

# FINAL REPORT

## SUBSURFACE INVESTIGATION **PROPOSED MAYON EVACUATION CENTER (2-STOREY)**

STO. DOMINGO CENTRAL SCHOOL  
BRGY. NAGSYA, PROVINCE OF ALBAY

MOHRI, ARCHITECT & ASSOCIATES, INC.

OCTOBER 2010  
JOB NO. 2209-10.R1



**GEOTECHNICS PHILIPPINES, INC.**  
GEOTECHNICAL & FOUNDATION CONSULTANTS



DPWH-BRS Accredited

**FINAL REPORT**

**TABLE OF CONTENTS**

<b>Contents</b>	<b>No. of Pages</b>
1.0 INTRODUCTION.....	1
2.0 OBJECTIVES.....	2
3.0 FIELD EXPLORATION AND INVESTIGATION.....	1
4.0 LABORATORY INVESTIGATION.....	2
5.0 BOREHOLE STRATIGRAPHY.....	2
6.0 SOIL PROPERTIES.....	1
7.0 LIQUEFACTION POTENTIAL.....	1
8.0 BEARING CAPACITY AND FOUNDATION TYPE.....	1
9.0 EXCAVATION AND FILL.....	1
<b>APPENDICES</b>	
• Distribution of Active Faults and Trenches in the Philippines.....	1
• Photos.....	1
• Location Plan.....	1
• Soil Profile.....	1
• Final Boring Logs.....	2
• Summary of Test.....	1
• Natural Moisture Content/Atterberg Limit.....	2
• Grain Size Analysis.....	5





**GEOTECHNICS PHILIPPINES, INC.**  
**Geotechnical Contractor**

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**FINAL REPORT**

**SUB-SURFACE INVESTIGATION FOR THE  
PROPOSED MAYON EVACUATION CENTER (2-STOREY)  
LOCATED AT STO. DOMINGO CENTRAL SCHOOL BRGY. NAGSYA,  
PROVINCE OF ALBAY**

**1.0 INTRODUCTION**

**Geotechnics Philippines, Incorporated (GPI)** completed the subsurface soil investigation for the Proposed Mayon Evacuation Center. The proposed site explored is located at Sto. Domingo Central School, Brgy. Nagsya, Province of Albay.

Two (2) boreholes were drilled at the proposed site from October 20 to October 22, 2010. Borings were undertaken down to 8.45m to 8.25m respectively for both BH-1 and BH-2 below existing natural ground line. Borehole locations are as indicated on the accompanying Boring Plan and Soil Profile Sheets.

The subsurface soil exploration was undertaken upon the request of Mohri, Architect & Associates, Inc. in order to gain information on the subsurface conditions and bearing characteristics of the underlying soils at site.

The undersigned was tasked to evaluate the results of the completed subsurface soil exploration and to recommend a suitable foundation solution for the proposed structure.

This report embodies the undersigned's engineering analysis and recommendations based mainly on the results of the geotechnical soil borings and pertinent laboratory tests performed on extracted samples.

The results of geotechnical soil borings and laboratory tests can be referred to in the Attachments accompanying this report.

**2.0 OBJECTIVES**

The geotechnical investigation aims to determine the following:

- Soil Profile
- Engineering properties of the Soil Strata
- Bearing Capacities and Foundation Types
- Settlement conditions of critical areas
- Comment on ground stability and liquefaction potential of the site
- Recommend ground improvement when necessary
- Provide Excavation and Fill Guidelines

In addition to the above mentioned items, matters on implementation and construction shall be given as required.

### **3.0 FIELD EXPLORATION AND INVESTIGATION**

The field exploration implored continuous was boring as the Standard Penetration Test (SPT) was performed at the last 45cm of every change strata or 1.0 meter intervals. The blow counts (N value or NB) were recorded as disturbed samples from the split spoon sampler were retrieved for laboratory testing. The recovered samples were described semi qualitative in terms of extracted length. The extracted soil samples were wrapped in double plastic bags for moisture and sample protection and were transported to the laboratory for further testing of engineering properties.

Advancing through the hard strata, the same technique was implored. Hard strata are defined over a series of high blow count layers of more than 50 blows or the inability of driving the hammer to penetrate at high blow counts termed as refusal.

#### **3.1 Standard Penetration Test**

The Standard Penetration Test (SPT) is a field test used in determining the shear strength of soils from an established correlation. The SPT requires the count of the number of blows that it would take a standard split spoon sampler to penetrate its last 30.5cm (12inches) of the sampler. The standard mass is 63.5 kilograms and the height of the drop is 76.2cm specified as a free drop.

#### **3.2 Hard Strata and Soft Strata Sampling**

Hard strata are defined as a consecutive ground resistance of refusal to the standard penetration test of blow counts of 50 with a penetration less than or equal to 25.4mm. This is in accordance to the American Standard for Testing Materials (ASTM) Designated D 1586. Coring techniques were applied in this investigation. Sampling of undisturbed samples for soft cohesive soils was not conducted via pressing the sampler.

#### **3.3 Ground Water Table**

The ground water table (GWT) elevation was observed at least 4 hours from the completion of the borehole up to demobilization.

### **4.0 LABORATORY INVESTIGATION**

The retrieved samples were brought to the laboratory in Sauyo Road, Novaliches, Quezon City. Various tests were conducted on all extracted samples with test procedures conforming to the American Standards for Testing Materials (ASTM). The following are the laboratory tests conducted on the soil samples.

Type of Test	ASTM Designation	Description of Test
Soil Classification for Engineering Purposes – Unified Soil Classification System	ASTM D 2487-05	<ul style="list-style-type: none"> <li>• Standard in classifying the type of soil based on composition and physical properties</li> <li>• These were classified in accordance to grain size, composition, percentage of size in the distribution</li> </ul>
Particle Size Distribution – Sieve Analysis	ASTM D 422-63 (Reapproved 2002)	<ul style="list-style-type: none"> <li>• The test allows the dried or wet soil to pass through a series of sieves in order to determine the distribution of grain sizes.</li> <li>• The distributions of the particles are graphed on a semi log scale</li> <li>• This test aids the previous test in classification</li> </ul>
Moisture Content	ASTM D 2216-05	<ul style="list-style-type: none"> <li>• The test aims to determine the natural content of water in the soil</li> <li>• This is taken as the ratio of water to the ratio of the soil particles</li> <li>• The test uses a weighing scale measuring the initial weight of the soil and the final weight of the soil after drying it in the oven</li> </ul>
Atterberg Limits Liquid Limit, Plastic Limit and Plasticity Index	ASTM D4318-05	<ul style="list-style-type: none"> <li>• Tests determining the limits of cohesive soils in behaving as a plastic or a flowing medium by incrementally changing the water content</li> <li>• The plastic limit is determined by rolling a clay sample to around 1/8 of an inch or 3mm</li> <li>• The liquid limit uses the liquid limit device and determines the number of blows it would take for the slit to close</li> <li>• Correlative values can be used for settlement relations</li> </ul>

The results of the laboratory investigation are appended.

## 5.0 BOREHOLE STATIGRAPHY

Two (2) boreholes were driven to investigate the subsurface. The following are the findings:



### 5.1 Borehole BH-1

Borehole BH-1 extends 8.45 meters obtaining the following stratification: Medium dense silty sand at 0-1 meter, very dense poorly graded sand at 1-1.85 meters, sludge at 1.85-2.85 meters, very dense poorly graded sand at 2.85-3 meters, very dense gravel to cobbles at 3-4 meters, no recovery at 4-5 meters, very dense well graded sand at 5-5.15 meters, very dense cobble at 5.15-6.15 meters, sludge at 6.15-7.15 meters, very dense well graded sand at 7.15-7.3 meters, sludge at 7.3-8.3 meters, very dense well graded sand at 8.3-8.45 meters, the extent of the borehole.

The ground water was detected at 2.31 meters from the existing grade.

### 5.2 Borehole BH-2

Borehole BH-2 extends 8.25 meters obtaining the following subsurface stratification: Medium dense silty sand at 0-0.85 meters, very dense gravel to cobble at 0.85-1.35 meters, sludge at 1.35-2.35 meters, very dense poorly graded sand at 2.35-2.45 meters, sludge at 2.45-3.5 meters, very dense poorly graded sand at 3.5-6.85 meters, very dense well graded sand at 6.85-8.1, very dense well graded sand at 8.1-8.25 meters, the extent of the borehole.

The ground water table was detected at 0.73 meters from the existing grade.

## 6.0 SOIL PROPERTIES

The following are the adapted soil properties for the investigated strata:

Soil Parameters			
Gravels, Sands, Silty Sands and Clayey Sands (Non-cohesive)			
Sands	c	$\phi$	$\gamma$ (kcf)
Very Loose	0	26	0.085
Loose	0	28	0.100
Medium Dense	0	30	0.110
Dense	0	32	0.120
Very Dense	0	35	0.130
Silts and Clays (Cohesive)			
Silts and Clays	c	$\phi$	$\gamma$ (kcf)
Very Soft	$= (N \cdot 10) / 2$ from Braja Das	0	0.100
Soft		0	0.105
Firm		0	0.115
Stiff		0	0.120
Very Stiff		0	0.125
Hard		0	0.130

## 7.0 LIQUEFACTION POTENTIAL

The two (2) boreholes showed no potential for liquefaction due to dense and stiff layer layers found until the end of boreholes.

## 8.0 BEARING CAPACITY AND FOUNDATION TYPE

Shallow Foundations have good bearing capacities. The following are the allowable net bearing capacities based on Terzaghi's Bearing Capacity Equation:

BH-1:

Depth	Bearing Capacity (kPa)
1.0	96

BH-2:

Depth	Bearing Capacity (kPa)
1.0	96

The associated settlement on the other hand is within the tolerable engineering settlement of 25mm.

## 9.0 EXCAVATION AND FILL

Fill for the excavation for footings may utilize the same materials. On the other hand, grade and subgrade materials should be sandy frictional materials.

Fill should be compacted at 95% its maximum dry density. Should the amount of soil be inept, sandy fill may be utilized and should be compacted in the same degree. In both cases, the height of fill should be reviewed and adjusted accordingly to adapt minimal settlements.

### *Borehole Conclusions and Recommendations*

The conclusions and recommendations are based on the data of two (2) boreholes and the geologic map. Deviations from these are expected and should be minimal as the boreholes are typical of an alluvial formation. Should there be any major deviation in the substrata be detected during the excavation phase, may the undersigned through Geotechnics Philippines Inc (02-930-6555) be approached immediately for proper reassessment.



DIOSDADO A. UREÑA

CE REG No. 053884

PTR No. 3228274

Issued on January 8, 2010

Issued at Quezon City

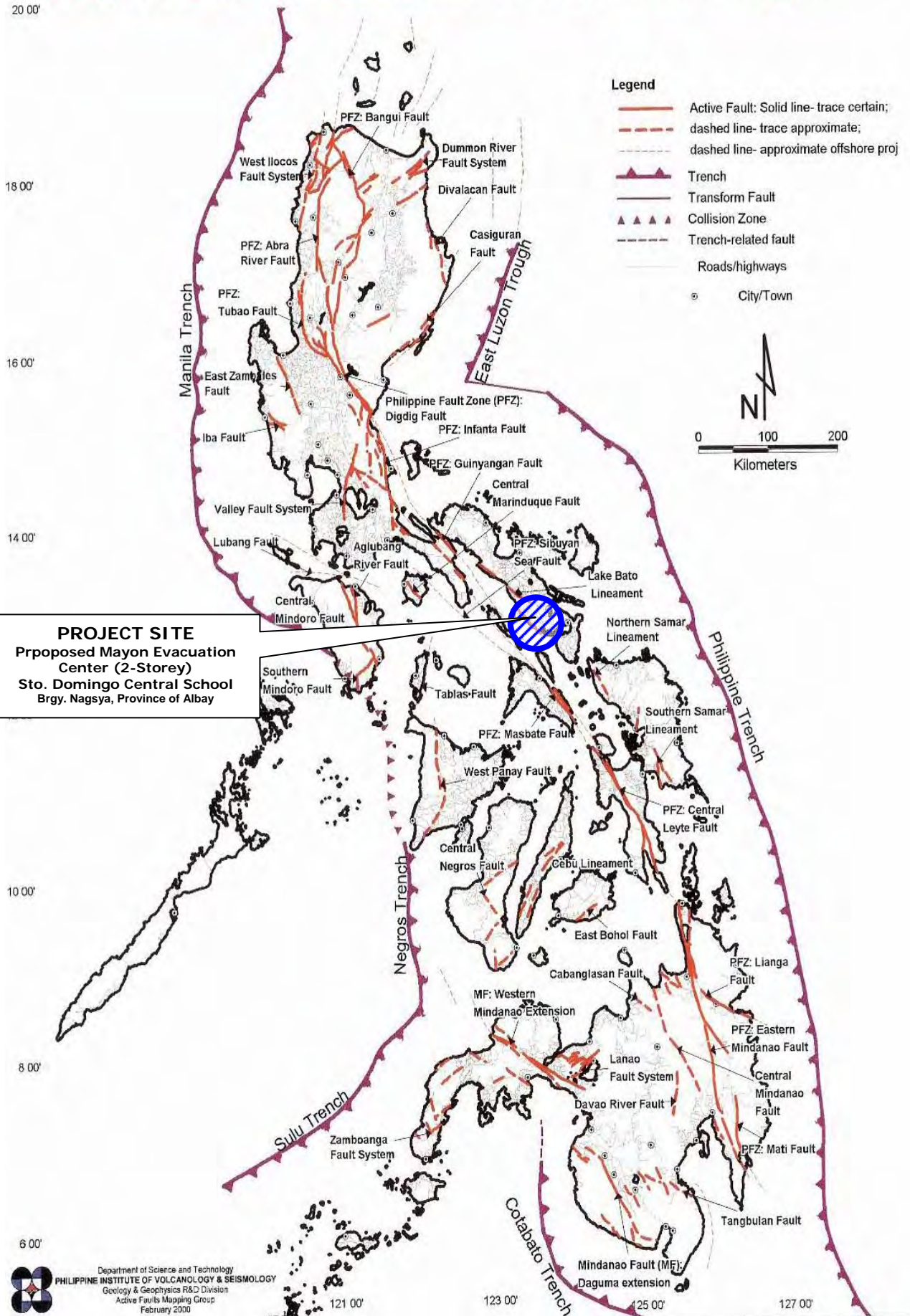
# ***APPENDICES***

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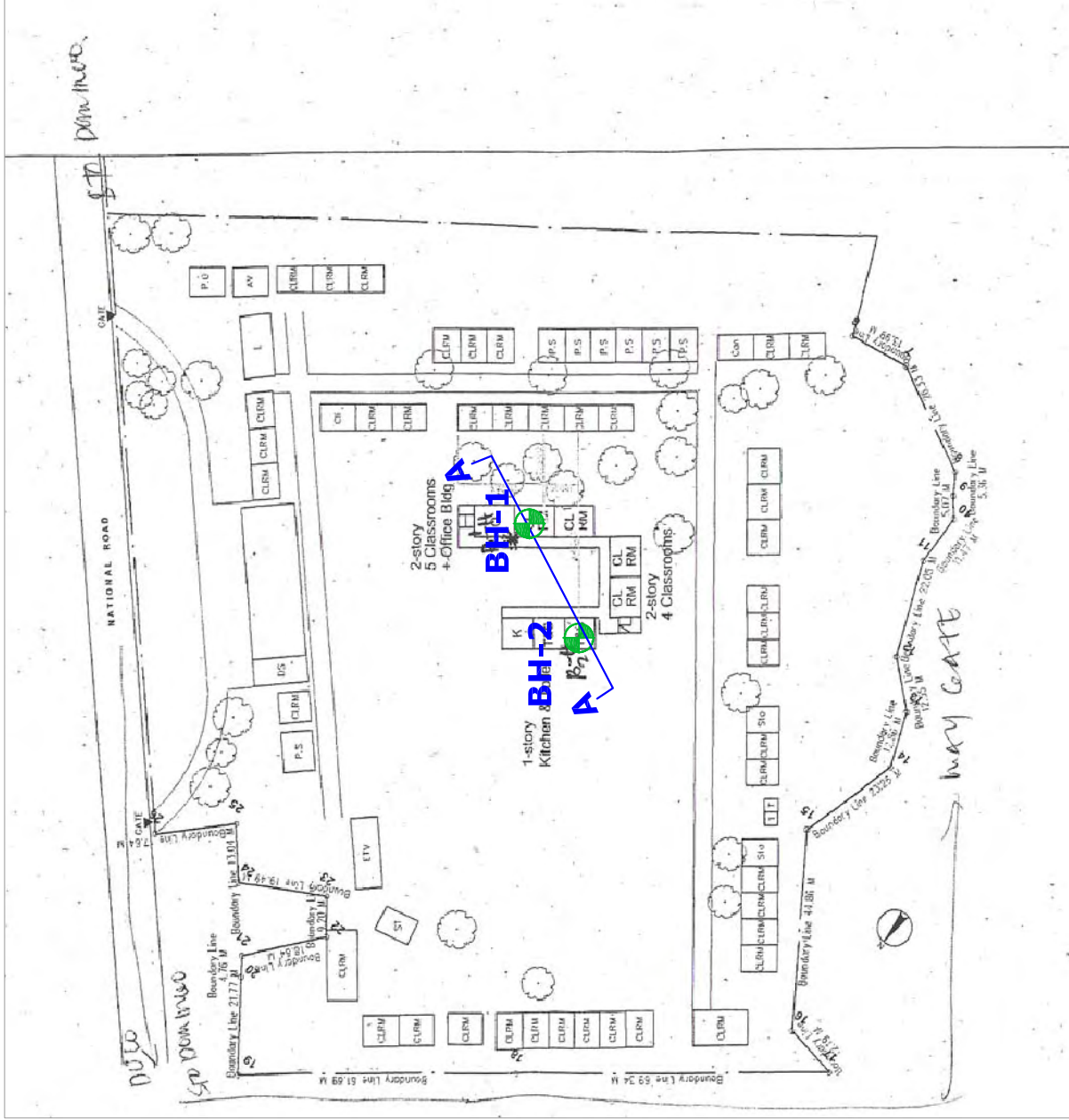


# Distribution of Active Faults and Trenches in the Philippines





VICINITY MAP



SHEET CONTENTS	LOCATION PLAN/VICINITY MAP	JOB NO. 2209-10.R3
	CLIENT MOHRI, ARCHITECT & ASSOCIATES, INC.	SHEET NO. 1/1

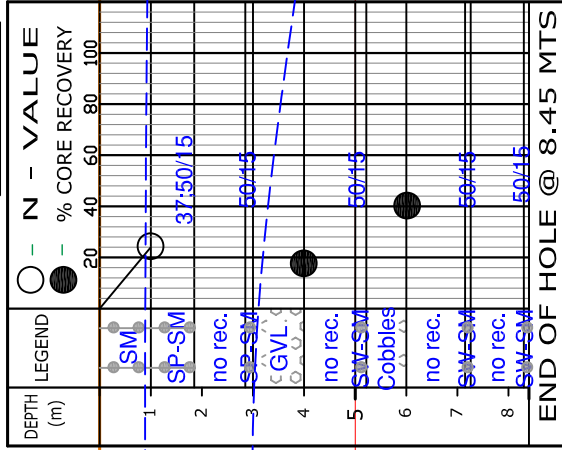
SCALE NTS	PROJECT TITLE <b>Proposed Mayon Evacuation Center (Sto. Domingo Central School)</b> Brgy. Nagsya, Province of Albay
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CONTRACTOR	<b>GEOTECHNICS PHILIPPINES, INC.</b> 119 SAUYO ROAD, NOVALICHES, QUEZON CITY
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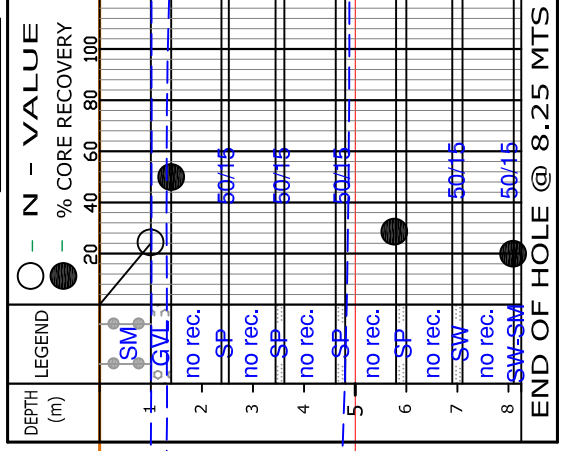
# BH-1

BOREHOLE NO.



# BH-2

BOREHOLE NO.



## SECTION A - A

LEGEND :

- Silty CLAY
- Sandy CLAY
- Clayey SILT
- Sandy SILT
- Clayey SAND
- Silty SAND
- Silty GRAVEL
- Clayey silty SAND

- Poorly graded SAND
- Well graded SAND
- Poorly graded SAND w/ silt
- Well graded SAND w/ silt
- Silty GRAVEL
- Poorly graded GRAVEL w/ silt
- Well graded GRAVEL w/ silt

- SANDSTONE
- Clayey silty GRAVEL
- COBBLES
- GRAVEL
- Poorly graded GRAVEL
- Well graded GRAVEL
- Poorly graded GRAVEL w/ silt
- Well graded GRAVEL w/ silt

- SILTSTONE
- Silty TUFF
- Sandy TUFF
- SHALE
- I - N-VALUE < 10 (LIQUEFIABLE ZONE)
- II - N-VALUE > 10
- III - REFUSAL (WEATHERED ZONE)
- IV - CORING / HARD FORMATION

CONTRACTOR



**GEOTECHNICS PHILIPPINES, INC.**  
119 SAUYO ROAD, NOVALICHES, QUEZON CITY

PROJECT TITLE:

**Proposed Mayon Evacuation Center  
(Sto. Domingo Central School)**  
Brgy. Nagsya, Province of Albay

SHEET CONTENTS:

**SOIL PROFILE**  
SCALE: N. T. S.

CLIENT:  
**MOHRI, ARCHITECT & ASSOCIATES, INC.**

JOB NO.

**2209-10.R1**

CHECKED BY:

**A. B. A. / M. R. R.**

DRAWN BY:

**MARIA ANTONIETTE P. CUNAHAP**

CERTIFIED BY:

**A. B. A. / M. R. R.**

AUTHORIZED SIGNATORY

**1 / 1**



CLIENT	<b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	BOREHOLE NO.	<b>BH- 1</b>
PROJECT	<b>Proposed Mayon Evacuation Center (Sto. Domingo Central School)</b>	JOB NO.	2209-10.R1-FBL-01
LOCATION	Brgy. Nagsya, Province of Albay	DRILLED	R. POLIDAN
RIG	KSK SMALL	LOGGED	R. POLIDAN
	Hammer Weight 63.50 Kg.	DATE STARTED	Oct. 20, 2010
	Fall Height 76.20 cm.	DATE COMPLETED	Oct. 20, 2010
METHOD	WASH BORING	NORTHING	-
		EASTING	-
		GROUND LEVEL	- m.
		WATER LEVEL	2.31 m.

**FINAL BORING LOG**

DEPTH (m)	SOIL SYMBOL	SAMPLE NUMBER	TYPE OF SAMPLING	REC (cm)	RQD (%)	PL NMC LL  ---○---  20 40 60 80 100	PI	CONSISTENCY	○ - N - VALUE ● - % Core Recovery 0 20 40 60 80 100	SOIL DESCRIPTION	OTHER TEST DATA
1.00		S-1	SPT	45	-		NP	MEDIUM DENSE	25	(SM) Silty SAND, fine to coarse grained with little amount of gravel, dark gray, very moist NB: (10)(12)(13)	
2.00		S-2	SPT	30	-		NP		37 50/15	(SP-SM) Poorly graded SAND with silt and little amount of gravel, dark gray, moist NB: (22)(37)(50/15)	
3.00		C-1	CRG	0	0		-		0	Sludge: recovered, fine to coarse grained sand, (pyroclastic materials), weakly cemented, highly weathered sandy tuff, hard drilling, dark gray	
3.00		S-3	SPT	10	-		NP		50/15	(SP-SM) Poorly graded SAND with silt, dark gray, moist NB: (50/15)	
4.00		C-2	CRG	50	0		-		17	GRAVEL to COBBLES, high strength, andesitic rock fragments ranges:1.0cm-10.3cm with iron oxide and silt on rough surfaces, brown NO RECOVERY	
5.00		C-3	CRG	0	0		-		0		
5.00		S-4	SPT	10	-		NP	VERY DENSE	50/15	(SW-SM) Well graded SAND with silt and little amount of gravel, dark gray, moist NB: (50/15)	
6.00		C-4	CRG	40	0		-		40	COBBLE, ranges:9.6cm-10.4cm	
7.00		C-5	CRG	0	0		-		0	Sludge: recovered, fine to coarse grained sand, (pyroclastic materials), weakly cemented, highly weathered sandy tuff, hard drilling, dark gray	
7.00		S-5	SPT	15	-		NP		50/15	(SW-SM) Well graded SAND with silt and little amount of gravel, dark gray, moist NB: (50/15)	
8.00		C-6	CRG	0	0		-		0	Sludge: recovered, fine to coarse grained sand (pyroclastic materials), hard drilling, weakly cemented sandy tuff, brownish dark gray	
8.00		S-6	SPT	15	-		NP		50/15	(SW-SM) Well graded SAND with silt and little amount of gravel, dark gray, moist NB: (50/15)	
END OF BORING AT 8.45 METERS											

Type of Sampling	Type of Soil	CONSISTENCY		MOISTURE		PERCENTAGE			
STANDARD PENETRATION TEST (SPT) UNDISTURBED SAMPLING (UDS) CORING (CRG)	Silty CLAY Clayey SILT Clayey SAND Silty SAND Clayey silty SAND SAND	COHESIVE SOILS		COHENSIONLESS SOILS		MOISTURE CONTENT		% of SAND and GRAVEL	
		N-VALUE	CONSISTENCY	N-VALUE	CONSISTENCY	RANGES	VALUES	RANGES	VALUES
	Silty GRAVEL Well graded GRAVEL with silt GRAVEL SILTSTONE TUFF Tuffaceous SILTSTONE	0 - 2 - VERY SOFT 2 - 4 - SOFT 4 - 8 - FIRM 8 - 15 - STIFF 15 - 30 - VERY STIFF > 30 - HARD		0 - 4 - VERY LOOSE 4 - 10 - LOOSE 10 - 30 - MEDIUM DENSE 30 - 50 - DENSE > 50 - VERY DENSE		0 - 10 - DRY 10 - 30 - MOIST 30 - 70 - VERY MOIST 70 - 100 - WET > 100 - SATURATED		0 - 5 - TRACES 6 - 10 - FEW 11 - 25 - LITTLE 26 - 35 - SOME 36 - 45 - WITH	

REMARKS:	Rec = Recovery in Centimeters    NB = No. of Blows    HW = Hammer Weight	Prepared by :	<b>R. T. LUSTRE</b>
	Reference Joint Spacing: #1 >30cm.    10 cm. >#3>3cm.    #5 <1cm.	Checked by :	<b>A.B.A. / M.R.R.</b>
	30 cm.>#2>10cm.    3 cm. >#4>1cm.	Certified by :	
	RQD = Rock Quality Designation    SCR = Solid Core Recovery		_____ AUTHORIZED SIGNATORY
Description of Strata is according to Unified Soil Classification System		Date Issued :	



**GEOTECHNICS PHILIPPINES, INCORPORATED**  
**SOILS AND MATERIALS TESTING LABORATORY**  
 119 SAUYO ROAD, NOVALICHES, QUEZON CITY  
 TEL. NO. 938-2124 \ 456-1140 \ 930-6555



CLIENT	<b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	BOREHOLE NO.	<b>BH- 2</b>
PROJECT	<b>Proposed Mayon Evacuation Center (Sto. Domingo Central School)</b>	JOB NO.	2209-10.R1-FBL-02
LOCATION	Brgy. Nagsya, Province of Albay	DRILLED	R. POLIDAN
RIG	KSK SMALL	LOGGED	R. POLIDAN
	Hammer Weight 63.50 Kg.	DATE STARTED	Oct. 22, 2010
	Fall Height 76.20 cm.	DATE COMPLETED	Oct. 22, 2010
METHOD	WASH BORING	NORTHING	-
		EASTING	-
		GROUND LEVEL	- m.
		WATER LEVEL	0.73 m.

**FINAL BORING LOG**

DEPTH (m)	SOIL SYMBOL	SAMPLE NUMBER	TYPE OF SAMPLING	REC (cm)	RQD (%)	PL NMC LL  ---○---  20 40 60 80 100	PI	CONSISTENCY	N - VALUE		SOIL DESCRIPTION	OTHER TEST DATA
									○ - N - VALUE	● - % Core Recovery		
0.00		S-1	SPT	25	-		NP	MEDIUM DENSE	10		(SM) Silty SAND, fine to coarse grained with little amount of gravel, dark gray, very moist NB: (3)(4)(6)	
1.00		C-1	CRG	50	0		-		50		GRAVEL to COBBLE, very high strength, andesitic rock fragments, ranges:3.6cm-13.6cm, angular with iron oxide with silt on rough surfaces, slightly to moderately weathered, dark gray Sludge: recovered fine to coarse grained sand, (pyroclastic materials), weakly cemented, highly weathered sandy tuff, hard drilling, dark gray	
2.00		C-2	CRG	0	0		-		0			
2.50		S-2	SPT	15	-		NP		50/15		(SP) Poorly graded SAND, dark gray, moist NB: (50/15)	
3.00											Sludge: recovered up to bottom	
3.50		C-3	CRG	0	0		-		0			
4.00		S-3	SPT	15	-		NP		50/15		(SP) Poorly graded SAND with little amount of gravel, dark gray, moist NB: (50/15)	
4.50												
5.00		C-4	CRG	0	0		-	VERY DENSE	0			
5.50		S-4	SPT	15	-		NP		50/15		(SP) Poorly graded SAND with few gravel, dark gray, moist NB: (50/15)	
6.00												
6.50		C-5	CRG	0	0		-		28			
7.00		S-5	SPT	15	-		NP		50/15		(SP) Poorly graded SAND with some gravel, dark gray, moist NB: (50/15)	
7.50												
8.00		C-6	CRG	0	0		-		0			
8.50		S-6	SPT	15	-		NP		50/15		(SW) Well graded SAND with some gravel, dark gray, moist NB: (50/15)	
9.00												
9.50		C-7	CRG	0	0		-		20			
10.00		S-7	SPT	15	-		NP		50/15		(SW-SM) Well graded SAND with silt and little amount of gravel, dark gray, moist NB: (50/15)	
END OF BORING AT 8.25 METERS												

Type of Sampling	Type of Soil	CONSISTENCY		MOISTURE		PERCENTAGE	
 STANDARD PENETRATION TEST (SPT)  UNDISTURBED SAMPLING (UDS)  CORING (CRG)	 Silty CLAY  Clayey SILT  Clayey SAND  Silty SAND  Clayey silty SAND  SAND	 Silty GRAVEL  Well graded GRAVEL with silt  GRAVEL  SILTSTONE  TUFF  Tuffaceous SILTSTONE	<b>COHESIVE SOILS</b> <u>N-VALUE</u> <u>CONSISTENCY</u> 0 - 2    -    VERY SOFT 2 - 4    -    SOFT 4 - 8    -    FIRM 8 - 15    -    STIFF 15 - 30    -    VERY STIFF > 30    -    HARD	<b>COHENSIONLESS SOILS</b> <u>N-VALUE</u> <u>CONSISTENCY</u> 0 - 4    -    VERY LOOSE 4 - 10    -    LOOSE 10 - 30    -    MEDIUM DENSE 30 - 50    -    DENSE > 50    -    VERY DENSE	<b>MOISTURE CONTENT</b> <u>RANGES</u> <u>VALUES</u> 0 - 10    -    DRY 10 - 30    -    MOIST 30 - 70    -    VERY MOIST 70 - 100    -    WET > 100    -    SATURATED	<b>% of SAND and GRAVEL</b> <u>RANGES</u> <u>VALUES</u> 0 - 5    -    TRACES 6 - 10    -    FEW 11 - 25    -    LITTLE 26 - 35    -    SOME 36 - 45    -    WITH	

REMARKS:	Rec = Recovery in Centimeters    NB = No. of Blows    HW = Hammer Weight	Prepared by :	<b>R. T. LUSTRE</b>
	Reference Joint Spacing: #1 >30cm.    10 cm. >#3>3cm.    #5 <1cm.	Checked by :	<b>A.B.A. / M.R.R.</b>
	30 cm.>#2>10cm.    3 cm. >#4>1cm.	Certified by :	
	RQD = Rock Quality Designation    SCR = Solid Core Recovery		_____ AUTHORIZED SIGNATORY
Description of Strata is according to Unified Soil Classification System		Date Issued :	



CLIENT..... **MOHRI, ARCHITECT & ASSOCIATES, INC.**

JOB NUMBER..... 2209-10.R1-SUM-1

PROJECT..... **Proposed Mayon Evacuation Center (Sto. Domingo Central School)**

DATE OF RECEIPT.... October 27, 2010

LOCATION..... Brgy. Nagsya, Province of Albay

DATE OF TEST..... Oct. 27-Nov. 2, 2010

**SUMMARY OF LABORATORY TESTS**

SAMPLE NUMBER	DEPTH (m)	NMC (%)	ATTERBERG LIMIT, (%)			USCS Class.	SIEVE ANALYSIS (% FINER) PASSING SIEVE NO.								Remarks		
			LL	PL	PI		1	3/4	3/8	4	10	20	40	60		140	200
<b>BH-1</b>																	
1	0.55 - 1.00	30	-	NP	-	SM		100	92	84	76	64	49	39	27	24	-
2	1.55 - 1.85	19	-	NP	-	SP-SM		100	89	84	77	60	31	17	6	5	-
3	2.55 - 3.00	21	-	NP	-	SP-SM				100	98	75	48	28	9	7	-
4	5.00 - 5.15	19	-	NP	-	SW-SM		100	85	80	79	63	42	25	8	6	-
5	7.15 - 7.50	20	-	NP	-	SW-SM		100	89	86	83	64	41	25	9	6	-
6	8.30 - 8.45	20	-	NP	-	SW-SM		100	83	80	79	60	38	22	8	6	-
<b>BH-2</b>																	
1	0.55 - 0.85	30	-	NP	-	SM			100	96	86	72	53	37	21	18	-
2	2.36 - 2.41	23	-	NP	-	SP				100	94	70	35	17	6	4	-
3	3.41 - 3.56	17	-	NP	-	SP		100	88	83	62	46	24	11	4	3	-
4	4.65 - 4.80	21	-	NP	-	SP			100	90	42	13	9	6	4	3	-
5	5.80 - 5.95	14	-	NP	-	SP		100	82	65	44	28	17	11	5	4	-
6	6.95 - 7.10	15	-	NP	-	SW		100	85	65	38	19	12	9	4	4	-
7	8.10 - 8.25	19	-	NP	-	SW-SM		100	86	72	55	27	17	12	7	6	-

SAMPLE SUBMITTED BY :  
 Walk-in Clients      GPI Field Operator  
 R. POLIDAN

REMARKS:     \* with hydrometer

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
 Encoder  
 Data Chkd by: ABA / MRR  
 Quality Assurance  
 Date Issued \_\_\_\_\_

CERTIFIED BY: \_\_\_\_\_  
 AUTHORIZED SIGNATORY

*This report should not be copied, divulged or reproduced, in full or in part, without prior advice to and written approval from GPI-SMTL.*



ACCREDITED TESTING  
LABORATORY  
PNS ISO/IEC 17025:2005  
LA-2006-097B



**GEOTECHNICS PHILIPPINES, INC.**

SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



DPWH-BRS Accredited

Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-NMC-01-1
Project..... <b>Proposed Mayon Evacuation Center (Sto. Domingo Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Nagsya, Province of Albay	Date of Test..... October 28-30, 2010

**TEST REPORT FOR LABORATORY DETERMINATION OF WATER (MOISTURE) CONTENT OF SOIL & ROCK BY MASS**

**ASTM D 2216 - 05**

Test Method  A  B

BOREHOLE NO...BH-1

SAMPLE NUMBER	DEPTH (m)	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	WATER CONTENT (%)	REMARKS
NATURAL MOISTURE CONTENT								
1	0.55-1.00	90.00	71.51	18.49	9.99	61.52	30	
2	1.55-1.85	104.20	88.82	15.38	9.47	79.35	19	
3	2.55-3.00	98.10	82.61	15.49	9.56	73.05	21	
4	5.00-5.15	99.58	85.28	14.30	9.72	75.56	19	
5	7.15-7.50	100.30	85.43	14.87	9.61	75.82	20	
6	8.30-8.45	101.90	86.77	15.13	9.87	76.90	20	

**TEST REPORT FOR LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS**

**ASTM Designation : D 4318 - 05, Method B**

SAMPLE NUMBER	DEPTH (m)	BLOWS	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	% Retained on 0.425 mm	ATTERBERG LIMIT		REMARKS
									LL	PL	
LIQUID LIMIT											
PLASTIC LIMIT											

Uncertainty Results: Water Content (%) = ± 0.0324      Liquid Limit = ---      Plastic Limit = ---  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.      LAB.FILE NO.:NMC-10-506

SAMPLE SUBMITTED BY : \_\_\_\_\_ REMARKS: \_\_\_\_\_  
 Walk-in Clients       GPI Field Operator  
 R. POLIDAN \_\_\_\_\_

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
    Encoder  
 Data Checked by: ABA/MRR  
    Quality Assurance  
 Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
    LABORATORY TECHNICIAN  
 CERTIFIED BY : \_\_\_\_\_  
    AUTHORIZED SIGNATORY



Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-NMC-02-1
Project..... <b>Proposed Mayon Evacuation Center (Sto. Domingo Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Nagsya, Province of Albay	Date of Test..... October 28-30, 2010

**TEST REPORT FOR LABORATORY DETERMINATION OF WATER (MOISTURE) CONTENT OF SOIL & ROCK BY MASS**

**ASTM D 2216 - 05**

Test Method  A  B

BOREHOLE NO...BH-2

SAMPLE NUMBER	DEPTH (m)	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	WATER CONTENT (%)	REMARKS
<b>NATURAL MOISTURE CONTENT</b>								
1	0.55-0.85	90.20	71.48	18.72	9.50	61.98	30	
2	2.36-2.41	106.00	88.15	17.85	9.77	78.38	23	
3	3.41-3.56	101.56	88.36	13.20	9.56	78.80	17	
4	4.65-4.80	103.29	86.86	16.43	10.40	76.46	21	
5	5.80-5.95	102.49	90.91	11.58	9.60	81.31	14	
6	6.95-7.10	105.10	92.94	12.16	9.25	83.69	15	
7	8.10-8.25	129.15	109.82	19.33	9.48	100.34	19	

**TEST REPORT FOR LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS**

**ASTM Designation : D 4318 - 05, Method B**

SAMPLE NUMBER	DEPTH (m)	BLOWS	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	% Retained on 0.425 mm	ATTERBERG LIMIT		REMARKS
									LL	PL	
<b>LIQUID LIMIT</b>											
<b>PLASTIC LIMIT</b>											

Uncertainty Results: Water Content (%) = ± 0.0322      Liquid Limit = ---      Plastic Limit = ---  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.      LAB.FILE NO.:NMC-10-507

SAMPLE SUBMITTED BY :  Walk-in Clients       GPI Field Operator      REMARKS: \_\_\_\_\_  
 R. POLIDAN

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
    Encoder  
 Data Checked by: ABA/MRR  
    Quality Assurance  
 Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
    LABORATORY TECHNICIAN  
 CERTIFIED BY : \_\_\_\_\_  
    AUTHORIZED SIGNATORY



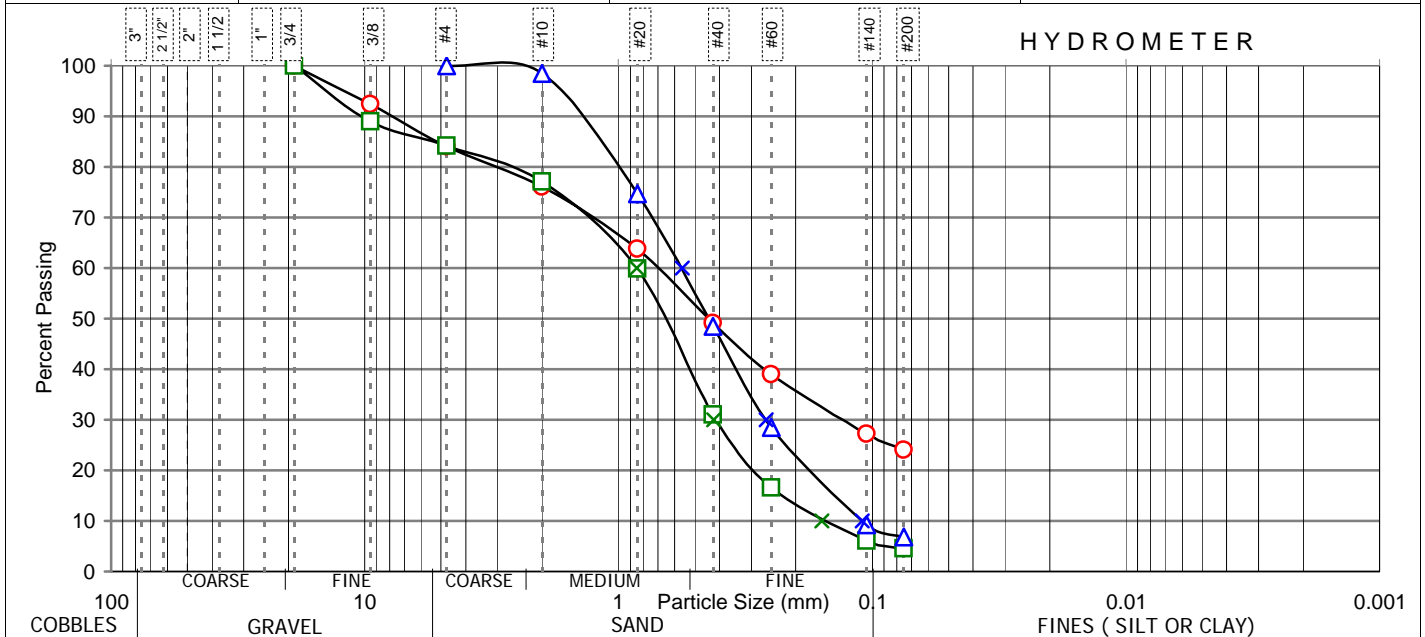


Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-01-1
Project..... <b>Proposed Mayon Evacuation Center (Sto. Domingo Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Nagsya, Province of Albay	Date of Test..... November 2, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO..... **BH-1**      **○ 1**      **□ 2**      **△ 3**  
 DEPTH (m)..... 0.55-1.00      1.55-1.85      2.55-3.00  
 SOIL DESCRIPTION..... Silty SAND      Poorly graded SAND with silt      Poorly graded SAND with silt

SIEVE SIZE inches      mm	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
2 1/2      62.5									
2      50.0									
1 1/2      37.5									
1      25.0									
3/4      19.0			100			100			
3/8      9.5	4.70	7.64	92	8.76	11.04	89			
4      4.75	9.80	15.93	84	12.55	15.82	84			100
10      2.0	14.68	23.86	76	18.16	22.89	77	1.12	1.53	98
20      0.8	22.29	36.23	64	31.81	40.09	60	18.50	25.33	75
40      0.425	31.33	50.93	49	54.75	69.00	31	37.65	51.54	48
60      0.25	37.52	60.99	39	66.21	83.44	17	52.29	71.58	28
140      0.105	44.80	72.82	27	74.50	93.89	6	66.27	90.72	9
200      0.075	46.70	75.91	24	75.69	95.39	5	68.10	93.22	7
OVEN DRIED MASS			61.52 gms	79.35 gms			73.05 gms		



\* - with Hydrometer  
 REMARKS : S-2: Cu = 5.37      Cc = 1.33  
 S-3: Cu = 5.13      Cc = 1.12

SAMPLE SUBMITTED BY:  
 Walk-in Clients     GPI Field Operator

R. POLIDAN

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
 Encoder  
 Data Checked by: ABA/MRR  
 Quality Assurance  
 Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
 LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
 AUTHORIZED SIGNATORY

Uncertainty Results:      % Finer = ± 0.0501      LAB.FILE NO.:GSA-10-406  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.

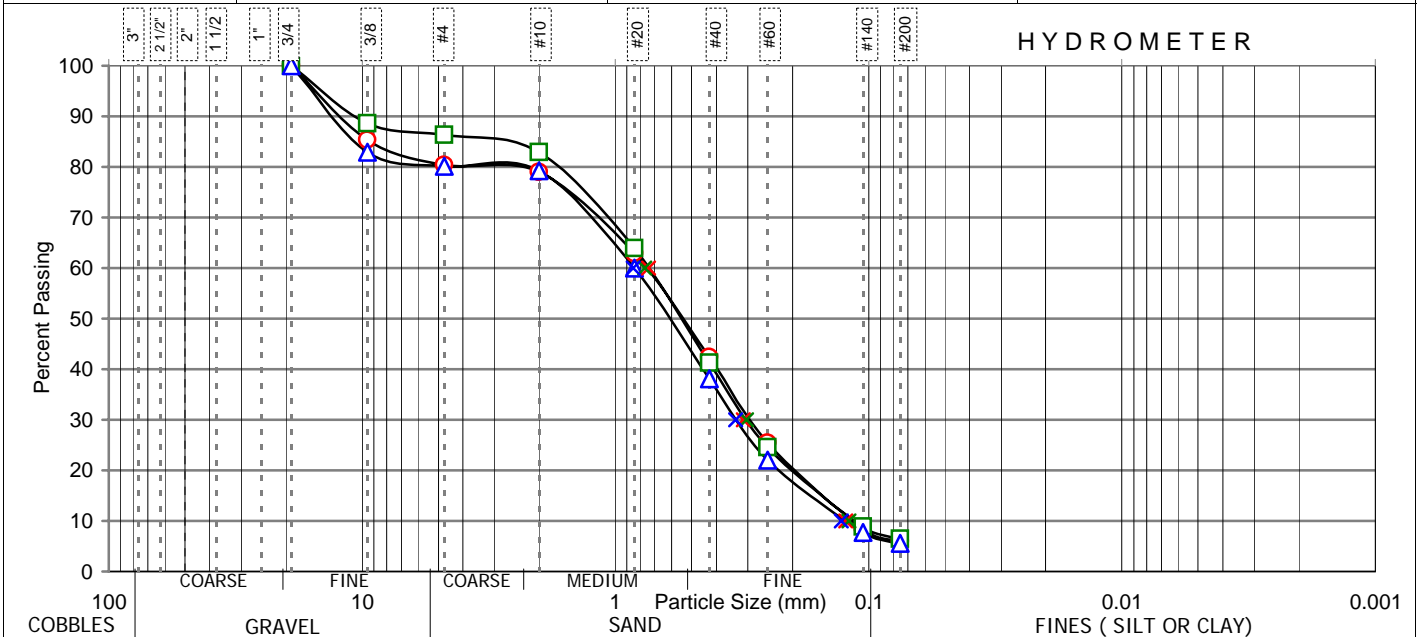


Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-01-2
Project..... <b>Proposed Mayon Evacuation Center (Sto. Domingo Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Nagsya, Province of Albay	Date of Test..... November 2, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO..... **BH-1**      **○ 4**      **□ 5**      **△ 6**  
 DEPTH (m)..... 5.00-5.15      7.15-7.50      8.30-8.45  
 SOIL DESCRIPTION..... Well graded SAND with silt      Well graded SAND with silt      Well graded SAND with silt

SIEVE SIZE inches      mm	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
2 1/2      62.5									
2      50.0									
1 1/2      37.5									
1      25.0									
3/4      19.0			100			100			100
3/8      9.5	11.05	14.62	85	8.59	11.33	89	13.10	17.04	83
4      4.75	14.83	19.63	80	10.37	13.68	86	15.28	19.87	80
10      2.0	15.92	21.07	79	12.98	17.12	83	15.94	20.73	79
20      0.8	28.00	37.06	63	27.36	36.09	64	30.78	40.03	60
40      0.425	43.48	57.54	42	44.56	58.77	41	47.59	61.89	38
60      0.25	56.36	74.59	25	57.19	75.43	25	59.96	77.97	22
140      0.105	69.21	91.60	8	69.12	91.16	9	71.00	92.33	8
200      0.075	71.11	94.11	6	70.95	93.58	6	72.65	94.47	6
OVEN DRIED MASS	75.56 gms			75.82 gms			76.90 gms		



\* - with Hydrometer  
 REMARKS : S-4: Cu = 6.00      Cc = 1.07  
 S-5: Cu = 6.40      Cc = 1.00  
 S-6: Cu = 6.64      Cc = 1.04

SAMPLE SUBMITTED BY:  
 Walk-in Clients     GPI Field Operator

R. POLIDAN

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
 Encoder  
 Data Checked by: ABA/MRR  
 Quality Assurance  
 Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
 LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
 AUTHORIZED SIGNATORY

Uncertainty Results:      % Finer = ± 0.0447      LAB.FILE NO.:GSA-10-407  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.

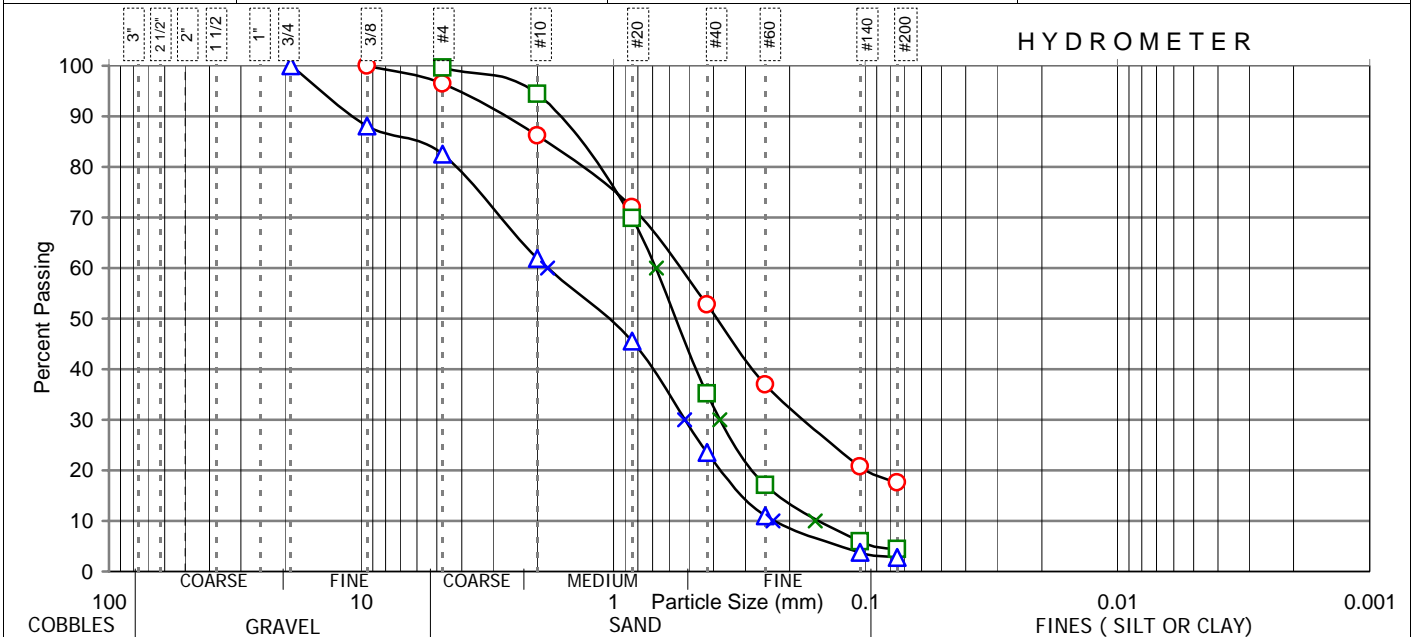


Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-02-1
Project..... <b>Proposed Mayon Evacuation Center (Sto. Domingo Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Nagsya, Province of Albay	Date of Test..... November 2, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO.....	<b>BH-2</b>	<span style="color:red">○</span> <b>1</b>	<span style="color:green">□</span> <b>2</b>	<span style="color:blue">△</span> <b>3</b>
DEPTH (m).....		0.55-0.85	2.36-2.41	3.41-3.56
SOIL DESCRIPTION.....		Silty SAND	Poorly graded SAND	Poorly graded SAND

SIEVE SIZE	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
2 1/2									
2									
1 1/2									
1									
3/4									100
3/8			100				9.40	11.93	88
4	2.18	3.52	96	0.31	0.40	100	13.74	17.44	83
10	8.53	13.76	86	4.33	5.52	94	29.98	38.05	62
20	17.37	28.03	72	23.58	30.08	70	42.93	54.48	46
40	29.25	47.19	53	50.82	64.84	35	60.25	76.46	24
60	39.06	63.02	37	65.02	82.95	17	70.14	89.01	11
140	49.12	79.25	21	73.70	94.03	6	75.80	96.19	4
200	51.11	82.46	18	74.86	95.51	4	76.57	97.17	3
OVEN DRIED MASS	61.98 gms			78.38 gms			78.80 gms		



\* - with Hydrometer

REMARKS :

S-2:	Cu = 4.27	Cc = 1.34
S-3:	Cu = 7.83	Cc = 0.64

SAMPLE SUBMITTED BY:

Walk-in Clients  GPI Field Operator

R. POLIDAN

TESTED BY : ARTURO Q. AQUINO  
LABORATORY TECHNICIAN

COMPUTER PRINT-OUT  
By: MARIA ANTONIETTE P. CUNAHAP  
Encoder

Data Checked by: ABA/MRR  
Quality Assurance

Date Issued: \_\_\_\_\_

CERTIFIED BY : \_\_\_\_\_  
AUTHORIZED SIGNATORY

Uncertainty Results: % Finer = ± 0.0514 LAB.FILE NO.:GSA-10-408  
Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.

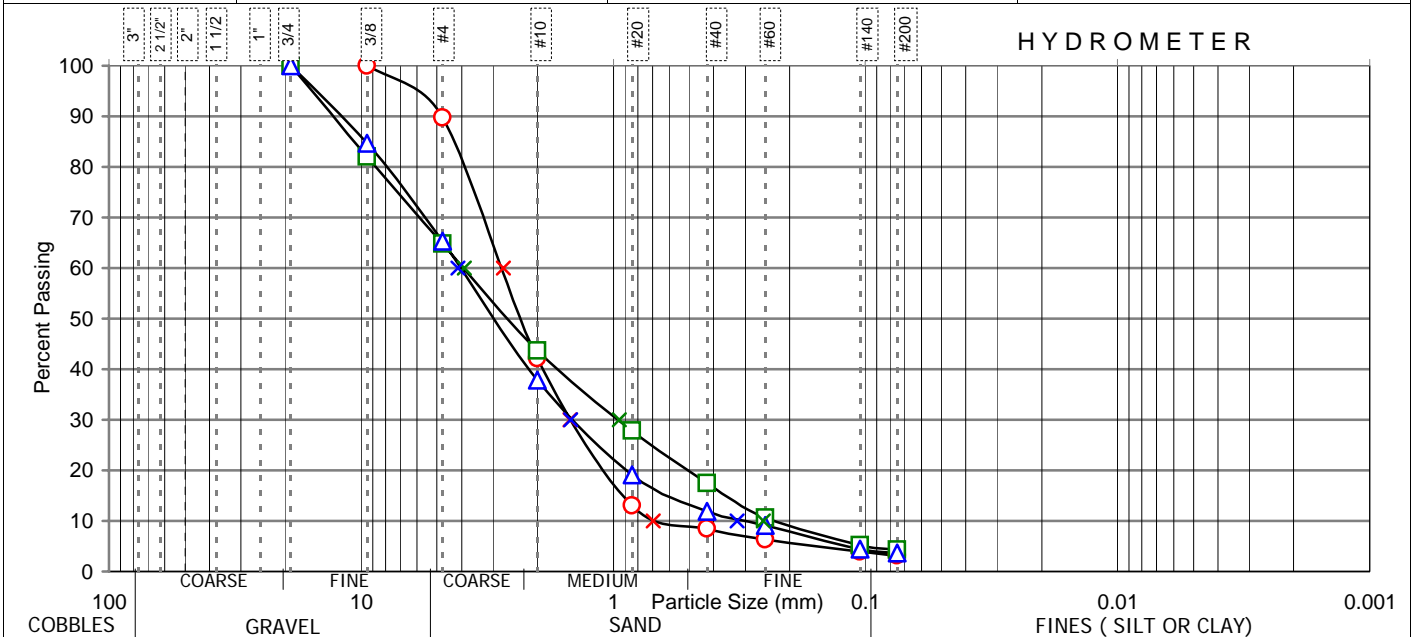


Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-02-2
Project..... <b>Proposed Mayon Evacuation Center (Sto. Domingo Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Nagsya, Province of Albay	Date of Test..... November 2, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO.....	<b>BH-2</b>	<b>○ 4</b>	<b>□ 5</b>	<b>△ 6</b>
DEPTH (m).....		4.65-4.80	5.80-5.95	6.95-7.10
SOIL DESCRIPTION.....	Poorly graded SAND		Well graded SAND	

SIEVE SIZE	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
2 1/2									
2									
1 1/2									
1									
3/4						100			100
3/8			100	14.59	17.94	82	12.83	15.33	85
4	7.87	10.29	90	28.61	35.19	65	29.05	34.71	65
10	44.26	57.89	42	45.82	56.35	44	52.06	62.21	38
20	66.49	86.96	13	58.70	72.19	28	67.70	80.89	19
40	69.96	91.50	9	67.10	82.52	17	73.72	88.09	12
60	71.60	93.64	6	72.64	89.34	11	76.09	90.92	9
140	73.50	96.13	4	77.10	94.82	5	80.00	95.59	4
200	74.08	96.89	3	77.83	95.72	4	80.62	96.33	4
OVEN DRIED MASS	76.46 gms			81.31 gms			83.69 gms		



\* - with Hydrometer

SAMPLE SUBMITTED BY:

Walk-in Clients  GPI Field Operator

R. POLIDAN

REMARKS :

S-4:	Cu = 3.94	Cc = 1.17
S-5:	Cu = 15.31	Cc = 0.91
S-6:	Cu = 12.74	Cc = 1.63

COMPUTER PRINT-OUT

By: MARIA ANTONIETTE P. CUNAHAP  
Encoder

Data Checked by: ABA/MRR  
Quality Assurance

Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
AUTHORIZED SIGNATORY

Uncertainty Results: % Finer = ± 0.0447 LAB.FILE NO.:GSA-10-408  
Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.

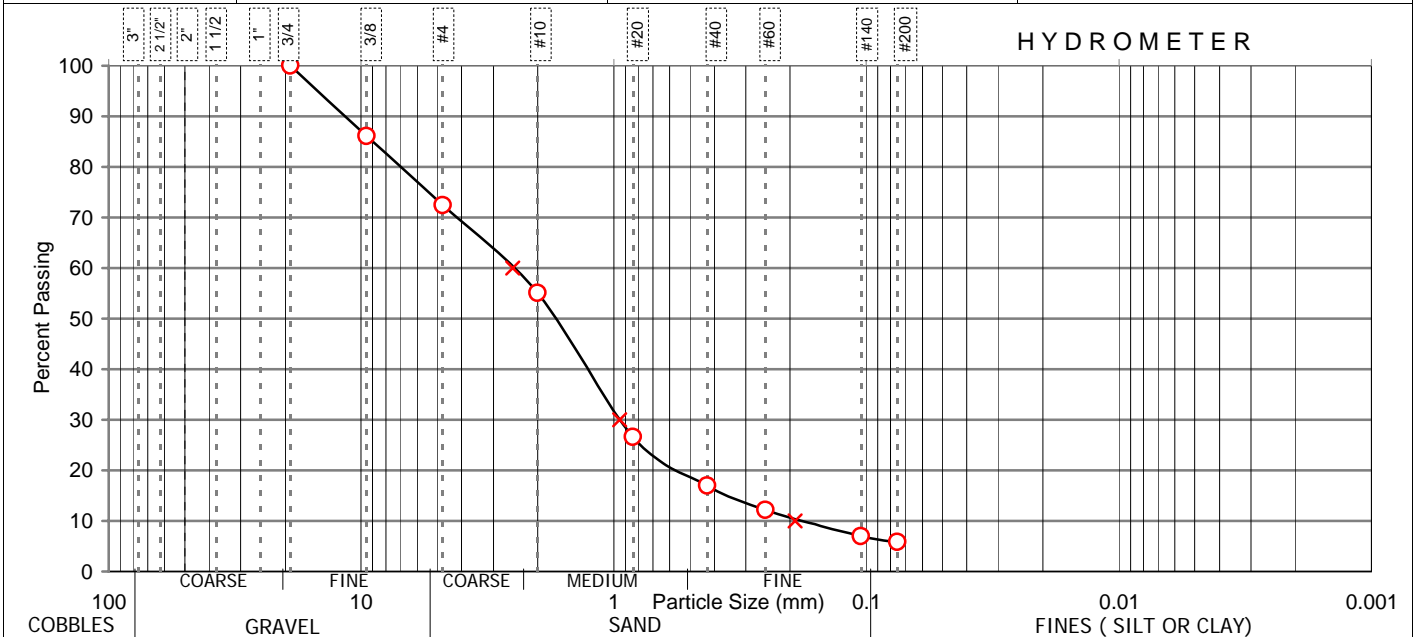


Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-02-3
Project..... <b>Proposed Mayon Evacuation Center (Sto. Domingo Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Nagsya, Province of Albay	Date of Test..... November 2, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO..... **BH-2**      **○ Z**      **□**      **△**  
 DEPTH (m)..... 8.10-8.25  
 SOIL DESCRIPTION..... Well graded SAND with silt

SIEVE SIZE		Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
inches	mm									
2 1/2	62.5									
2	50.0									
1 1/2	37.5									
1	25.0									
3/4	19.0			100						
3/8	9.5	14.00	13.95	86						
4	4.75	27.73	27.64	72						
10	2.0	45.14	44.99	55						
20	0.8	73.68	73.43	27						
40	0.425	83.32	83.04	17						
60	0.25	88.10	87.80	12						
140	0.105	93.40	93.08	7						
200	0.075	94.46	94.14	6						
OVEN DRIED MASS		100.34 gms								



\* - with Hydrometer      REMARKS : S-7:      Cu = 13.09      Cc = 1.87

SAMPLE SUBMITTED BY:  
 Walk-in Clients     GPI Field Operator

R. POLIDAN

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
 Encoder  
 Data Checked by: ABA/MRR  
 Quality Assurance  
 Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
 LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
 AUTHORIZED SIGNATORY

Uncertainty Results:      % Finer = ± 0.0336      LAB.FILE NO.:GSA-10-408  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.

# FINAL REPORT

**SUBSURFACE INVESTIGATION**  
**PROPOSED MAYON**  
**EVACUATION CENTER**  
**(2-STOREY)**  
**GOGON CENTRAL SCHOOL**  
**BRGY. GOGON, PROVINCE OF ALBAY**

**MOHRI, ARCHITECT & ASSOCIATES, INC.**

OCTOBER 2010  
JOB NO. 2209-10.R1



**GEOTECHNICS PHILIPPINES, INC.**  
GEOTECHNICAL & FOUNDATION CONSULTANTS



DPWH-BRS Accredited

**FINAL REPORT**

**TABLE OF CONTENTS**

<b>Contents</b>	<b>No. of Pages</b>
1.0 INTRODUCTION.....	1
2.0 OBJECTIVES.....	1
3.0 FIELD EXPLORATION AND INVESTIGATION.....	2
4.0 LABORATORY INVESTIGATION.....	1
5.0 BOREHOLE STRATIGRAPHY.....	1
6.0 SOIL PROPERTIES.....	1
7.0 LIQUEFACTION POTENTIAL.....	1
8.0 BEARING CAPACITY AND FOUNDATION TYPE.....	1
9.0 EXCAVATION AND FILL.....	2
<b>APPENDICES</b>	
• Distribution of Active Faults and Trenches in the Philippines.....	1
• Photos.....	1
• Location Plan.....	1
• Soil Profile.....	1
• Final Boring Logs.....	2
• Summary of Test.....	1
• Natural Moisture Content/Atterberg Limit.....	4
• Atterberg Limit.....	3
• Grain Size Analysis.....	8





**GEOTECHNICS PHILIPPINES, INC.**  
**Geotechnical Contractor**

119 Sauyo Road, Novaliches  
Quezon City, Philippines

Business development : 9306555  
Customer Service : 9382124/9353730  
Fax : 4561140  
Homepage : [www.geophill.com](http://www.geophill.com)  
Email : [jmcgpi@gmail.com](mailto:jmcgpi@gmail.com)

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**FINAL REPORT**

**SUB-SURFACE INVESTIGATION FOR THE  
PROPOSED MAYON EVACUATION CENTER (3-STOREY)  
LOCATED AT BRGY. GOGON, PROVINCE OF ALBAY**

**1.0 Introduction:**

**Geotechnics Philippines, Incorporated (GPI)** completed the subsurface soil investigation for the Proposed Mayon Evacuation Center. The proposed site explored is located at Brgy. Gogon, Province of Albay.

Two (2) boreholes were drilled at the proposed site on October 23, 2010. Borings were undertaken down to 10m for both BH-1 and BH-2 below existing natural grade line. Borehole locations are as indicated on the accompanying Boring Plan and Soil Profile Sheets.

The subsurface soil exploration was undertaken upon the request of Mohri, Architect & Associates, Inc. in order to gain information on the subsurface conditions and bearing characteristics of the underlying soils at site.

The undersigned was tasked to evaluate the results of the completed subsurface soil exploration and to recommend a suitable foundation solution for the proposed structure.

This report embodies the undersigned's engineering analysis and recommendations based mainly on the results of the geotechnical soil borings and pertinent laboratory tests performed on extracted samples.

The results of geotechnical soil borings and laboratory tests can be referred to in the Attachments accompanying this report.

**2.0 Objectives:**

The geotechnical investigation aims to determine the following:

- Soil Profile
- Engineering properties of the Soil Strata
- Bearing Capacities and Foundation Types
- Settlement conditions of critical areas
- Comment on ground stability and liquefaction potential of the site
- Provide Excavation and Fill Guidelines

In addition to the above mentioned items, matters on implementation and construction shall be given as required.

**3.0 Field Exploration and Investigation**

The field exploration implored continuous was boring as the Standard Penetration Test (SPT) was performed at the last 45cm of every change strata or 1.0 meter intervals. The blow counts (N value or NB) were recorded as disturbed samples from the split spoon sampler were retrieved for laboratory testing. The recovered samples were described semi qualitative in terms of extracted length. The extracted soil samples were wrapped in double plastic bags for moisture and sample protection and were transported to the laboratory for further testing of engineering properties.



Advancing through the hard strata, the same technique was employed. Hard strata are defined over a series of high blow count layers of more than 50 blows or the inability of driving the hammer to penetrate at high blow counts termed as refusal.

### 3.1 Standard Penetration Test

The Standard Penetration Test (SPT) is a field test used in determining the shear strength of soils from an established correlation. The SPT requires the count of the number of blows that it would take a standard split spoon sampler to penetrate its last 30.5cm (12inches) of the sampler. The standard mass is 63.5 kilograms and the height of the drop is 76.2cm specified as a free drop.

### 3.3 Ground Water Table

The ground water table (GWT) elevation was observed at least 4 hours from the completion of the borehole up to demobilization.

### 4.0 Laboratory Investigation

The retrieved samples were brought to the laboratory in 119 Sauyo Road, Novaliches, Quezon City. Various tests were conducted on all extracted samples with test procedures conforming to the American Standards for Testing Materials (ASTM). The following are the laboratory tests conducted on the soil samples.

Type of Test	ASTM Designation	Description of Test
Soil Classification for Engineering Purposes - Unified Soil Classification System	ASTM D 2487-05	<ul style="list-style-type: none"> <li>Standard in classifying the type of soil based on composition and physical properties</li> <li>These were classified in accordance to grain size, composition, percentage of size in the distribution</li> </ul>
Particle Size Distribution - Sieve Analysis	ASTM D 422-63 (Reapproved 2002)	<ul style="list-style-type: none"> <li>The test allows the dried or wet soil to pass through a series of sieves in order to determine the distribution of grain sizes.</li> <li>The distributions of the particles are graphed on a semi log scale</li> <li>This test aids the previous test in classification</li> </ul>
Moisture Content	ASTM D 2216-05	<ul style="list-style-type: none"> <li>The test aims to determine the natural content of water in the soil</li> <li>This is taken as the ratio of water to the ratio of the soil particles</li> <li>The test uses a weighing scale measuring the initial weight of the soil and the final weight of the soil after drying it in the oven</li> </ul>
Atterberg Limits Liquid Limit, Plastic Limit and Plasticity Index	ASTM D4318-05	<ul style="list-style-type: none"> <li>Tests determining the limits of cohesive soils in behaving as a plastic or a flowing medium by incrementally changing the water content</li> <li>The plastic limit is determined by rolling a clay sample to around 1/8 of an inch or 3mm</li> <li>The liquid limit uses the liquid limit device and determines the number of blows it would take for the slit to close</li> <li>Correlative values can be used for settlement relations</li> </ul>

The results of the laboratory investigation are appended.

### 5.0 Borehole Stratigraphy

Two (2) boreholes were driven to investigate the subsurface. The following are the findings:

#### 5.1 Borehole - BH-1

Depth (m)	Soil Classification	Consistency	N-Value
0.00 - 4.00	Silty SAND	Firm	11 ~ 19
4.00 - 5.00	Poorly graded SAND	Loose	8
5.00 - 6.00	Elastic SILT	Firm	13
6.00 - 9.00	SAND	Firm	12 ~ 17
9.00 - 10.00	SAND	Dense	>50

The ground water was measured at 0.81 meters from the existing ground.

#### 5.2 Borehole - BH-2

Depth (m)	Soil Classification	Consistency	N-Value
0.00 - 2.00	Silty SAND	Loose	8
2.00 - 4.00	SAND	Firm	13 ~ 28
4.00 - 5.00	Clayey SAND	Loose	8
5.00 - 6.00	Elastic SAND	Very Stiff	27
6.00 - 7.00	Silty SAND	Firm	16
7.00 - 8.00	SAND	Dense	32
8.00 - 10.00	SAND	Firm	10~17

The ground water table was measured at 0.8 ~ 0.83 meters from the existing ground.

### 6.0 Soil Properties

The following are the adapted soil properties for the investigated strata:

Soil Parameters			
Gravels, Sands, Silty Sands and Clayey Sands (Non-cohesive)			
Sands	c	$\phi$	$\gamma$ (kcf)
Very Loose	0	26	0.085
Loose	0	28	0.100
Medium Dense	0	30	0.110
Dense	0	32	0.120
Very Dense	0	35	0.130
Silts and Clays (Cohesive)			
Silts and Clays	c	$\phi$	$\gamma$ (kcf)
Very Soft	= (N*10)/2 from Braja Das	0	0.100
Soft		0	0.105
Firm		0	0.115
Stiff		0	0.120
Very Stiff		0	0.125
Hard		0	0.130

### **7.0 Liquefaction Potential**

The two boreholes showed thin layered of potentially liquefiable materials between 4~5 m. The effect would be minimal due to the presence of dense layer in between loose formation.

### **8.0 Bearing Capacity and Foundation Type**

#### *Shallow Foundations*

Shallow Foundation is suggested to the proposed 2-storey building. The following are the allowable net bearing capacities based on Terzaghi's Bearing Capacity Equation:

BH-1:

<b>Depth (m)</b>	<b>Bearing Capacity (kPa)</b>
0.5	48
1.0	72

BH-2:

<b>Depth (m)</b>	<b>Bearing Capacity (kPa)</b>
0.5	24
1.0	48

The associated settlement on the other hand is within the tolerable engineering settlement of 25mm. Structural tie beam is suggested to hold the foundation rigid and minimize the effect of differential settlement due to different soil bearing capacity.

### **9.0 Excavation and Fill**

The contractor of the proposed structure is advised to rail the excavation at night and during break times so as to ensure the general safety of the students within school premises. Existing structures, whether temporary or permanent that are adjacent, the excavation should be protected from damages. Dewatering shall be necessary as the water table is shallow.

Fill for the excavation for footings may utilize the same materials. On the other hand, grade and subgrade materials should be sandy frictional materials.

Fill should be compacted at 95% its maximum dry density. Should the amount of soil be inept, sandy fill may be utilized and should be compacted in the same degree. In both cases, the height of fill should be reviewed and adjusted accordingly to adapt minimal settlements.

8

***Borehole Conclusions and Recommendations***

The conclusions and recommendations are based on the data of two (2) boreholes and the geologic map. Deviations from these are expected and should be minimal as the boreholes are typical of an alluvial formation. Should there be any major deviation in the substrata be detected during the excavation phase, may the undersigned thru Geotechnics Philippines Inc (02-930-6555) be contacted immediately for proper reassessment.



**DIOSDADO A. URENA**  
CE Reg. No. 053884  
PTR No. 3228274  
Issued on January 8, 2010  
Issued at Quezon City

# ***APPENDICES***

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# Distribution of Active Faults and Trenches in the Philippines

20 00'

18 00'

16 00'

14 00'

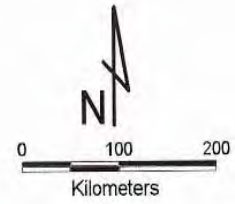
10 00'

8 00'

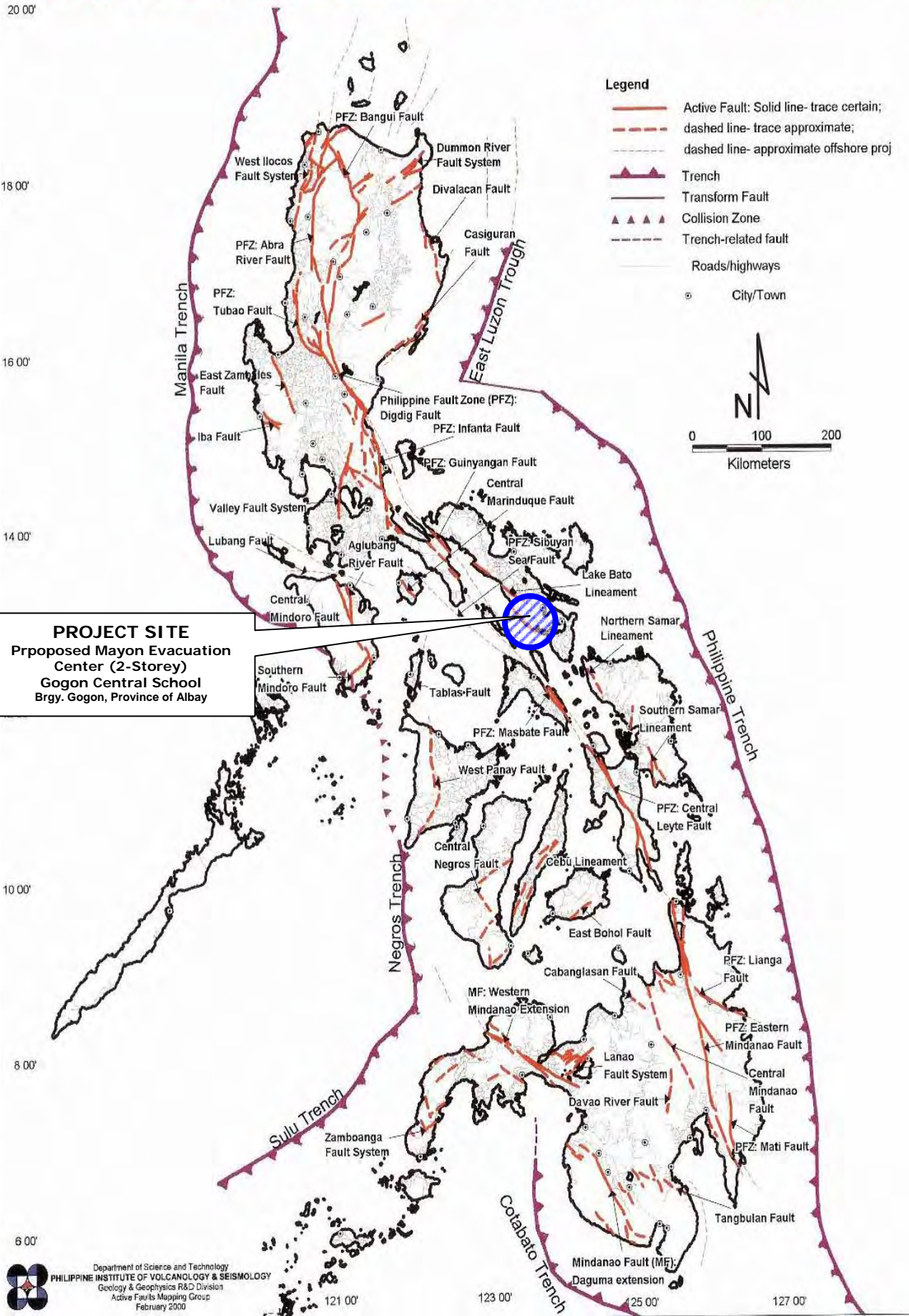
6 00'

## Legend

- Active Fault: Solid line- trace certain;
- dashed line- trace approximate;
- dashed line- approximate offshore proj
- Trench
- Transform Fault
- Collision Zone
- Trench-related fault
- Roads/highways
- City/Town



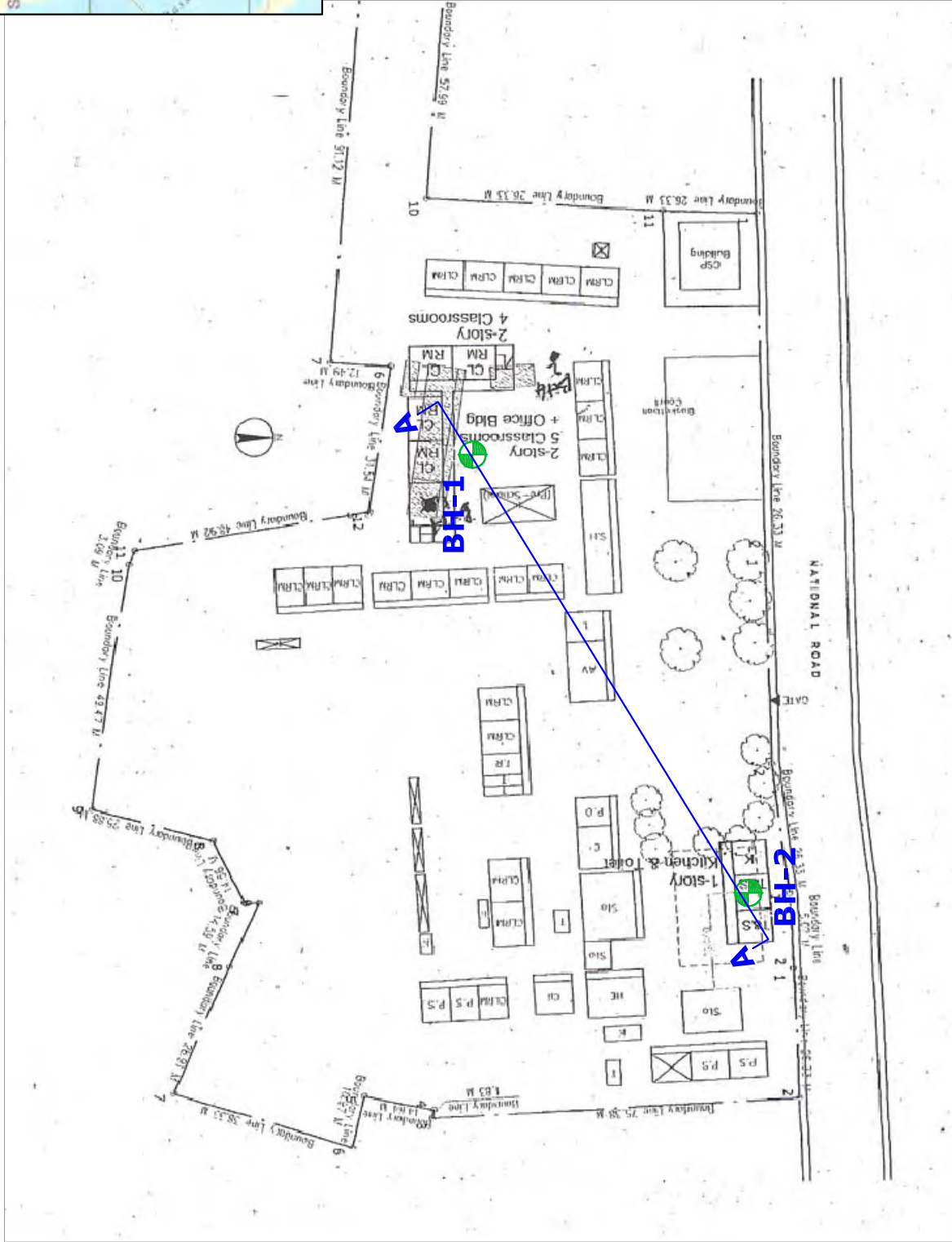
**PROJECT SITE**  
 Proposed Mayon Evacuation  
 Center (2-Storey)  
 Gogon Central School  
 Brgy. Gogon, Province of Albay



121 00' 123 00' 125 00' 127 00'



VICINITY MAP



CONTRACTOR



**GEOTECHNICS PHILIPPINES, INC.**  
119 SAUYO ROAD, NOVALICHES, QUEZON CITY

PROJECT TITLE

**Proposed Mayon Evacuation Center  
(Gogon Central School)**  
Brgy. Gogon, Province of Albay

SCALE

NTS

SHEET CONTENTS

**LOCATION PLAN/VICINITY MAP**

CLIENT  
**MOHRI, ARCHITECT & ASSOCIATES, INC.**

JOB NO.

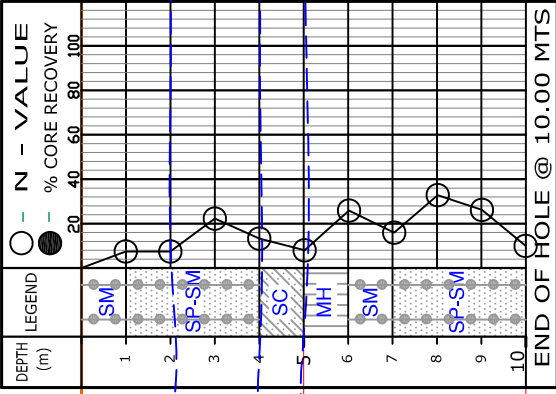
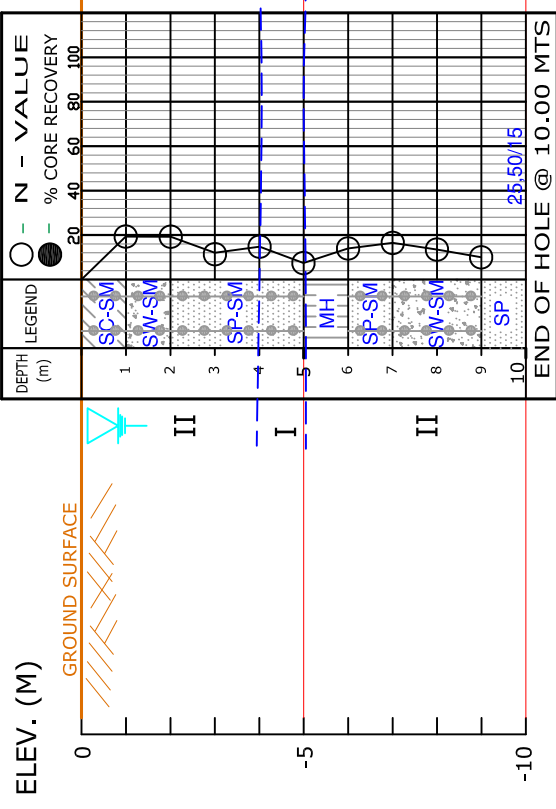
**2209-10-R1**

SHEET NO.

1/1

# BOREHOLE NO. BH-1

# BOREHOLE NO. BH-2



## SECTION A - A

- LEGEND :**
- Silty CLAY
  - Silty SAND
  - Silty GRAVEL
  - Clayey SILT
  - Clayey SILTY SAND
  - Poorly graded SAND
  - Well graded SAND
  - Poorly graded SAND w/ silt
  - Well graded SAND w/ silt
  - Clayey SAND
  - Silty SAND
  - Silty GRAVEL
  - Clayey silty SAND

- SANDSTONE
- Clayey silty GRAVEL
- COBBLES
- GRAVEL
- Poorly graded GRAVEL
- Well graded GRAVEL
- Poorly graded GRAVEL w/ silt
- Well graded GRAVEL w/ silt
- SILTSTONE
- Silty TUFF
- Sandy TUFF
- SHALE

- I - N-VALUE < 10 (LIQUEFIABLE ZONE)
- II - N-VALUE > 10
- III - REFUSAL (WEATHERED ZONE)
- IV - CORING / HARD FORMATION

CONTRACTOR

**GEOTECHNICS PHILIPPINES, INC.**  
119 SAUYO ROAD, NOVALICHES, QUEZON CITY

PROJECT TITLE: **Proposed Mayon Evacuation Center (Gogon Central School)**  
Brgy. Gogon, Province of Albay

SHEET CONTENTS: **SOIL PROFILE**  
SCALE: N. T. S.

CHECKED BY: **A. B. A. / M. R. R.**

CERTIFIED BY: \_\_\_\_\_  
AUTHORIZED SIGNATORY

DRAWN BY: **MARIA ANTONIETTE P. CUNAHAP**

JOB NO. **2209-10.R1**

SHEET NO. **1/1**





CLIENT	<b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	BOREHOLE NO.	<b>BH- 1</b>
PROJECT	<b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	JOB NO.	2209-10.R1-FBL-01
LOCATION	Brgy. Gogon, Province of Albay	DRILLED	R. POLIDAN
RIG	KSK SMALL	LOGGED	R. POLIDAN
	Hammer Weight 63.50 Kg.	DATE STARTED	Oct. 23, 2010
	Fall Height 76.20 cm.	DATE COMPLETED	Oct. 23, 2010
METHOD	WASH BORING	NORTHING	-
		EASTING	-
		GROUND LEVEL	- m.
		WATER LEVEL	0.81 m.

**FINAL BORING LOG**

DEPTH (m)	SOIL SYMBOL	SAMPLE NUMBER	TYPE OF SAMPLING	REC (cm)	RQD (%)	PL 20	NMC 40	LL 60	PI	CONSISTENCY	N - VALUE		SOIL DESCRIPTION	OTHER TEST DATA
											0	20		
1.00		S-1	SPT	45	-				4		19		(SC-SM) Clayey silty SAND with traces of gravel, dark gray, moist NB: (8)(9)(10)	
2.00		S-2	SPT	45	-				NP	MEDIUM DENSE	19		(SW-SM) Well graded SAND with silt and few gravel, dark gray, moist NB: (9)(9)(10)	
3.00		S-3	SPT	45	-				NP		11		(SP-SM) Poorly graded SAND with silt and traces of gravel, dark gray, moist NB: (3)(5)(6)	
4.00		S-4	SPT	45	-				NP		15		(SP-SM)...with few gravel NB: (3)(6)(9)	
5.00		S-5	SPT	45	-				NP	LOOSE	8		(SP-SM)...moist NB: (6)(5)(3)	
6.00		S-6	SPT	45	-				30	STIFF	13		(MH) Elastic SILT with little amount of sand, dark gray, very moist NB: (3)(5)(8)	
7.00		S-7	SPT	45	-				NP		17		(SP-SM) Poorly graded SAND with silt and traces of gravel, dark gray, moist NB: (13)(9)(8)	
8.00		S-8	SPT	45	-				NP	MEDIUM DENSE	12		(SW-SM) Well graded SAND with silt and traces of gravel, dark gray, very moist NB: (10)(7)(5)	
9.00		S-9	SPT	45	-				NP		10		(SW-SM)...moist NB: (9)(5)(5)	
10.00		S-10	SPT	30	-				NP	VERY DENSE	25;50/15		(SP) Poorly graded SAND, dark gray, moist NB: (15)(25)(50/15)	

Type of Sampling	Type of Soil	CONSISTENCY		MOISTURE		PERCENTAGE	
STANDARD PENETRATION TEST (SPT)	Silty CLAY	<b>COHESIVE SOILS</b>		<b>COHENSIONLESS SOILS</b>		<b>MOISTURE CONTENT</b>	
UNDISTURBED SAMPLING (UDS)	Clayey SILT	<u>N-VALUE</u>	<u>CONSISTENCY</u>	<u>N-VALUE</u>	<u>CONSISTENCY</u>	<u>RANGES</u>	<u>VALUES</u>
CORING (CRG)	Clayey SAND	0 - 2	VERY SOFT	0 - 4	VERY LOOSE	0 - 10	DRY
	Silty SAND	2 - 4	SOFT	4 - 10	LOOSE	10 - 30	MOIST
	Clayey silty SAND	4 - 8	FIRM	10 - 30	MEDIUM DENSE	30 - 70	VERY MOIST
	SAND	8 - 15	STIFF	30 - 50	DENSE	70 - 100	WET
	Silty GRAVEL	15 - 30	VERY STIFF	> 50	VERY DENSE	> 100	SATURATED
	Well graded GRAVEL with silt	> 30	HARD				
	GRAVEL						
	SILTSTONE						
	TUFF						
	Tuffaceous SILTSTONE						

REMARKS:	Rec = Recovery in Centimeters    NB = No. of Blows    HW = Hammer Weight	Prepared by :	<b>M. P. CUNAHAP</b>
	Reference Joint Spacing: #1 >30cm.    10 cm. >#3>3cm.    #5 <1cm.	Checked by :	<b>A.B.A. / M.R.R.</b>
	30 cm.>#2>10cm.    3 cm. >#4>1cm.	Certified by :	
	RQD = Rock Quality Designation    SCR = Solid Core Recovery		
Description of Strata is according to Unified Soil Classification System			_____ AUTHORIZED SIGNATORY
		Date Issued :	



**GEOTECHNICS PHILIPPINES, INCORPORATED**  
**SOILS AND MATERIALS TESTING LABORATORY**  
 119 SAUYO ROAD, NOVALICHES, QUEZON CITY  
 TEL. NO. 938-2124 \ 456-1140 \ 930-6555



CLIENT	<b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	BOREHOLE NO.	<b>BH- 2</b>
PROJECT	<b>Proposed Mayon Evacuation Center (Libon Community College)</b>	JOB NO.	2209-10.R1-FBL-02
LOCATION	Brgy. Gogon, Province of Albay	DRILLED	R. POLIDAN
RIG	KSK SMALL	LOGGED	R. POLIDAN
	Hammer Weight 63.50 Kg.	DATE STARTED	Oct. 18, 2010
	Fall Height 76.20 cm.	DATE COMPLETED	Oct. 18, 2010
METHOD	WASH BORING	NORTHING	-
		EASTING	-
		GROUND LEVEL	- m.
		WATER LEVEL	0.83 m.

**FINAL BORING LOG**

DEPTH (m)	SOIL SYMBOL	SAMPLE NUMBER	TYPE OF SAMPLING	REC (cm)	RQD (%)	PL 20	NMC 40	LL 60	PI	CONSISTENCY	N - VALUE		SOIL DESCRIPTION	OTHER TEST DATA
											0	20		
1.00		S-1	SPT	40	-				NP	LOOSE	8		(SM) Silty SAND, fine to coarse grained with little amount of gravel, dark gray, moist NB: (5)(4)(4)	
2.00		S-2	SPT	45	-				NP		8		(SP-SM) Poorly graded SAND with silt and traces of gravel, dark gray, moist NB: (4)(3)(5)	
3.00		S-3	SPT	32	-				NP	MEDIUM DENSE	23		(SP-SM)...with traces of gravel NB: (10)(10)(13)	
4.00		S-4	SPT	40	-				NP		13		(SP-SM)...with little amount of gravel NB: (5)(5)(8)	
5.00		S-5	SPT	45	-				13	LOOSE	8		(SC) Clayey SAND, dark gray, very moist NB: (2)(3)(5)	
6.00		S-6	SPT	45	-				20	VERY STIFF	27		(MH) Elastic SILT with sand and traces of gravel, dark gray, very moist NB: (10)(12)(15)	
7.00		S-7	SPT	45	-				NP	MEDIUM DENSE	16		(SM) Silty SAND, fine to coarse grained with little amount of gravel, dark gray, very moist NB: (5)(6)(10)	
8.00		S-8	SPT	39	-				NP	DENSE	32		(SP-SM) Poorly graded SAND with silt and little amount of gravel, dark gray, moist NB: (12)(15)(17)	
9.00		S-9	SPT	37	-				NP	MEDIUM DENSE	27		(SP-SM)...with traces of gravel NB: (10)(12)(15)	
10.00		S-10	SPT	45	-				NP		10		(SP-SM)...very moist NB: (7)(5)(5)	

END OF BORING AT 10.00 METERS

Type of Sampling	Type of Soil	CONSISTENCY		MOISTURE		PERCENTAGE			
		COHESIVE SOILS N-VALUE	CONSISTENCY	COHENSIONLESS SOILS N-VALUE	CONSISTENCY	MOISTURE CONTENT RANGES	VALUES	% of SAND and GRAVEL RANGES	VALUES
STANDARD PENETRATION TEST (SPT)	Silty CLAY	0 - 2	VERY SOFT	0 - 4	VERY LOOSE	0 - 10	DRY	0 - 5	TRACES
UNDISTURBED SAMPLING (UDS)	Clayey SILT	2 - 4	SOFT	4 - 10	LOOSE	10 - 30	MOIST	6 - 10	FEW
CORING (CRG)	Clayey SAND	4 - 8	FIRM	10 - 30	MEDIUM DENSE	30 - 70	VERY MOIST	11 - 25	LITTLE
	Silty SAND	8 - 15	STIFF	30 - 50	DENSE	70 - 100	WET	26 - 35	SOME
	Clayey silty SAND	15 - 30	VERY STIFF	> 50	VERY DENSE	> 100	SATURATED	36 - 45	WITH
	SAND	> 30	HARD						

REMARKS:	Rec = Recovery in Centimeters	NB = No. of Blows	HW = Hammer Weight	Prepared by :	<b>M. P. CUNAHAP</b>
	Reference Joint Spacing: #1 >30cm.	10 cm. >#3>3cm.	#5 <1cm.	Checked by :	<b>A.B.A. / M.R.R.</b>
	30 cm.>#2>10cm.	3 cm. >#4>1cm.		Certified by :	
	RQD = Rock Quality Designation	SCR = Solid Core Recovery			_____ AUTHORIZED SIGNATORY
Description of Strata is according to Unified Soil Classification System				Date Issued :	



CLIENT..... **MOHRI, ARCHITECT & ASSOCIATES, INC.** JOB NUMBER..... 2209-10.R1-SUM-1  
 PROJECT..... **Proposed Mayon Evacuation Center (Gogon Central School)** DATE OF RECEIPT.... October 27, 2010  
 LOCATION.... Brgy. Gogon, Province of Albay DATE OF TEST..... October 27-29, 2010

**SUMMARY OF LABORATORY TESTS**

SAMPLE NUMBER	DEPTH (m)	NMC (%)	ATTERBERG LIMIT, (%)			USCS Class.	SIEVE ANALYSIS (% FINER) PASSING SIEVE NO.										Remarks	
			LL	PL	PI		1	3/4	3/8	4	10	20	40	60	140	200		
<b>BH-1</b>																		
1	0.55 - 1.00	29	37	33	4	SC-SM			100	98	92	82	65	49	37	35	-	
2	1.55 - 2.00	20	-	NP	-	SW-SM			100	94	83	68	51	33	14	11	-	
3	2.55 - 3.00	27	-	NP	-	SP-SM			100	97	89	70	43	22	9	7	-	
4	3.55 - 4.00	29	-	NP	-	SP-SM		100	96	92	86	77	65	32	9	7	-	
5	4.55 - 5.00	21	-	NP	-	SP-SM		100	97	93	85	75	49	24	9	6	-	
6	5.55 - 6.00	48	62	32	30	MH					100	98	95	90	83	80	-	
7	6.55 - 7.00	25	-	NP	-	SP-SM			100	97	93	72	35	15	6	5	-	
8	7.55 - 8.00	30	-	NP	-	SW-SM		100	99	97	95	78	46	24	13	11	-	
9	8.55 - 9.00	25	-	NP	-	SW-SM		100	98	96	85	64	45	24	9	7	-	
10	9.55 - 10.00	26	-	NP	-	SP					100	99	90	51	21	4	3	-
<b>BH-2</b>																		
1	0.55 - 1.00	29	-	NP	-	SM		100	95	80	74	63	49	36	22	20		
2	1.55 - 2.00	28	-	NP	-	SP-SM		100	99	95	90	82	68	52	14	10		
3	2.55 - 3.00	26	-	NP	-	SP-SM			100	97	92	80	61	37	11	7		
4	3.55 - 4.00	28	-	NP	-	SP-SM		100	95	87	78	68	56	42	14	10		
5	4.55 - 5.00	40	46	33	13	SC				100	97	89	75	65	52	49		
6	5.55 - 6.00	46	51	31	20	MH			100	99	98	91	80	70	59	55		
7	6.55 - 7.00	30	-	NP	-	SM		100	94	80	64	50	41	33	22	21		
8	7.55 - 8.00	27	-	NP	-	SP-SM		100	92	86	80	70	44	26	9	7		
9	8.55 - 9.00	25	-	NP	-	SP-SM			100	98	95	81	51	31	13	10		
10	9.55 - 10.00	30	-	NP	-	SP-SM				100	98	87	48	23	9	7		

SAMPLE SUBMITTED BY :

Walk-in Clients  GPI Field Operator

R. POLIDAN

REMARKS: \* with hydrometer

COMPUTER PRINT-OUT

By: MARIA ANTONIETTE P. CUNAHAP  
Encoder

Data Chkd by: ABA / MRR  
Quality Assurance

Date Issued \_\_\_\_\_

CERTIFIED BY:

AUTHORIZED SIGNATORY



ACCREDITED TESTING  
LABORATORY  
PNS ISO/IEC 17025:2005  
LA-2006-097B



**GEOTECHNICS PHILIPPINES, INC.**  
SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



DPWH-BRS Accredited

Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-NMC-01-1
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 27-28, 2010

**TEST REPORT FOR LABORATORY DETERMINATION OF WATER (MOISTURE) CONTENT OF SOIL & ROCK BY MASS**

**ASTM D 2216 - 05**

Test Method  A  B

BOREHOLE NO...BH-1

SAMPLE NUMBER	DEPTH (m)	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	WATER CONTENT (%)	REMARKS
NATURAL MOISTURE CONTENT								
1	0.55-1.00	98.45	78.46	19.99	9.80	68.66	29	
2	1.55-2.00	107.30	91.14	16.16	10.27	80.87	20	
3	2.55-3.00	110.90	89.59	21.31	9.64	79.95	27	
4	3.55-4.00	117.40	93.12	24.28	9.70	83.42	29	
5	4.55-5.00	103.64	87.27	16.37	9.68	77.59	21	
6	5.55-6.00	115.38	81.01	34.37	9.72	71.29	48	

**TEST REPORT FOR LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS**

**ASTM Designation : D 4318 - 05, Method B**

SAMPLE NUMBER	DEPTH (m)	BLOWS	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	% Retained on 0.425 mm	ATTERBERG LIMIT		REMARKS
									LL	PL	
LIQUID LIMIT											
1	0.55-1.00	20	37.80	30.32	7.48	10.60	19.72		37		37
		20	37.94	30.44	7.50	10.65	19.79		37		
PLASTIC LIMIT											
1	0.55-1.00	P	22.74	19.46	3.28	9.53	9.93			33	33
		P	22.76	19.47	3.29	9.54	9.93			33	

Uncertainty Results: Water Content (%) = ± 0.0298      Liquid Limit = ± 0.0948      Plastic Limit = ± 0.2027  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%. LAB.FILE NO.:NMC-10-500

SAMPLE SUBMITTED BY : <input type="checkbox"/> Walk-in Clients <input checked="" type="checkbox"/> GPI Field Operator R. POLIDAN	REMARKS: _____ _____ _____
COMPUTER PRINT-OUT By: <u>MARIA ANTONIETTE P. CUNAHAP</u> Encoder Data Checked by: <u>ABA/MRR</u> Quality Assurance Date Issued: _____	TESTED BY : <u>ARTURO Q. AQUINO</u> LABORATORY TECHNICIAN CERTIFIED BY : _____ AUTHORIZED SIGNATORY



ACCREDITED TESTING  
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PNS ISO/IEC 17025:2005  
LA-2006-097B



**GEOTECHNICS PHILIPPINES, INC.**  
SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



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Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-NMC-01-2
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 27-28, 2010

**TEST REPORT FOR LABORATORY DETERMINATION OF WATER (MOISTURE) CONTENT OF SOIL & ROCK BY MASS**

**ASTM D 2216 - 05**

Test Method  A  B

BOREHOLE NO...BH-1

SAMPLE NUMBER	DEPTH (m)	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	WATER CONTENT (%)	REMARKS
NATURAL MOISTURE CONTENT								
7	6.55-7.00	108.34	88.51	19.83	9.72	78.79	25	
8	7.55-8.00	104.60	82.80	21.80	9.71	73.09	30	
9	8.55-9.00	111.40	91.31	20.09	9.88	81.43	25	
10	9.55-10.00	105.10	85.20	19.90	9.64	75.56	26	

**TEST REPORT FOR LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS**

**ASTM Designation : D 4318 - 05, Method B**

SAMPLE NUMBER	DEPTH (m)	BLOWS	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	% Retained on 0.425 mm	ATTERBERG LIMIT		REMARKS
									LL	PL	
LIQUID LIMIT											
PLASTIC LIMIT											

Uncertainty Results: Water Content (%) = ± 0.0273 Liquid Limit = --- Plastic Limit = ---  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%. LAB.FILE NO.:NMC-10-500

SAMPLE SUBMITTED BY :  Walk-in Clients  GPI Field Operator  
 R. POLIDAN

REMARKS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
 Encoder  
 Data Checked by: ABA/MRR  
 Quality Assurance  
 Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
 LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
 AUTHORIZED SIGNATORY

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119 Sauyo Road, Novaliches, Quezon City



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Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-NMC-02-1
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 27-28, 2010

**TEST REPORT FOR LABORATORY DETERMINATION OF WATER (MOISTURE) CONTENT OF SOIL & ROCK BY MASS**

**ASTM D 2216 - 05**

Test Method  A  B

BOREHOLE NO...BH-2

SAMPLE NUMBER	DEPTH (m)	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	WATER CONTENT (%)	REMARKS
NATURAL MOISTURE CONTENT								
1	0.55-1.00	87.34	69.84	17.50	9.66	60.18	29	
2	1.55-2.00	116.50	93.10	23.40	9.90	83.20	28	
3	2.55-3.00	108.00	88.00	20.00	9.64	78.36	26	
4	3.55-4.00	110.10	88.39	21.71	9.52	78.87	28	
5	4.55-5.00	97.80	72.66	25.14	9.56	63.10	40	
6	5.55-6.00	90.55	65.02	25.53	9.65	55.37	46	

**TEST REPORT FOR LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS**

**ASTM Designation : D 4318 - 05, Method B**

SAMPLE NUMBER	DEPTH (m)	BLOWS	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	% Retained on 0.425 mm	ATTERBERG LIMIT		REMARKS
									LL	PL	
LIQUID LIMIT											
PLASTIC LIMIT											

Uncertainty Results: Water Content (%) = ± 0.0380 Liquid Limit = --- Plastic Limit = ---  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%. LAB.FILE NO.:NMC-10-501

SAMPLE SUBMITTED BY :  Walk-in Clients  GPI Field Operator  
 R. POLIDAN

REMARKS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
 Encoder  
 Data Checked by: ABA/MRR  
 Quality Assurance  
 Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
 LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
 AUTHORIZED SIGNATORY

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Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-NMC-02-2
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 27-28, 2010

**TEST REPORT FOR LABORATORY DETERMINATION OF WATER (MOISTURE) CONTENT OF SOIL & ROCK BY MASS**

**ASTM D 2216 - 05**

Test Method  A  B

BOREHOLE NO...BH-2

SAMPLE NUMBER	DEPTH (m)	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	WATER CONTENT (%)	REMARKS
NATURAL MOISTURE CONTENT								
7	6.55-7.00	121.90	96.10	25.80	9.64	86.46	30	
8	7.55-8.00	121.40	97.34	24.06	9.81	87.53	27	
9	8.55-9.00	112.30	91.91	20.39	10.85	81.06	25	
10	9.55-10.00	117.00	91.99	25.01	9.58	82.41	30	

**TEST REPORT FOR LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS**

**ASTM Designation : D 4318 - 05, Method B**

SAMPLE NUMBER	DEPTH (m)	BLOWS	WET SOIL DISH (g)	DRY SOIL DISH (g)	WATER (g)	DISH MASS (g)	DRY SOIL (g)	% Retained on 0.425 mm	ATTERBERG LIMIT		REMARKS
									LL	PL	
LIQUID LIMIT											
PLASTIC LIMIT											

Uncertainty Results: Water Content (%) = ± 0.0243 Liquid Limit = --- Plastic Limit = ---  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%. LAB.FILE NO.:NMC-10-501

SAMPLE SUBMITTED BY :  Walk-in Clients  GPI Field Operator  
 R. POLIDAN

REMARKS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
 Encoder  
 Data Checked by: ABA/MRR  
 Quality Assurance  
 Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
 LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
 AUTHORIZED SIGNATORY



ACCREDITED TESTING  
LABORATORY  
PNS ISO/IEC 17025:2005  
LA-2006-097B



**GEOTECHNICS PHILIPPINES, INC.**  
SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



DPWH-BRS Accredited

Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-AL-01-1
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location.... Brgy. Gogon, Province of Albay	Date of Test..... October 28-29, 2010

**TEST REPORT FOR LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS**

**ASTM D 4318 - 05**

**Method : A**  Wet Preparation  Dry Preparation

BOREHOLE NO..... <b>BH-1</b>	DEPTH (m)..... 5.55-6.00	SOIL DESCRIPTION.....
SAMPLE NO..... S-6	USCS CLASS..... MH	Elastic SILT
MOISTURE CONTENT DETERMINATION	LIQUID LIMIT TRIAL 1 TRIAL 2 TRIAL 3	PLASTIC LIMIT TRIAL 1 TRIAL 2
DISH NUMBER	D24 D1 D26	C23 C72
WET SOIL + DISH (g)	32.54 35.16 38.22	22.68 22.71
DRY SOIL + DISH (g)	23.94 25.32 26.92	19.52 19.53
WATER (g)	8.60 9.84 11.30	3.16 3.18
DISH MASS (g)	9.62 9.70 9.80	9.54 9.55
DRY SOIL (g)	14.32 15.62 17.12	9.98 9.98
MOISTURE CONTENT	60.06 63.00 66.00	31.66 31.86
NUMBER OF BLOWS	31 21 15	32
% RETAINED ON 0.425mm .....	5.37	

Moisture Content (%)

No. of Blows

LL = 62      PL = 32      PI = 30

BOREHOLE NO.....	DEPTH (m).....	SOIL DESCRIPTION.....
SAMPLE NO.....	USCS CLASS.....	
MOISTURE CONTENT DETERMINATION	LIQUID LIMIT TRIAL 1 TRIAL 2 TRIAL 3	PLASTIC LIMIT TRIAL 1 TRIAL 2
DISH NUMBER		
WET SOIL + DISH (g)		
DRY SOIL + DISH (g)		
WATER (g)		
DISH MASS (g)		
DRY SOIL (g)		
MOISTURE CONTENT		
NUMBER OF BLOWS		
% RETAINED ON 0.425mm .....		

Moisture Content (%)

No. of Blows

LL =      PL =      PI =

Uncertainty Results: I      Liquid Limit = ± 0.1384      Plastic Limit = ± 0.2008  
 II      Liquid Limit = ---      Plastic Limit = ---

Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%. LAB.FILE NO.:AL-10-648

SAMPLE SUBMITTED BY :  Walk-in Clients  GPI Field Operator

REMARKS: \_\_\_\_\_

R. POLIDAN

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
 Encoder

Data Checked by: ABA / MRR  
 Quality Assurance

Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
 LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
 AUTHORIZED SIGNATORY





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LA-2006-097B



**GEOTECHNICS PHILIPPINES, INC.**  
SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



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Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-AL-02-1
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location.... Brgy. Gogon, Province of Albay	Date of Test..... October 28-29, 2010

**TEST REPORT FOR LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS**

**ASTM D 4318 - 05**

**Method : A**  Wet Preparation  Dry Preparation

BOREHOLE NO..... <b>BH-2</b>	DEPTH (m)..... 4.55-5.00	SOIL DESCRIPTION.....
SAMPLE NO..... S-5	USCS CLASS..... SC	Clayey SAND

MOISTURE CONTENT DETERMINATION	LIQUID LIMIT			PLASTIC LIMIT	
	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL 1	TRIAL 2
DISH NUMBER	C68	C80	C31	D16	D45
WET SOIL + DISH (g)	32.64	35.40	38.29	22.67	22.69
DRY SOIL + DISH (g)	25.49	27.12	28.80	19.42	19.42
WATER (g)	7.15	8.28	9.49	3.25	3.27
DISH MASS (g)	9.60	9.70	9.82	9.45	9.47
DRY SOIL (g)	15.89	17.42	18.98	9.97	9.95
MOISTURE CONTENT	45.00	47.53	50.00	32.60	32.86
NUMBER OF BLOWS	30	21	15	33	

Moisture Content (%)

No. of Blows

LL = 46      PL = 33      PI = 13

% RETAINED ON 0.425mm ..... 24.63

BOREHOLE NO..... <b>BH-2</b>	DEPTH (m)..... 5.55-6.00	SOIL DESCRIPTION.....
SAMPLE NO..... S-6	USCS CLASS..... MH	Elastic SILT

MOISTURE CONTENT DETERMINATION	LIQUID LIMIT			PLASTIC LIMIT	
	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL 1	TRIAL 2
DISH NUMBER	D14	D39	D7	C50	C93
WET SOIL + DISH (g)	32.50	35.28	38.20	22.66	22.68
DRY SOIL + DISH (g)	24.87	26.47	28.11	19.52	19.54
WATER (g)	7.63	8.81	10.09	3.14	3.14
DISH MASS (g)	9.62	9.68	9.78	9.51	9.52
DRY SOIL (g)	15.25	16.79	18.33	10.01	10.02
MOISTURE CONTENT	50.03	52.47	55.05	31.37	31.34
NUMBER OF BLOWS	31	22	15	31	

Moisture Content (%)

No. of Blows

LL = 51      PL = 31      PI = 20

% RETAINED ON 0.425mm ..... 19.72

Uncertainty Results: I      Liquid Limit = ± 0.1245      Plastic Limit = ± 0.2015  
 II      Liquid Limit = ± 0.1301      Plastic Limit = ± 0.2000

Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.      LAB.FILE NO.:AL-10-649

SAMPLE SUBMITTED BY : \_\_\_\_\_ REMARKS: \_\_\_\_\_  
 Walk-in Clients       GPI Field Operator  
 R. POLIDAN

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
 Encoder  
 Data Checked by: ABA / MRR  
 Quality Assurance  
 Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
 LABORATORY TECHNICIAN  
 CERTIFIED BY : \_\_\_\_\_  
 AUTHORIZED SIGNATORY

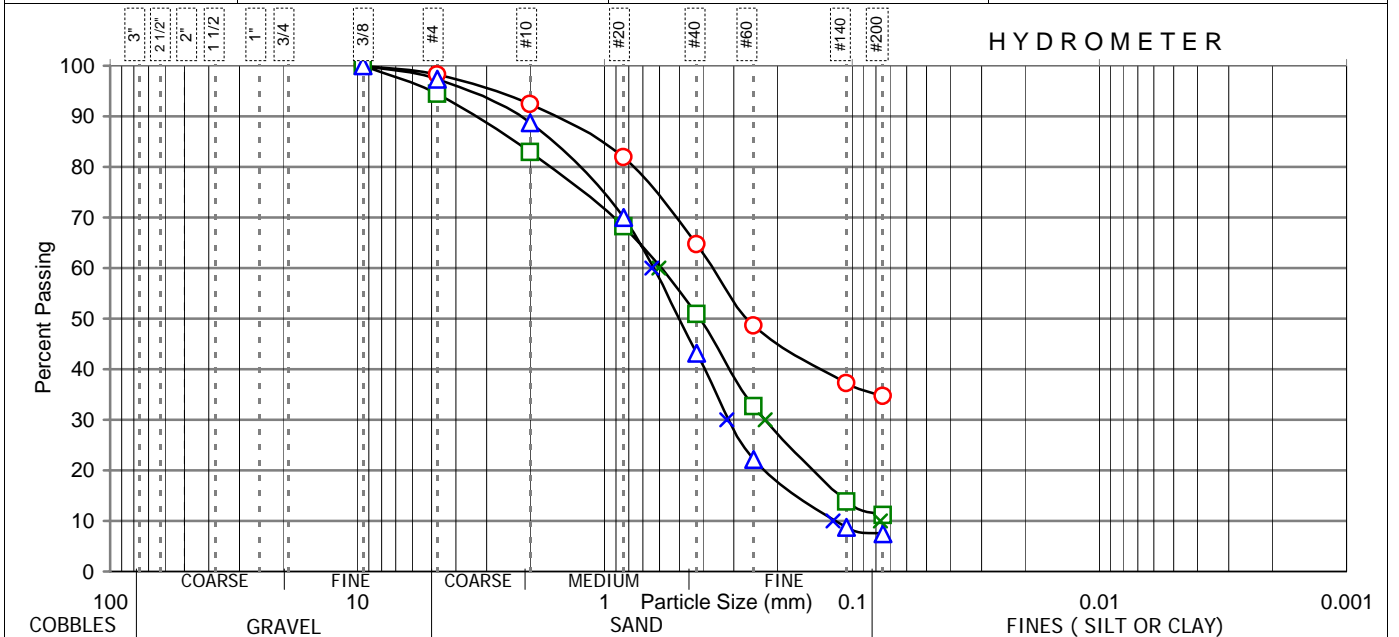


Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-01-1
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 28, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**
  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO.....	<b>BH-1</b>	<span style="color:red">○</span> 1	<span style="color:green">□</span> 2	<span style="color:blue">△</span> 3
DEPTH (m).....		0.55-1.00	1.55-2.00	2.55-3.00
SOIL DESCRIPTION.....		Clayey Silty SAND	Well graded SAND with silt	Poorly graded SAND with silt

SIEVE SIZE	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
2 1/2									
2									
1 1/2									
1									
3/4									
3/8			100			100			100
4	1.26	1.84	98	4.48	5.54	94	2.12	2.65	97
10	5.25	7.65	92	13.86	17.14	83	9.05	11.32	89
20	12.40	18.06	82	25.70	31.78	68	23.97	29.98	70
40	24.24	35.30	65	39.71	49.10	51	45.49	56.90	43
60	35.31	51.43	49	54.45	67.33	33	62.27	77.89	22
140	43.10	62.77	37	69.71	86.20	14	72.96	91.26	9
200	44.84	65.31	35	71.87	88.87	11	74.02	92.58	7
OVEN DRIED MASS	68.66 gms			80.87 gms			79.95 gms		



\* - with Hydrometer

REMARKS : S-2: Cu = 7.85 Cc = 1.09

S-3: Cu = 5.40 Cc = 1.34

SAMPLE SUBMITTED BY:

Walk-in Clients  GPI Field Operator

R. POLIDAN

TESTED BY : ARTURO Q. AQUINO

LABORATORY TECHNICIAN

COMPUTER PRINT-OUT

By: MARIA ANTONIETTE P. CUNAHAP

Encoder

Data Checked by: ABA/MRR

Quality Assurance

Date Issued: \_\_\_\_\_

CERTIFIED BY : \_\_\_\_\_

AUTHORIZED SIGNATORY

Uncertainty Results: % Finer = ± 0.0427

LAB.FILE NO.:GSA-10-402

Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.



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**GEOTECHNICS PHILIPPINES, INC.**  
SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



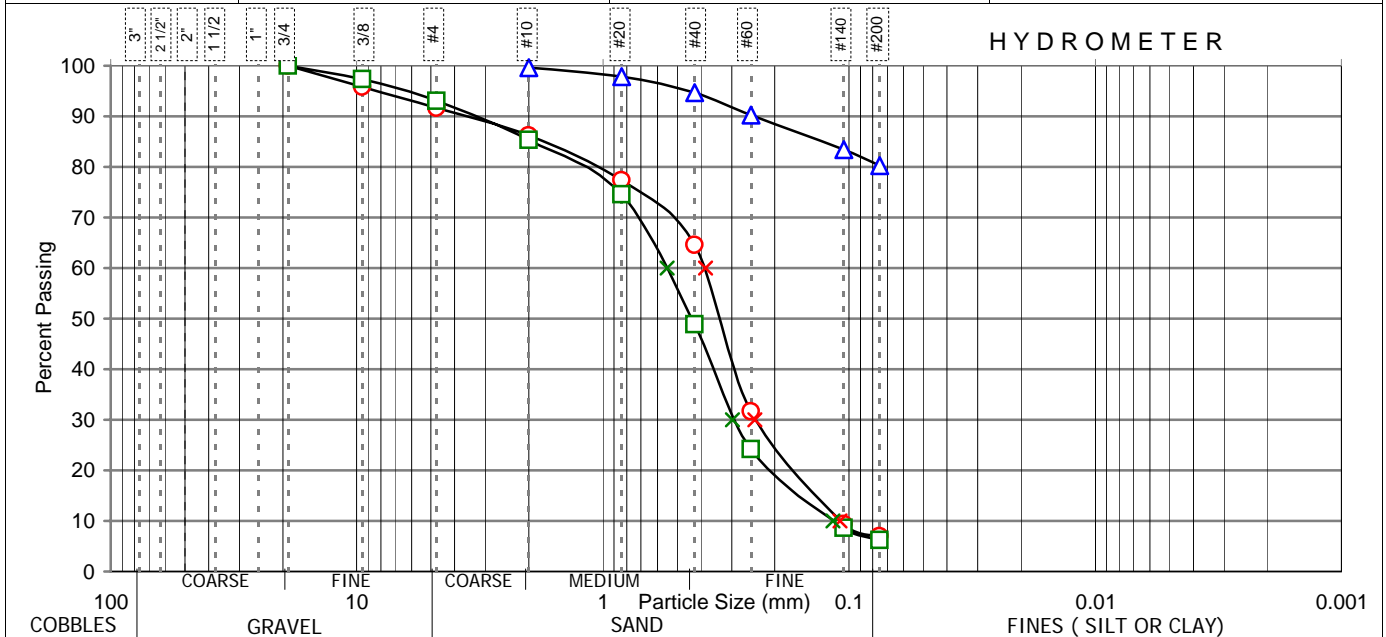
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Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-01-2
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 28, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO.....	<b>BH-1</b>	<b>○ 4</b>	<b>□ 5</b>	<b>△ 6</b>
DEPTH (m).....	3.55-4.00	4.55-5.00	5.55-6.00	
SOIL DESCRIPTION.....	Poorly graded SAND with silt	Poorly graded SAND with silt	Elastic SILT	

SIEVE SIZE	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
2 1/2									
2									
1 1/2									
1									
3/4			100			100			
3/8	3.48	4.17	96	2.07	2.67	97			
4	6.93	8.31	92	5.44	7.01	93			
10	11.55	13.85	86	11.39	14.68	85	0.30	0.42	100
20	18.94	22.70	77	19.71	25.40	75	1.52	2.13	98
40	29.58	35.46	65	39.69	51.15	49	3.83	5.37	95
60	57.00	68.33	32	58.83	75.82	24	6.97	9.78	90
140	75.64	90.67	9	70.94	91.43	9	11.78	16.52	83
200	77.65	93.08	7	72.82	93.85	6	14.10	19.78	80
OVEN DRIED MASS	83.42 gms			77.59 gms			71.29 gms		



\* - with Hydrometer

REMARKS : S-4: Cu = 3.53 Cc = 1.40  
S-5: Cu = 4.72 Cc = 1.39

SAMPLE SUBMITTED BY:  Walk-in Clients  GPI Field Operator

R. POLIDAN

COMPUTER PRINT-OUT  
By: MARIA ANTONIETTE P. CUNAHAP  
Encoder  
Data Checked by: ABA/MRR  
Quality Assurance  
Date Issued: \_\_\_\_\_

TESTED BY: ARTURO Q. AQUINO  
LABORATORY TECHNICIAN

CERTIFIED BY: \_\_\_\_\_  
AUTHORIZED SIGNATORY

Uncertainty Results: % Finer = ± 0.0434 LAB.FILE NO.: GSA-10-402  
Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.



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LA-2006-097B



**GEOTECHNICS PHILIPPINES, INC.**  
SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



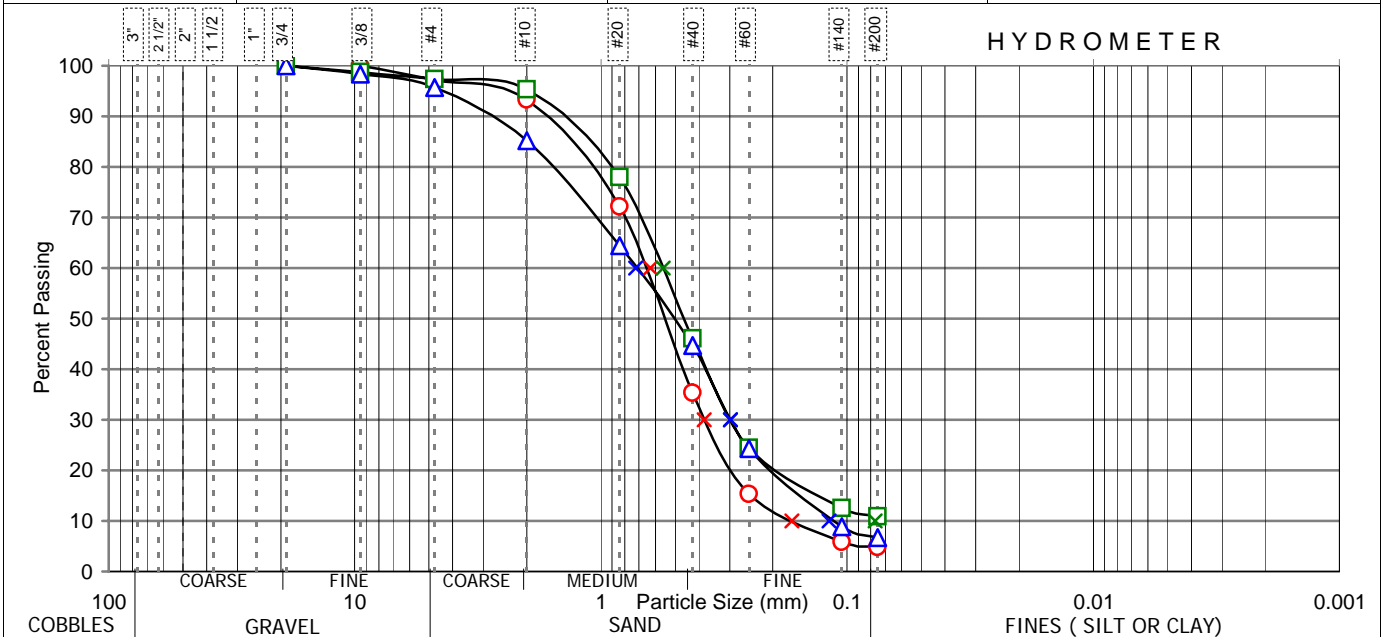
DPWH-BRS Accredited

Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-01-3
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 28, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO.....	<b>BH-1</b>	<b>7</b>	<b>8</b>	<b>9</b>
DEPTH (m).....	6.55-7.00	7.55-8.00	8.55-9.00	
SOIL DESCRIPTION.....	Poorly graded SAND with silt	Well graded SAND with silt	Well graded SAND with silt	

SIEVE SIZE	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
2 1/2									
2									
1 1/2									
1									
3/4						100			100
3/8			100	0.90	1.23	99	1.35	1.66	98
4	2.20	2.79	97	1.97	2.70	97	3.47	4.26	96
10	5.31	6.74	93	3.38	4.62	95	12.08	14.83	85
20	21.98	27.90	72	16.10	22.03	78	28.94	35.54	64
40	50.95	64.67	35	39.40	53.91	46	45.02	55.29	45
60	66.70	84.66	15	55.24	75.58	24	61.61	75.66	24
140	74.23	94.21	6	63.89	87.41	13	74.19	91.11	9
200	75.04	95.24	5	65.11	89.08	11	75.96	93.28	7
OVEN DRIED MASS	78.79 gms			73.09 gms			81.43 gms		



* - with Hydrometer	REMARKS :	S-7:	Cu = 3.77	Cc = 1.37
SAMPLE SUBMITTED BY:		S-8:	Cu = 7.28	Cc = 2.06
<input type="checkbox"/> Walk-in Clients <input checked="" type="checkbox"/> GPI Field Operator		S-9:	Cu = 6.10	Cc = 1.04

R. POLIDAN

COMPUTER PRINT-OUT  
By: MARIA ANTONIETTE P. CUNAHAP  
Encoder

Data Checked by: ABA/MRR  
Quality Assurance

Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
AUTHORIZED SIGNATORY

Uncertainty Results: % Finer = ± 0.0450 LAB.FILE NO.: GSA-10-402  
Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.

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ACCREDITED TESTING  
LABORATORY  
PNS ISO/IEC 17025:2005  
LA-2006-097B



**GEOTECHNICS PHILIPPINES, INC.**  
SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



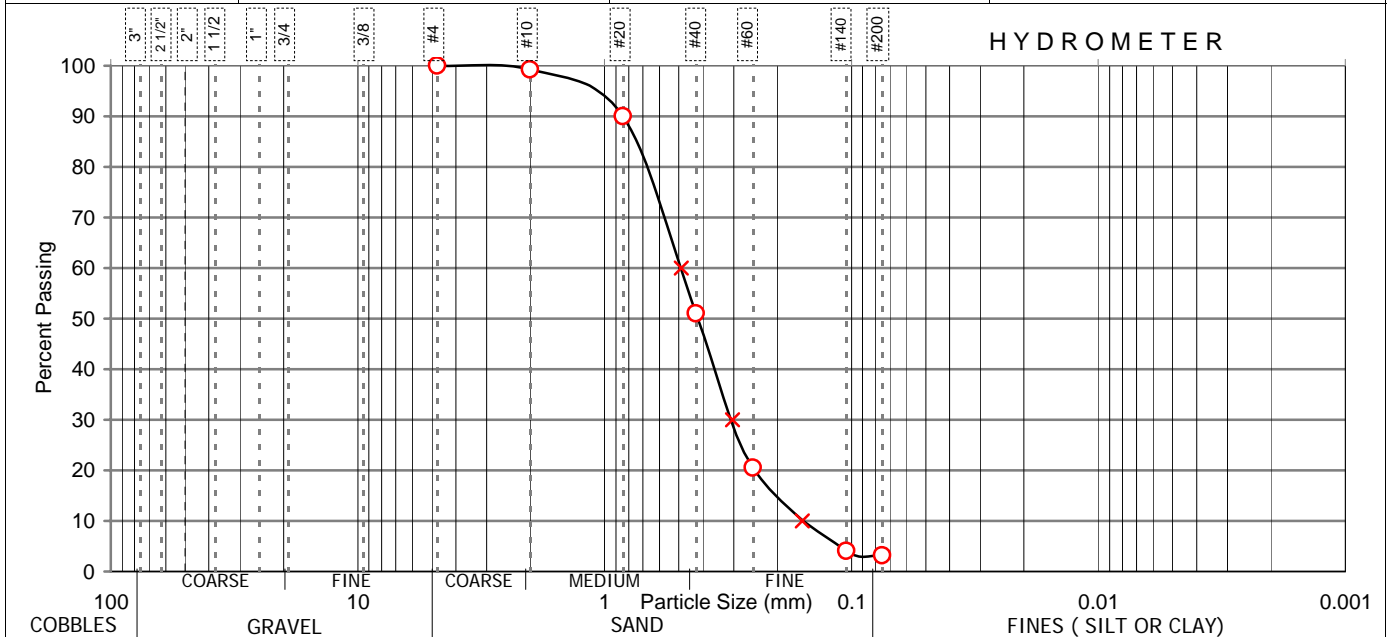
DPWH-BRS Accredited

Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-01-4
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 28, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO..... **BH-1**      ○ 10      □      △  
 DEPTH (m)..... 9.55-10.00  
 SOIL DESCRIPTION..... Poorly graded SAND

SIEVE SIZE		Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
inches	mm									
2 1/2	62.5									
2	50.0									
1 1/2	37.5									
1	25.0									
3/4	19.0									
3/8	9.5									
4	4.75			100						
10	2.0	0.53	0.70	99						
20	0.8	7.53	9.97	90						
40	0.425	36.98	48.94	51						
60	0.25	60.02	79.43	21						
140	0.105	72.50	95.95	4						
200	0.075	73.20	96.88	3						
OVEN DRIED MASS		75.56 gms								



\* - with Hydrometer      REMARKS : S-10:      Cu = 3.09      Cc = 1.19

SAMPLE SUBMITTED BY:  
 Walk-in Clients     GPI Field Operator  
 R. POLIDAN

COMPUTER PRINT-OUT  
 By: MARIA ANTONIETTE P. CUNAHAP  
    Encoder  
 Data Checked by: ABA/MRR  
    Quality Assurance  
 Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
    LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
    AUTHORIZED SIGNATORY

Uncertainty Results:      % Finer = ± 0.0453      LAB.FILE NO.:GSA-10-402  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.



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LA-2006-097B



# GEOTECHNICS PHILIPPINES, INC.

SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



DPWH-BRS Accredited

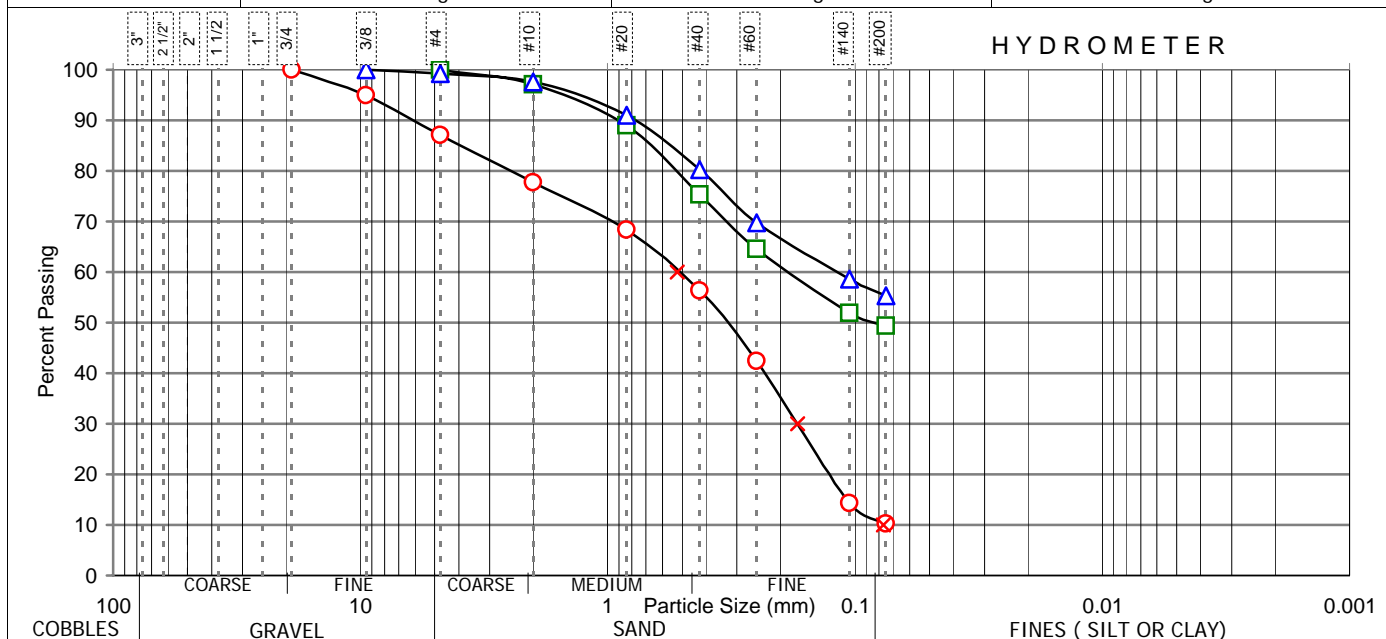
Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-02-2
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 28, 2010

## TEST REPORT FOR GRAIN SIZE ANALYSIS

ASTM D 422 - 63 (Re-approved 2007)

BH / SAMPLE NO..... **BH-2**      **○ 4**      **□ 5**      **△ 6**  
 DEPTH (m)..... 3.55-4.00      4.55-5.00      5.55-6.00  
 SOIL DESCRIPTION..... Poorly graded SAND with silt      Clayey SAND      Elastic SILT

SIEVE SIZE	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
inches									
mm									
2 1/2									
2									
1 1/2									
1									
3/4			100						
3/8	4.00	5.07	95						100
4	10.14	12.86	87			100	0.42	0.76	99
10	17.59	22.30	78	1.82	2.88	97	1.33	2.40	98
20	24.95	31.63	68	6.97	11.05	89	4.98	8.99	91
40	34.46	43.69	56	15.54	24.63	75	10.92	19.72	80
60	45.42	57.59	42	22.39	35.48	65	16.72	30.20	70
140	67.58	85.69	14	30.38	48.15	52	22.91	41.38	59
200	70.82	89.79	10	31.95	50.63	49	24.73	44.66	55
OVEN DRIED MASS	78.87 gms			63.10 gms			55.37 gms		



\* - with Hydrometer

REMARKS : S-4: Cu = 6.82 Cc = 0.72

SAMPLE SUBMITTED BY:

Walk-in Clients     GPI Field Operator

R. POLIDAN

COMPUTER PRINT-OUT

By: MARIA ANTONIETTE P. CUNAHAP  
Encoder

Data Checked by: ABA/MRR  
Quality Assurance

Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
AUTHORIZED SIGNATORY

Uncertainty Results: % Finer = ± 0.0486      LAB.FILE NO.:GSA-10-402  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.

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**GEOTECHNICS PHILIPPINES, INC.**  
SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



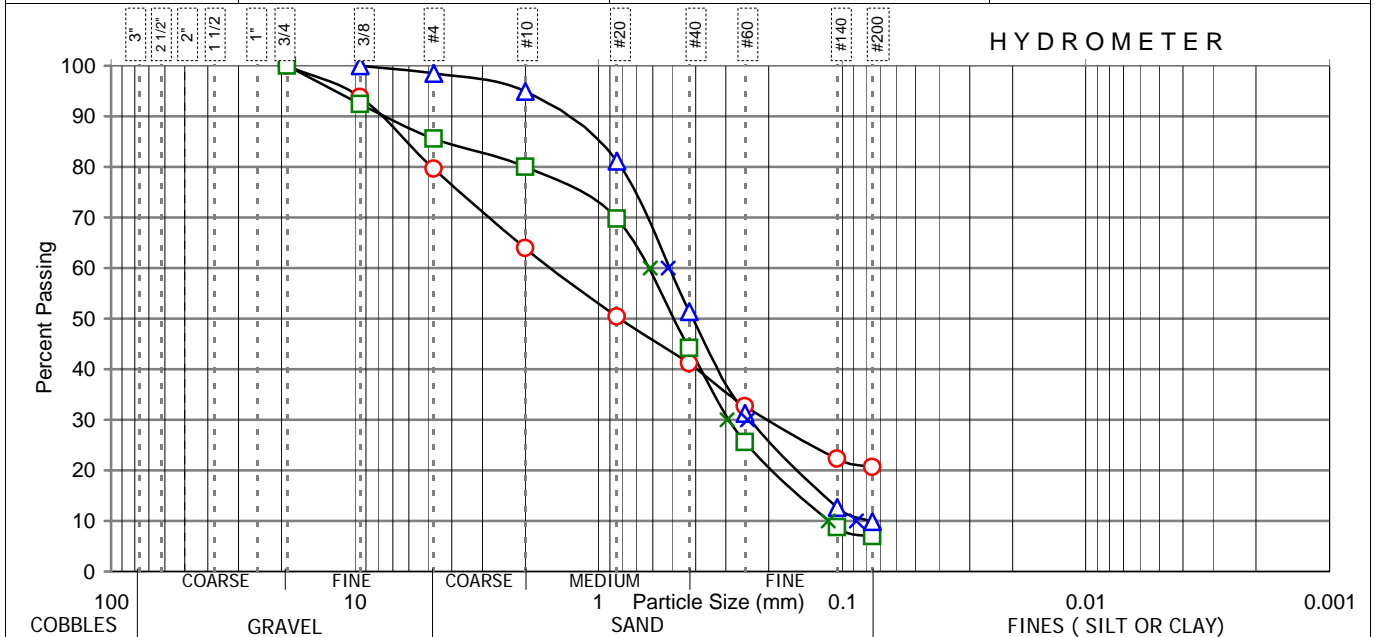
DPWH-BRS Accredited

Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-02-
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 28, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO.....	<b>BH-2</b>	<b>○ 7</b>	<b>□ 8</b>	<b>△ 9</b>
DEPTH (m).....		6.55-7.00	7.55-8.00	8.55-9.00
SOIL DESCRIPTION.....		Silty SAND	Poorly graded SAND with silt	Poorly graded SAND with silt

SIEVE SIZE inches      mm	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
2 1/2      62.5									
2          50.0									
1 1/2      37.5									
1          25.0									
3/4        19.0			100			100			
3/8        9.5	5.35	6.19	94	6.62	7.56	92			100
4          4.75	17.63	20.39	80	12.64	14.44	86	1.24	1.53	98
10         2.0	31.20	36.09	64	17.54	20.04	80	4.10	5.06	95
20         0.8	42.90	49.62	50	26.44	30.21	70	15.30	18.87	81
40         0.425	50.87	58.84	41	48.81	55.76	44	39.40	48.61	51
60         0.25	58.23	67.35	33	65.14	74.42	26	55.69	68.70	31
140        0.105	67.22	77.75	22	79.85	91.23	9	70.85	87.40	13
200        0.075	68.67	79.42	21	81.48	93.09	7	73.07	90.14	10
OVEN DRIED MASS	86.46 gms			87.53 gms			81.06 gms		



\* - with Hydrometer

REMARKS : S-8: Cu = 5.40 Cc = 1.26  
S-9: Cu = 5.93 Cc = 1.32

SAMPLE SUBMITTED BY:  
 Walk-in Clients  GPI Field Operator

R. POLIDAN

COMPUTER PRINT-OUT  
By: MARIA ANTONIETTE P. CUNAHAP  
Encoder  
Data Checked by: ABA/MRR  
Quality Assurance  
Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
AUTHORIZED SIGNATORY

Uncertainty Results: % Finer = ± 0.0408      LAB.FILE NO.:GSA-10-402  
Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.

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LA-2006-097B



**GEOTECHNICS PHILIPPINES, INC.**  
SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



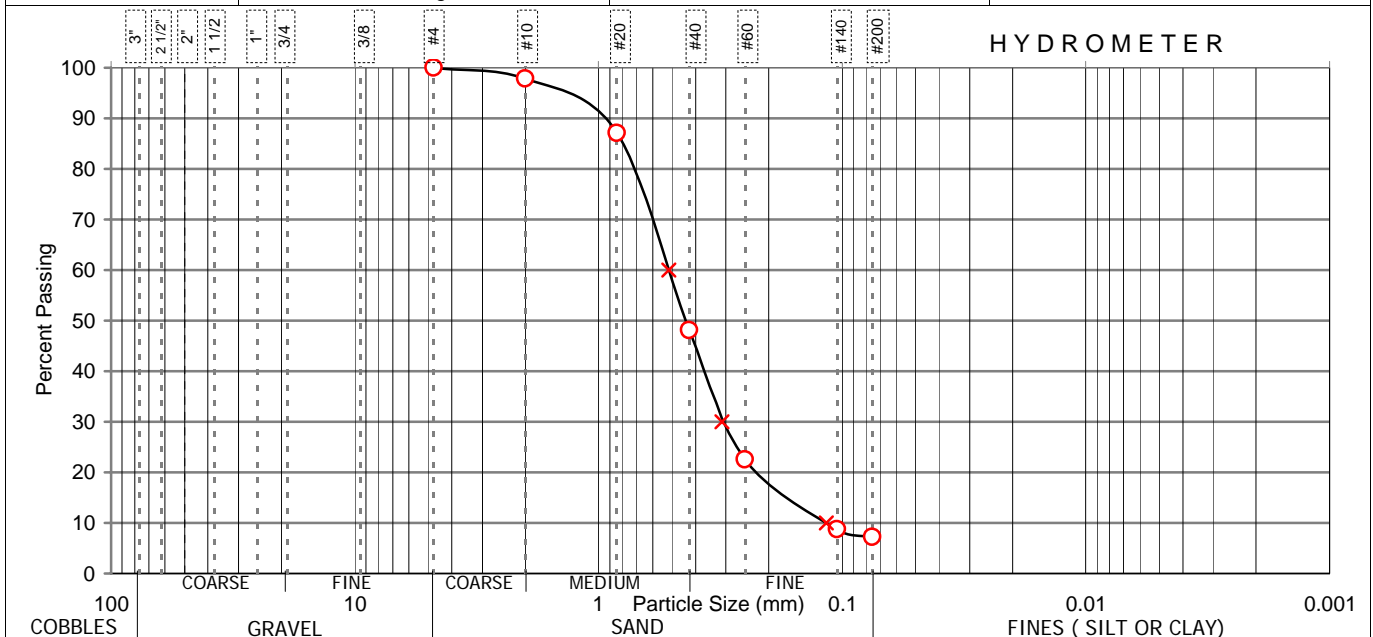
DPWH-BRS Accredited

Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-02-4
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 28, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO..... **BH-2**      **○10**      **□**      **△**  
 DEPTH (m)..... 9.55-10.00  
 SOIL DESCRIPTION..... Poorly graded SAND with silt

SIEVE SIZE	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
inches	mm								
2 1/2	62.5								
2	50.0								
1 1/2	37.5								
1	25.0								
3/4	19.0								
3/8	9.5								
4	4.75		100						
10	2.0	1.73	2.10	98					
20	0.8	10.61	12.87	87					
40	0.425	42.78	51.91	48					
60	0.25	63.81	77.43	23					
140	0.105	75.23	91.29	9					
200	0.075	76.45	92.77	7					
OVEN DRIED MASS		82.41	gms						



\* - with Hydrometer

REMARKS : S-10: Cu = 4.43 Cc = 1.63

SAMPLE SUBMITTED BY:

Walk-in Clients     GPI Field Operator

R. POLIDAN

TESTED BY : ARTURO Q. AQUINO  
LABORATORY TECHNICIAN

COMPUTER PRINT-OUT

By: MARIA ANTONIETTE P. CUNAHAP  
Encoder

Data Checked by: ABA/MRR  
Quality Assurance

Date Issued: \_\_\_\_\_

CERTIFIED BY : \_\_\_\_\_  
AUTHORIZED SIGNATORY

Uncertainty Results:      % Finer = ± 0.0407      LAB.FILE NO.:GSA-10-403  
 Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.

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**GEOTECHNICS PHILIPPINES, INC.**  
SOILS AND MATERIALS TESTING LABORATORY  
119 Sauyo Road, Novaliches, Quezon City



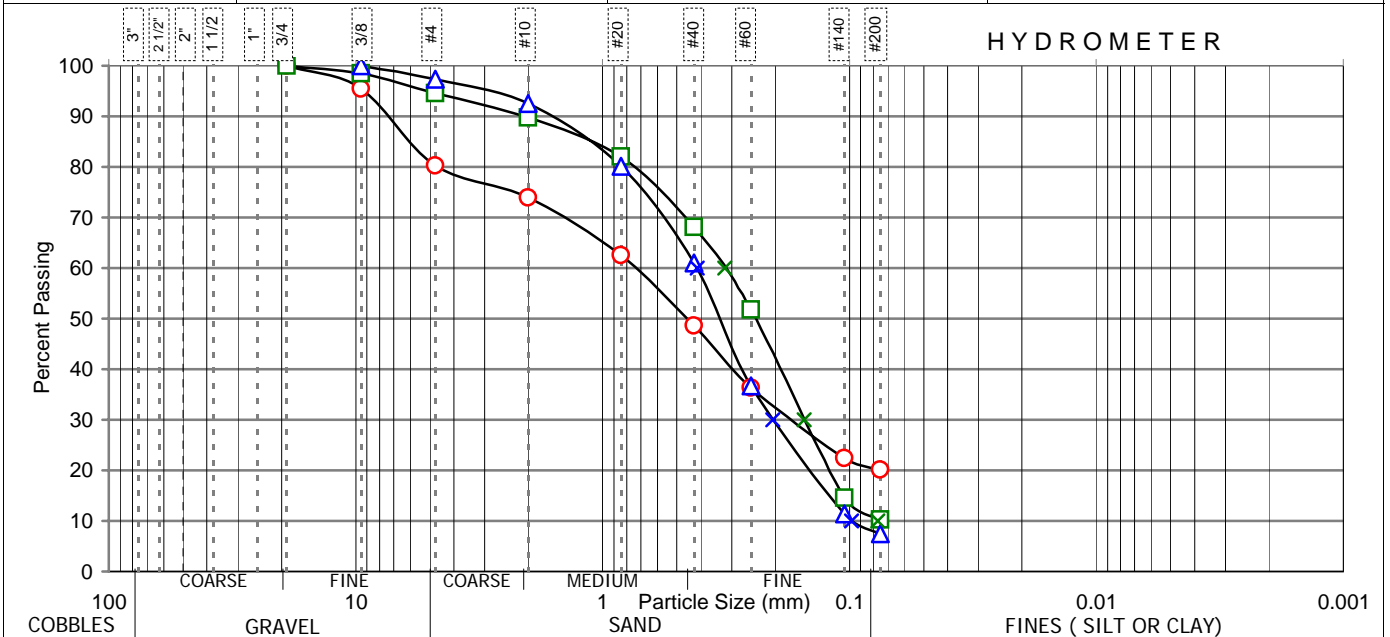
DPWH-BRS Accredited

Client..... <b>MOHRI, ARCHITECT &amp; ASSOCIATES, INC.</b>	Job Number..... 2209-10.R1-GSA-02-1
Project..... <b>Proposed Mayon Evacuation Center (Gogon Central School)</b>	Date of Receipt..... October 27, 2010
Location..... Brgy. Gogon, Province of Albay	Date of Test..... October 28, 2010

**TEST REPORT FOR GRAIN SIZE ANALYSIS**  
**ASTM D 422 - 63 (Re-approved 2007)**

BH / SAMPLE NO.....	<b>BH-2</b>	<b>○ 1</b>	<b>□ 2</b>	<b>△ 3</b>
DEPTH (m).....	0.55-1.00	1.55-2.00	2.55-3.00	
SOIL DESCRIPTION.....	Silty SAND	Poorly graded SAND with silt	Poorly graded SAND with silt	

SIEVE SIZE inches      mm	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer	Cumm.Mass Retained (g)	Cumm.% Retained	Percent Finer
2 1/2      62.5									
2          50.0									
1 1/2      37.5									
1          25.0									
3/4        19.0			100			100			
3/8        9.5	2.71	4.50	95	1.23	1.48	99			100
4          4.75	11.87	19.72	80	4.57	5.49	95	2.08	2.65	97
10         2.0	15.73	26.14	74	8.52	10.24	90	5.89	7.52	92
20         0.8	22.56	37.49	63	14.98	18.00	82	15.54	19.83	80
40         0.425	30.90	51.35	49	26.54	31.90	68	30.56	39.00	61
60         0.25	38.32	63.68	36	40.10	48.20	52	49.60	63.30	37
140        0.105	46.68	77.57	22	71.14	85.50	14	69.43	88.60	11
200        0.075	48.10	79.93	20	74.68	89.76	10	72.49	92.51	7
OVEN DRIED MASS	60.18 gms			83.20 gms			78.36 gms		



\* - with Hydrometer

REMARKS : S-2: Cu = 4.18 Cc = 0.94  
S-3: Cu = 4.23 Cc = 1.03

SAMPLE SUBMITTED BY:  
 Walk-in Clients     GPI Field Operator

R. POLIDAN

COMPUTER PRINT-OUT  
By: MARIA ANTONIETTE P. CUNAHAP  
Encoder  
Data Checked by: ABA/MRR  
Quality Assurance  
Date Issued: \_\_\_\_\_

TESTED BY : ARTURO Q. AQUINO  
LABORATORY TECHNICIAN

CERTIFIED BY : \_\_\_\_\_  
AUTHORIZED SIGNATORY

Uncertainty Results:      % Finer = ± 0.0523      LAB.FILE NO.:GSA-10-402  
Note: The reported expanded uncertainty is based on a combined uncertainty by a coverage factor of k=2, providing a level of confidence of approximately 95%.

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