



PEOPLE'S TELEVISION
P A R A S A B A Y A N

People's Television Network, Inc
Broadcast Complex, Visayas Avenue, Diliman, Quezon City 1100
Telephone No. 3453-1097 /www.ptv.ph

BID BULLETIN NO. 1
14 March 2022

Supply, Delivery Design and Build of a Four (4) Legged Two Hundred Fifty (250) Feet TV Broadcast Tower including the Construction of Transmitter Building with Roofdeck, Permanent Electricity Facilities, Grounding and Lightning Protection System with Site Development; Perimeter Fence and Guard House for PTV Ilocos Norte of the People's Television Network, Inc. (PTNI)
ITB NO. 2022-0004

This bulletin is being issued to revise/clarify certain portions of the bidding documents. This shall form an integral part of the bidding document for the above-stated project.

Reminder/ Additional Requirement	
1	Please see the Geotechnical Investigation Report in Annex "A" as basis for the detailed Preliminary Design.

All other information in the Bidding Documents inconsistent with the above is hereby revised accordingly. All other provisions which are not affected shall remain in effect.

For further guidance and information of all concerned.

Thank you.


ATTY. JASON SHAHEER H. SALENDAB
Chairman
Bids and Awards Committee

Annex "A"

Geotechnical Investigation Report

JVLDC Engineering Services

SOIL AND MATERIAL TESTING LABORATORY

GEOTECHNICAL INVESTIGATION REPORT

SUPPLY, DELIVERY, DESIGN & BUILD OF A FOUR LEGGED TWO HUNDRED FIFTY FEET TV BROADCAST TOWER INCLUDING THE CONSTRUCTION OF A TRANSMITTER BUILDING WITH ROOF DECK, PERMANENT ELECTRICITY FACILITIES, GROUNDING, LIGHTNING PROTECTION SYSTEM WITH SITE DEVELOPMENT, PERIMETER FENCE & GUARD HOUSE FOR PTV ILOCOS NORTE

**MMSU CAMPUS, BATAK CITY, ILOCOS NORTE
(Reference No. 11121172)**

**Prepared for:
PEOPLE'S TELEVISION NETWORK, INC.**

**Prepared by:
JVLDC ENGINEERING SERVICES**

NOVEMBER 29, 2021



November 29, 2021

Officer-In-Charge
People's Television Network, Inc.
Batac City, Ilocos Norte


Subject: Geotechnical Investigation Report for the Proposed TV Broadcast Tower at
MMSU Campus, Batac City, Ilocos Norte (Reference No. 11121172)

Dear Sir/ Madam:

We are pleased to submit this final report on the geotechnical investigation conducted at the above referenced project based on the agreed scope of work. The final report described in detail the procedures for geotechnical investigation and the findings to be utilized in the structural analysis and design of proposed structures as well as other applications.

We appreciate this opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please do not hesitate to contact us.

Yours Sincerely,


Engr. Jonathan V. Lacambra, PhD.
Proprietor
JVLD Engineering Services

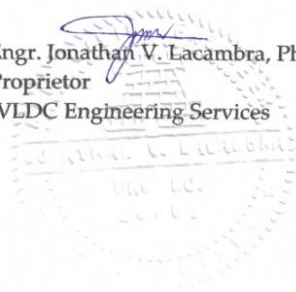




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I. INTRODUCTION

This report presents the results of a geotechnical investigation performed at the request of People's Television Network, Inc., for the Proposed T.V. Broadcast Tower located at MMSU Campus, Batak City, Ilocos Norte.

This geotechnical investigation provides information on the subsurface conditions at the proposed site with exploratory boreholes, evaluate the engineering properties of the subsurface materials with appropriate field and laboratory tests, and perform engineering analyses for developing foundation design and construction recommendations for the proposed project.

II. PROJECT BACKGROUND

The proposed project involves the construction of a Four Legged Two Hundred Fifty Feet T.V. Broadcast Tower. As per guidelines of the City Engineer's Office and the Department of Public Works and Highways (DPWH), geotechnical investigation must be undertaken with boreholes drilled to depths reaching the levels of stable soil for foundation purposes. Through soil sampling and testing, we establish a relationship between layers of soil and rock at the sub-surface. The determination of the Soil Bearing capacity at different depths on the sub-surface are necessary parameters for the structural design of the foundations.



III. PROJECT LOCATION AND SITE DESCRIPTION

The Proposed site is on a flat terrain at MMSU Campus, Batak City, Ilocos Norte. The borehole was drilled at a point within the proposed layout of the structure specifically adjacent the projected foundation.

IV. OBJECTIVES & SCOPE OF WORK

The objective of the geotechnical investigation was to assess the nature and engineering properties of the encountered subsurface materials and to provide foundation design recommendations for the proposed development. The scope of work consisted of the following tasks:

- Drill, log and gather soil sample from boring activities,
- Perform Standard Penetration Test at regular intervals to assess the relative density and/or consistency of the subsurface soil,
- Perform laboratory testing on selected samples,
- Evaluate geotechnical properties of materials encountered pertinent to the foundation design and construction of the project, and
- Develop conclusions and recommendations regarding:
 - Foundation recommendation for the proposed building/structure,
 - Appropriate foundation type(s) for support of new structures along with geotechnical criteria for foundation design.



V. GEOLOGY

a. Regional Geology (Ilocos Provinces)

Ilocos highlands is part of the Luzon Central Cordillera which form a rugged topography. The Ilocos region includes La Union, Ilocos Sur, Norte and Abra. The highest point in the area is Mt Pulag (2929 meters) which is also the highest peak in Luzon. Four main rivers, the Agno, Laoag, Chico- Amburayan and Abra river drain the cordillera into the south China sea. The ridges are structured by intermediate to mafic plutonic masses with intercalated volcanics and meta- sediments. The foot hills are mainly comprised of klondyke Formation composed on conglomerate and sandstone intercalated with lava flows, volcanic breccia and pyroclastics. The rolling hills are mainly comprised of Rosario Formation composed of a sequence interbedded sandstone, siltstone, shale and minor conglomerate in the lower portion and tuffaceous sandstone and conglomerate with minor siltstone, shale, reefal limestone and basalt flow in the upper portion. Quarternary alluvium of which compositions are clay, silt, sand, gravel and boulders are deposited in the valleys and the narrow coastal plains.

The Ilocos lowlands lie along northwestern Luzon bounded on the east by Luzon Central Cordillera and on the West by the China Sea. It measures about 95 km long and 35 km at its widest, extending south of Vigan to Pasaleng, Ilocos Norte. The lowland consists of low rolling hills and a narrow plain along the coast line. Alluvial fans are forms in the upper Laoag river. The predominant geological formations are Baruyen, Bojeador , Pasuquin Limestone and Laoag Formations. The Baruyen Formation dated cretaceous-paleogene is outcropped in the southern part of Nueva Era and all parts of Dumanlig, Ilocos Norte. The formation is composed of chert interbedded with basic volcanics and sediments, which are partly metamorphosed into schist and serpentine. The Bojeador formation dated early to middle Miocene is outcropped in the Vintar area. This formation includes agglomerate, folded, faulted and sedimentary rocks, volcanic flows and pyroclastics. The rocks are peneplaned before the disposition of Pasuquin Limestone. In the Burgos-Pasuquin area, the Pasuquin formation dated middle to late Miocene lies unconformably over the Bojeador formation. The coastal plains and foothills in Laoag, the Laoag formation dated Pliocene- Pleistocene forms rolling hills composing of sandstone and shale.

www.open_jicareport.gov.jp



b. Site Geology

The project site is within an area where farmlands used to be. These are basically soft at the upper grade levels. Normal clay soil formation which is a mix of brown to gray colors are observed. The vicinity is flat.

VI. FIELD & LABORATORY TESTS

a. In-Situ Tests

***AASHTO T-206 (ASTM D-1586)
Standard Method for Penetration Test and Split Barrel Sampling of Soils***

The borehole was drilled and samples were retrieved using a Split Barrel Sampler with an outside diameter of two (2) inches or 50.88 millimeter and an inner diameter of 1-3/8 inches or 34.93 millimeter.

Simultaneous with the retrieval of samples, the Standard Penetration Test (SPT) was undertaken wherein the sample was driven into the soil at the bottom of the boreholes by means of a hammer weighing 140 lbs. falling freely from a height of 30 inches or 0.762 meter. The number of blows required to drive the sampler through the last 6 inch interval after setting it by six inches is referred to as the Standard Penetration Number, "n".

The above sampling and testing procedure was done at interval depths of 1.5 meters or five (5) feet and depths where a change in the soil layer was observed.

A modified soil penetration test was used where compatibility with the standard penetration test was achieved by rectifying the blow count with the energy ratio of the modified test and applying the necessary efficiency factors relative to the actual conditions in the site.



b. Laboratory Tests

AASHTO T89-81 (ASTM 4318-85)
Standard Method for the Determining of the Liquid Limit, Plastic Limit and the Plasticity Index of Soils

The liquid limit is the moisture content at the boundary between the plastic and liquid phase. Meanwhile, the plastic limit is the moisture content at the boundary between the semi- solid to plastic phase. The range of moisture content at which the soil is in plastic state is defined as the plasticity index and is given by the difference between the liquid limit and the plastic limit.

AASHTO M145-87 (ASTM 2478-85)
Classification of Soils for Engineering Purposes

Recommended practice for the Classification of Soils and Soil Aggregate Mixtures for highway construction purposes. In this connection, soil samples were classified using the Unified Soil Classification System (USCS).

AASHTO T88-81 (ASTM D-422-63)
Standard Method for Particle Size Analysis of Soils.

The material is allowed to pass a series of sieves with decreasing opening sizes. The weight retained on each sieve is recorded and presented on a particle size distribution chart.



VII. RESULTS OF FIELD INVESTIGATION & LABORATORY TESTING

The prevailing sub-surface soil conditions at the proposed site were made on the basis of the field investigations and laboratory tests which are presented in the appendix of the report.

1. The subsurface conditions at the site were explored by drilling **one (1) test borehole**. This borehole showed findings with a top layer of yellowish-brown soil with traces of gray, fine, moist sandy clay of low plasticity with a group index of **CL** from the USCS Chart. After 4.5 to 6 meters depth, the soil changed to a clayey sand, gray to brown, non-plastic material classified as **SC** in the USCS chart up to the termination of the drilling operation. Consistency is from soft to hard from elevation 100 m to elevation 87.5 m. There was refusal encountered at this level. Soil sampling using a split barrel was intended for soft to stiff soils.

The ground water level was not observed in the drilling operation. It should be noted that the ground water levels at deeper elevations rises or fall relative to rainfall occurrences.

2. The idealized soil profile and borehole log profile were used to arrive at the following considerations:

The recommended Net Allowable Bearing capacity is presented for the purpose of designing the most appropriate type of foundation of the structure. Computed results were made considering the limiting SPT values derived from the boreholes explored at foundation levels where average **N_{spt}** value is 21 blows. With a factor of safety FS equal to 3, foundations with a minimum base **B of 2 meters** and a foundation depth **D_f of 4.5 meters**, the allowable soil bearing capacity shall be **Two Hundred Ten Kilo Pascals (210 KPa)**.




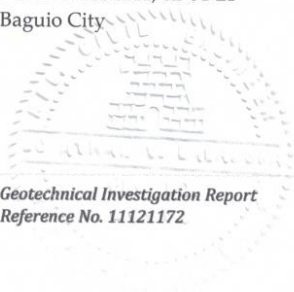
Tabulated Values for Net Allowable Bearing Capacity

Depth (m)	Net Allowable Capacity (KPa)
1.5	220
3	260
4.5	210
6	320

3. Verification of the depths of the individual foundations is to be made because of the rather limited scope of the study which was based only on the exploratory borehole and samples retrieved herein.
4. Differential settlement shall not exceed 25 mm or else, the allowable bearing pressure of the soil should be decreased accordingly.
5. The presence of sub-surface features not consistent with the findings of this study such as tunnels, large holes or under holes, which were not detected by this limited study, may pose a problem in the implementation of the project. These should be immediately referred to the undersigned so that remedial measures or adjustments may be made on the value of the allowable bearing pressure.

Prepared by:


ENGR. JONATHAN V. LACAMBRA, PhD.
PRC No. 24667, June 1981
PTR No. 4851141, 02-04-21
Baguio City


Geotechnical Investigation Report
Reference No. 11121172

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TABLATION OF FINDINGS (ALTERNATE VALUES USING TERZAGHI'S FORMULA)

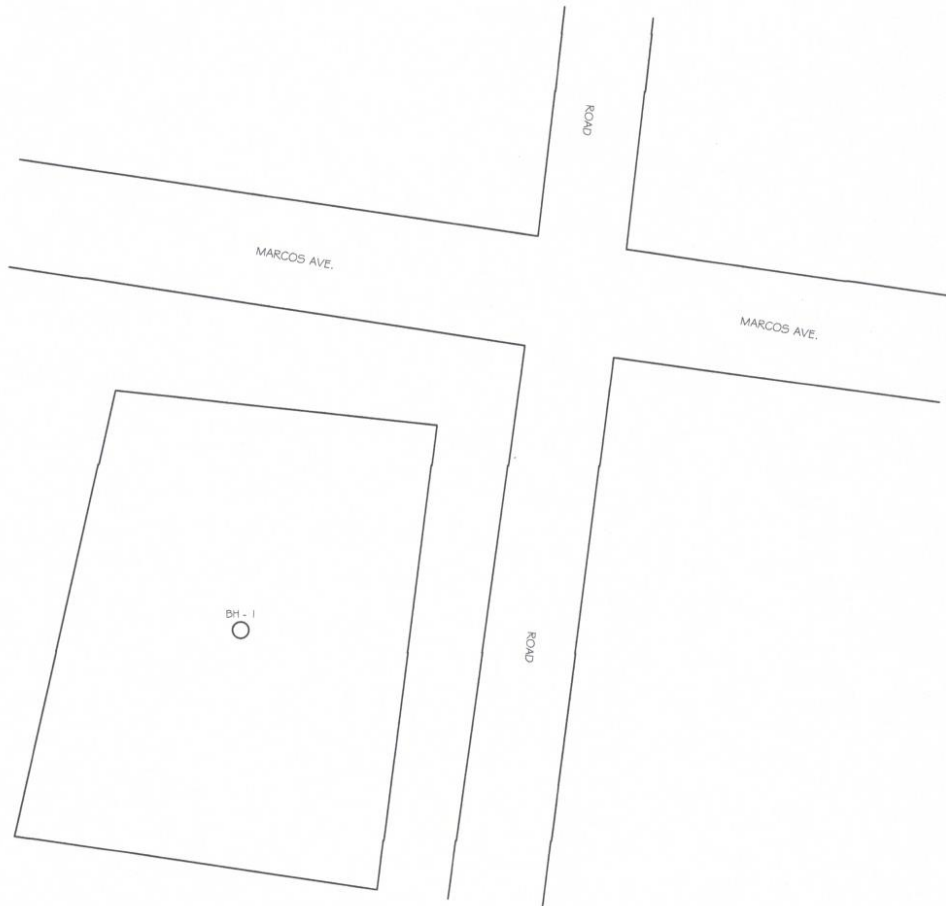
Bore hole	Depth m	N	N'	C Kpa	Unit Wt Kg/cum	F degrees	Nc	Nq	Ng	Fc	Fq	Fg	W m	L m	Qa Kpa	Qu Kpa	Soil Classification
BH1	1.5	17	13.6	4	1529	30	37.2	22.5	19.7				1.5	1.5	262	787	sandy clay
	3	27	21.6	4	1529	30	37.2	22.5	19.7				1.5	1.5	317	951	sandy clay
	4.5	29	23.2	4	1529	30	37.2	22.5	19.7				1.5	1.5	372	1115	sandy clay
	6	15	12	0	1681	30	37.2	22.5	19.7				1.5	1.5	256	768	clayey sand
	7	50	40	0	1681	30	37.2	22.5	19.7				1.5	1.5	296	889	clayey sand
	9	>50	40	0	1681	30	37.2	22.5	19.7				1.5	1.5	376	1129	clayey sand

Df/B <1



VIII. REFERENCES:

- Look, B. 2014, *Handbook of Geotechnical Investigation and Design Tables*. 2nd ed. CRC Press
- Rajapakse, R. 2016, *Geotechnical Engineering Calculations and Rules of Thumb*. 2nd ed. Butterworth-Heinemann
- Kaniraj, S. 2017, *Design Aids in Soil Mechanics and Foundation Engineering*. McGraw-Hill Inc., US
- Teng, W. 1962, *Foundation Design*. Prentice-Hall, Inc.
- Raj, P. P. 2013, *Soil Mechanics and Foundation Engineering*, 2nd ed. Pearson
- Das, B. 1990, *Principles of Geotechnical Engineering*, 2nd ed. PWS-Kent



BORHOLE LOCATION

PROJECT : SUPPLY, DELIVERY, DESIGN AND BUILD OF A FOUR LEGGE
TWO HUNDRED FIFTY FEET TV BROADCAST TOWER INCLUDING
THE CONSTRUCTION OF TRANSMITTER BUILDING WITH ROOF DECK,
PERMANENT ELECTRICITY FACILITIES, GROUNDING AND LIGHTNING
PROTECTION SYSTEM WITH SITE DEVELOPMENT, PERIMETER FENCE,
GUARD HOUSE FOR PTV ILOCOS NORTE OF THE PEOPLES
TELEVISION NETWORK, INC.
LOCATION : MMSU, BATAAC, ILOCOS NORTE
CLIENT : PEOPLES TELEVISION NETWORK, INC.

SUBSURFACE EXPLORATION LOG



Project: Proposed TV Broadcast Tower
Location: MMSU Campus, Batac City, Ilocos Norte
Borehole No.: One (01)
Ground Elev.: 100 m
Casing Depth:
Coordinates (GPS): 18.058847
 120.541403

Date Started: 19-Nov-21
Date Completed: 19-Nov-21
Final Depth: 12 m
Groundwater Level: N/A m
Type of Sampler **Diameter** **Length**
 Split Barrel X 2" 32"
 Shelby Tube
 Core Barrel
Wt. of Drive Hammer 63.5 Kg

Depth in m	Sampling Depth, m	Type of Sampling	Rec (%)/ MC	SPT Blows per 15cm		N-Value	SPT Depth	Consistency / R.Q.D.	N-Value (Graphical)	Soil / Rock Description (Visual Classification)	Soil Symbol	Remarks
				7	15							
1.5		X	38.5	7	17			soft				
3				8	27							
4.5				1	29							
6			26.6	5	15			stiff				
7.5		X		20	50			hard				
9				>	50							
10.5				>	50							
12				>	50							
13.5												
15												
16.5												
18												
19.5												
21												
22.5												
24												
25.5												
27												
28.5												
30												

Type of Sampling Standard Penetration Test (SPT) Undisturbed Sampling (US) Coring (C)	Soil Types Clays Silts Sands Gravels Shells Tuff	Cohesive Soils N-value Consistency 0 -- 1 Very Soft 2 -- 4 Soft 5 -- 8 Medium Soft 9 -- 15 Stiff 16 -- 30 Very Stiff 31 -- 60 Hard > 60 Very Hard	Granular Soils N-value Consistency 0 -- 4 Very Loose 5 -- 10 Loose 11 -- 24 Med. Loose 25 -- 50 Dense > 50 Very Dense
Rock Quality Designator RQD (%) Description > 25 Very Poor 25 -- 50 Poor 51 -- 75 Fair 76 -- 90 Good > 90 Excellent			

Drilling Crew : JVLDC DRILLING _____ _____ _____	Prepared by: _____ Engineer / Geologist
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SUMMARY OF LABORATORY RESULTS

PROJECT: PROPOSED FOUR LEGGED TWO HUNDRED FIFTY FEET TV BROADCAST TOWER
 LOCATION: MMSU CAMPUS, BATAV CITY, ILOCOS NORTE
 CLIENT: PEOPLE'S TELEVISION NETWORK, INC.
 BOREHOLE: BH 1



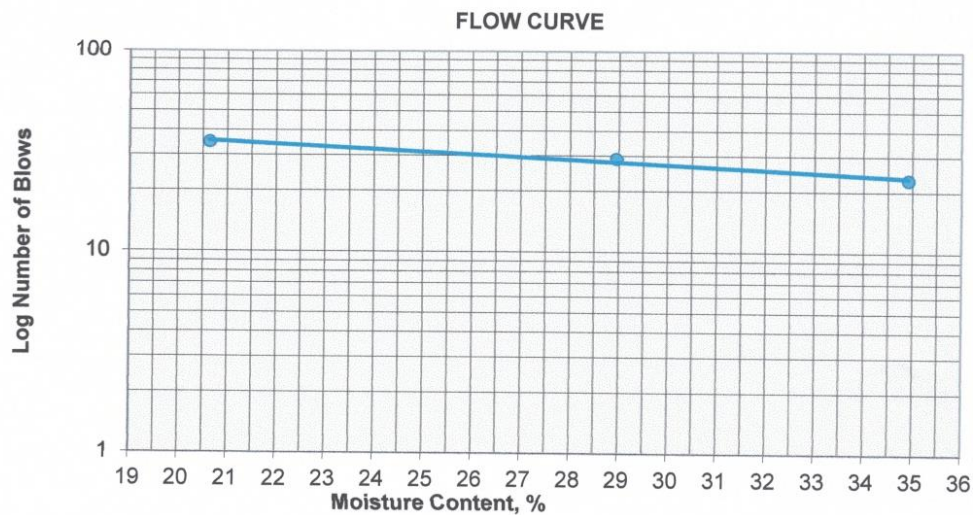
Sample ID Number	Sample Depth (m)	Sieve Analysis, Cumulative Percent Passing								Liquid Limit (LL, %)	Plasticity Index (P.I.)	AASHTO/USCS Soil Classification	NP non-plastic			Specific Gravity (G.S.)
		(1.5") (37.50)mm	(1.0") (25.00)mm	(3/4") (19.50)mm	(1/2") (12.50)mm	(3/8") (9.50)mm	(#4) (4.75)mm	(#10) (2.00)mm	(#40) (0.425)mm				(#200) (0.075)mm	Natural Moisture Cont. (%)	Organic Content (O.C., %)	
BH 1	1.500					100	97.890	86.04	42.32	15.03	32.00	7	CL	38.50	n/a	2.47
	6					100	97.53	90.58	72.48	10.08		NP	SC	26.60	n/a	2.53



WORKSHEET FOR LIQUID AND PLASTIC LIMIT

PROJECT: PROPOSED FOUR LEGGED TWO HUNDRED FIFTY FEET TV BROADCAST TOWER
LOCATION: MMSU CAMPUS, BATAK CITY, ILOCOS NORTE
CLIENT: PEOPLE'S TELEVISION NETWORK, INC.
BOREHOLE: ONE (01)
DEPTH: 1.5 mtrs

Determination No.	LIQUID LIMIT			PLASTIC LIMIT	
	3	2	1	1	2
Container No.	3	2	1	2	1
Container + Wet Soil, g	24.60	24.10	23.70	12.50	12.30
Container + Dry Soil, g	22.00	20.80	20.00	11.80	11.80
Weight of Container, g	9.40	9.40	9.40	9.40	9.40
Weight of Wet Soil, g	15.20	14.70	14.30	3.10	2.90
Weight of Dry Soil, g	12.60	11.40	10.60	2.40	2.40
Moisture Lss, g	2.60	3.30	3.70	0.70	0.50
Moisture Content, %	20.63	28.95	34.91	29.17	20.83
Number of Blows	35	29	23		25.00



Liquid Limit =	<u>32</u>	Group Index	<u>CL</u>
Plastic Limit =	<u>25.00</u>	Classification	<u>Inorganic sandy clay</u>
P. Index	<u>7.00</u>		<u>with slight plasticity</u>



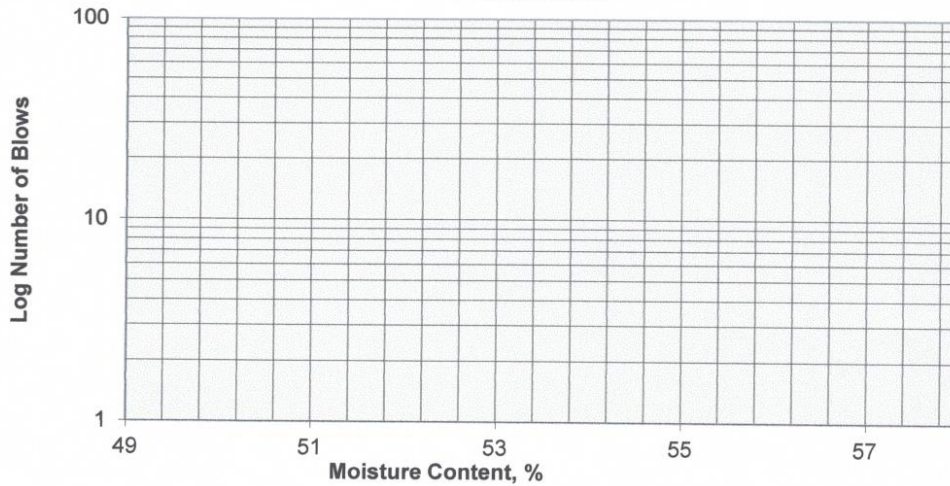
WORKSHEET FOR LIQUID AND PLASTIC LIMIT

PROJECT: PROPOSED FOUR LEGGED TWO HUNDRED FIFTY FEET TV BROADCAST TOWER
 LOCATION: MMSU CAMPUS, BATAK CITY, ILOCOS NORTE
 CLIENT: PEOPLE'S TELEVISION NETWORK, INC.
 BOREHOLE: ONE (01)
 DEPTH: 6.0 mtrs

Determination No.	LIQUID LIMIT			PLASTIC LIMIT	
	3	2	1	1	2
Container No.	3	2	1	2	1
Container + Wet Soil, g					
Container + Dry Soil, g					
Weight of Container, g	9.40	9.40	9.40	9.40	9.40
Weight of Wet Soil, g	-9.40	-9.40	-9.40	-9.40	-9.40
Weight of Dry Soil, g	-9.40	-9.40	-9.40	-9.40	-9.40
Moisture Lss, g	0.00	0.00	0.00	0.00	0.00
Moisture Content, %	0.00	0.00	0.00	0.00	0.00
Number of Blows					0.00

NON-PLASTIC

FLOW CURVE



Liquid Limit =	0.00	Group Index	SC
Plastic Limit =	0.00	Classification	Inorganic clayey sand
P. Index	0.00		with slight plasticity

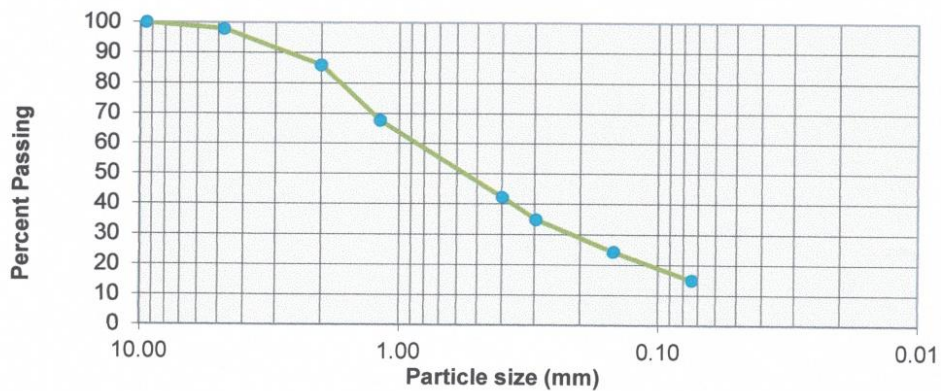


WORKSHEET ON SIEVE ANALYSIS

PROJECT: PROPOSED FOUR LEGGED TWO HUNDRED FIFTY FEET TV BROADCAST TOWER
 LOCATION: MMSU CAMPUS, BATAK CITY, ILOCOS NORTE
 CLIENT: PEOPLE'S TELEVISION NETWORK, INC.
 BOREHOLE: ONE (01)
 DEPTH: 1.5 mtrs

Sieve No.	Diameter (mm)	Weight Retained (gm)	Percent Retained (%)	Percent Passing (%)	Accumulated Percent Retained (%)
3/8-in	9.500	0.00	0.00	100.00	0.00
No. 4	4.750	8.10	2.11	97.89	2.11
No. 10	2.000	45.50	11.85	86.04	13.96
No. 16	1.190	70.00	18.23	67.81	32.19
No. 40	0.400	97.90	25.49	42.32	57.68
No. 50	0.297	28.30	7.37	34.95	65.05
No. 100	0.149	40.60	10.57	24.38	75.63
No. 200	0.074	35.90	9.35	15.03	84.97
PAN	0.000	57.70	15.03	0.00	100.00
TOTAL		384.00	100.00		

GRAIN-SIZE DISTRIBUTION CURVE



Wt dry +cont.	<u>389.80</u>	Cu	<u>17.60</u>
Wt Cont.	<u>5.80</u>	Cc	<u>1.00</u>
Wt. dry sample	<u>384.00</u>	Passing No. 200	<u>15.03</u>

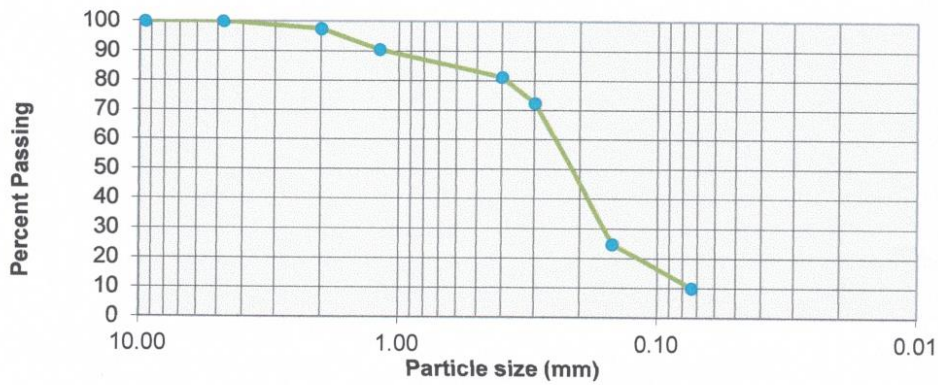


WORKSHEET ON SIEVE ANALYSIS

PROJECT: PROPOSED FOUR LEGGED TWO HUNDRED FIFTY FEET TV BROADCAST TOWER
 LOCATION: MMSU CAMPUS, BATAK CITY, ILOCOS NORTE
 CLIENT: PEOPLE'S TELEVISION NETWORK, INC.
 BOREHOLE: ONE (01)
 DEPTH: 6.0 mtrs

Sieve No.	Diameter (mm)	Weight Retained (gm)	Percent Retained (%)	Percent Passing (%)	Accumulated Percent Retained (%)
3/8-in	9.500	0.00	0.00	100.00	0.00
No. 4	4.750	0.00	0.00	100.00	0.00
No. 10	2.000	9.40	2.47	97.53	2.47
No. 16	1.190	26.40	6.95	90.58	9.42
No. 40	0.400	35.20	9.26	81.32	18.68
No. 50	0.297	33.60	8.84	72.48	27.52
No. 100	0.149	181.20	47.67	24.81	75.19
No. 200	0.074	56.00	14.73	10.08	89.92
PAN	0.000	38.30	10.08	0.00	100.00
TOTAL		380.10	100.00		

GRAIN-SIZE DISTRIBUTION CURVE



Wt dry +cont.	<u>385.90</u>	Cu	<u>3.33</u>
Wt Cont.	<u>5.80</u>	Cc	<u>1.30</u>
Wt. dry sample	<u>380.10</u>	Passing No. 200	<u>10.08</u>



WORKSHEET FOR SPECIFIC GRAVITY OF FINE-GRAINED SOIL

PROJECT: PROPOSED FOUR LEGGED TWO HUNDRED FIFTY FEET TV BROADCAST TOWER
 LOCATION: MMSU CAMPUS, BATAK CITY, ILOCOS NORTE
 CLIENT: PEOPLE'S TELEVISION NETWORK, INC.

Determination No.
 Container + dry soil, g
 Container, g
 Container no.
 Dry soil, g
 Temperature after boiling (@ room temp.)
 Pycnometer + soil + water, g
 Pycnometer + water (Calibration curve)
 Specific gravity of distilled water
 Specific gravity of soil

BH 01	BH 01
1.5 mtrs.	6.0 mtrs
1	1
184.30	181.20
7.30	7.20
A	A
177.00	174.00
776.90	719.30
671.50	614.20
1.0	1.0
2.47	2.53

Formula:

$$G_s = \frac{W_s \times G_t}{W_s + (W_2 - W_1)}$$

Where:

G_s = Specific Gravity
 W_s = Weight / Mass of dry soil
 G_t = Specific gravity of distilled water
 W₁ = Pycnometer + soil + water
 W₂ = Pycnometer + Water (from calibration curve)

PROJECT:	PROPOSED FOUR LEGGED TWO HUNDRED FIFTY FEET TV BROADCAST TOWER
LOCATION:	MMSU CAMPUS, BATAK CITY, ILOCOS NORTE
CLIENT:	PEOPLE'S TELEVISION NETWORK, INC.



ACTUAL BORING TEST

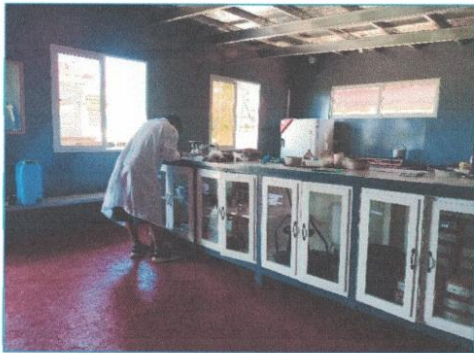


ACTUAL BORING TEST

PROJECT: | PROPOSED FOUR LEGGED TWO HUNDRED FIFTY FEET TV BROADCAST TOWER
LOCATION: | MMSU CAMPUS, BATAK CITY, ILOCOS NORTE
CLIENT: | PEOPLE'S TELEVISION NETWORK, INC.



SOIL SAMPLE



LABORATORY TEST