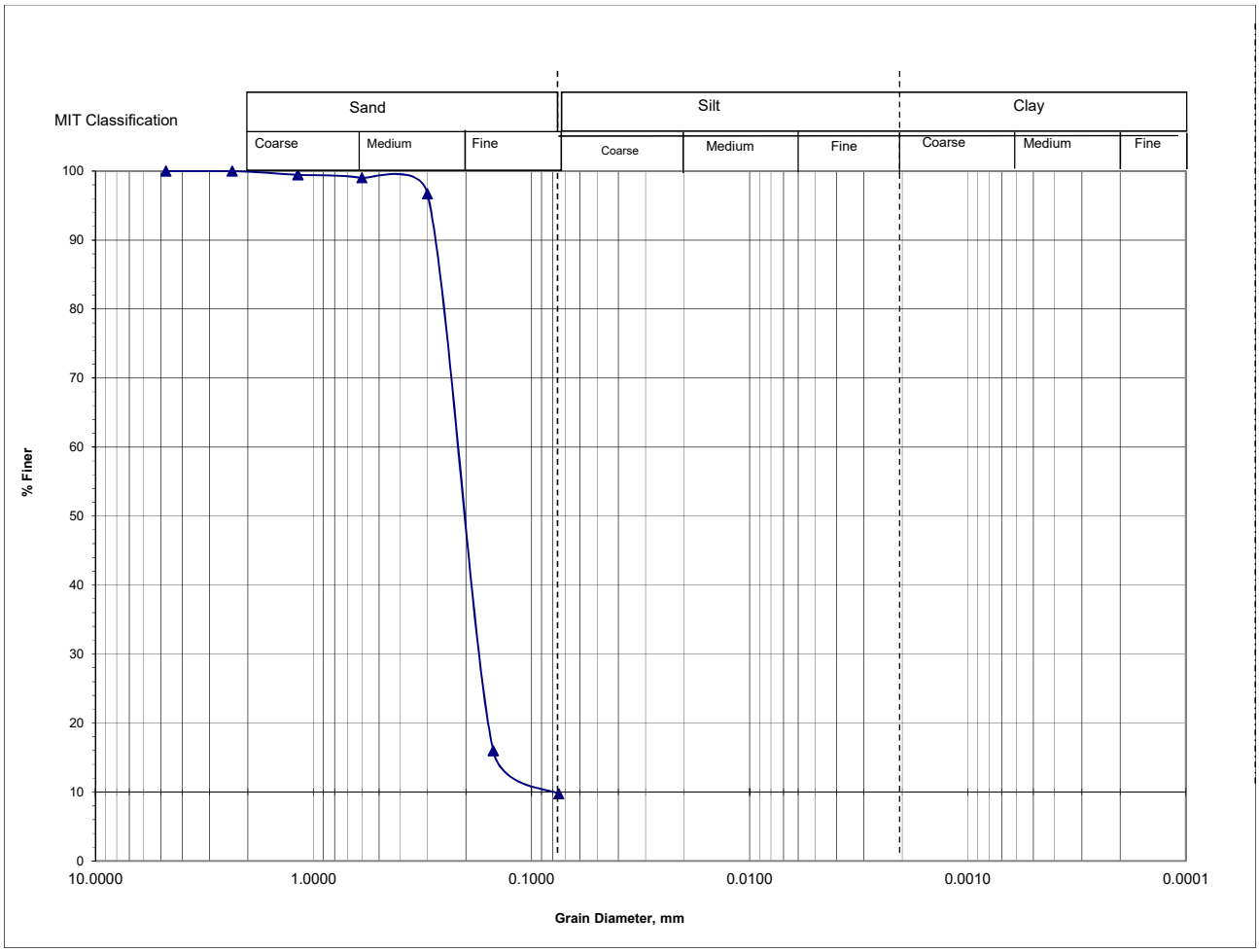
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
03 (BR-1)	46.5	0	75.1331377	24.8668623
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**01 (BR-2)**



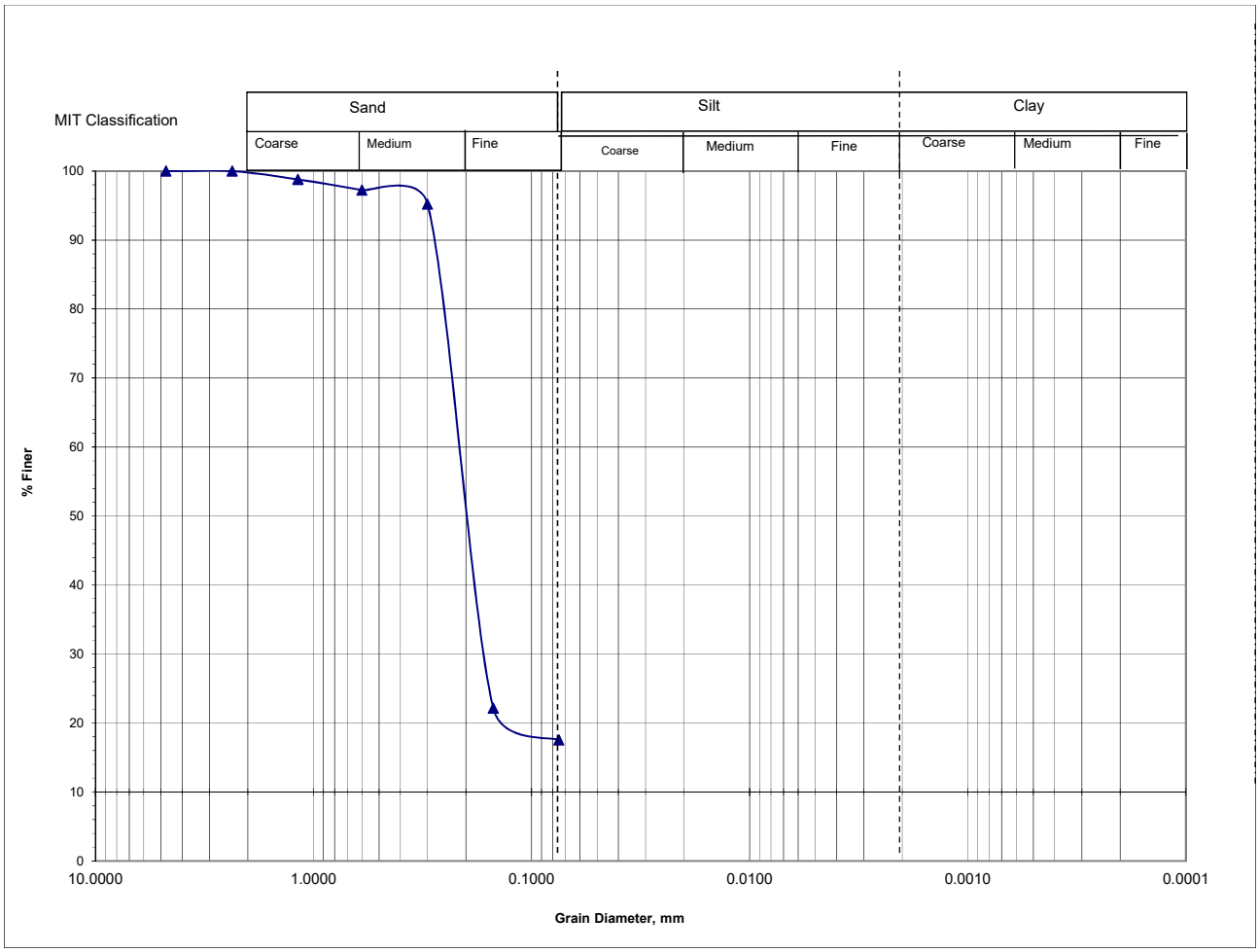
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
01 (BR-2)	39	0	57.74278215	42.25721785
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**01 (BR-2)**



Borehole No	Sample Depth	%Gravel	%Sand	%Fine
01 (BR-2)	45	0	90.27444711	9.725552891
	0	0	0	0
	0	0	0	0

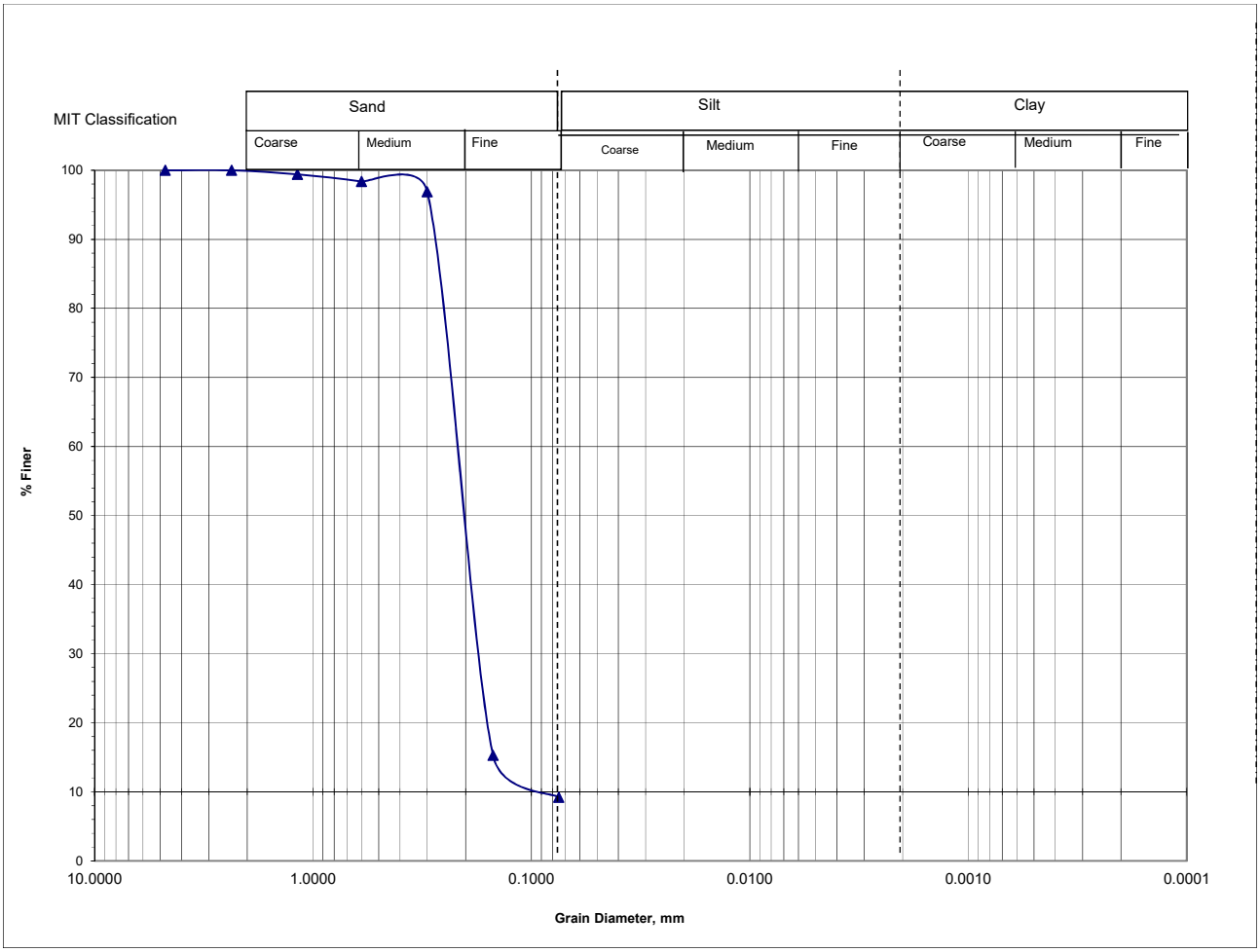
SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**02 (BR-2)**



Borehole No	Sample Depth	%Gravel	%Sand	%Fine
02 (BR-2)	27	0	82.47129838	17.52870162
	0	0	0	0
	0	0	0	0

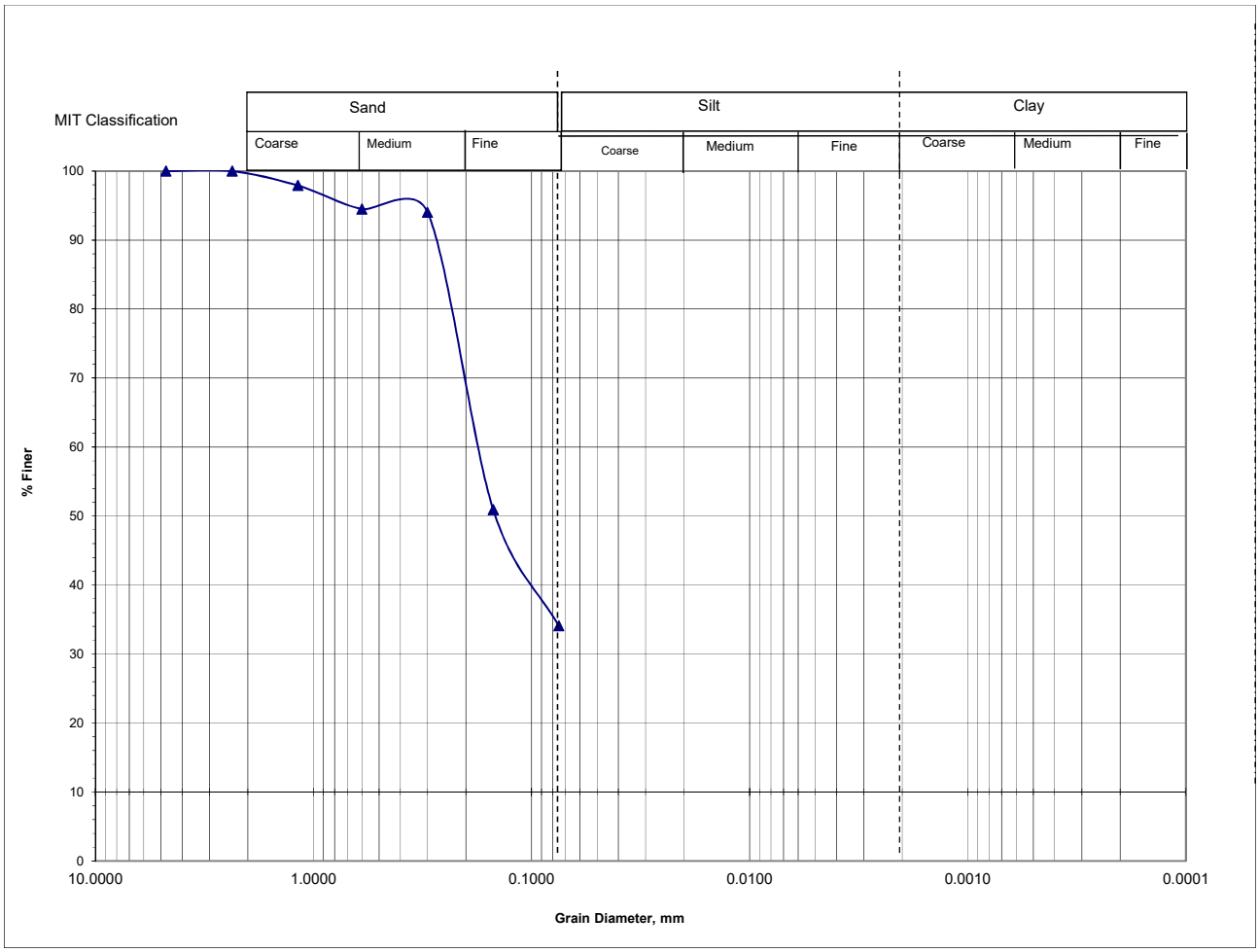
SIEVE ANALYSIS

Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**02 (BR-2)**



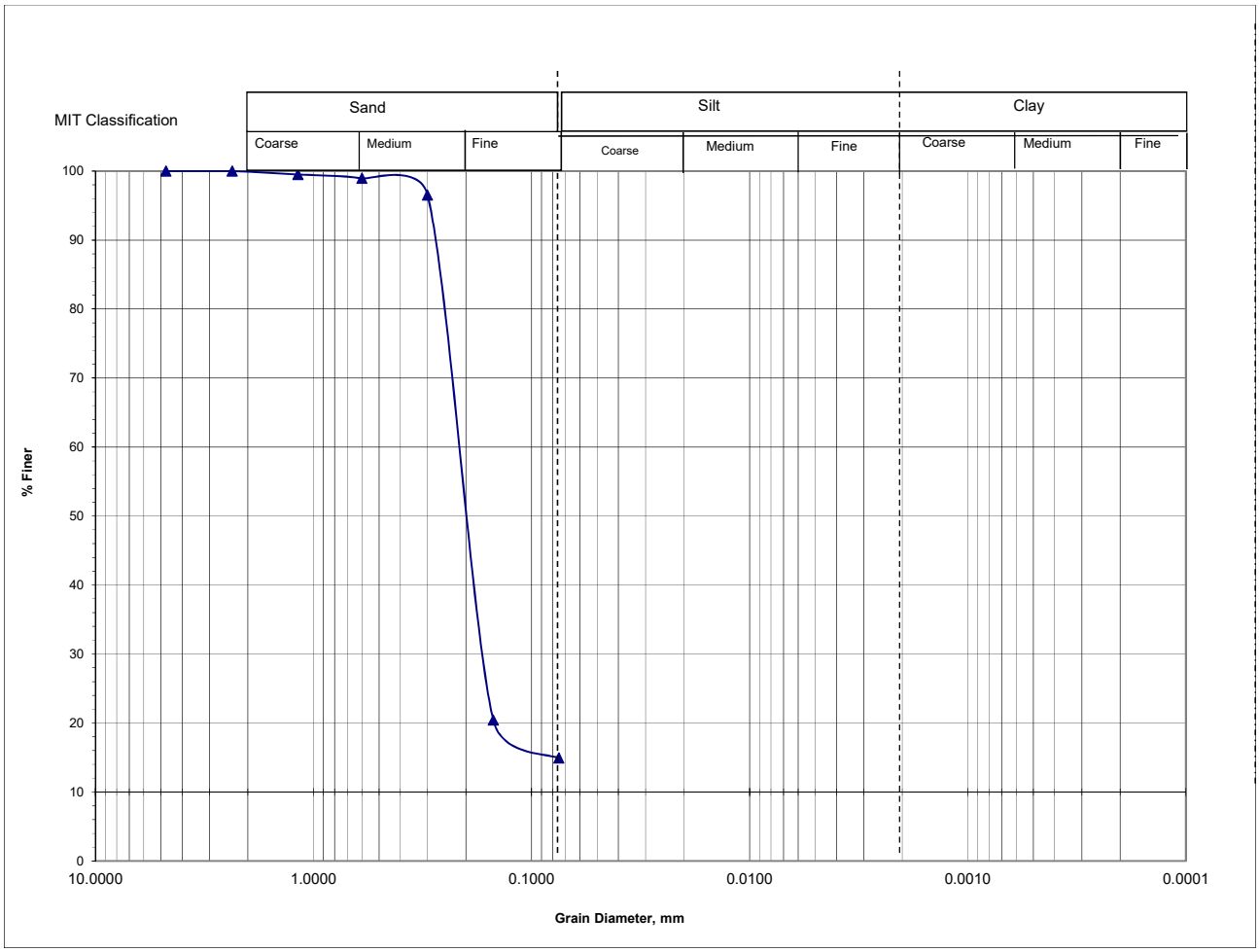
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
02 (BR-2)	43.5	0	90.77946768	9.220532319
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**01 (BR-3)**



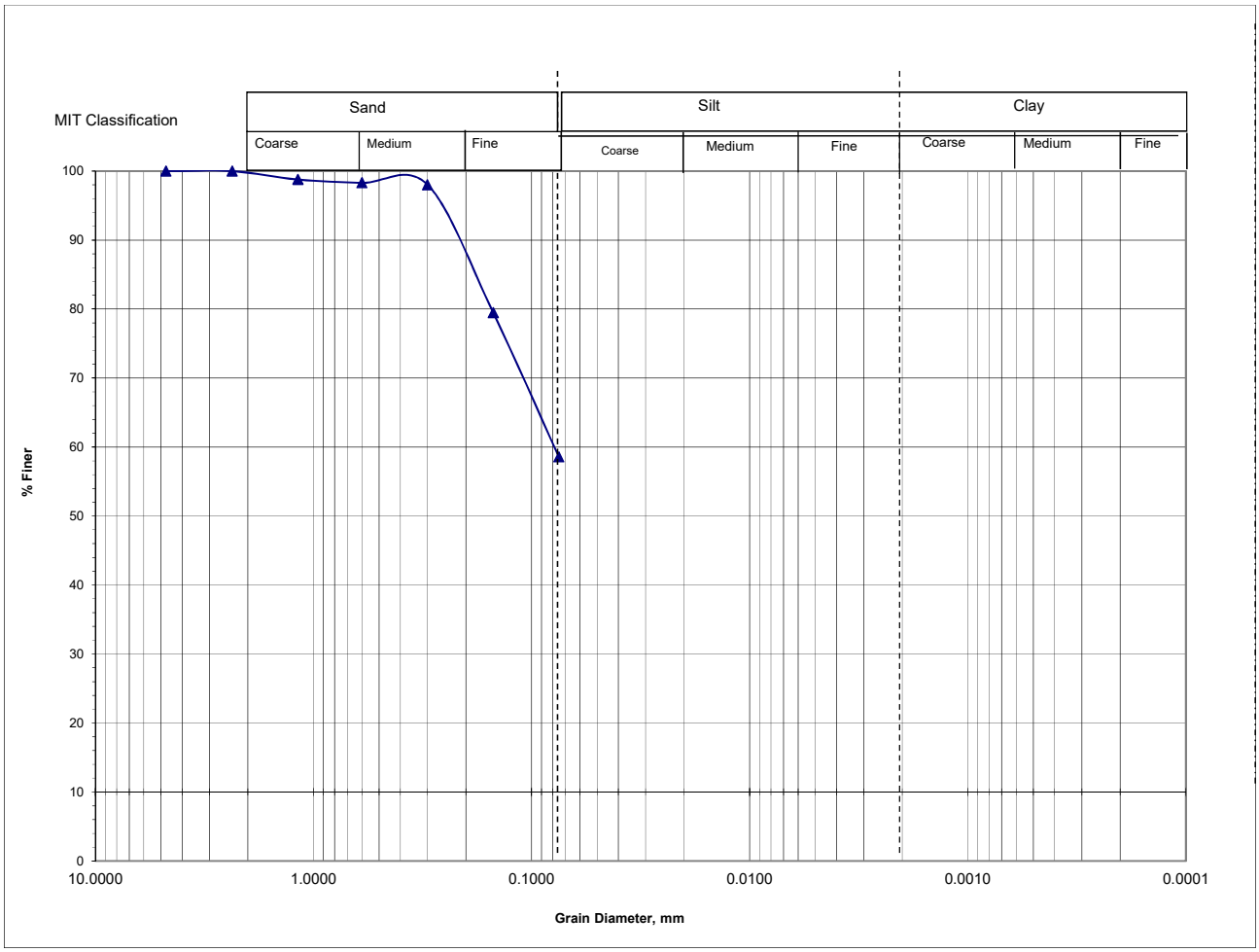
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
01 (BR-3)	19.5	0	65.92728847	34.07271153
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**01 (BR-3)**



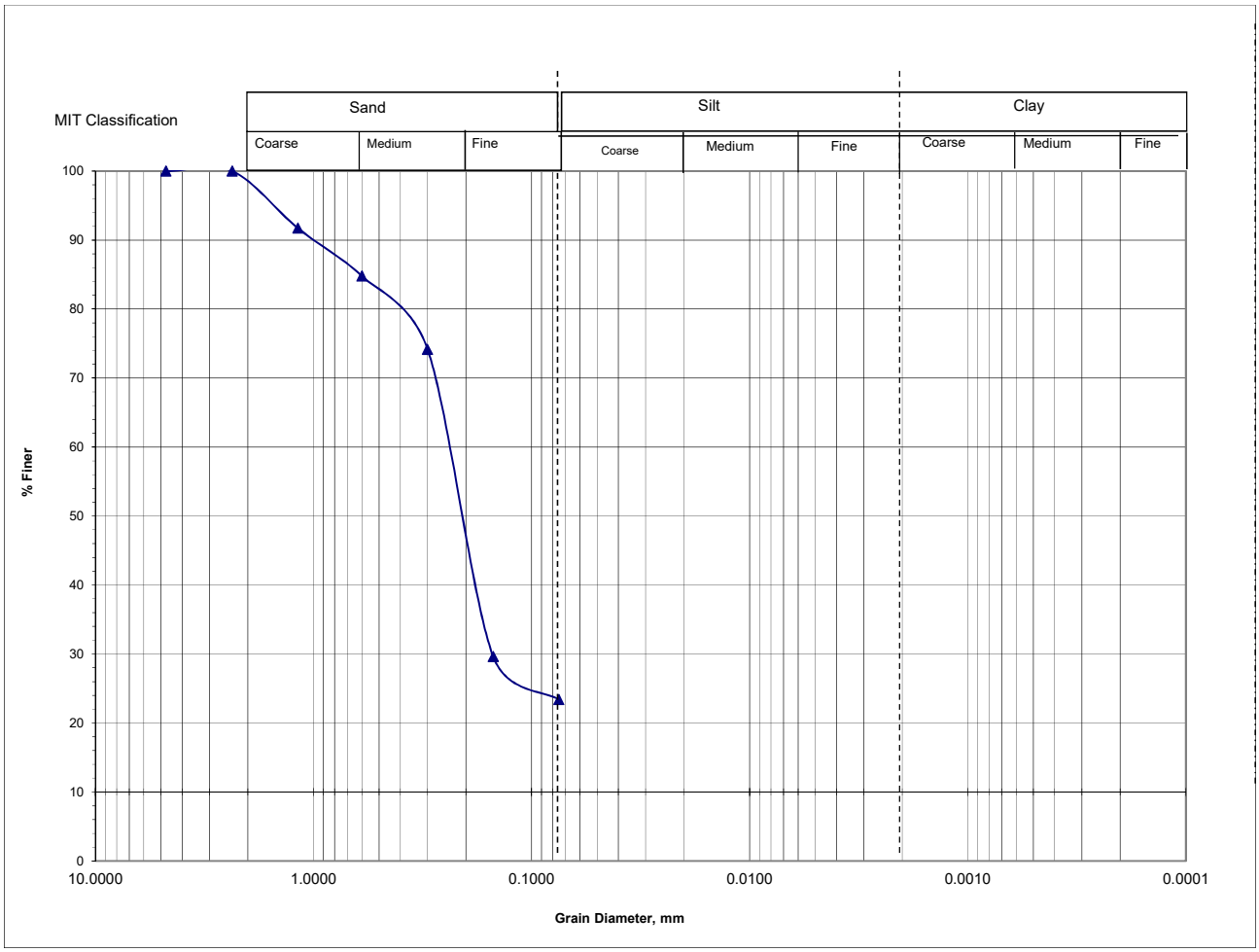
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
01 (BR-3)	37.5	0	85.09249184	14.90750816
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**02 (BR-3)**



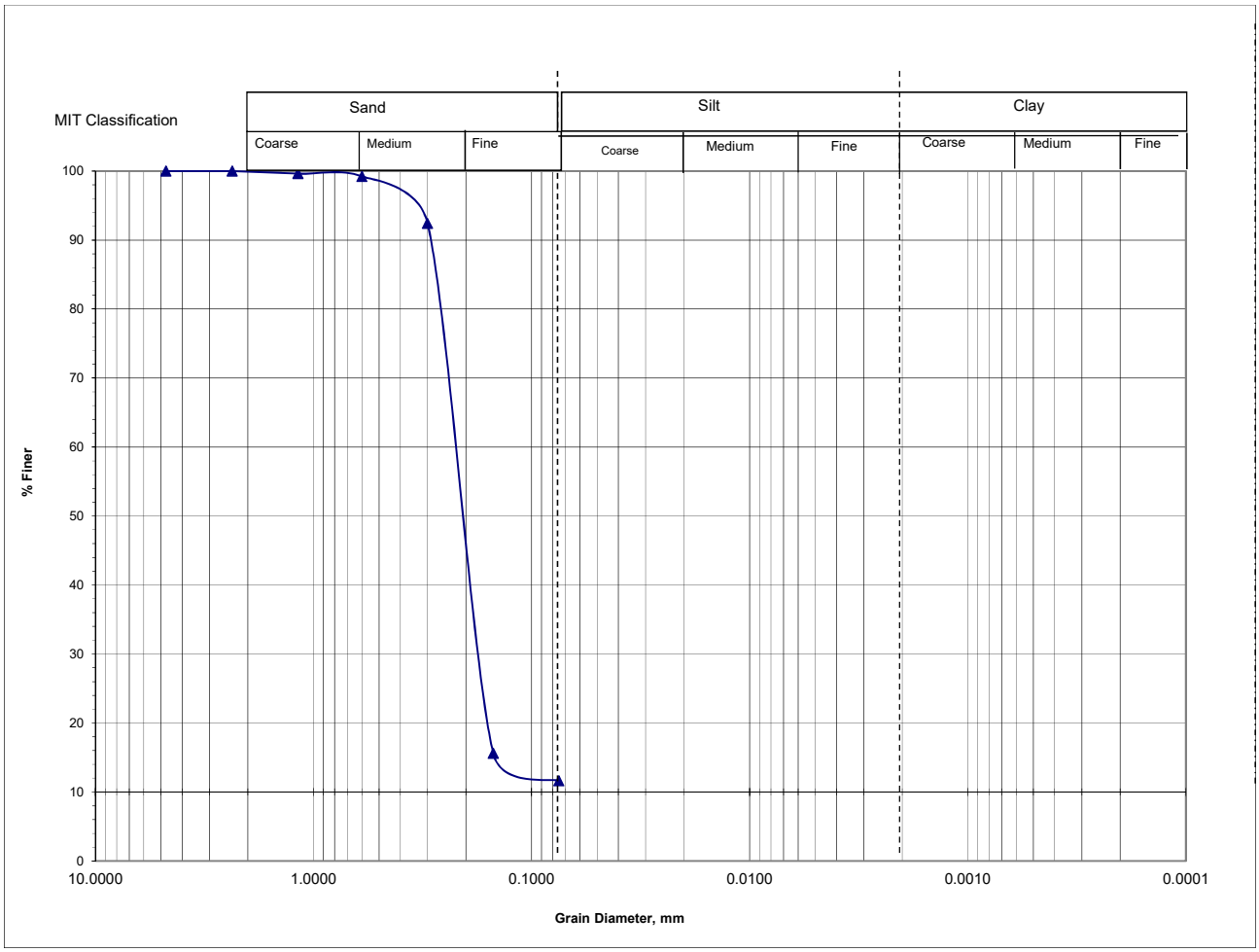
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
02 (BR-3)	16.5	0	41.43897996	58.56102004
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**02 (BR-3)**



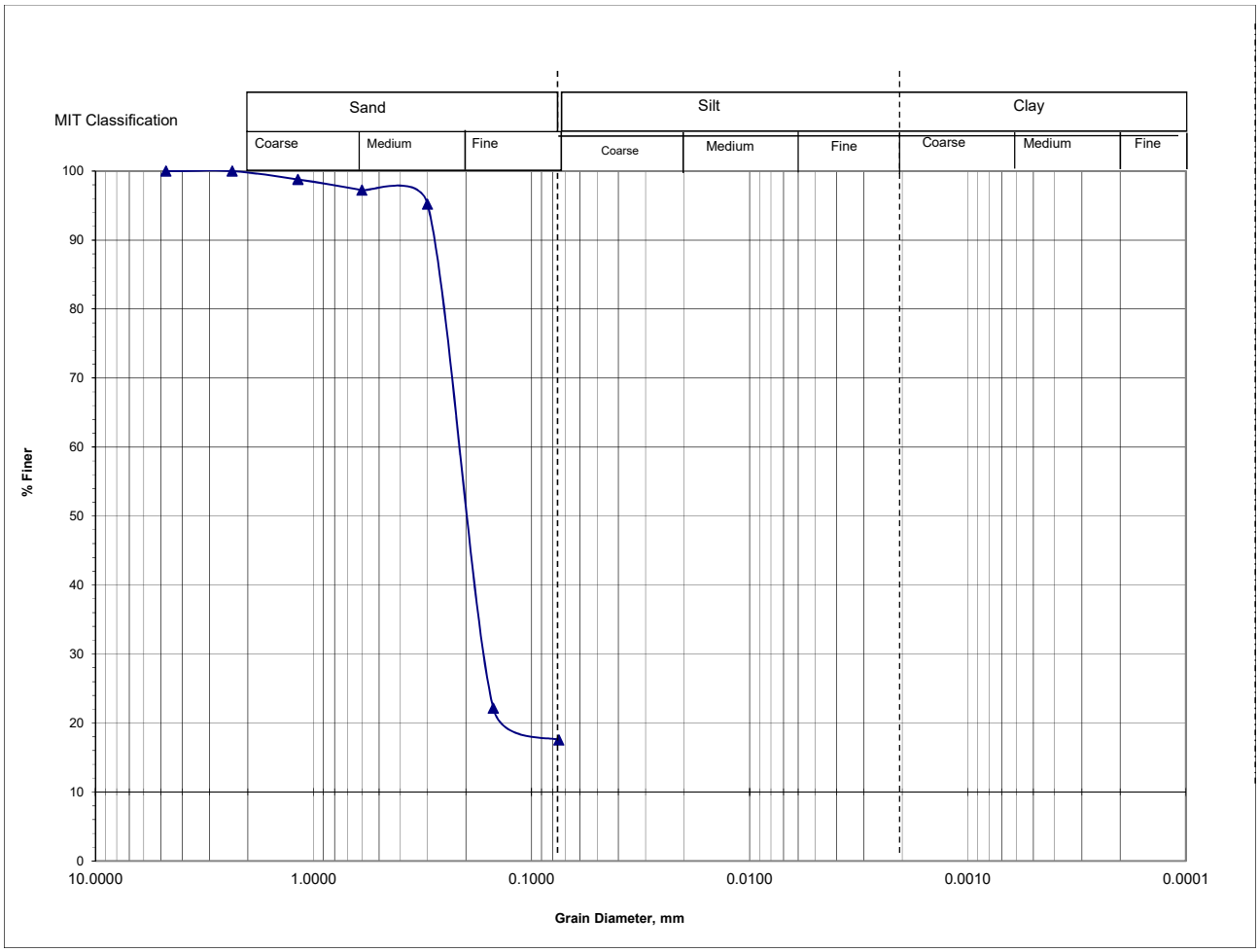
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
02 (BR-3)	28.5	0	76.60724554	23.39275446
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**02 (BR-3)**



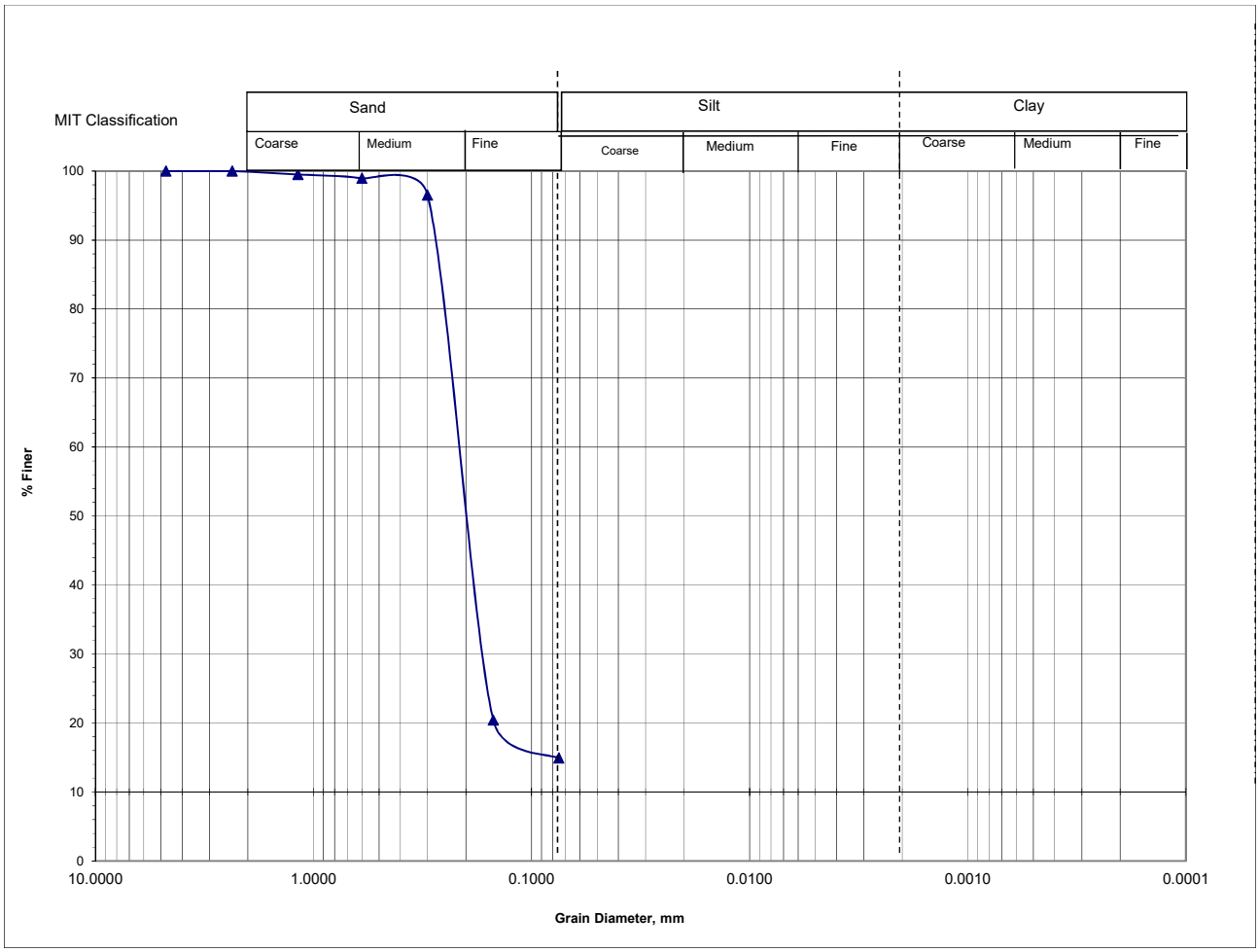
Borehole No	Sample Depth	%Gravel	%Sand	%Fine
02 (BR-3)	39	0	88.38546922	11.61453078
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**RB 02**



Borehole No	Sample Depth	%Gravel	%Sand	%Fine
RB 02	10.5	0	62.72247213	37.27752787
	0	0	0	0
	0	0	0	0

SIEVE ANALYSIS	
Project:	Sub-Regional Road Transportation Project (SRTPPF-II), Sylhet- Sutarkandi Road.
Client :	Roads and Highways Department (RHD)
Bore Hole :	**RB 04**



Borehole No	Sample Depth	%Gravel	%Sand	%Fine
RB 04	12	0	59.09569882	40.90430118
	0	0	0	0
	0	0	0	0

Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-1
Boring No: 01
Sample Depth: 7.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 13-Sep-18

USCS Soil Classification: Low Plastic Silt (ML)

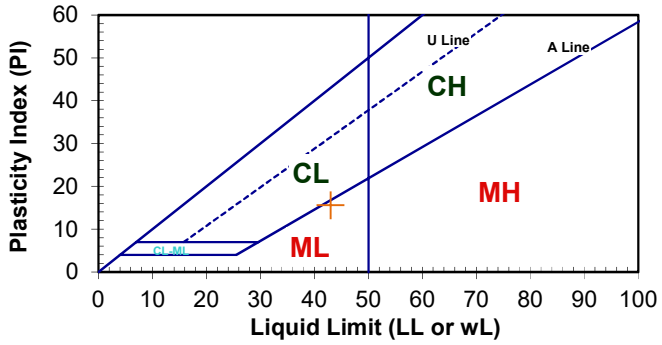
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					32	26	20	
Can Number	---	---	5	15	18		14	3	2	
Mass of Empty Can	M_C	(g)	30.01	24.81	19.07		18.91	18.84	18.59	
Mass Can & Soil (Wet)	M_{CMS}	(g)	35.55	30.09	24.47		36.01	43.47	37.73	
Mass Can & Soil (Dry)	M_{CDS}	(g)	34.24	29.02	23.37		31.71	35.98	31.51	
Mass of Soil	M_S	(g)	4.23	4.21	4.30		12.80	17.14	12.92	
Mass of Water	M_W	(g)	1.31	1.07	1.10		4.30	7.49	6.22	
Water Content	w	(%)	31.0	25.4	25.6		33.6	43.7	48.1	

Liquid Limit (LL or w_L) (%):	**43**
Plasticity Index (PI) (%):	**16**
Plastic Limit (PL or w_P) (%):	**27**
USCS Classification:	**ML**

PI at "A" Line = 0.73(LL-20)

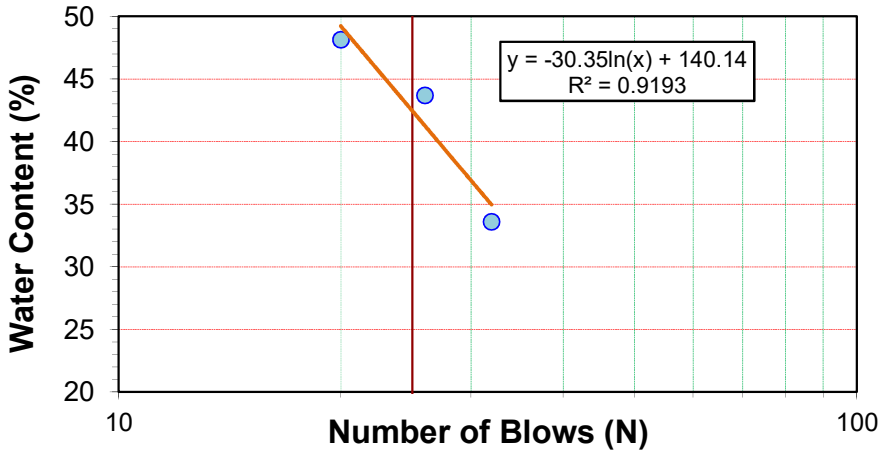
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-1
Boring No: 01
Sample Depth: 37.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 13-Sep-18

USCS Soil Classification: Silty Clay (CL)

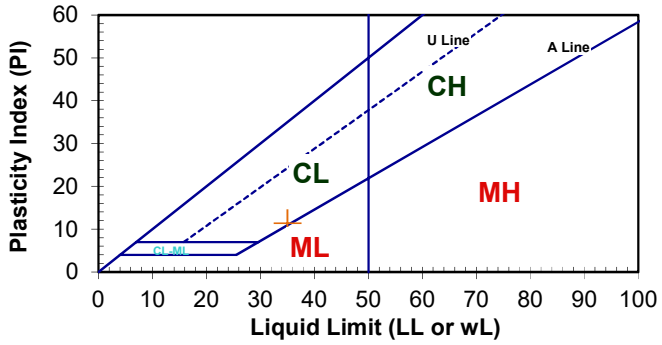
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					34	28	21	
Can Number	---	---	21	38	28		27	30	33	
Mass of Empty Can	M_C	(g)	24.44	18.96	18.97		24.32	23.96	24.18	
Mass Can & Soil (Wet)	M_{CMS}	(g)	32.18	24.84	24.17		42.29	39.29	40.82	
Mass Can & Soil (Dry)	M_{CDS}	(g)	30.71	23.70	23.19		37.91	35.33	36.45	
Mass of Soil	M_S	(g)	6.27	4.74	4.22		13.59	11.37	12.27	
Mass of Water	M_W	(g)	1.47	1.14	0.98		4.38	3.96	4.37	
Water Content	w	(%)	23.4	24.1	23.2		32.2	34.8	35.6	

Liquid Limit (LL or w_L) (%):	**35**
Plasticity Index (PI) (%):	**11**
Plastic Limit (PL or w_P) (%):	**24**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

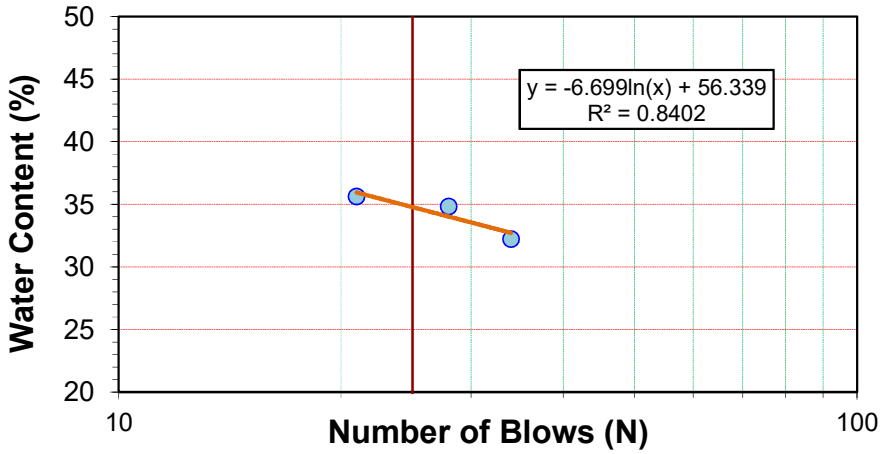
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-1
Boring No: 02
Sample Depth: 7.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 13-Sep-18

USCS Soil Classification: Low Plastic Silt (ML)

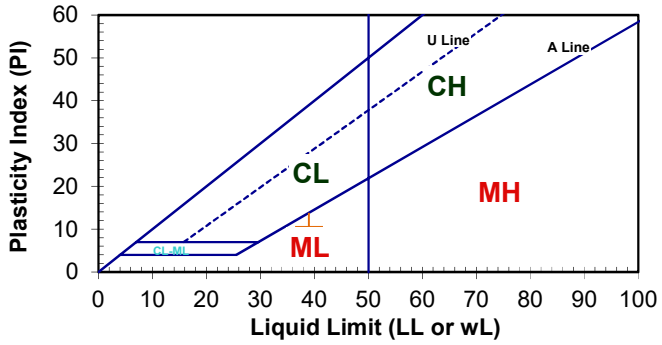
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					34	27	22	
Can Number	---	---	7	13	1		4	5	16	
Mass of Empty Can	M_C	(g)	19.10	19.17	19.21		19.26	30.19	19.05	
Mass Can & Soil (Wet)	M_{CMS}	(g)	24.11	26.95	25.44		45.50	53.66	50.45	
Mass Can & Soil (Dry)	M_{CDS}	(g)	22.96	25.29	24.06		38.67	47.10	41.61	
Mass of Soil	M_S	(g)	3.86	6.12	4.85		19.41	16.91	22.56	
Mass of Water	M_W	(g)	1.15	1.66	1.38		6.83	6.56	8.84	
Water Content	w	(%)	29.8	27.1	28.5		35.2	38.8	39.2	

Liquid Limit (LL or w_L) (%):	**39**
Plasticity Index (PI) (%):	**11**
Plastic Limit (PL or w_P) (%):	**28**
USCS Classification:	**ML**

PI at "A" Line = 0.73(LL-20)

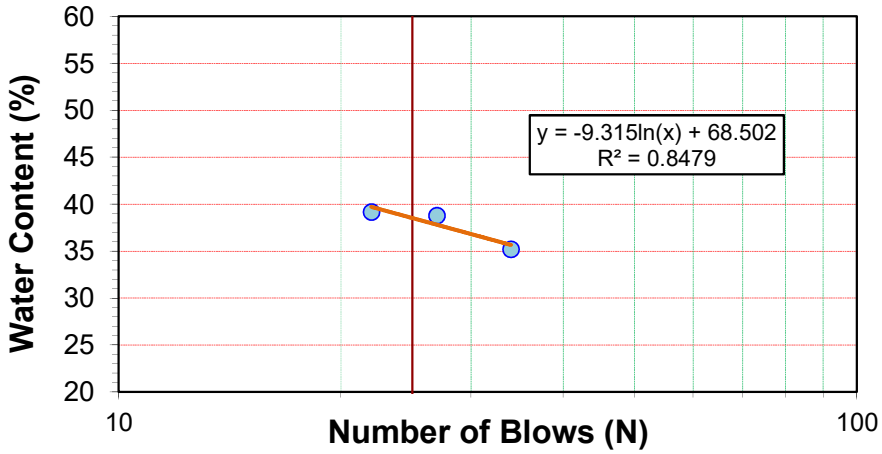
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

	Wet Preperation Multipoint
X	Dry Preperation Multipoint
	Procedure A Multipoint
	Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-1
Boring No: 02
Sample Depth: 28.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 13-Sep-18

USCS Soil Classification: Low Plastic Silt (ML)

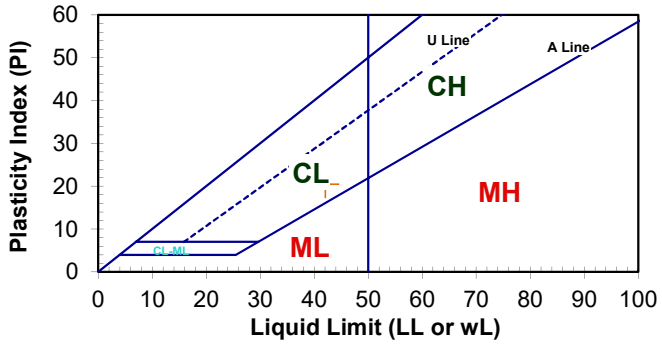
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					33	27	20	
Can Number	---	---	21	38	28		40	39	26	
Mass of Empty Can	M_C	(g)	24.16	24.00	25.03		24.78	24.01	24.41	
Mass Can & Soil (Wet)	M_{CMS}	(g)	29.36	28.78	28.54		41.54	43.44	39.66	
Mass Can & Soil (Dry)	M_{CDS}	(g)	28.42	27.95	27.92		36.72	37.71	35.07	
Mass of Soil	M_S	(g)	4.26	3.95	2.89		11.94	13.70	10.66	
Mass of Water	M_W	(g)	0.94	0.83	0.62		4.82	5.73	4.59	
Water Content	w	(%)	22.1	21.0	21.5		40.4	41.8	43.1	

Liquid Limit (LL or w_L) (%):	**42**
Plasticity Index (PI) (%):	**20**
Plastic Limit (PL or w_P) (%):	**22**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

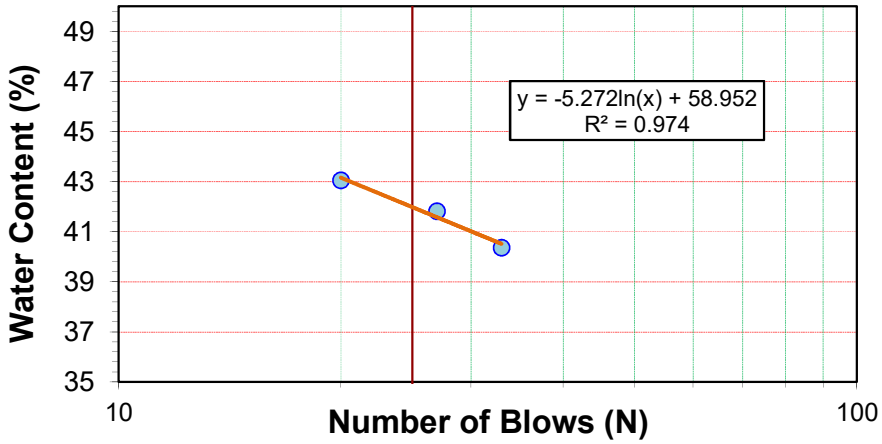
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-1
Boring No: 03
Sample Depth: 10.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 12-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

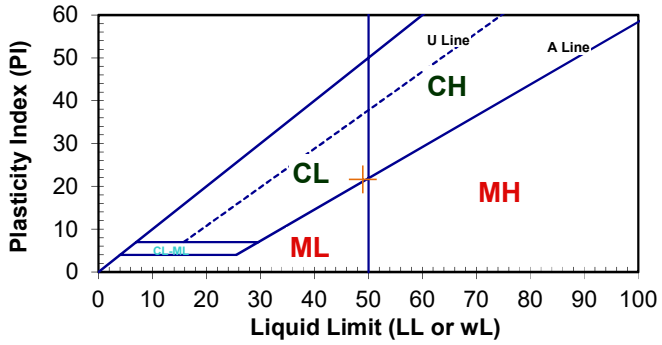
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					33	27	20	
Can Number	---	---	5	15	18		13	9	11	
Mass of Empty Can	M_C	(g)	30.01	24.81	19.07		19.08	19.10	19.19	
Mass Can & Soil (Wet)	M_{CMS}	(g)	35.55	30.09	24.47		36.95	37.57	37.11	
Mass Can & Soil (Dry)	M_{CDS}	(g)	34.24	29.02	23.37		31.18	31.50	31.10	
Mass of Soil	M_S	(g)	4.23	4.21	4.30		12.10	12.40	11.91	
Mass of Water	M_W	(g)	1.31	1.07	1.10		5.77	6.07	6.01	
Water Content	w	(%)	31.0	25.4	25.6		47.7	49.0	50.5	

Liquid Limit (LL or w_L) (%):	49
Plasticity Index (PI) (%):	22
Plastic Limit (PL or w_P) (%):	27
USCS Classification:	CL

PI at "A" Line = 0.73(LL-20)

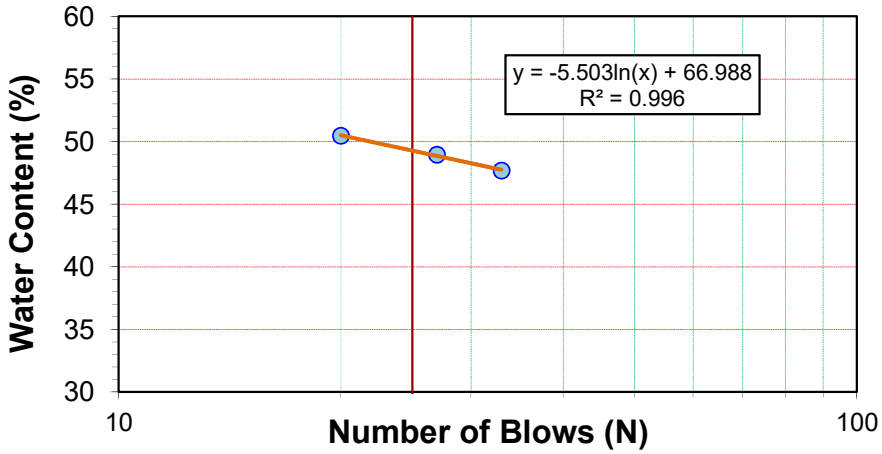
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-1
Boring No: 03
Sample Depth: 30.0 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 12-Sep-18

USCS Soil Classification: Low Plastic Silt (ML)

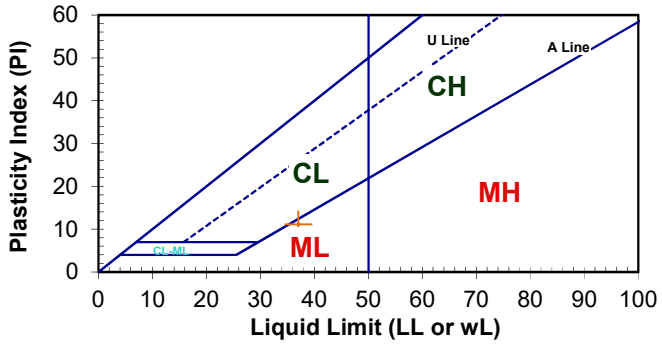
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					34	27	20	
Can Number	---	---	20	1	12		4	7	13	
Mass of Empty Can	M_C	(g)	18.87	19.15	18.96		19.12	18.98	19.04	
Mass Can & Soil (Wet)	M_{CMS}	(g)	24.07	25.28	24.86		34.55	35.53	33.78	
Mass Can & Soil (Dry)	M_{CDS}	(g)	22.97	24.03	23.68		30.74	31.02	29.57	
Mass of Soil	M_S	(g)	4.10	4.88	4.72		11.62	12.04	10.53	
Mass of Water	M_W	(g)	1.10	1.25	1.18		3.81	4.51	4.21	
Water Content	w	(%)	26.8	25.6	25.0		32.8	37.5	40.0	

Liquid Limit (LL or w_L) (%):	37
Plasticity Index (PI) (%):	11
Plastic Limit (PL or w_P) (%):	26
USCS Classification:	ML

PI at "A" Line = 0.73(LL-20)

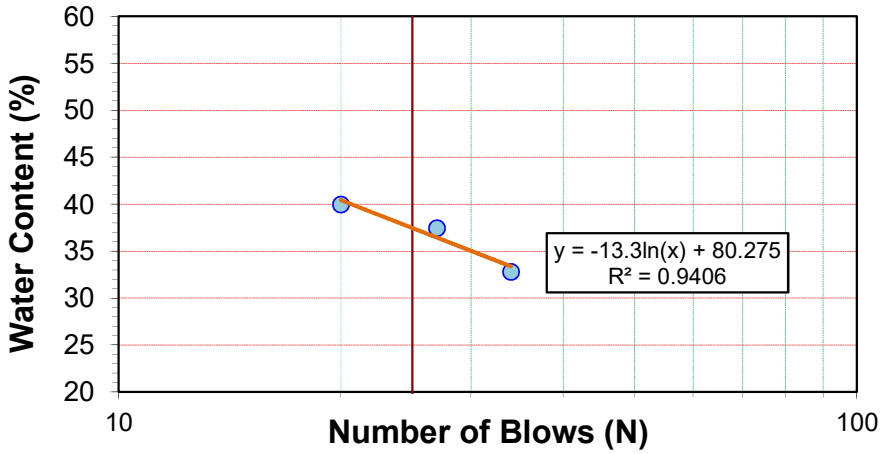
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-2
Boring No: 01
Sample Depth: 3.0 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 12-Sep-18

USCS Soil Classification: Low Plastic Clay (ML)

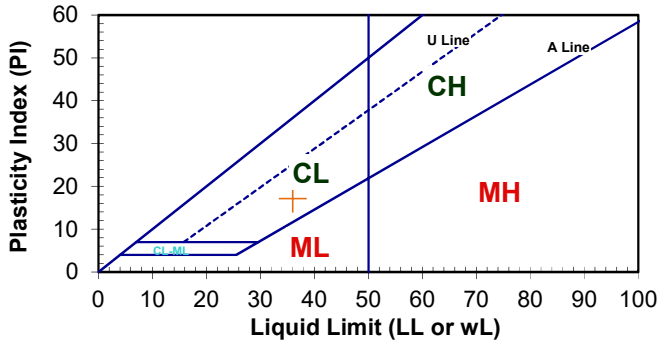
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					34	27	20	
Can Number	---	---	35	37	35		27	28	31	
Mass of Empty Can	M_C	(g)	20.63	20.66	20.63		17.33	17.41	17.45	
Mass Can & Soil (Wet)	M_{CMS}	(g)	29.26	30.03	29.26		48.61	55.53	51.71	
Mass Can & Soil (Dry)	M_{CDS}	(g)	27.90	28.53	27.90		40.82	45.57	42.28	
Mass of Soil	M_S	(g)	7.27	7.87	7.27		23.49	28.16	24.83	
Mass of Water	M_W	(g)	1.36	1.50	1.36		7.79	9.96	9.43	
Water Content	w	(%)	18.7	19.1	18.7		33.2	35.4	38.0	

Liquid Limit (LL or w_L) (%):	**36**
Plasticity Index (PI) (%):	**17**
Plastic Limit (PL or w_P) (%):	**19**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

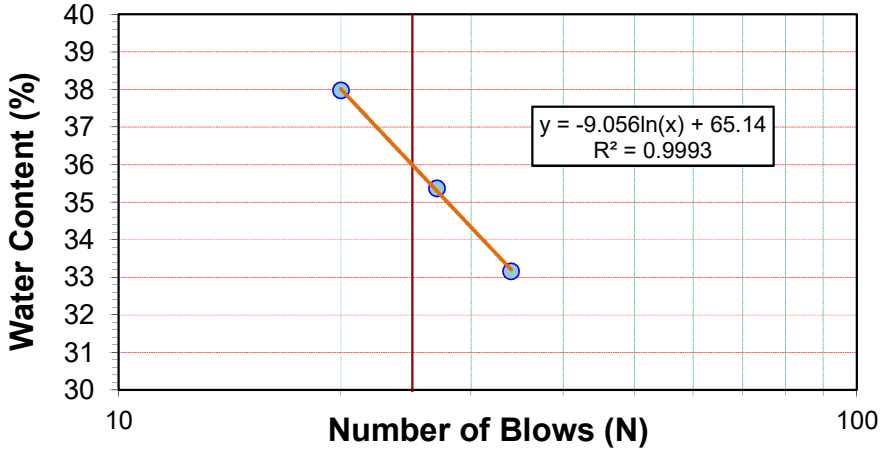
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- [ ] Wet Preperation Multipoint
- [X] Dry Preperation Multipoint
- [ ] Procedure A Multipoint
- [ ] Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-2
Boring No: 01
Sample Depth: 19.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 12-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

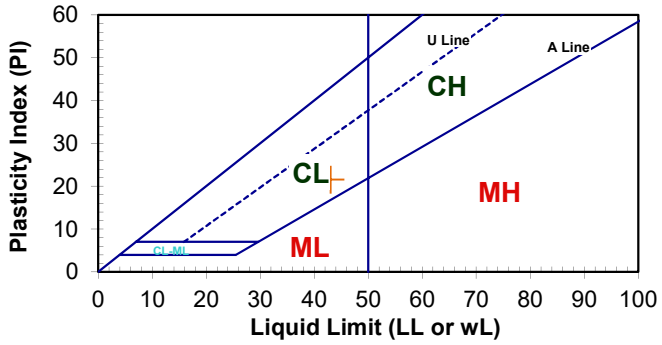
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					34	27	20	
Can Number	---	---	1	14	9		16	7	5	
Mass of Empty Can	M_C	(g)	19.10	18.87	19.12		18.85	18.97	30.00	
Mass Can & Soil (Wet)	M_{CMS}	(g)	24.51	24.76	24.02		35.20	33.64	46.48	
Mass Can & Soil (Dry)	M_{CDS}	(g)	23.56	23.73	23.15		30.60	29.23	41.26	
Mass of Soil	M_S	(g)	4.46	4.86	4.03		11.75	10.26	11.26	
Mass of Water	M_W	(g)	0.95	1.03	0.87		4.60	4.41	5.22	
Water Content	w	(%)	21.3	21.2	21.6		39.1	43.0	46.4	

Liquid Limit (LL or w_L) (%):	**43**
Plasticity Index (PI) (%):	**22**
Plastic Limit (PL or w_P) (%):	**21**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

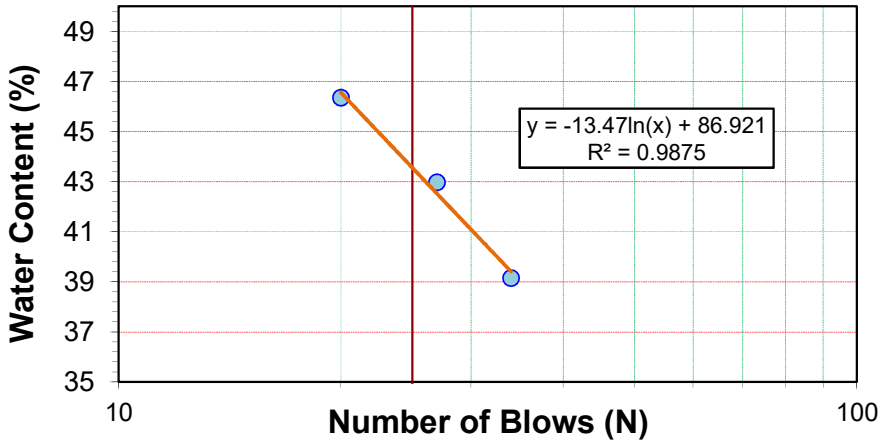
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-2
Boring No: 01
Sample Depth: 27.0 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 13-Sep-18

USCS Soil Classification: Low Plastic Silt (ML)

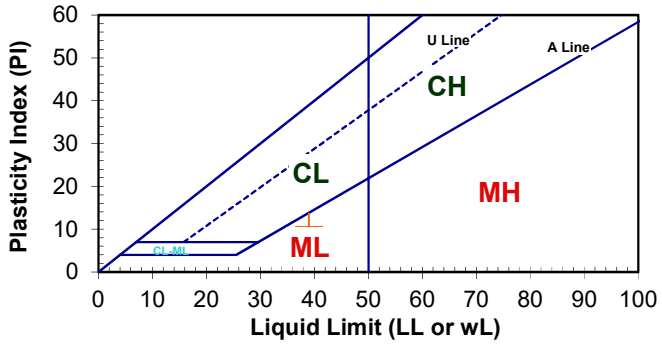
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					33	26	23	
Can Number	---	---	7	13	1		15	11	2	
Mass of Empty Can	M_C	(g)	19.10	19.17	19.21		24.88	19.31	18.56	
Mass Can & Soil (Wet)	M_{CMS}	(g)	24.11	26.95	25.44		59.75	44.16	42.85	
Mass Can & Soil (Dry)	M_{CDS}	(g)	22.96	25.29	24.06		50.56	37.30	35.90	
Mass of Soil	M_S	(g)	3.86	6.12	4.85		25.68	17.99	17.34	
Mass of Water	M_W	(g)	1.15	1.66	1.38		9.19	6.86	6.95	
Water Content	w	(%)	29.8	27.1	28.5		35.8	38.1	40.1	

Liquid Limit (LL or w_L) (%):	39
Plasticity Index (PI) (%):	11
Plastic Limit (PL or w_P) (%):	28
USCS Classification:	CL

PI at "A" Line = 0.73(LL-20)

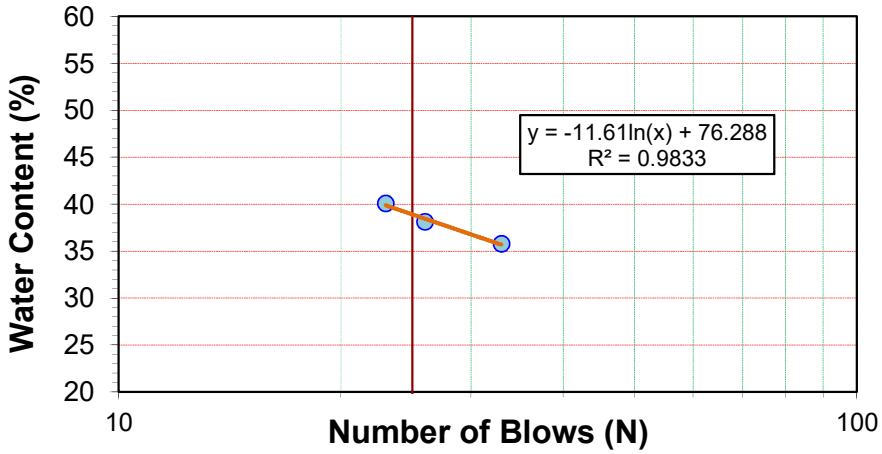
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-2
Boring No: 02
Sample Depth: 4.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 13-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

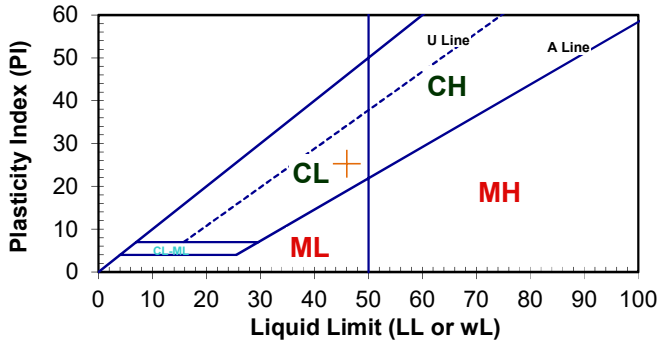
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					33	26	20	
Can Number	---	---	22	27	26		30	33	38	
Mass of Empty Can	M_C	(g)	24.52	24.21	24.35		24.10	24.23	23.76	
Mass Can & Soil (Wet)	M_{CMS}	(g)	29.08	28.53	28.95		44.19	40.91	42.84	
Mass Can & Soil (Dry)	M_{CDS}	(g)	28.23	27.82	28.20		38.26	35.65	36.56	
Mass of Soil	M_S	(g)	3.71	3.61	3.85		14.16	11.42	12.80	
Mass of Water	M_W	(g)	0.85	0.71	0.75		5.93	5.26	6.28	
Water Content	w	(%)	22.9	19.7	19.5		41.9	46.1	49.1	

Liquid Limit (LL or w_L) (%):	**46**
Plasticity Index (PI) (%):	**25**
Plastic Limit (PL or w_P) (%):	**21**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

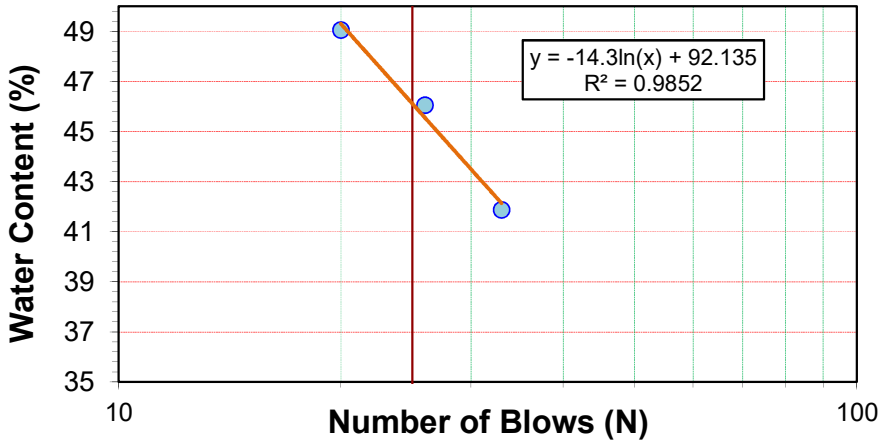
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- [ ] Wet Preperation Multipoint
- [X] Dry Preperation Multipoint
- [ ] Procedure A Multipoint
- [ ] Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-2
Boring No: 02
Sample Depth: 15.0 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 13-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

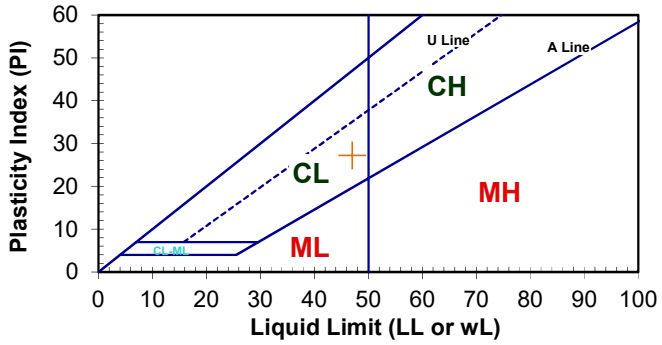
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					34	28	20	
Can Number	---	---	21	28	40		23	34	39	
Mass of Empty Can	M_C	(g)	23.98	24.81	24.81		24.49	24.92	24.05	
Mass Can & Soil (Wet)	M_{CMS}	(g)	30.11	30.28	29.71		37.18	45.91	40.06	
Mass Can & Soil (Dry)	M_{CDS}	(g)	29.10	29.38	28.90		33.27	39.30	34.85	
Mass of Soil	M_S	(g)	5.12	4.57	4.09		8.78	14.38	10.80	
Mass of Water	M_W	(g)	1.01	0.90	0.81		3.91	6.61	5.21	
Water Content	w	(%)	19.7	19.7	19.8		44.5	46.0	48.2	

Liquid Limit (LL or w_L) (%):	47
Plasticity Index (PI) (%):	27
Plastic Limit (PL or w_P) (%):	20
USCS Classification:	CL

PI at "A" Line = 0.73(LL-20)

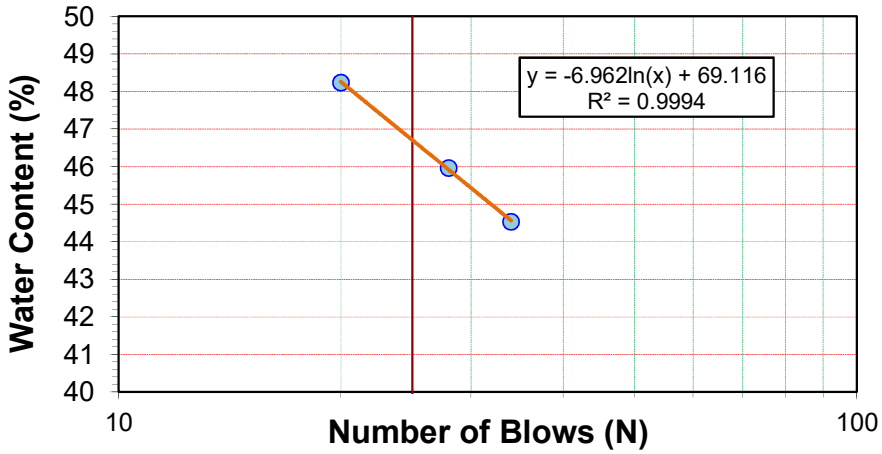
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-3
Boring No: 01
Sample Depth: 4.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 13-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

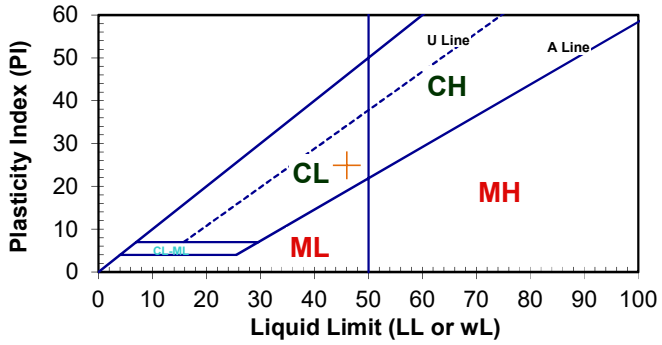
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					35	29	20	
Can Number	---	---	1	3	13		7	8	20	
Mass of Empty Can	M_C	(g)	19.12	18.82	19.01		18.96	19.04	18.86	
Mass Can & Soil (Wet)	M_{CMS}	(g)	26.62	25.98	25.82		53.28	51.22	46.04	
Mass Can & Soil (Dry)	M_{CDS}	(g)	25.28	24.76	24.64		43.04	41.23	37.24	
Mass of Soil	M_S	(g)	6.16	5.94	5.63		24.08	22.19	18.38	
Mass of Water	M_W	(g)	1.34	1.22	1.18		10.24	9.99	8.80	
Water Content	w	(%)	21.8	20.5	21.0		42.5	45.0	47.9	

Liquid Limit (LL or w_L) (%):	**46**
Plasticity Index (PI) (%):	**25**
Plastic Limit (PL or w_P) (%):	**21**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

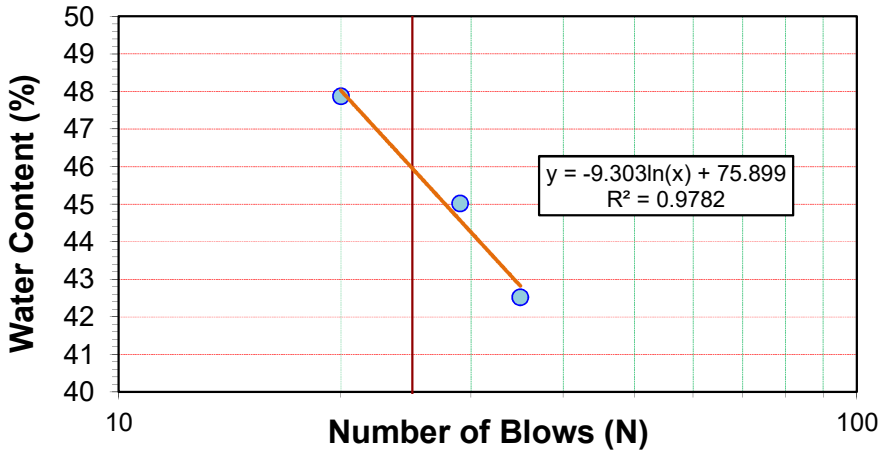
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-3
Boring No: 01
Sample Depth: 24.0 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 13-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

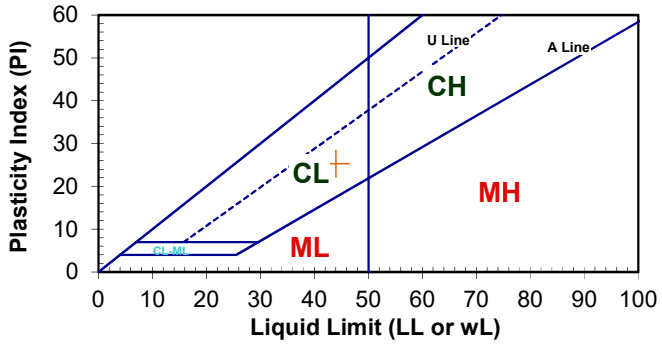
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					35	27	19	
Can Number	---	---	1	14	9		16	7	5	
Mass of Empty Can	M_C	(g)	19.10	18.87	19.12		18.85	18.97	30.00	
Mass Can & Soil (Wet)	M_{CMS}	(g)	24.51	24.76	24.02		35.20	33.64	46.48	
Mass Can & Soil (Dry)	M_{CDS}	(g)	23.66	23.83	23.25		30.60	29.22	41.11	
Mass of Soil	M_S	(g)	4.56	4.96	4.13		11.75	10.25	11.11	
Mass of Water	M_W	(g)	0.85	0.93	0.77		4.60	4.42	5.37	
Water Content	w	(%)	18.6	18.8	18.6		39.1	43.1	48.3	

Liquid Limit (LL or w_L) (%):	44
Plasticity Index (PI) (%):	25
Plastic Limit (PL or w_P) (%):	19
USCS Classification:	CL

PI at "A" Line = 0.73(LL-20)

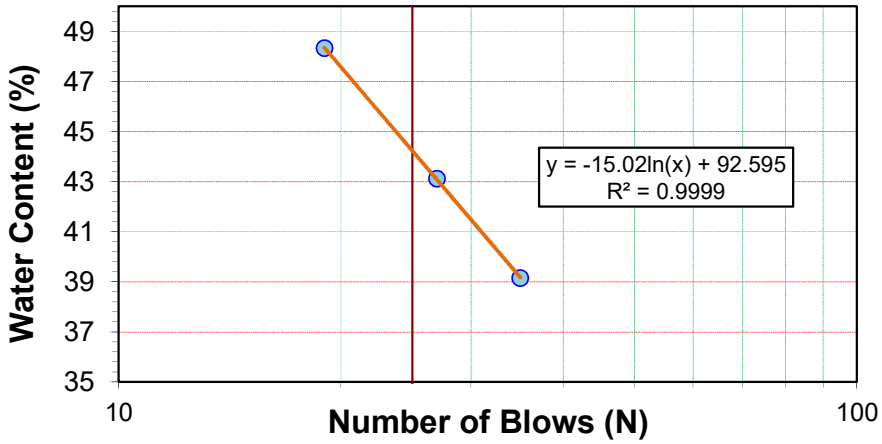
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-3
Boring No: 02
Sample Depth: 10.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 13-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

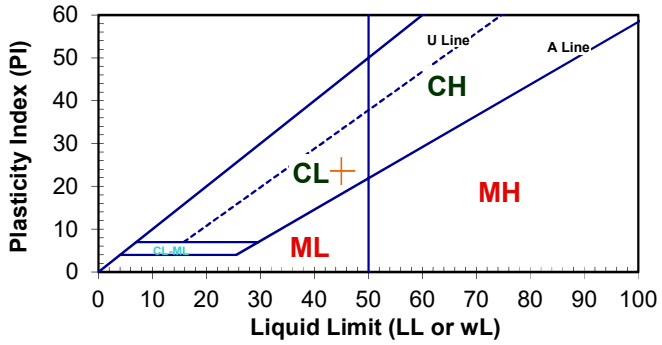
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					34	27	20	
Can Number	---	---	1	14	9		16	7	5	
Mass of Empty Can	M_C	(g)	19.10	18.87	19.12		18.85	18.97	30.00	
Mass Can & Soil (Wet)	M_{CMS}	(g)	24.51	24.76	24.02		35.20	33.64	46.48	
Mass Can & Soil (Dry)	M_{CDS}	(g)	23.56	23.73	23.15		30.60	29.22	41.11	
Mass of Soil	M_S	(g)	4.46	4.86	4.03		11.75	10.25	11.11	
Mass of Water	M_W	(g)	0.95	1.03	0.87		4.60	4.42	5.37	
Water Content	w	(%)	21.3	21.2	21.6		39.1	43.1	48.3	

Liquid Limit (LL or w_L) (%):	**45**
Plasticity Index (PI) (%):	**24**
Plastic Limit (PL or w_P) (%):	**21**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

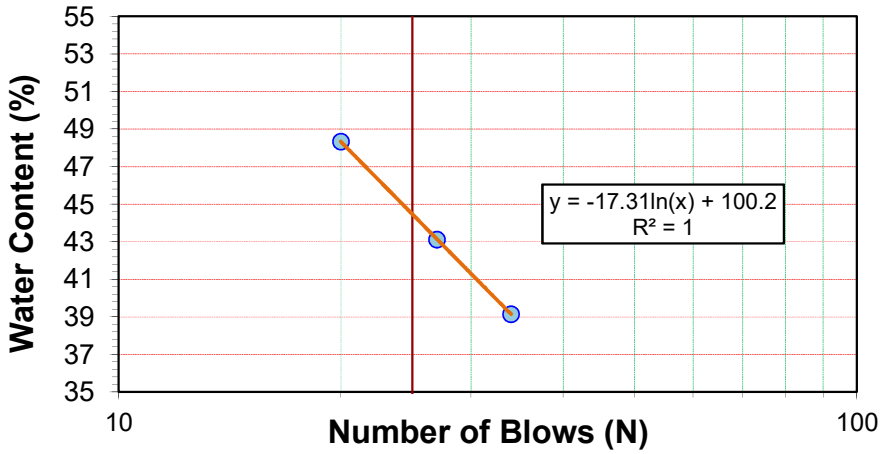
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: BR-3
Boring No: 02
Sample Depth: 25.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 11-Sep-18

USCS Soil Classification: Low Plastic Silt (ML)

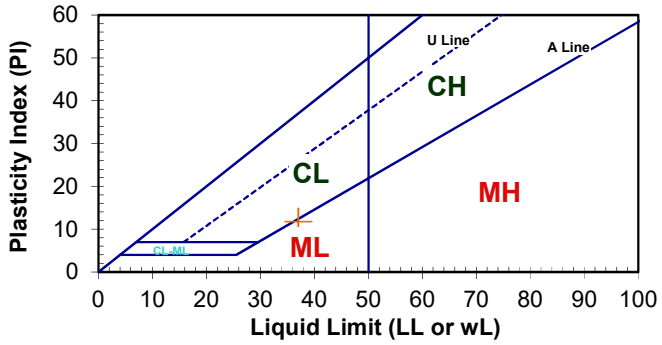
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					36	29	21	
Can Number	---	---	30	38	28		33	39	22	
Mass of Empty Can	M_C	(g)	24.12	23.91	24.87		24.21	24.07	24.57	
Mass Can & Soil (Wet)	M_{CMS}	(g)	30.58	30.35	30.26		53.60	60.16	61.20	
Mass Can & Soil (Dry)	M_{CDS}	(g)	29.26	28.99	29.25		45.99	50.56	50.82	
Mass of Soil	M_S	(g)	5.14	5.08	4.38		21.78	26.49	26.25	
Mass of Water	M_W	(g)	1.32	1.36	1.01		7.61	9.60	10.38	
Water Content	w	(%)	25.7	26.8	23.1		34.9	36.2	39.5	

Liquid Limit (LL or w_L) (%):	37
Plasticity Index (PI) (%):	12
Plastic Limit (PL or w_P) (%):	25
USCS Classification:	CL

PI at "A" Line = 0.73(LL-20)

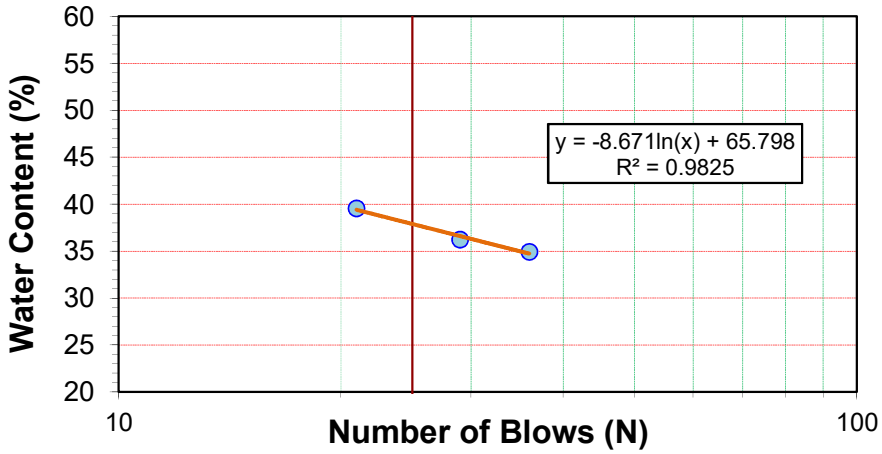
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: Sylhet- Sutarkandi Road
Boring No: RB-1
Sample Depth: 3.0 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 11-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

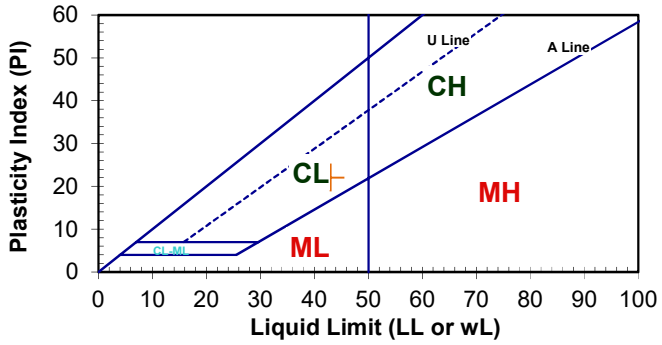
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					34	27	20	
Can Number	---	---	12	15	18		22	40	33	
Mass of Empty Can	M_C	(g)	19.03	18.97	19.01		24.50	24.79	24.19	
Mass Can & Soil (Wet)	M_{CMS}	(g)	24.81	24.13	23.61		39.09	41.73	38.59	
Mass Can & Soil (Dry)	M_{CDS}	(g)	23.79	23.27	22.80		34.92	36.59	34.12	
Mass of Soil	M_S	(g)	4.76	4.30	3.79		10.42	11.80	9.93	
Mass of Water	M_W	(g)	1.02	0.86	0.81		4.17	5.14	4.47	
Water Content	w	(%)	21.4	20.0	21.4		40.0	43.6	45.0	

Liquid Limit (LL or w_L) (%):	43
Plasticity Index (PI) (%):	22
Plastic Limit (PL or w_P) (%):	21
USCS Classification:	CL

PI at "A" Line = 0.73(LL-20)

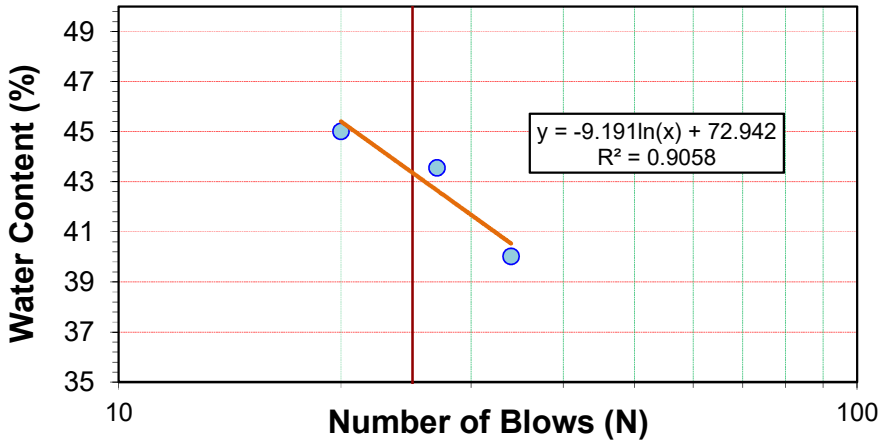
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: Sylhet- Sutarkandi Road
Boring No: RB-1
Sample Depth: 15.0 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 11-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

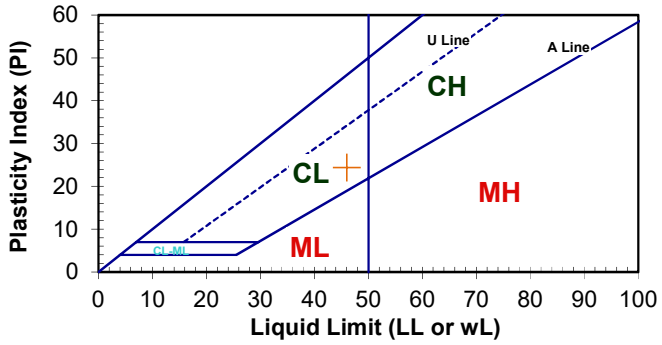
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					33	26	20	
Can Number	---	---	11	13	17		3	2	6	
Mass of Empty Can	M_C	(g)	19.08	19.01	18.96		18.80	18.49	24.00	
Mass Can & Soil (Wet)	M_{CMS}	(g)	24.08	24.69	24.46		40.59	37.55	42.17	
Mass Can & Soil (Dry)	M_{CDS}	(g)	23.19	23.69	23.48		33.95	31.57	36.21	
Mass of Soil	M_S	(g)	4.11	4.68	4.52		15.15	13.08	12.21	
Mass of Water	M_W	(g)	0.89	1.00	0.98		6.64	5.98	5.96	
Water Content	w	(%)	21.7	21.4	21.7		43.8	45.7	48.8	

Liquid Limit (LL or w_L) (%):	**46**
Plasticity Index (PI) (%):	**24**
Plastic Limit (PL or w_P) (%):	**22**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

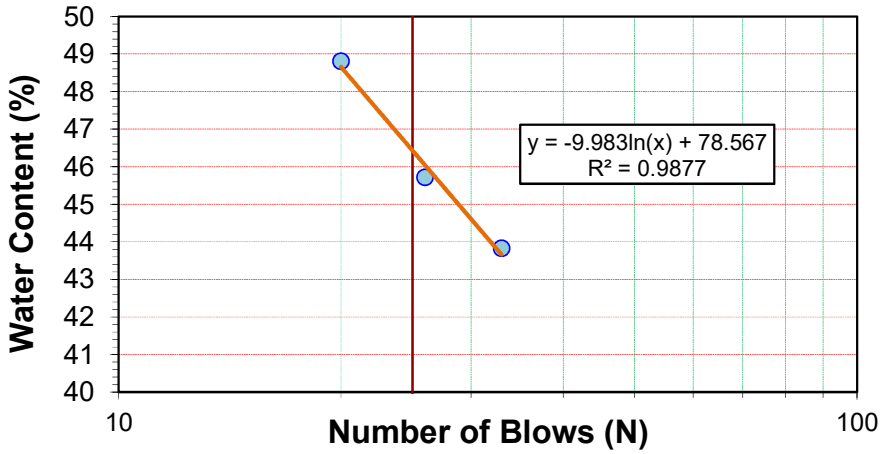
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- [ ] Wet Preperation Multipoint
- [X] Dry Preperation Multipoint
- [ ] Procedure A Multipoint
- [ ] Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: Sylhet- Sutarkandi Road
Boring No: RB-2
Sample Depth: 4.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 11-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

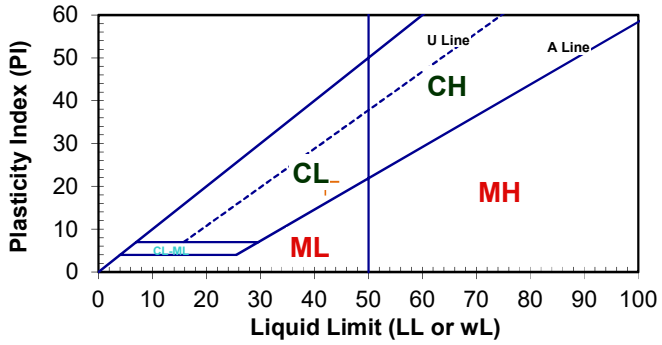
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					34	28	22	
Can Number	---	---	11	2	19		6	12	4	
Mass of Empty Can	M_C	(g)	19.21	18.50	18.39		24.00	19.16	19.22	
Mass Can & Soil (Wet)	M_{CMS}	(g)	26.93	24.51	26.66		48.18	48.48	45.33	
Mass Can & Soil (Dry)	M_{CDS}	(g)	25.56	23.46	25.28		41.44	39.85	37.42	
Mass of Soil	M_S	(g)	6.35	4.96	6.89		17.44	20.69	18.20	
Mass of Water	M_W	(g)	1.37	1.05	1.38		6.74	8.63	7.91	
Water Content	w	(%)	21.6	21.2	20.0		38.6	41.7	43.5	

Liquid Limit (LL or w_L) (%):	**42**
Plasticity Index (PI) (%):	**21**
Plastic Limit (PL or w_P) (%):	**21**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

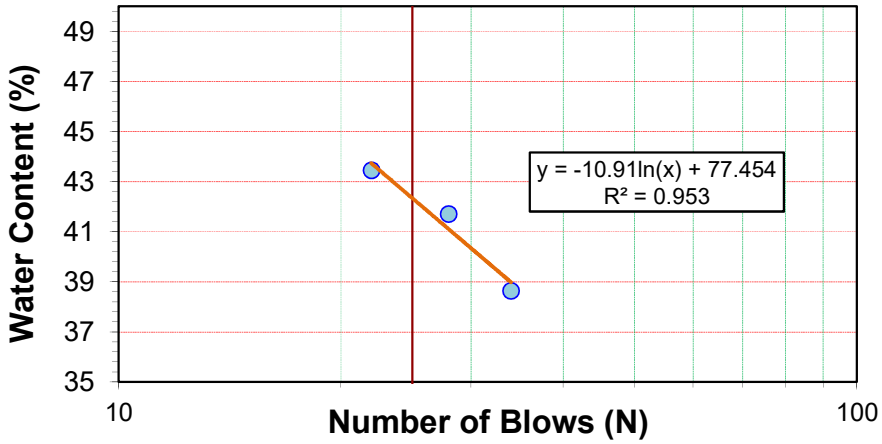
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: Sylhet- Sutarkandi Road
Boring No: RB-3
Sample Depth: 3.0 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 11-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

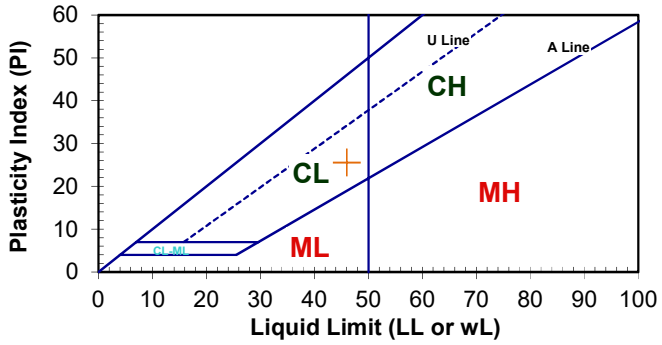
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					32	25	19	
Can Number	---	---	23	21	22		27	38	28	
Mass of Empty Can	M_C	(g)	24.50	23.98	24.48		24.35	23.83	24.86	
Mass Can & Soil (Wet)	M_{CMS}	(g)	29.79	29.69	30.06		42.39	40.81	42.74	
Mass Can & Soil (Dry)	M_{CDS}	(g)	28.89	28.73	29.11		37.04	35.44	36.73	
Mass of Soil	M_S	(g)	4.39	4.75	4.63		12.69	11.61	11.87	
Mass of Water	M_W	(g)	0.90	0.96	0.95		5.35	5.37	6.01	
Water Content	w	(%)	20.5	20.2	20.5		42.2	46.3	50.6	

Liquid Limit (LL or w_L) (%):	**46**
Plasticity Index (PI) (%):	**26**
Plastic Limit (PL or w_P) (%):	**20**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

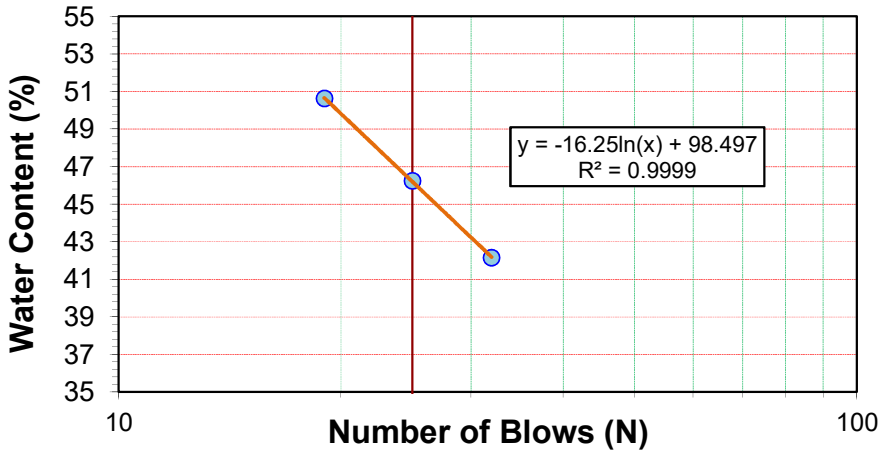
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: Sylhet- Sutarkandi Road
Boring No: RB-3
Sample Depth: 3.0 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 14-Sep-18

USCS Soil Classification: Low Plastic Silt (ML)

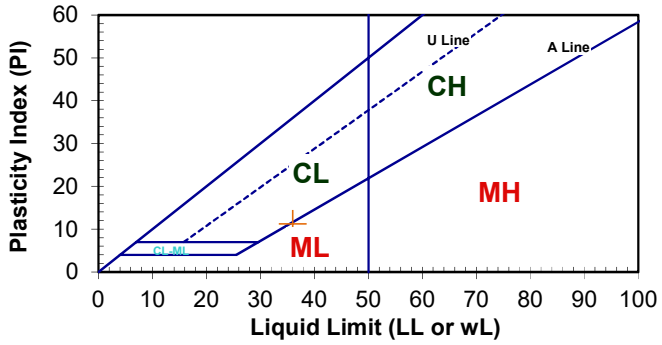
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					37	26	19	
Can Number	---	---	5	15	17		9	10	14	
Mass of Empty Can	M_C	(g)	30.00	24.79	18.96		19.08	18.79	18.91	
Mass Can & Soil (Wet)	M_{CMS}	(g)	37.35	32.04	24.06		45.73	48.59	46.91	
Mass Can & Soil (Dry)	M_{CDS}	(g)	35.89	30.65	23.02		38.99	40.64	39.18	
Mass of Soil	M_S	(g)	5.89	5.86	4.06		19.91	21.85	20.27	
Mass of Water	M_W	(g)	1.46	1.39	1.04		6.74	7.95	7.73	
Water Content	w	(%)	24.8	23.7	25.6		33.9	36.4	38.1	

Liquid Limit (LL or w_L) (%):	**36**
Plasticity Index (PI) (%):	**11**
Plastic Limit (PL or w_P) (%):	**25**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

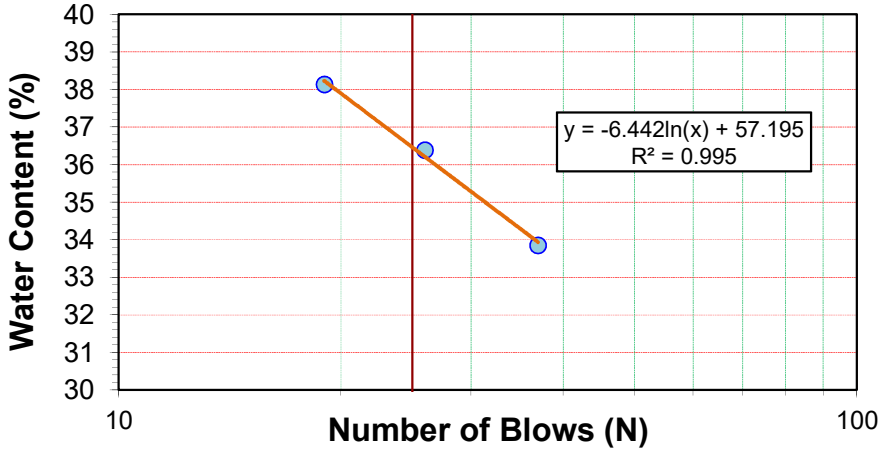
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



PROCEDURE USED

- ☐ Wet Preperation Multipoint
- ☒ Dry Preperation Multipoint
- ☐ Procedure A Multipoint
- ☐ Procedure B One-Point



Atterberg Limits Data Sheet

ASTM D4318-10

Project Name: Sub-Regional Road Transportation Project
Location: Sylhet- Sutarkandi Road
Boring No: RB-4
Sample Depth: 4.5 m

Tested By: Sadia Afrin
Checked By: Md.Moheful Islam
Test Number:
Gnd Elevation:

Date: 14-Sep-18

USCS Soil Classification: Low Plastic Clay (CL)

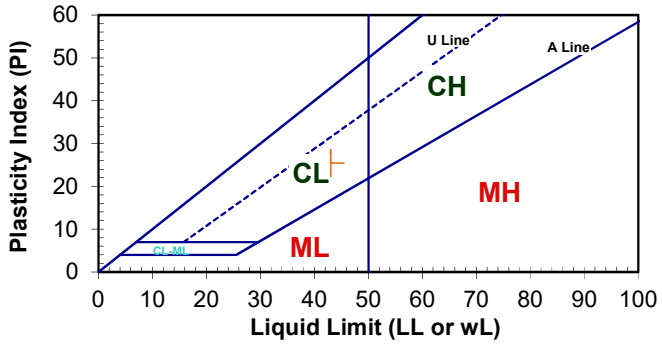
TEST			PLASTIC LIMIT				LIQUID LIMIT			
Variable	NO		1	2	3	4	1	2	3	4
	Var.	Units								
Number of Blows	N	blows					34	27	20	
Can Number	---	---	40	21	23		22	39	33	
Mass of Empty Can	M_C	(g)	24.01	23.96	24.48		24.50	24.79	24.19	
Mass Can & Soil (Wet)	M_{CMS}	(g)	29.91	28.27	29.25		39.09	41.73	38.59	
Mass Can & Soil (Dry)	M_{CDS}	(g)	29.05	27.62	28.53		34.92	36.59	34.12	
Mass of Soil	M_S	(g)	5.04	3.66	4.05		10.42	11.80	9.93	
Mass of Water	M_W	(g)	0.86	0.65	0.72		4.17	5.14	4.47	
Water Content	w	(%)	17.1	17.8	17.8		40.0	43.6	45.0	

Liquid Limit (LL or w_L) (%):	**43**
Plasticity Index (PI) (%):	**25**
Plastic Limit (PL or w_P) (%):	**18**
USCS Classification:	**CL**

PI at "A" Line = 0.73(LL-20)

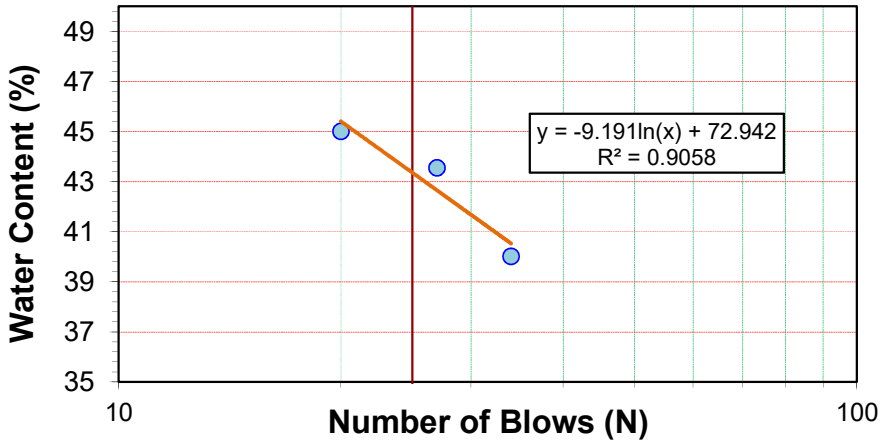
One Point Liquid Limit Calculation:

$LL = w_n (N/25)^{0.12}$



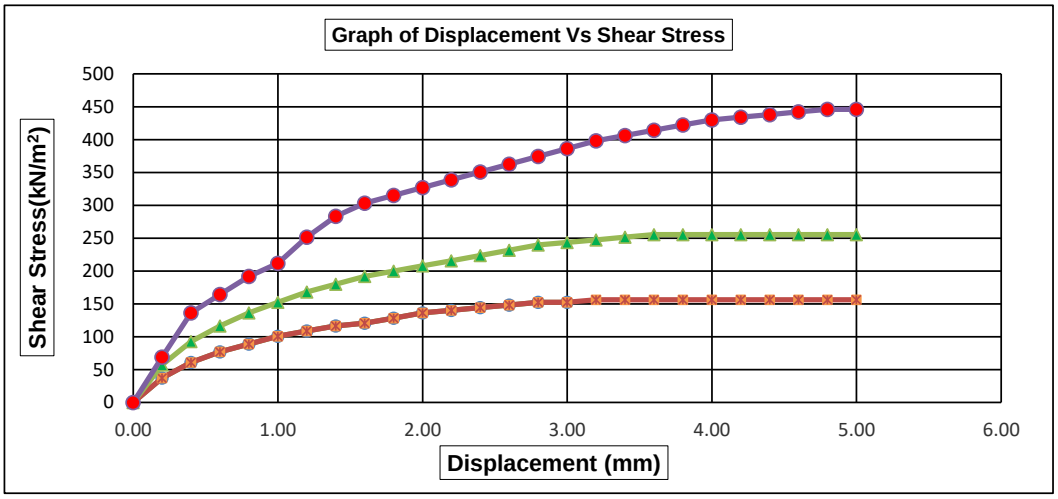
PROCEDURE USED

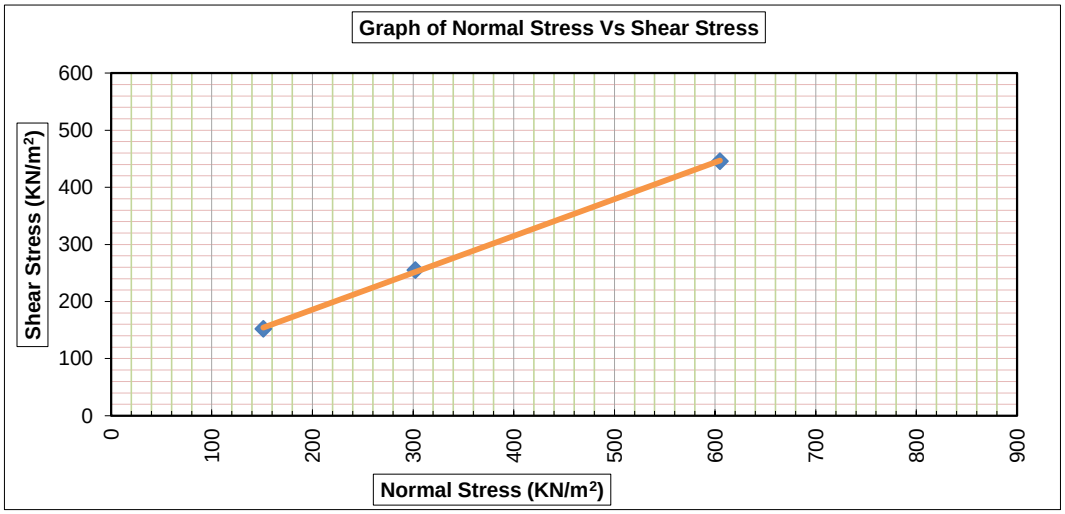
- [ ] Wet Preperation Multipoint
- [X] Dry Preperation Multipoint
- [ ] Procedure A Multipoint
- [ ] Procedure B One-Point



EHAN FOUNDATION SOLUTION

Project: Sub-Regional Road Transportation Project
Client: RHD
Borehole No. 01(BR-01)
Sample number: D33 Soil description: Silty Sand
Sample Depth: 49.5m Soil Density: 18.24 KN/m3





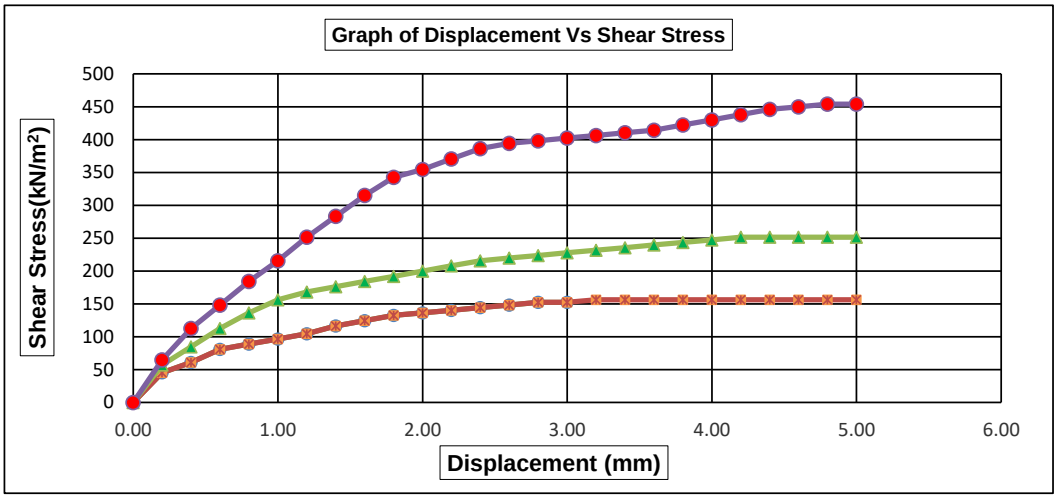
Normal Load(kg)	Normal stress (KPa)	Shear stress (KPa)
4.00	151.210	152.25
8.00	302.420	255.45
16.00	604.840	445.9616

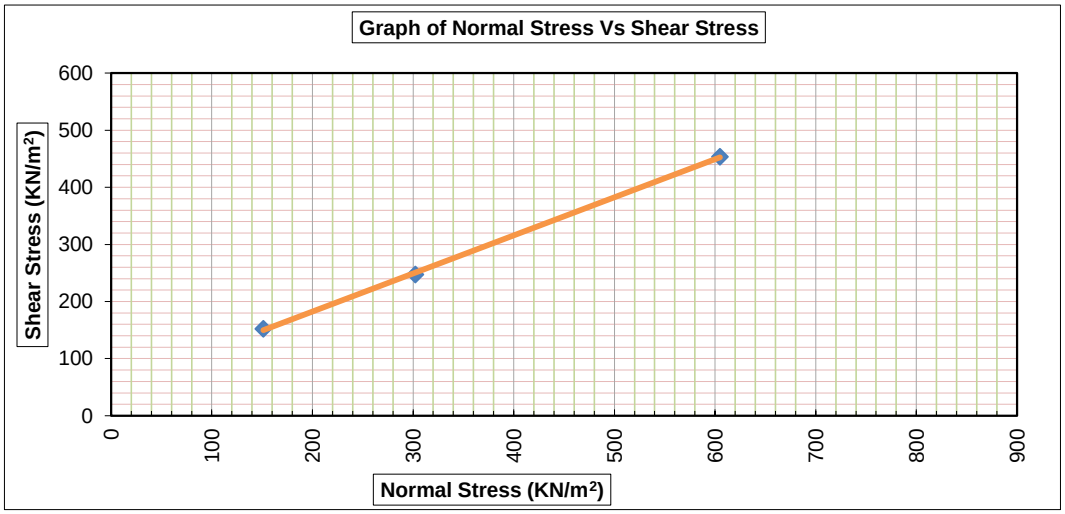
Correlation Coefficient= 1.00

Cohesion = **0.00** Kpa
Angle of friction = 32.2 °

EHAN FOUNDATION SOLUTION

Project: Sub-Regional Road Transportation Project
Client: RHD
Borehole No. 02(BR-01)
Sample number: D32 Soil description: Silty Sand
Sample Depth: 48.0 m Soil Density: 18.24 KN/m3





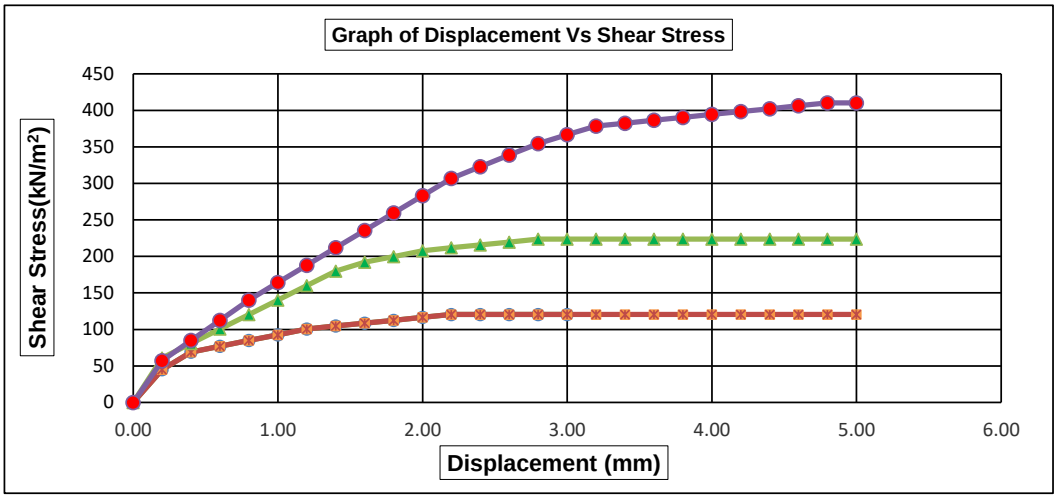
Normal Load(kg)	Normal stress (KPa)	Shear stress (KPa)
4.00	151.210	152.25
8.00	302.420	247.51
16.00	604.840	453.8998

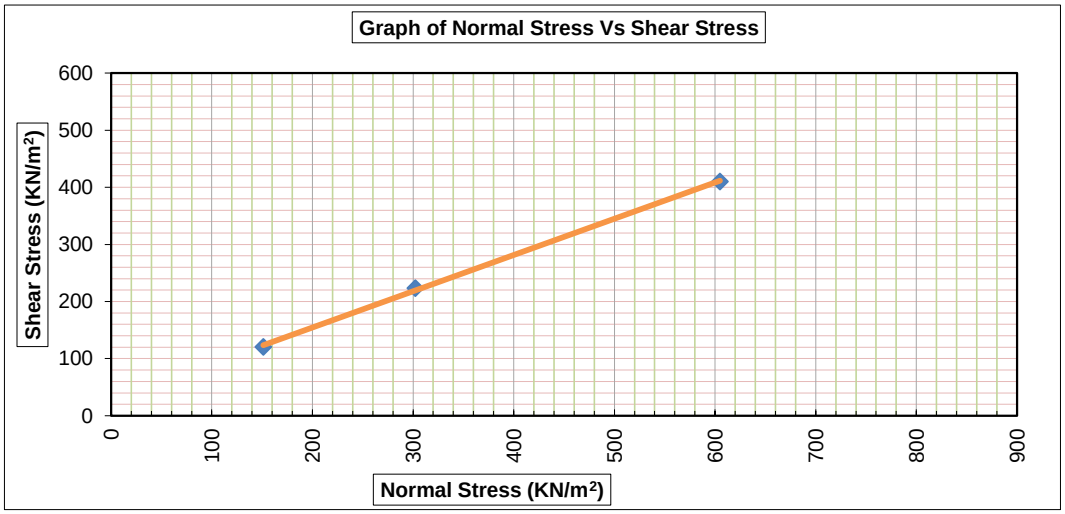
Correlation Coefficient= 1.00

Cohesion = **0.00** Kpa
Angle of friction = 34.3 °

EHAN FOUNDATION SOLUTION

Project: Sub-Regional Road Transportation Project
Client: RHD
Borehole No. 03(BR-01)
Sample number: D31 Soil description: Silty Sand
Sample Depth: 46.5 m Soil Density: 18.26 KN/m3





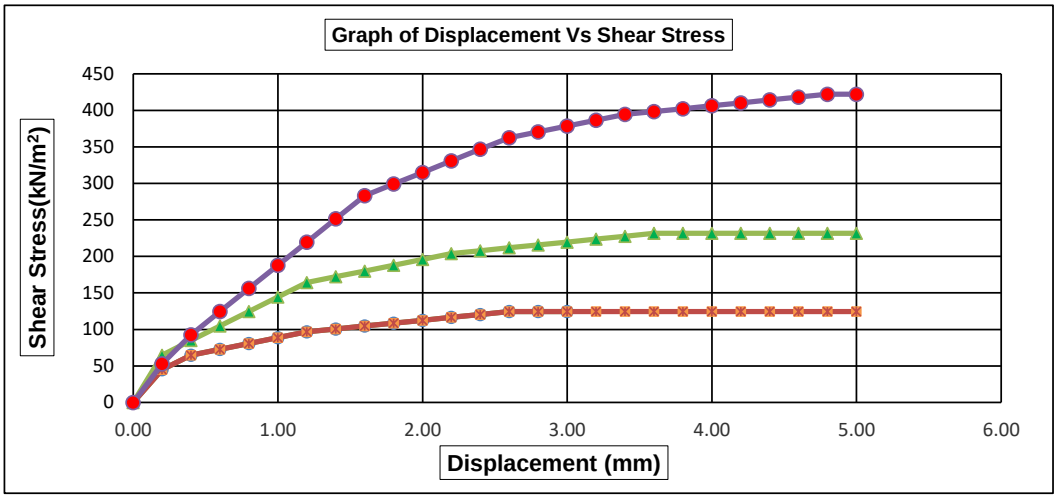
Normal Load(kg)	Normal stress (KPa)	Shear stress (KPa)
4.00	151.210	120.50
8.00	302.420	223.69
16.00	604.840	410.2400

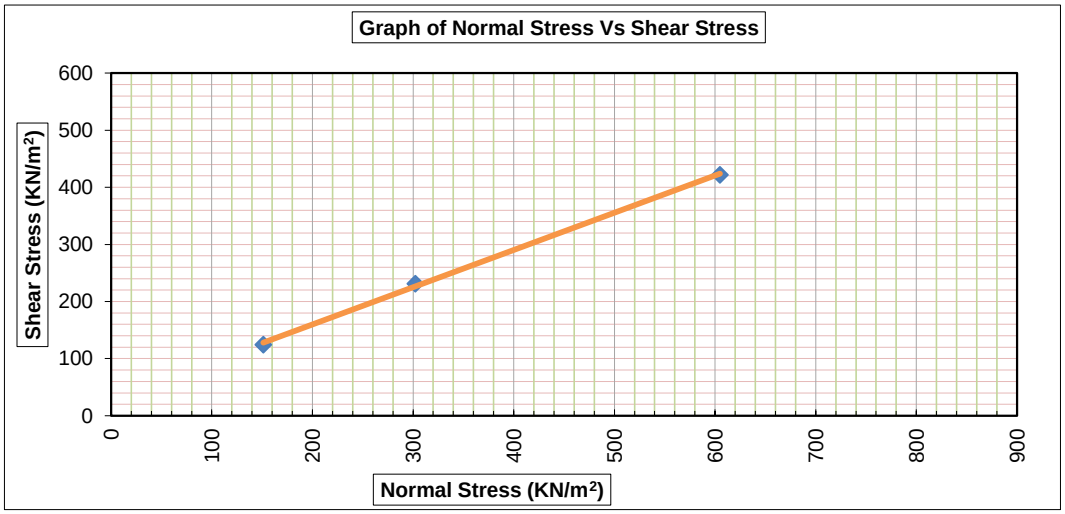
Correlation Coefficient= 1.00

Cohesion = **0.00** Kpa
Angle of friction = 31.7 °

EHAN FOUNDATION SOLUTION

Project: Sub-Regional Road Transportation Project
Client: RHD
Borehole No. 01(BR-02)
Sample number: D30 Soil description: Silty Sand
Sample Depth: 45.0 m Soil Density: 19.07 KN/m3





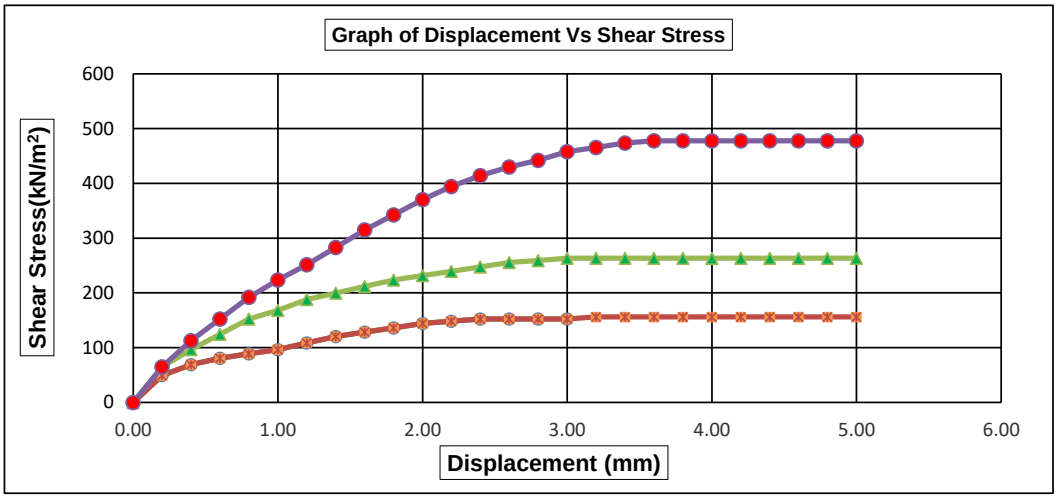
Normal Load(kg)	Normal stress (KPa)	Shear stress (KPa)
4.00	151.210	124.47
8.00	302.420	231.63
16.00	604.840	422.1472

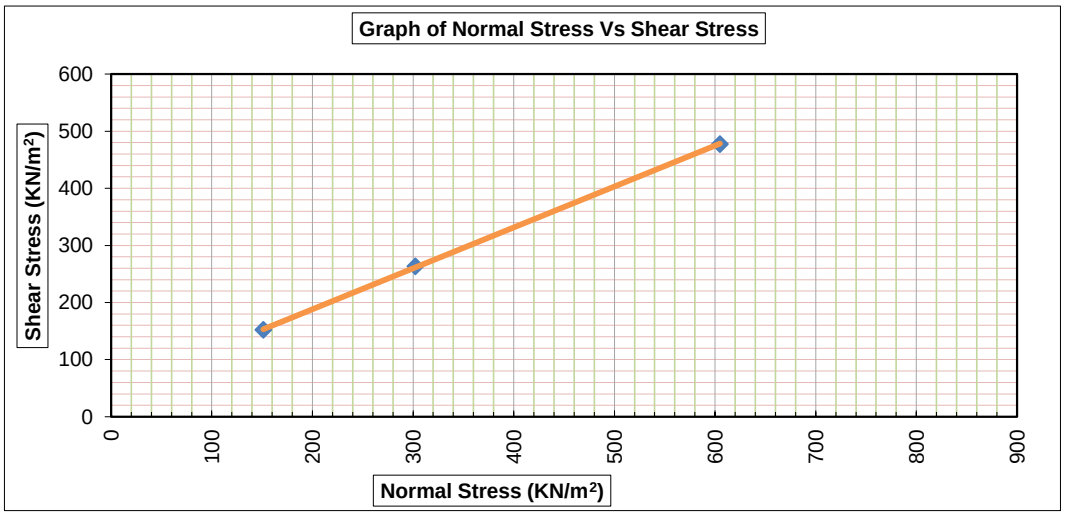
Correlation Coefficient= 1.00

Cohesion = **0.00** Kpa
Angle of friction = 32.2 °

EHAN FOUNDATION SOLUTION

Project: Sub-Regional Road Transportation Project
Client: RHD
Borehole No. 02(BR-2)
Sample number: D33 Soil description: Silty Sand
Sample Depth: 49.5m Soil Density: 19.72 KN/m3





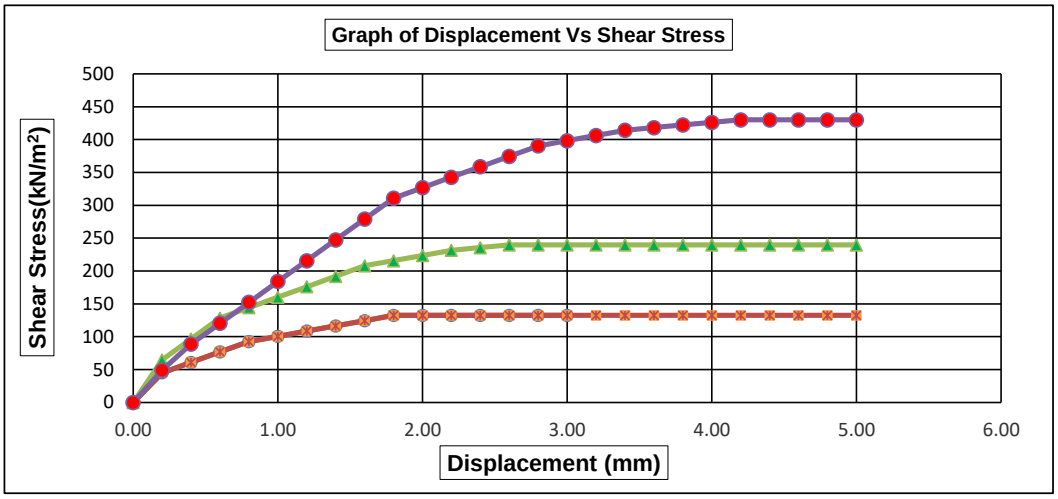
Normal Load(kg)	Normal stress (KPa)	Shear stress (KPa)
4.00	151.210	152.25
8.00	302.420	263.38
16.00	604.840	477.7142

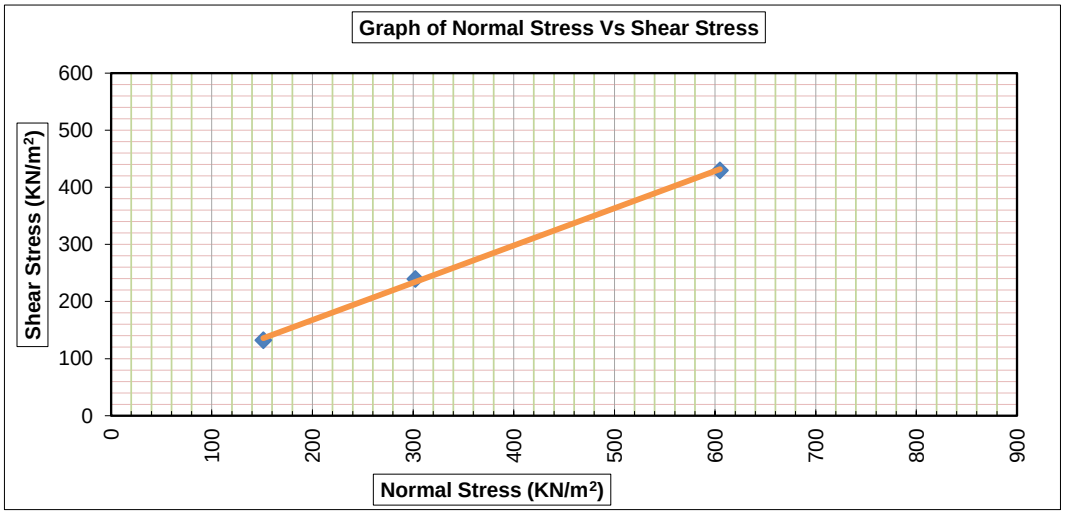
Correlation Coefficient= 1.00

Cohesion = **0.00** Kpa
Angle of friction = 35.3 °

EHAN FOUNDATION SOLUTION

Project: Sub-Regional Road Transportation Project
Client: RHD
Borehole No. 01(BR-3)
Sample number: D28 Soil description: Silty Sand
Sample Depth: 42.0 m Soil Density: 18.80 KN/m3





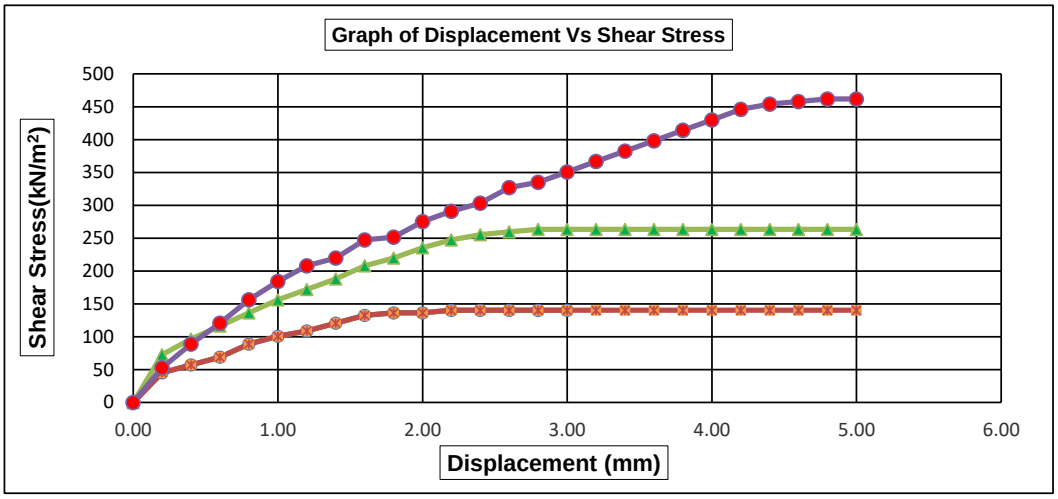
Normal Load(kg)	Normal stress (KPa)	Shear stress (KPa)
4.00	151.210	132.41
8.00	302.420	239.57
16.00	604.840	430.0853

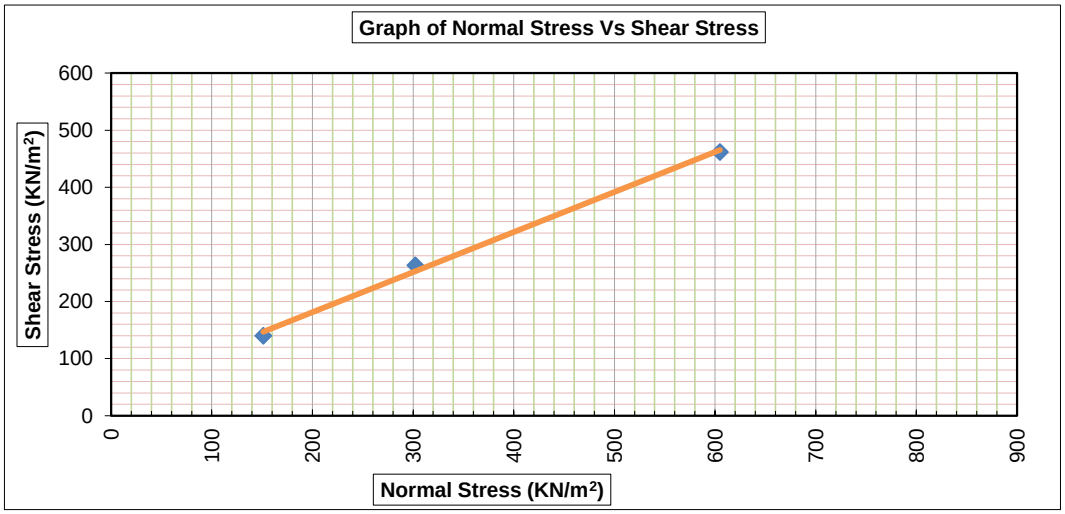
Correlation Coefficient= 1.00

Cohesion = **0.00** Kpa
Angle of friction = 32.2 °

EHAN FOUNDATION SOLUTION

Project: Sub-Regional Road Transportation Project
Client: RHD
Borehole No. 02(BR-3)
Sample number: D26 Soil description: Silty Sand
Sample Depth: 39.0 m Soil Density: 19.64 KN/m3





Normal Load(kg)	Normal stress (KPa)	Shear stress (KPa)
4.00	151.210	140.34
8.00	302.420	263.38
16.00	604.840	461.8379

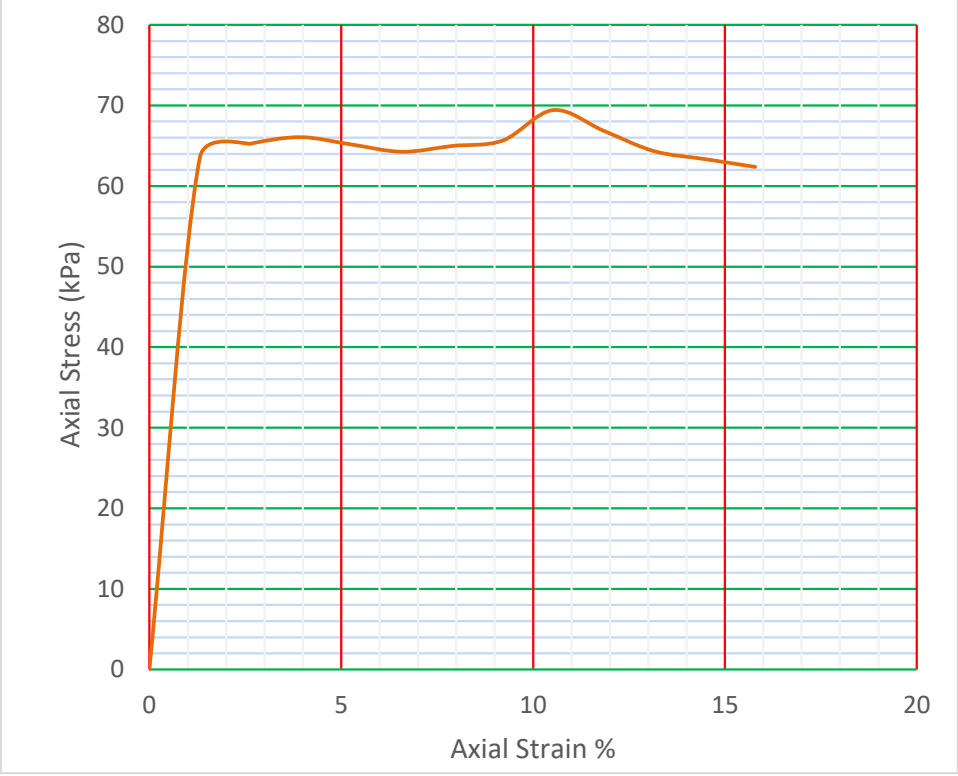
Correlation Coefficient= 1.00

Cohesion = **0.00** Kpa
Angle of friction = 33.3 °

UNCONFINED COMPRESSION STRENGTH TEST

Project :	Sub - Regional Road Transportation Project (SRTPPF-II)		
Client :	Roads and Highways Department		
Location :	BR-1		
Borehole No:	BH-1	Sample ID:	UD-1
Date:	24-Aug-18	Sample Depth (m):	3.60-4.05 m

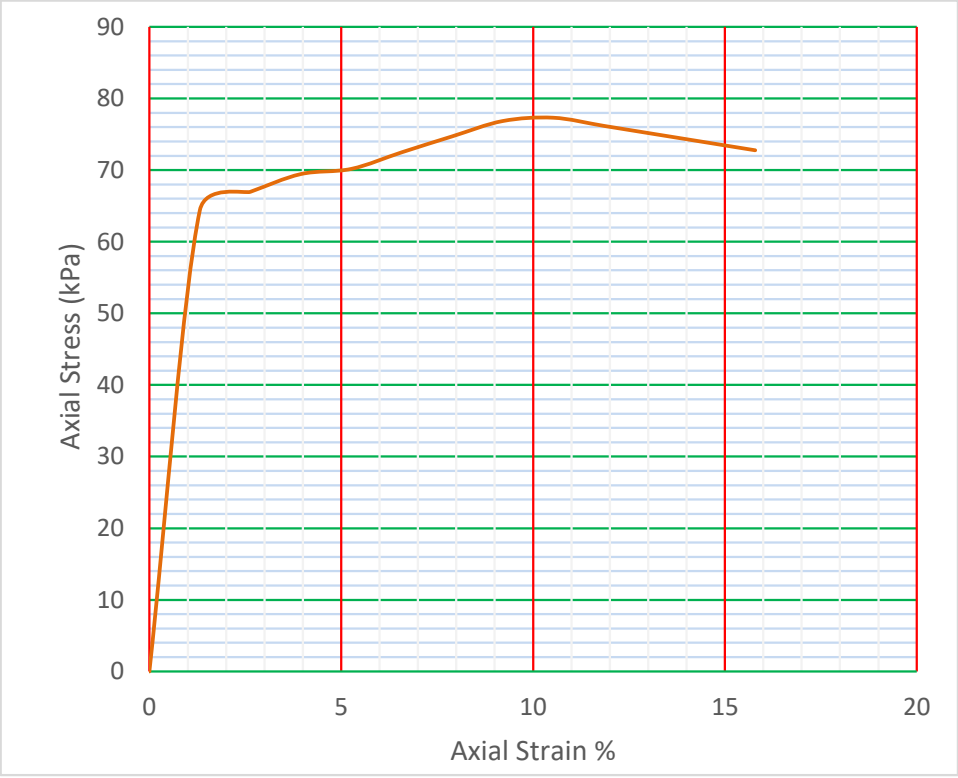
Loading Rate (mm/min)	Undrained Shear Strength Cu (kPa)	Unconfined Compressive Strength qu (kPa)	% Strain at qu max	Bulk Unit Weight ϒ (KN/m3)	Dry Unit Weight ϒd (KN/m3)
2	34.71	69.43	10.8	**18.85**	**15.71**



UNCONFINED COMPRESSION STRENGTH TEST

Project :	Sub - Regional Road Transportation Project (SRTPPF-II)		
Client :	Roads and Highways Department		
Location :	BR-1		
Borehole No:	BH-2	Sample ID:	UD-1
Date:	25-Aug-18	Sample Depth (m):	2.05-2.55 m

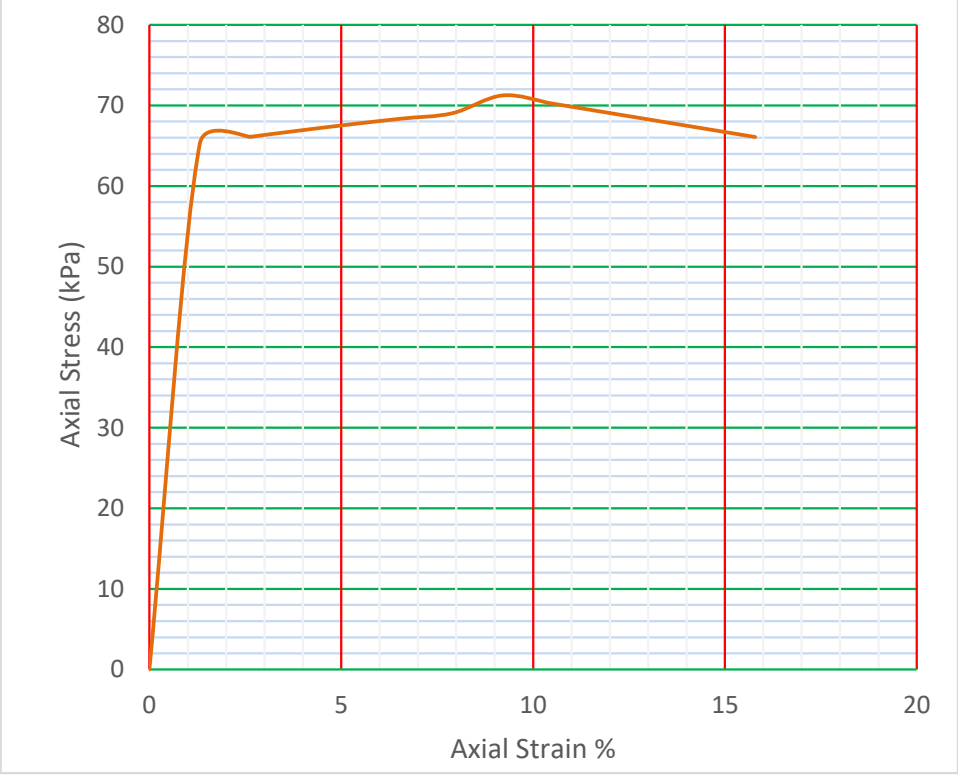
Loading Rate (mm/min)	Undrained Shear Strength Cu (kPa)	Unconfined Compressive Strength qu (kPa)	% Strain at qu max	Bulk Unit Weight ϒ (KN/m3)	Dry Unit Weight ϒd (KN/m3)
2	38.66	77.32	10.1	**19.19**	**15.19**



UNCONFINED COMPRESSION STRENGTH TEST

Project :	Sub - Regional Road Transportation Project (SRTPPF-II)		
Client :	Roads and Highways Department		
Location :	BR-1		
Borehole No:	BH-3	Sample ID:	UD-1
Date:	25-Aug-18	Sample Depth (m):	3.6-4.05 m

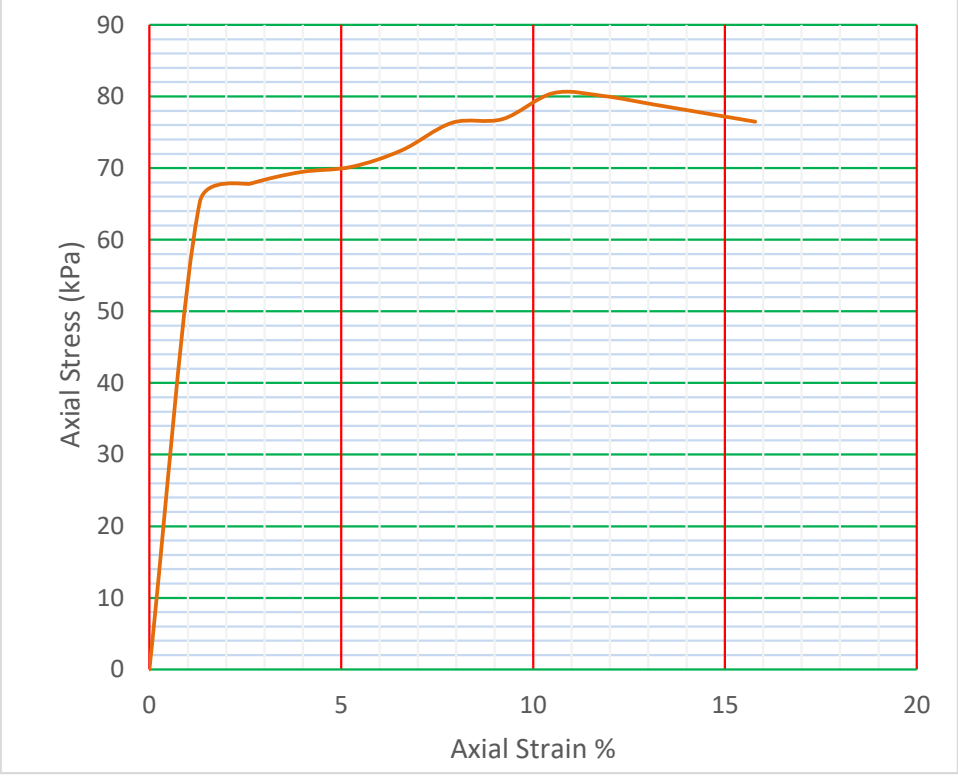
Loading Rate (mm/min)	Undrained Shear Strength Cu (kPa)	Unconfined Compressive Strength qu (kPa)	% Strain at qu max	Bulk Unit Weight ϒ (KN/m3)	Dry Unit Weight ϒd (KN/m3)
2	35.62	71.25	9.5	**18.45**	**14.32**



UNCONFINED COMPRESSION STRENGTH TEST

Project :	Sub - Regional Road Transportation Project (SRTPPF-II)		
Client :	Roads and Highways Department		
Location :	BR-2		
Borehole No:	BH-1	Sample ID:	UD-1
Date:	24-Aug-18	Sample Depth (m):	2.05-2.55 m

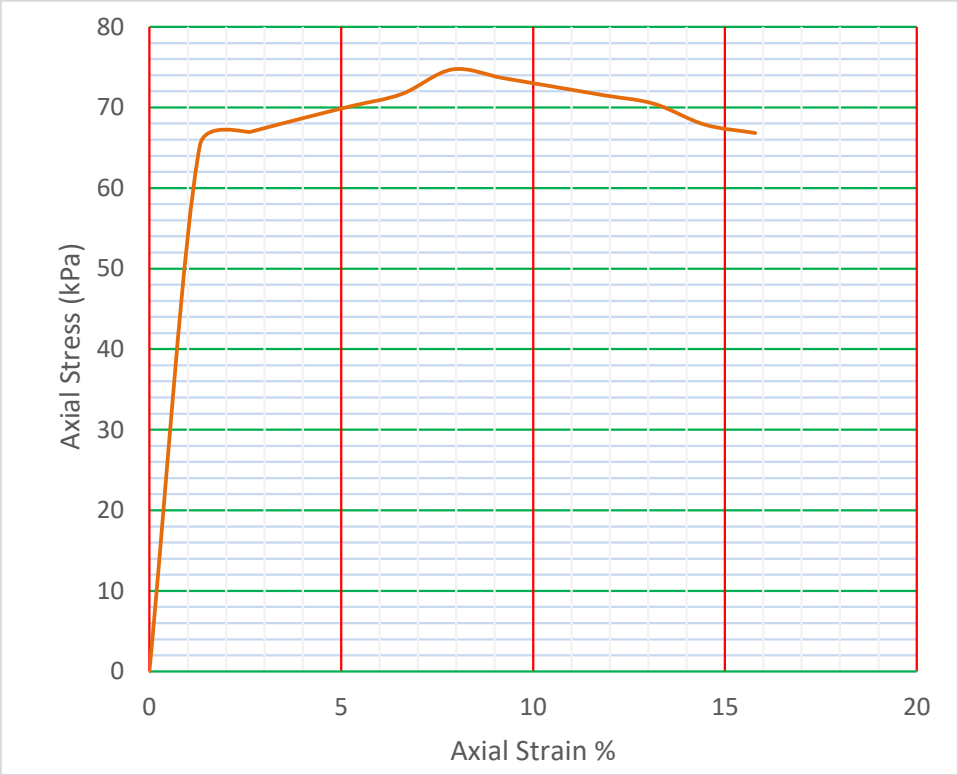
Loading Rate (mm/min)	Undrained Shear Strength Cu (kPa)	Unconfined Compressive Strength qu (kPa)	% Strain at qu max	Bulk Unit Weight ϒ (KN/m3)	Dry Unit Weight ϒd (KN/m3)
2	40.24	80.47	10.6	**19.49**	**15.74**



UNCONFINED COMPRESSION STRENGTH TEST

Project :	Sub - Regional Road Transportation Project (SRTPPF-II)		
Client :	Roads and Highways Department		
Location :	BR-2		
Borehole No:	BH-2	Sample ID:	UD-1
Date:	24-Aug-18	Sample Depth (m):	5.05-5.55 m

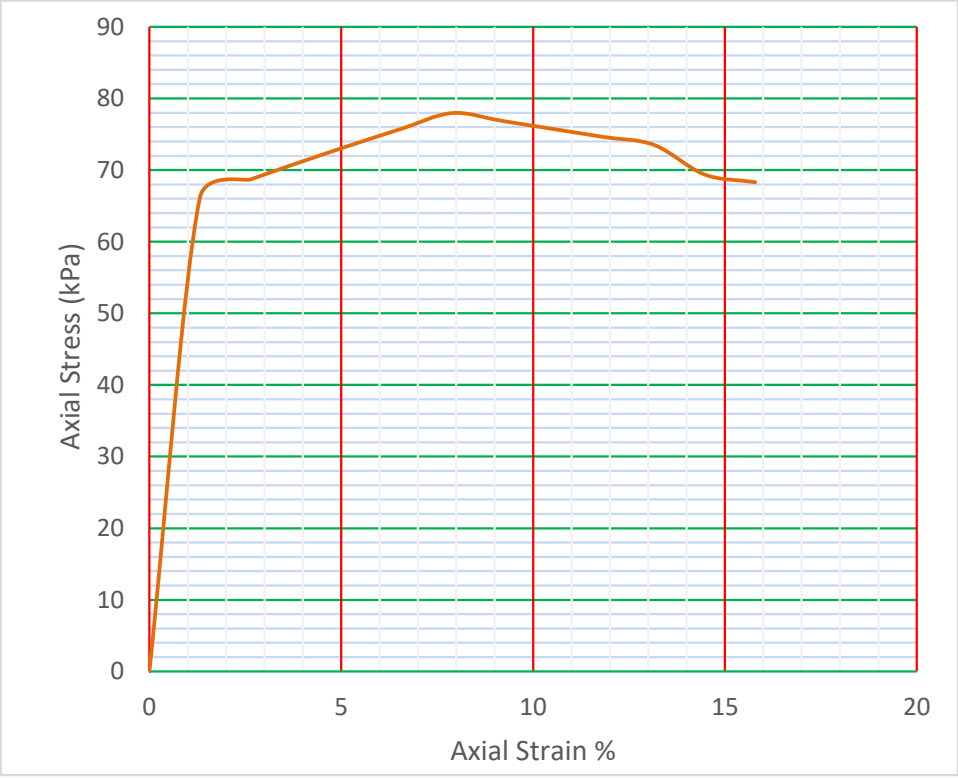
Loading Rate (mm/min)	Undrained Shear Strength Cu (kPa)	Unconfined Compressive Strength qu (kPa)	% Strain at qu max	Bulk Unit Weight ϒ (KN/m3)	Dry Unit Weight ϒd (KN/m3)
2	37.36	74.72	8	**18.74**	**14.98**



UNCONFINED COMPRESSION STRENGTH TEST

Project :	Sub - Regional Road Transportation Project (SRTPPF-II)		
Client :	Roads and Highways Department		
Location :	BR-3		
Borehole No:	BH-1	Sample ID:	UD-1
Date:	25-Aug-18	Sample Depth (m):	2.05-2.55 m

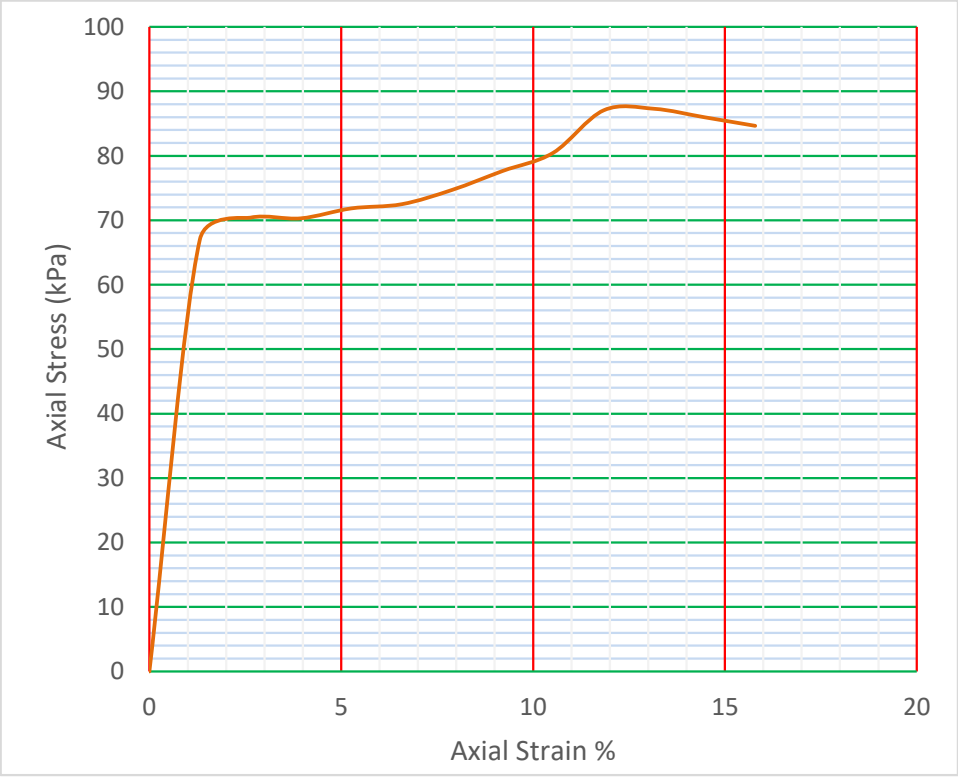
Loading Rate (mm/min)	Undrained Shear Strength Cu (kPa)	Unconfined Compressive Strength qu (kPa)	% Strain at qu max	Bulk Unit Weight ϒ (KN/m3)	Dry Unit Weight ϒd (KN/m3)
2	38.98	77.96	8	**18.83**	**14.98**



UNCONFINED COMPRESSION STRENGTH TEST

Project :	Sub - Regional Road Transportation Project (SRTPPF-II)		
Client :	Roads and Highways Department		
Location :	BR-3		
Borehole No:	BH-2	Sample ID:	UD-1
Date:	25-Aug-18	Sample Depth (m):	3.6-4.05 m

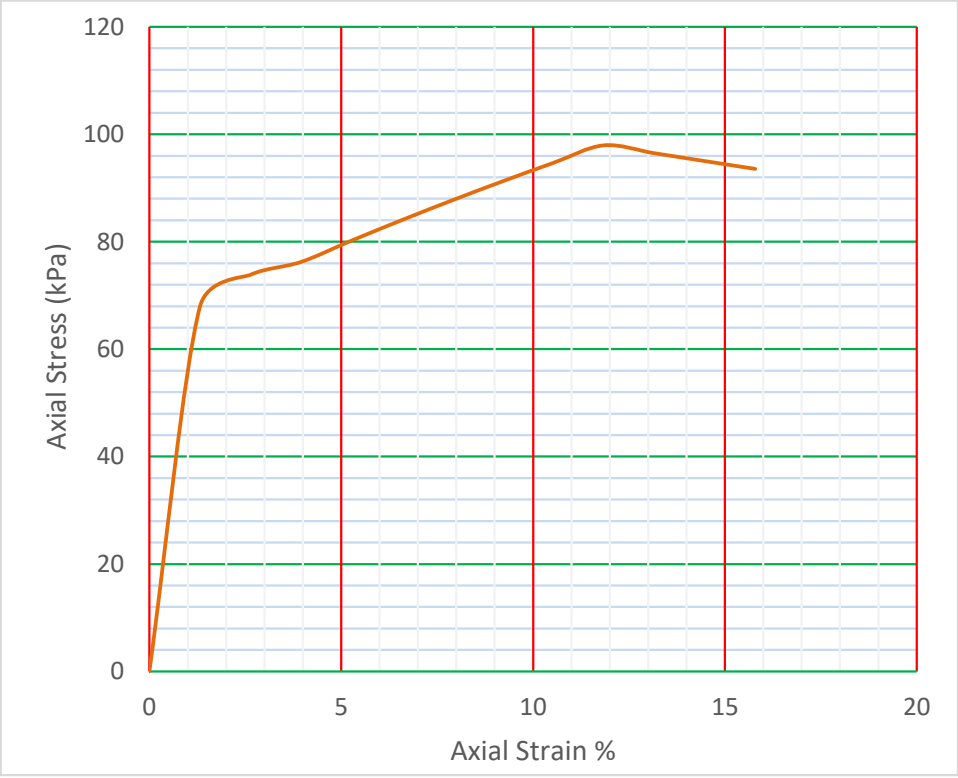
Loading Rate (mm/min)	Undrained Shear Strength Cu (kPa)	Unconfined Compressive Strength qu (kPa)	% Strain at qu max	Bulk Unit Weight ϒ (KN/m3)	Dry Unit Weight ϒd (KN/m3)
2	43.65	87.29	8	**19.38**	**16.11**



UNCONFINED COMPRESSION STRENGTH TEST

Project :	Sub - Regional Road Transportation Project (SRTPPF-II)		
Client :	Roads and Highways Department		
Location :	Sylhet		
Borehole No:	RBH-1	Sample ID:	UD-1
Date:	25-Aug-18	Sample Depth (m):	2.05-2.55 m

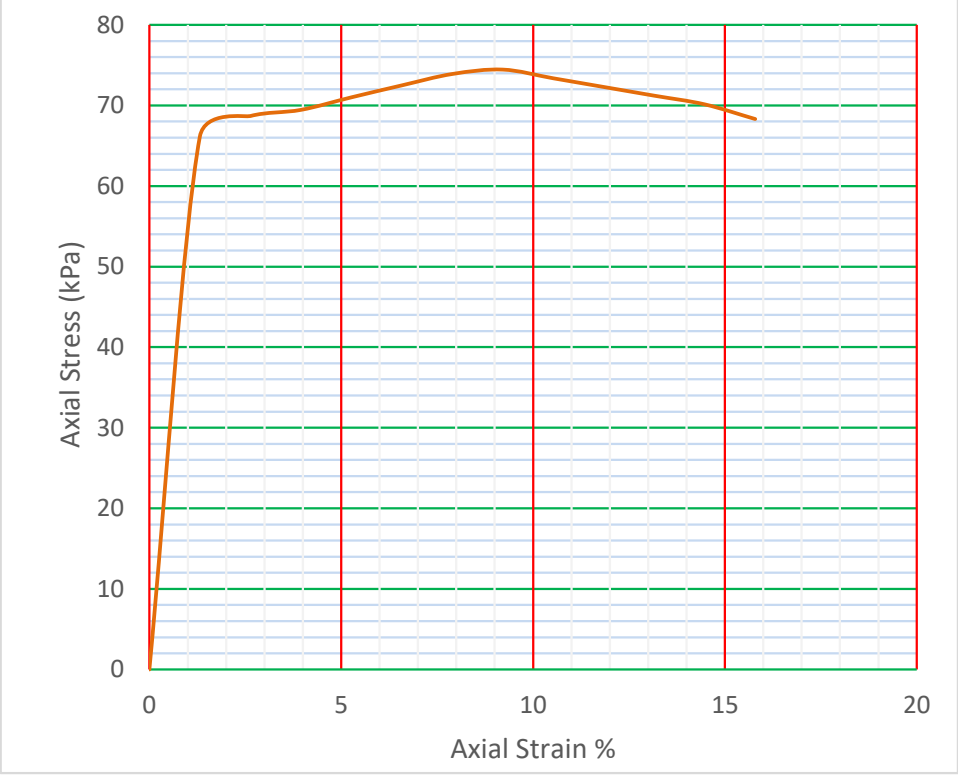
Loading Rate (mm/min)	Undrained Shear Strength Cu (kPa)	Unconfined Compressive Strength qu (kPa)	% Strain at qu max	Bulk Unit Weight ϒ (KN/m3)	Dry Unit Weight ϒd (KN/m3)
2	48.97	97.94	12	**19.90**	**16.51**



UNCONFINED COMPRESSION STRENGTH TEST

Project :	Sub - Regional Road Transportation Project (SRTPPF-II)		
Client :	Roads and Highways Department		
Location :	Sylhet		
Borehole No:	RBH-2	Sample ID:	UD-1
Date:	25-Aug-18	Sample Depth (m):	3.6-4.05 m

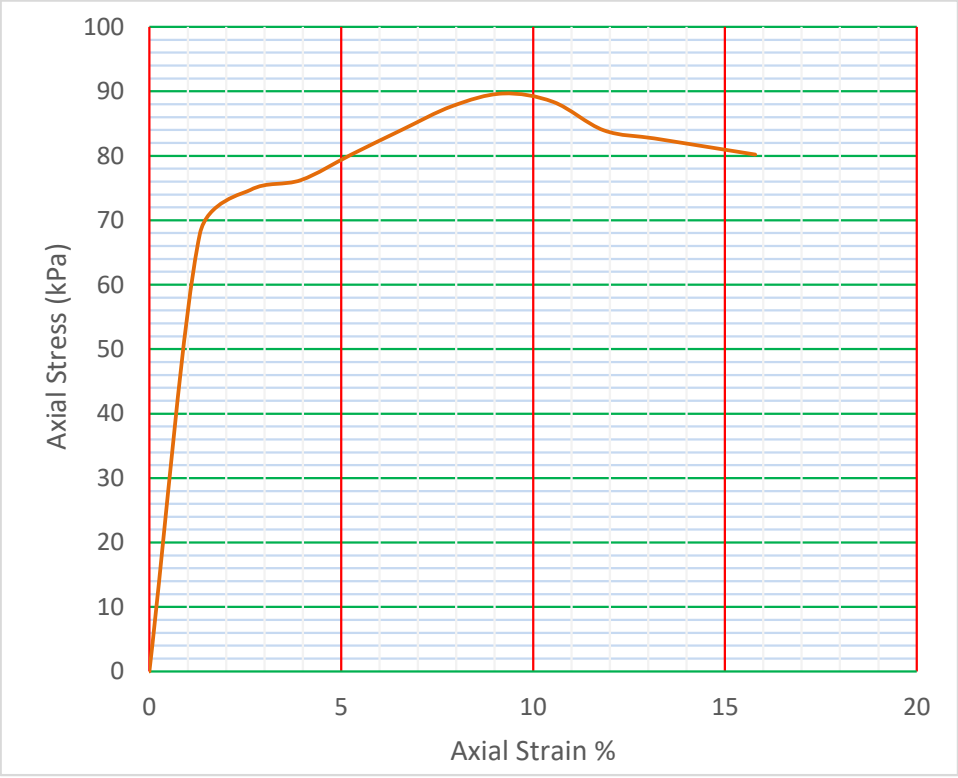
Loading Rate (mm/min)	Undrained Shear Strength Cu (kPa)	Unconfined Compressive Strength qu (kPa)	% Strain at qu max	Bulk Unit Weight ϒ (KN/m3)	Dry Unit Weight ϒd (KN/m3)
2	37.22	74.45	9	**16.59**	**13.47**



UNCONFINED COMPRESSION STRENGTH TEST

Project :	Sub - Regional Road Transportation Project (SRTPPF-II)		
Client :	Roads and Highways Department		
Location :	Sylhet		
Borehole No:	RBH-3	Sample ID:	UD-1
Date:	25-Aug-18	Sample Depth (m):	2.05-2.55 m

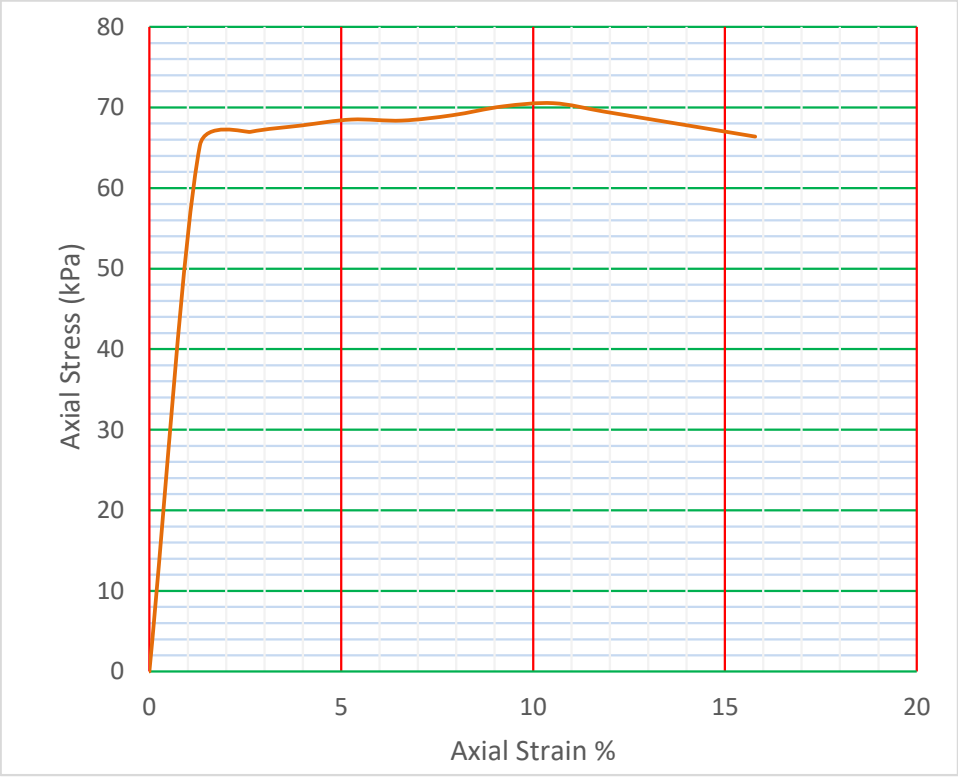
Loading Rate (mm/min)	Undrained Shear Strength Cu (kPa)	Unconfined Compressive Strength qu (kPa)	% Strain at qu max	Bulk Unit Weight ϒ (KN/m3)	Dry Unit Weight ϒd (KN/m3)
2	44.83	89.66	9	**19.72**	**16.63**



UNCONFINED COMPRESSION STRENGTH TEST

Project :	Sub - Regional Road Transportation Project (SRTPPF-II)		
Client :	Roads and Highways Department		
Location :	Sylhet		
Borehole No:	RBH-4	Sample ID:	UD-1
Date:	25-Aug-18	Sample Depth (m):	2.05-2.55 m

Loading Rate (mm/min)	Undrained Shear Strength Cu (kPa)	Unconfined Compressive Strength qu (kPa)	% Strain at qu max	Bulk Unit Weight ϒ (KN/m3)	Dry Unit Weight ϒd (KN/m3)
2	35.27	70.53	10.5	**19.84**	**16.30**



EHAN FOUNDATION SOLUTION

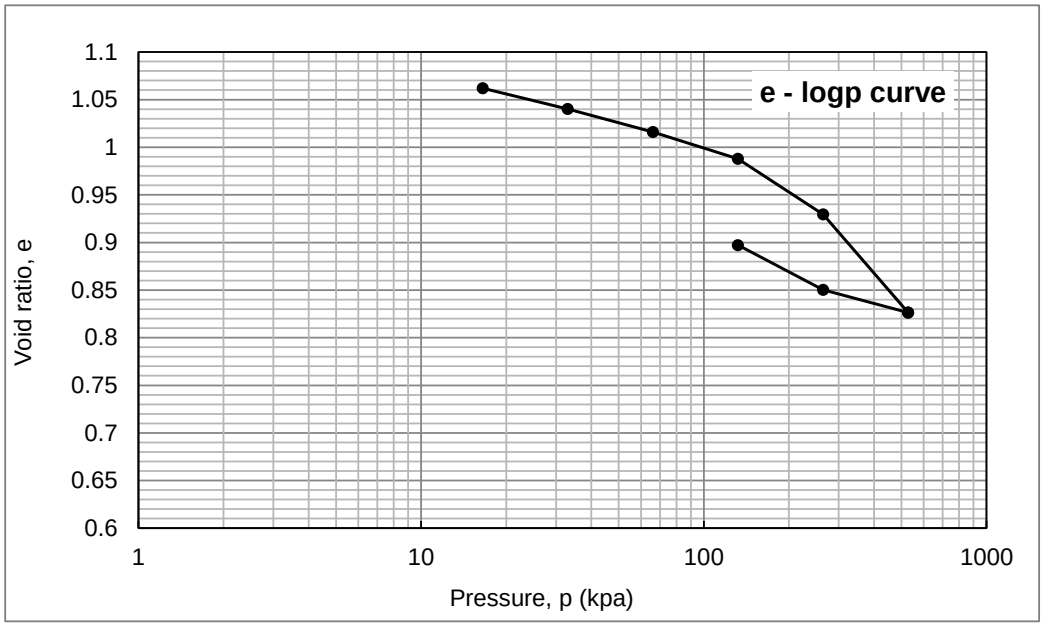
ONE DIMENTIONAL CONSOLIDATION TEST REPORT

Project:	Sub-Regional Road Transportation Project (SRTPPF-II)		
Client:	Roads and Highways Department		
Location:	Sylhet		
		Bore Hole:	RBH-01
Sample Type:	UD-1	Depth:	2.55 m
Soil Type:	Medium Stiff Clay	Date:	1-Sep

Test Results

Bulk Density (gm/cc)	Natural M/C (%)	Saturation M/C (%)	Sp. Gr.	Compression Index, Cc	Re-compression Index, C_r	Initial Void Ratio, e_o	Pre-consolidation pressure (kPa)
1.988	20.54	17.93	2.70	0.343	0.080	1.085	110

Applied Pressure (kpa)	av m2/kN	mv m2/kN	t90 min	cv (t90) m²/year
16.51	0.001389	0.000666		
33.02	0.001326	0.000643	4.00	10.67
66.05	0.000726	0.000356	10.89	3.83
132.10	0.000426	0.000211	5.76	7.04
264.19	0.000442	0.000222	7.84	4.87
528.38	0.000391	0.000202	4.41	7.76



EHAN FOUNDATION SOLUTION

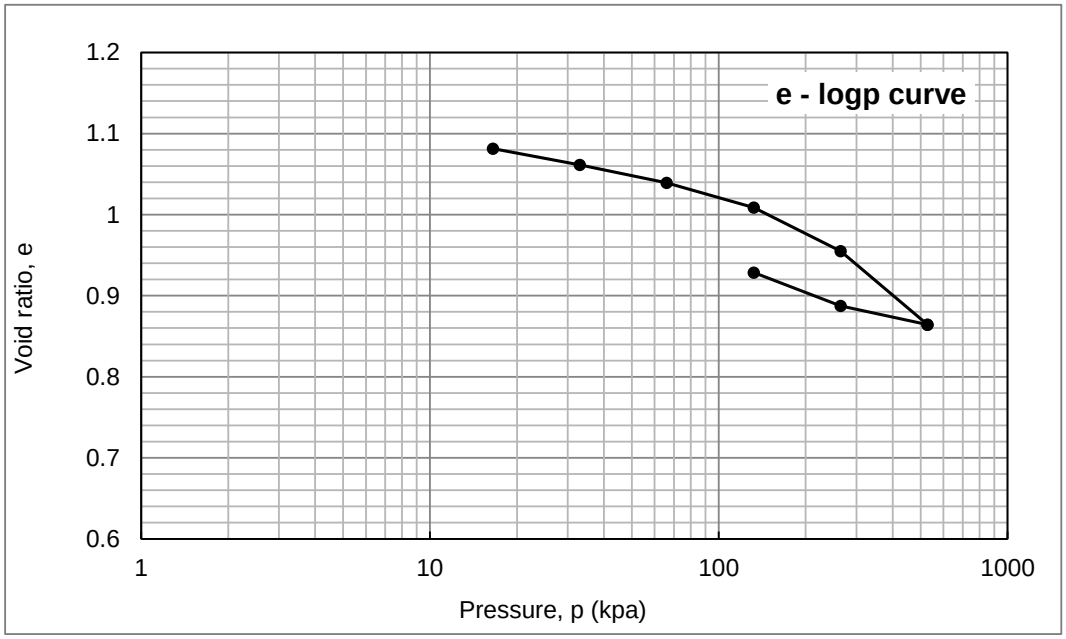
ONE DIMENTIONAL CONSOLIDATION TEST REPORT

Project:	Sub-Regional Road Transportation Project (SRTPPF-II)		
Client:	Roads and Highways Department		
Location:	Sylhet		
		Bore Hole:	RBH-02
Sample Type:	UD-1	Depth:	4.05 m
Soil Type:	Soft to Medium Stiff Clay	Date:	1-Sep

Test Results

Bulk Density (gm/cc)	Natural M/C (%)	Saturation M/C (%)	Sp. Gr.	Compression Index, Cc	Re-compression Index, C_r	Initial Void Ratio, e_o	Pre-consolidation pressure (kPa)
1.63	23.16	20.55	2.70	0.301	0.077	1.108	100

Applied Pressure (kpa)	av m2/kN	mv m2/kN	t90 min	cv (t90) m²/year
16.51	0.001596	0.000757		
33.02	0.001213	0.000583	5.00	8.53
66.05	0.00067	0.000325	11.00	3.79
132.10	0.000463	0.000227	7.00	5.78
264.19	0.000407	0.000203	8.84	4.34
528.38	0.000343	0.000175	5.42	6.43



ASTM D-2435

EHAN FOUNDATION SOLUTION

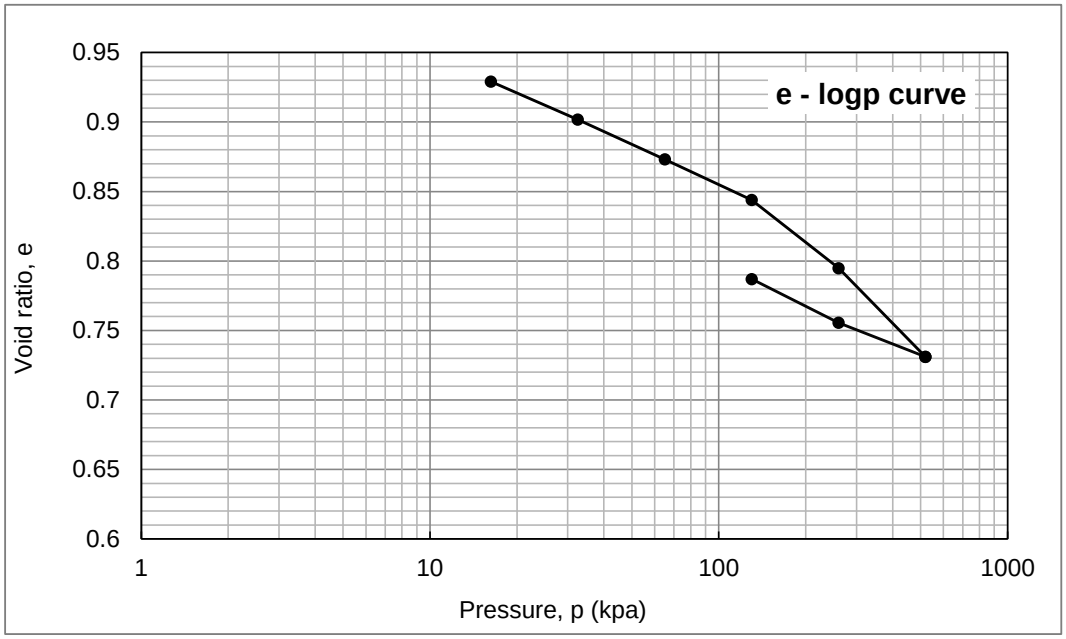
ONE DIMENTIONAL CONSOLIDATION TEST REPORT

Project:	Sub-Regional Road Transportation Project (SRTPPF-II)		
Client:	Roads and Highways Department		
Location:	Sylhet		
		Bore Hole:	RBH-03
Sample Type:	UD-1	Depth:	2.55 m
Soil Type:	Medium Stiff Clay	Date:	1-Sep

Test Results

Bulk Density (gm/cc)	Natural M/C (%)	Saturation M/C (%)	Sp. Gr.	Compression Index, Cc	Re-compression Index, C_r	Initial Void Ratio, e_o	Pre-consolidation pressure (kPa)
1.985043	18.59	15.98	2.71	0.212	0.081	0.962	155

Applied Pressure (kpa)	av m2/kN	mv m2/kN	t90 min	cv (t90) m²/year
16.25	0.001992	0.001016		
32.49	0.00169	0.000876	5.50	7.62
64.99	0.000875	0.000460	11.50	3.53
129.97	0.000453	0.000242	7.50	5.25
259.95	0.000377	0.000205	9.84	3.79
519.89	0.000245	0.000137	6.42	5.41



ASTM D-2435

EHAN FOUNDATION SOLUTION

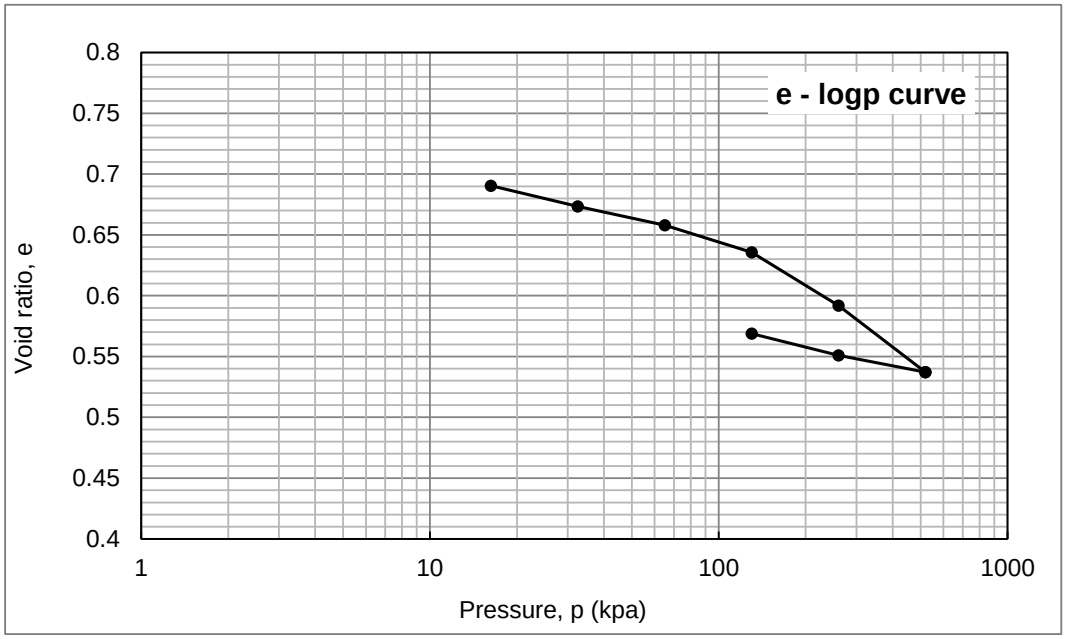
ONE DIMENTIONAL CONSOLIDATION TEST REPORT

Project:	Sub-Regional Road Transportation Project (SRTPPF-II)		
Client:	Roads and Highways Department		
Location:	Sylhet		
		Bore Hole:	RBH-04
Sample Type:	UD-1	Depth:	2.55 m
Soil Type:	Soft Clay	Date:	1-Sep

Test Results

Bulk Density (gm/cc)	Natural M/C (%)	Saturation M/C (%)	Sp. Gr.	Compression Index, Cc	Re-compression Index, C_r	Initial Void Ratio, e_o	Pre-consolidation pressure (kPa)
1.904224	21.62	19.01	2.69	0.182	0.046	0.714	80

Applied Pressure (kpa)	av m2/kN	mv m2/kN	t90 min	cv (t90) m²/year
16.25	0.001424	0.000831		
32.49	0.001055	0.000624	4.50	9.44
64.99	0.000475	0.000284	10.22	4.08
129.97	0.000343	0.000207	6.50	6.25
259.95	0.000336	0.000206	8.50	4.53
519.89	0.000211	0.000133	5.30	6.77



ASTM D-2435

APPENDIX E

Photographs of Field Works


B·R-1
B·H 1
Depth-50"


B-R 1
B-H- 02
02.m


B-R 1
B-H 3