GUAM WATERWORKS AUTHORITY
Gloria B. Nelson Public Service Building | 688 Route 15, Mangilao, Guam 96913
P.O. Box 3010, Hagåtña, Guam 96932
Tel. No. (671) 300-6846/48 Fax No. (671) 648-3290

Invitation For Bid:	IFB-04-ENG-2026
Project:	Asbestos Cement Pipe (ACP) Waterline Replacement-Construction, GWA Project No. 12310
Addendum No.:	**04**
Date:	July 9, 2026

All Potential Bidders:

This addendum is issued to modify the previously issued bid documents and/or given for informational purposes and is hereby made a part of the bid documents. Failure to acknowledge receipt of this addendum shall be grounds for the bidder's disqualification and rejection of the bidder's proposal.

1. **SECTION 00100- Invitation for Bid and other sections on the bid documents where applies, which states:**

   *"All sealed bids must be submitted through GWA's Portal in the format stipulated in the IFB document. Bids must be received by GWA no later than **7/17/26 3:00 PM** Chamorro Standard Time. The contract time for this project is **240** calendar days for the Base Bid portion of the project. "*

   *"All questions or clarifications must be submitted by email to engbids@guamwaterworks.org or by utilizing Messages in the Portal on or before **7/7/26."***

   Has now been changed to read:

   *"All sealed bids must be submitted through GWA's Portal in the format stipulated in the IFB document. Bids must be received by GWA no later than **7/31/26 3:00 PM** Chamorro Standard Time. The contract time for this project is **240** calendar days for the Base Bid portion of the project. "*

   *"All questions or clarifications must be submitted by email to engbids@guamwaterworks.org or by utilizing Messages in the Portal on or before **7/16/26."***

2. The following sheets of **Preliminary Geotechnical Assessment** will now be included as supporting documentation for the project.

Bidders are also notified to visit GWA website: http://guamwaterworks.org/bids/ to ensure that all addenda to the bid, answers to questions, and reminders communicated are received by all bidders throughout the solicitation process.

Christopher Budasi,
Acting General Manager

MCB; eq

Mr. Aaron Sutton
GHD, Inc.
316 Hernan Cortez Ave. Ste. 300
Hagåtña, GU 96910

PRELIMINARY GEOTECHNICAL ASSESSMENT

GWA PROJECT NO. W22-05-BND : DESIGN OF ACP WATERLINE REPLACEMENT ROUTE 4 – AJAYAN AND LIYOG RIVER CROSSINGS, MERIZO, GUAM

Dear Mr. Sutton,

We are pleased to provide this preliminary geotechnical assessment to support construction of horizontal directional drilling (HDD) pipeline crossings along Route 4 at the Ajayan River and Liyog River. This data report presents available geologic and geotechnical data for the two river crossings for information only during the RFP process. A geotechnical field exploration will be performed at a later date to supplement this letter report, and present site specific information.

SITE BACKGROUND AND LOCAL GEOLOGY

Both bridge sites are located along Route 4, at the southern end of Guam within areas mapped as Quaternary Beach Deposits (Qrb) and Quaternary Alluvium (Qal) (***Figure 1***). These units are mapped at or near the surface and are likely underlain by Miocene Bolanos Pyroclastic member formation (Tub).

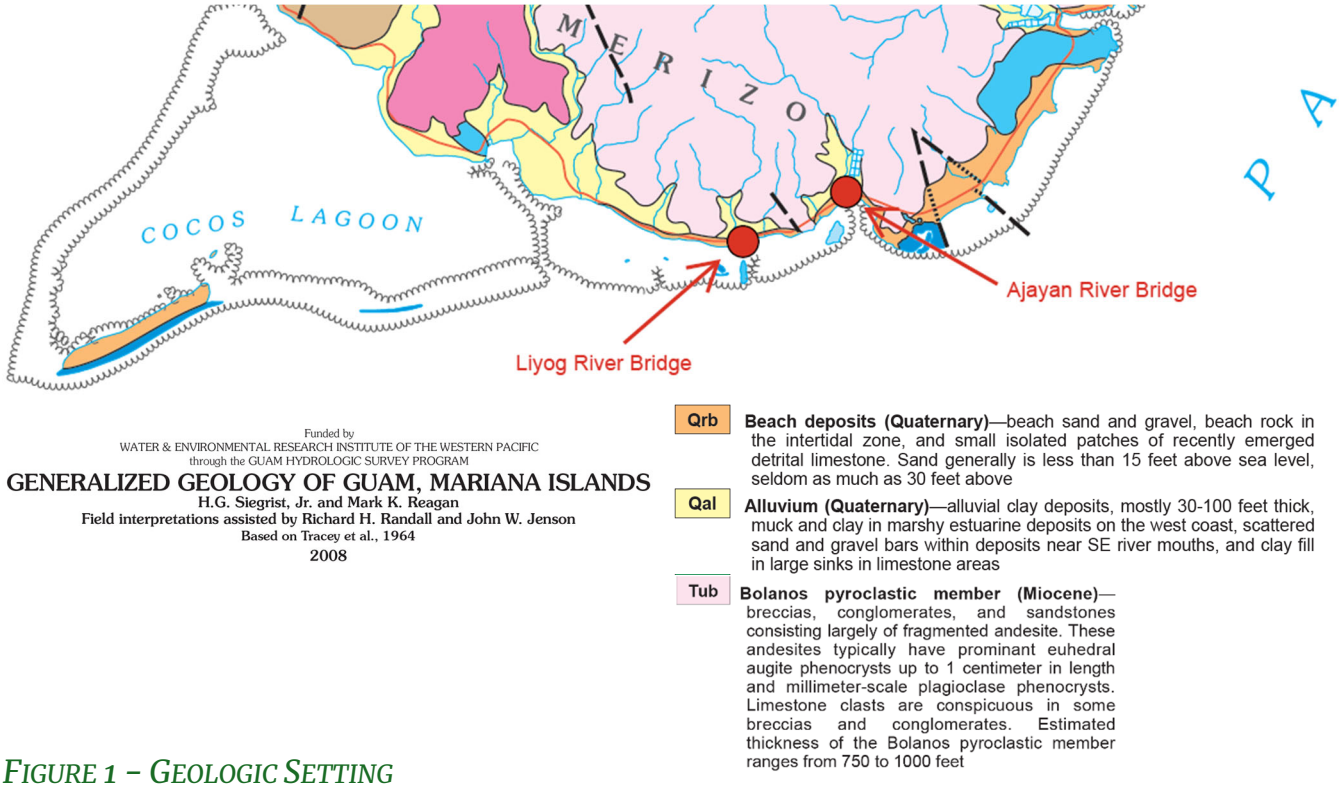


FIGURE 1 – GEOLOGIC SETTING

HISTORIC GEOTECHNICAL DATA – AJAYAN RIVER CROSSING

We reviewed a geotechnical study prepared by Geo-Engineering & Testing, Inc. (GET) in May of 2012. This study was performed for design of a replacement bridge, and included four geotechnical borings, two on either side of the bridge (***Figure 2***). Boring logs (***Attachment 1***) and laboratory test data (***Attachment 2***) are appended to this memorandum.

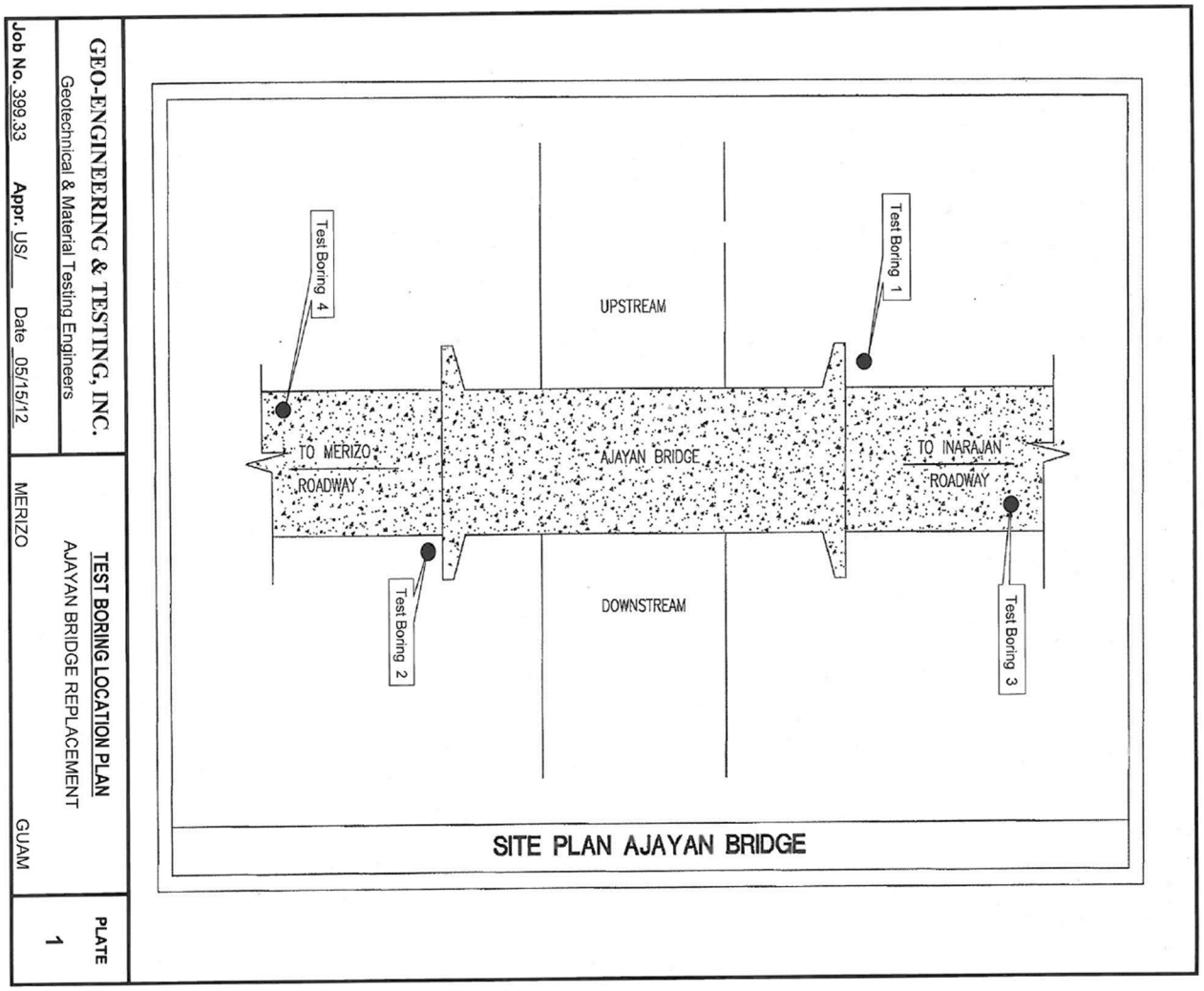


FIGURE 2 – AJAYAN RIVER BORING LOCATION PLAN (GET, 2012)

Test Borings 1 and 2, located nearest to the river, encountered fill and pavement subgrade to a depth of approximately 6 to 10 feet. Alluvial river deposits composed of loose sands and silts underlay the fill to depths between 77 and 88 feet. Tuffaceous siltstone and sandstone bedrock were observed below the Alluvial river deposits. The maximum depths of Test Borings 1 and 2 were 90 feet and 104 feet respectively.

Test Borings 3 and 4 are located an undisclosed distance from the river and were significantly shallower, having a maximum depth of 23 feet below grade. Each encountered approximately 15 feet of fill and/or pavement subgrade material over a relatively thin layer (approximately 5 feet) of alluvial deposits. Coralline gravel was encountered below the alluvial deposits.

Groundwater near the river is tidally influenced. Measurements taken during drilling showed groundwater at approximately 11 feet below grade near the river, and at approximately 8 to 10 feet below grade further from the river. Note that the ground surface elevations were not presented in the borings.

HISTORIC GEOTECHNICAL DATA – LIYOG RIVER CROSSING

No data was provided for the Liyog River crossing, however, due to its proximity to the Ajayan River, and given they are in a similar geologic and hydrogeologic setting, conditions are likely similar to those encountered at Ajayan.

PENDING GEOTECHNICAL EXPLORATION

Our planned exploration will include four (4) geotechnical borings – two (2) at either side of each bridge (***Figures 3 and 4***). Borings will be drilled using rotary wash methods to approximately 50 feet below existing grade, or to refusal based on conditions observed onsite. Samples will be taken for laboratory index and strength testing at intervals of approximately five feet for the depth of drilling.

A report will be prepared that includes the following:

- Geotechnical boring logs
- Geotechnical laboratory data
- Hydrogeologic assessment

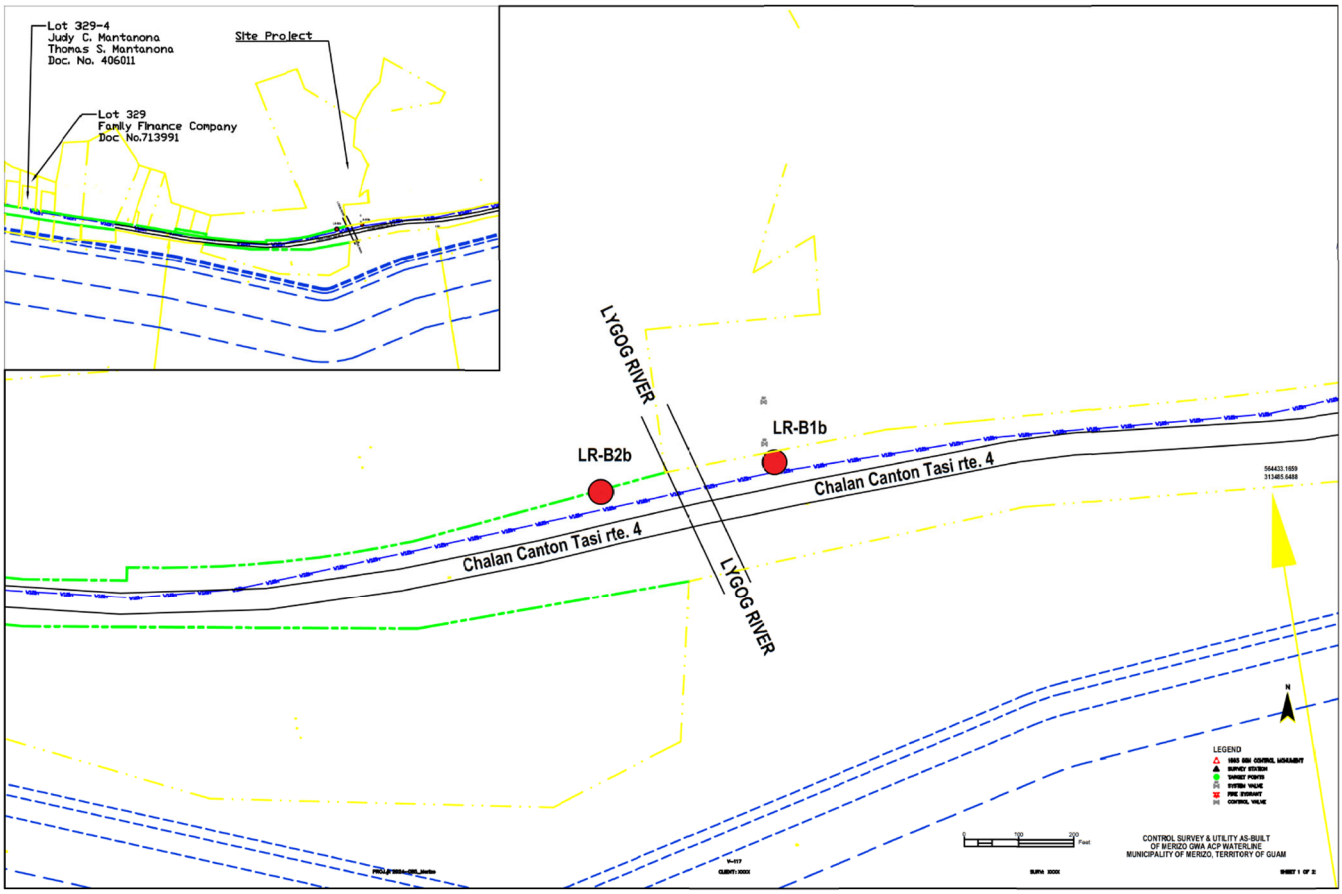


FIGURE 3 – LIYOG RIVER EXPLORATION

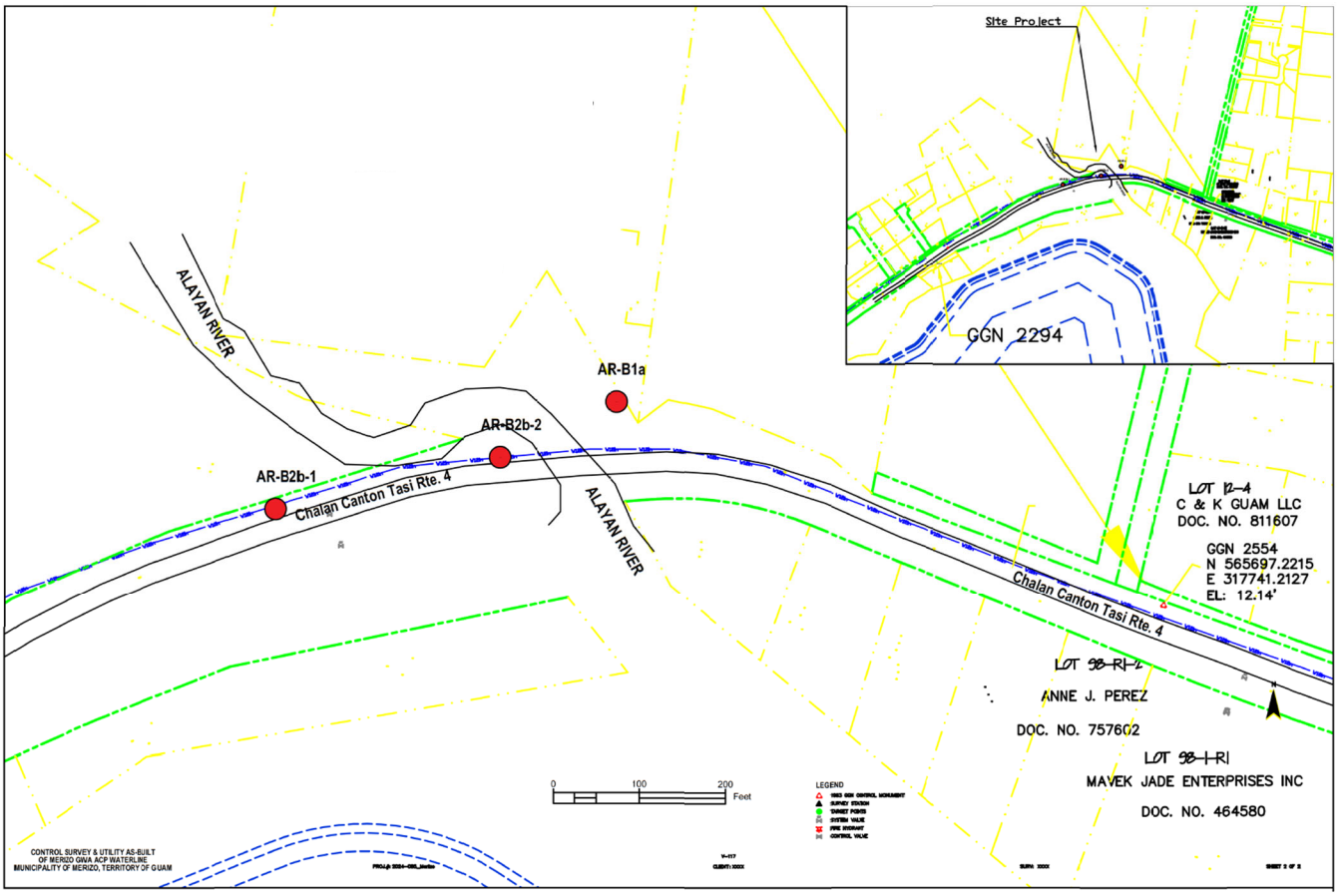


FIGURE 4 – AJAYAN RIVER EXPLORATION

CLOSURE

This data report is intended for use by GHD and GWA in the RFP process for Route 4 Ajayan and Liyog River Crossings project. All data presented herein is freely available to the public, or has been provided by authorized personnel for the express purpose stated above.

Agnew Consulting Engineers, L.L.C. strives to provide professional engineering services within the standard practices employed in Guam. We make no warranty, express or implied, associated with our services.

Please contact us with any questions or concerns regarding this letter report.

Sincerely,
Agnew Consulting Engineers, L.L.C.
Dustin Agnew, PE, GE

Attachments:

1) Log of Test Borings
2) Laboratory Data

LOG OF TEST BORING 1

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE May 07, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, kg/cu.m	LABORATORY TESTS
0	0	LIGHT BROWN-WHITE SILTY LIMESTONE GRAVEL WITH SAND (GM) - dense, moist, short grass on surface					3.1	100	
5	1	very dense at 2'-4'							
	2	LIGHT BROWN-WHITE SILTY SAND WITH LIMESTONE GRAVEL (SM) - medium dense, moist				19	8.8	111	SA
10	3	very loose, saturated from 11'							
		water level at 12', 2:35 pm, 05/08/12							
	4								
15	5	greyish green-white, loose, saturated from 17'				5	30.4	94	SA
20	6								
	7	greyish brown-white, medium dense, with shell fragments at 22'				12	60.5	64	SA
25	8	light grey-white at 27'				12	38.1	84	SA
30	9	loose from 31'							
	10	poorly graded sand, with silt from 32'				10	41.3	81	SA
35									

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 399.33 Date 05/15/12

LOG OF TEST BORING 1
AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

PLATE 2

LOG OF TEST BORING 1

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE May 07, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, kg/cu.m	LABORATORY TESTS
35	11								
	12								
40									
	13					7			
45									
	14								
		very loose from 48'							
50	15								
	16	silty sand, loose, from 53'				3	49.8	73	SA
55									
	17								
	18								
60									
	19					5			
65									
	20								
	21								
70		medium dense from 69'							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 399.33 Date 05/15/12

LOG OF TEST BORING 1 (continued)

AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

PLATE 2 (cont'd)

LOG OF TEST BORING 1

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE May 07, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, kg/cu.m	LABORATORY TESTS
70									
	22	GREYISH GREEN GRAVELLY ELASTIC SILT (MH) - stiff, saturated, with tuffaceous siltstone fragments				12	71.4	54	SA
75	23								
	24	BROWNISH BEIGE TUFFACEOUS SILTSTONE - hard							
80									
	25					80/5"			
85	26								
	27					61/3"			
90									

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 399.33 Date 05/15/12

LOG OF TEST BORING 1 (continued)

AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

PLATE 2 (cont'd)

LOG OF TEST BORING 2

Notes:

- Relatively Undisturbed Sample
- Disturbed/Bulk Sample
- SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE May 04, 2012
EQUIPMENT 8" Dia. Hollow Stem Auger
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, kg/cu.m	LABORATORY TESTS
0	0	6" THICK ASPHALT PAVEMENT				
		LIGHT BROWN-WHITE SILTY LIMESTONE GRAVEL WITH SAND (GM) - medium dense, moist	16	6.5	105	
5	1					
	2		14			
10	3	GREYISH GREEN-BROWN-WHITE POORLY GRADED SAND WITH SILT (SP-SM) - very loose, saturated, with occasional gravel water level at 11.9', 4:16 pm, 05/04/12	3			
	4					
15	5	DARK GREYISH GREEN-BLACK SANDY ELASTIC SILT (MH) - medium stiff, saturated (Hammer sank 6" at 17')	5			
20	6					
		GREYISH WHITE SILTY SAND (SM) - very loose, saturated, with shell fragments	3			
25	7					
	8	light greyish white, loose from 27'	7	47.2	74	SA
30	9					
	10		5			
35						

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 399.33 Date 05/15/12

LOG OF TEST BORING 2
AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

PLATE 3

LOG OF TEST BORING 2

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE May 04, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, kg/cu.m	LABORATORY TESTS
35	11								
	12								
40						4	43.4	78	SA
	13								
45									
	14								
	15								
50		very loose from 50'							
	16					3			
55									
	17								
	18								
60									
	19	LIGHT GREY-WHITE SANDY ELASTIC SILT (MH) - soft, saturated hammer sank 12" at 62'				3	52.2	71	SA
65	20								
	21								
70									

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 399.33 Date 05/15/12

LOG OF TEST BORING 2 (continued)

AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

PLATE 3 (cont'd)

LOG OF TEST BORING 2

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE May 04, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, kg/cu.m	LABORATORY TESTS
70	22	dark greyish black from 72', hammer sank 12" at 72'				3	65.3	60	SA PI=13; LL=58
75	23								
	24	dark greyish green, medium stiff from 78'							
80	25					5			
85	26								
	27	DARK GREYISH GREEN-BLACK TUFFACEOUS SANDSTONE - weak							
90	28					24			
95	29	LIGHT BLUE-GREY-BROWN TUFFACEOUS SILTSTONE - hard							
	30								
100	31					10/0"	33.5	85	

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 399.33 Date 05/15/12

LOG OF TEST BORING 2 (continued)

AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

PLATE 3 (cont'd)

LOG OF TEST BORING 3

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE May 03, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, kg/cu.m	LABORATORY TESTS
0	0	3" THICK ASPHALT PAVEMENT							
		LIGHT BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - hard, moist							
	1	LIGHT BROWN-WHITE-GREY SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist				37	10.1	118	
5									
	2	MOTTLED REDDISH BROWN-GREY-GREEN-WHITE SILTY SAND WITH GRAVEL (SM) - loose, moist				7	15.2	102	SA PI=15; LL=46 Tx=1321(400)
10	3	water level at 9.7', 3:00 pm, 05/03/12							
		DARK GREY-BLACK-WHITE SILTY LIMESTONE CORAL GRAVEL WITH SAND (GM) - loose, saturated				9	55.3		SA
	4	(Added catcher to sampler) dark greyish black-white, with coral gravel at 12'							
15		GREYISH WHITE CLAYEY SILTY SAND (SM) - very loose, saturated							
	5					2			
20	6								
	7	LIGHT BROWN-WHITE SANDY CORAL GRAVEL AND COBBLES (GP) - very dense, saturated, with shell fragments				76/10"			

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 399.33 Date 05/15/12

LOG OF TEST BORING 3
AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

PLATE 4

LOG OF TEST BORING 4

Notes:

- Relatively Undisturbed Sample
- Disturbed/Bulk Sample
- SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE May 03, 2012
EQUIPMENT 8" Dia. Hollow Stem Auger
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE / DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, kg/cu.m	LABORATORY TESTS
0	0	RED-BROWN-WHITE SILTY LIMESTONE GRAVEL WITH SAND (GM) - dense, moist, short grass on surface						
	1				41	2.8	115	
5								
	2	medium dense from 6'						
		water level at 7'-9", 1:20 pm, 05/30/12			26			
10	3	DARK GREYISH GREEN-BLACK-SPOTTED WHITE SANDY ELASTIC SILT (MH) - soft, saturated						
		hammer sank 10" at 12'						
	4				3			
15								
	5	DARK GREY-RED SILTY SAND (SM) - very loose, saturated, lagoonal soils, with odor			2	47.3	71	SA PI=21; LL=63 Consol
20	6							
	7	LIGHT BROWN-WHITE SANDY CORAL GRAVEL AND COBBLES (GP) - very dense, saturated			68			

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 399.33 Date 05/12/12

LOG OF TEST BORING 4
AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

PLATE 5

MAJOR DIVISIONS			SYMBOL		TYPICAL NAMES
COARSE GRAINED SOILS (MORE THAN HALF IS LARGER THAN # 200 SIEVE)	GRAVELS (MORE THAN HALF COARSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE)	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVEL, WELL-GRADED GRAVEL WITH SAND
			GP		POORLY GRADED GRAVEL, POORLY GRADED GRAVEL WITH SAND
		GRAVELS WITH OVER 12 % FINES	GM		SILTY GRAVEL, SILTY GRAVEL WITH SAND
			GC		CLAYEY GRAVEL, CLAYEY GRAVEL WITH SAND
	SANDS (MORE THAN HALF COARSE FRACTION IS SMALLER THAN No. 4 SIEVE SIZE)	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL-GRADED SAND, WELL-GRADED SAND WITH GRAVEL
			SP		POORLY GRADED SAND, POORLY GRADED SAND WITH GRAVEL
		SANDS WITH OVER 12 % FINES	SM		SILTY SAND, SILTY SAND WITH GRAVEL
			SC		CLAYEY SAND, CLAYEY SAND WITH GRAVEL
FINE GRAINED SOILS (MORE THAN HALF IS SMALLER THAN # 200 SIEVE)	SILTS AND CLAYS (LIQUID LIMIT LESS THAN 50)		ML		SILT, SILT WITH SAND OR GRAVEL, SANDY OR GRAVELLY SILT
			CL		LEAN CLAY, LEAN CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY LEAN CLAY
			OL		ORGANIC SILT OR CLAY, ORGANIC SILT OR CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY ORGANIC SILT OR CLAY
	SILTS AND CLAYS (LIQUID LIMIT GREATER THAN 50)		MH		ELASTIC SILT, ELASTIC SILT WITH SAND OR GRAVEL, SANDY OR GRAVELLY ELASTIC SILT
			CH		FAT CLAY, FAT CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY FAT CLAY
			OH		ORGANIC SILT OR CLAY, ORGANIC SILT OR CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY ORGANIC SILT OR CLAY
HIGHLY ORGANIC SOILS			Pt		PEAT AND OTHER HIGHLY ORGANIC SOILS

UNIFIED SOIL CLASSIFICATION SYSTEM

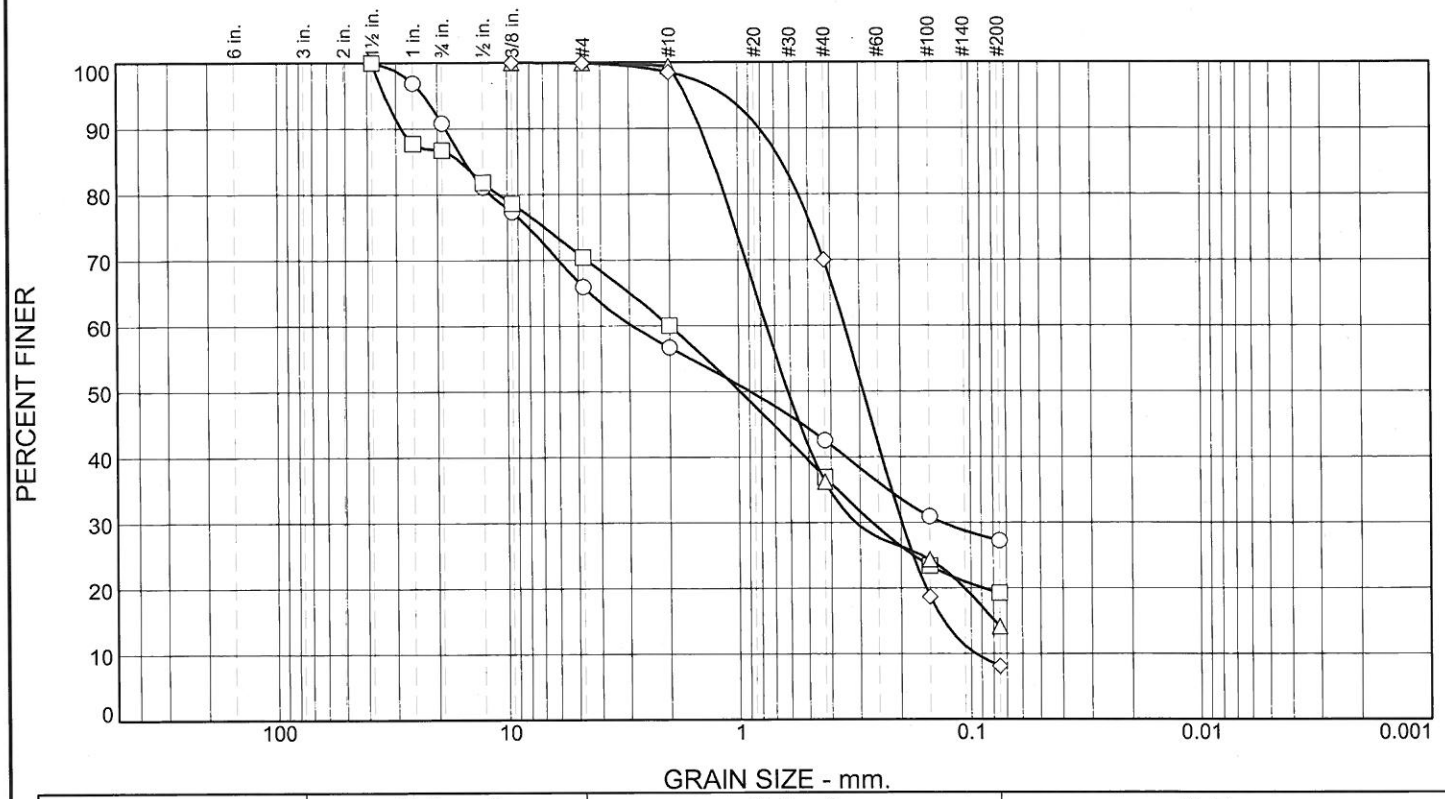
SA	=	Sieve Analysis (ASTM C117/C136)
LL	=	Liquid Limit (ASTM D4318)
PI	=	Plasticity Index (ASTM D4318)
Consol	=	Consolidation (ASTM D4186)
Compaction	=	Compaction (ASTM D698)
CBR	=	California Bearing Ratio (ASTM D1883)
Tx	=	Triaxial Shear Strength Unconsolidated/ Undrained (ASTM D2850)

BLOW COUNTS REPORTED FOR UNDISTURBED SAMPLES ARE CORRECTED TO REPRESENT EQUIVALENT STANDARD PENETRATION TEST BLOWS PER 305 MILLIMETERS (FOOT)

☒ DISTURBED SAMPLE ■ RELATIVELY UNDISTURBED SAMPLE

GEO-ENGINEERING & TESTING, INC. **Geotechnical & Material Testing Engineers**	**SOIL CLASSIFICATION CHART AND KEY TO TEST DATA**	**PLATE**
Job No. 399.33 Appr. U.S. Date: 05/15/12	AJAYAN BRIDGE REPLACEMENT MERIZO GUAM	**6**

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	9	25	9	15	15	27	
□	0	13	17	10	23	18	19	
△	0	0	0	1	63	22	14	
◇	0	0	0	2	28	62	8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			15.2179	2.9231	0.8972	0.1326				
□			15.8819	2.0000	0.9896	0.2662				
△			1.2794	0.7587	0.6139	0.3134	0.0790			
◇			0.6488	0.3468	0.2883	0.1977	0.1312	0.0956	1.18	3.63

	Material Description	USCS	AASHTO
○	LIGHT BROWN-WHITE SILTY SAND WITH LIMESTONE GRAVEL	SM	
□	GREYISH GREEN-WHITE SILTY SAND WITH LIMESTONE GRAVEL	SM	
△	LIGHT GREY-WHITE SILTY SAND WITH LIMESTONE GRAVEL	SM	
◇	LIGHT BROWN-WHITE SILTY SAND WITH LIMESTONE GRAVEL	SM	

Project No. 399.33 **Client:** N. C. Macario & Associates

Project: AJAYAN BRIDGE REPLACEMENT

○ **Source of Sample:** 1 **Depth:** 7.5

□ **Source of Sample:** 1 **Depth:** 17 & 23

△ **Source of Sample:** 1 **Depth:** 28

◇ **Source of Sample:** 1 **Depth:** 32.5

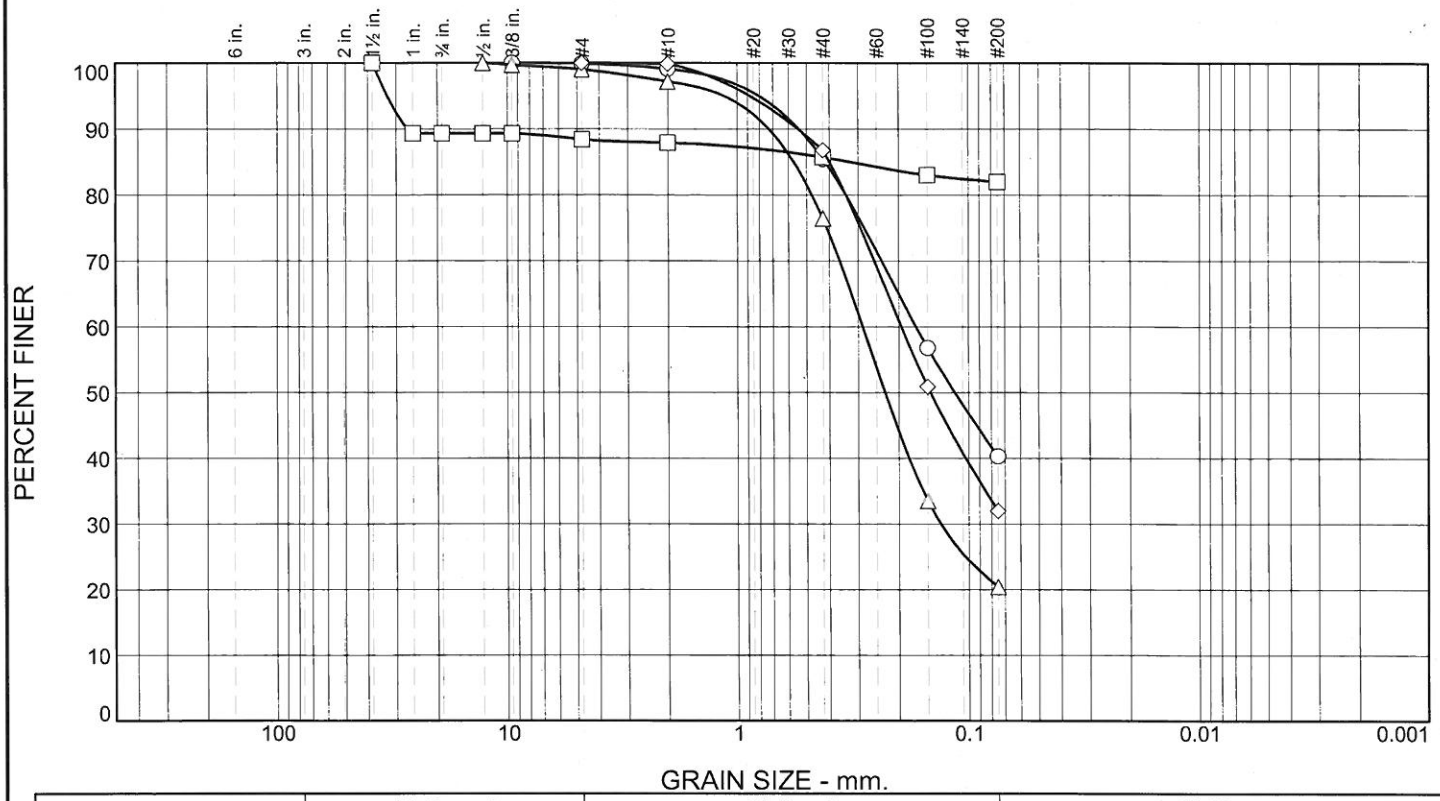
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Plate 7

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	0	1	13	46	40	
□	0	11	1	0	2	4	82	
△	0	0	1	2	21	56	20	
◇	0	0	0	0	13	55	32	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.4154	0.1684	0.1147					
□			0.3262							
△			0.5684	0.2860	0.2292	0.1322				
◇			0.3980	0.1946	0.1459					

	Material Description	USCS	AASHTO
○	LIGHT BROWN-WHITE SILTY SAND WITH LIMESTONE GRAVEL	SM	
□	GREYISH GREEN GRAVELLY ELASTIC SILT	MH	
△	LIGHT GREYISH WHITE SANDY ELASTIC SILT	SM	
◇	GREYISH WHITE SILTY SAND	SM	

Project No. 399.33 **Client:** N. C. Macario & Associates

Project: AJAYAN BRIDGE REPLACEMENT

○ **Source of Sample:** 1 **Depth:** 53

□ **Source of Sample:** 1 **Depth:** 72.5

△ **Source of Sample:** 2 **Depth:** 27.5

◇ **Source of Sample:** 2 **Depth:** 42

Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Plate 8

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	0	0	4	18	78	
□	0	0	1	0	2	5	92	
△	0	12	12	7	17	18	34	
◇	0	20	22	6	11	14	27	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1362							
□	58	45								
△	46	31	14.7829	0.8251	0.3816					
◇			26.3242	6.9953	1.5142	0.1541				

Material Description	USCS	AASHTO
○ LIGHT GREY-WHITE SANDY ELASTIC SILT	MH	
□ DARK GREYISH BLACK SANDY ELASTIC SILT	MH	
△ MOTTLED REDDISH BROWN-GREY-GREEN-WHITE SILTY SAND WITH GRAVEL	SM	
◇ DARK GREY-BLACK-WHITE SILTY LIMESTONE CORAL GRAVEL WITH SAND	GM	

Project No. 399.33 **Client:** N. C. Macario & Associates

Project: AJAYAN BRIDGE REPLACEMENT

○ **Source of Sample:** 2 **Depth:** 63

□ **Source of Sample:** 2 **Depth:** 73

△ **Source of Sample:** 3 **Depth:** 8

◇ **Source of Sample:** 3 **Depth:** 12

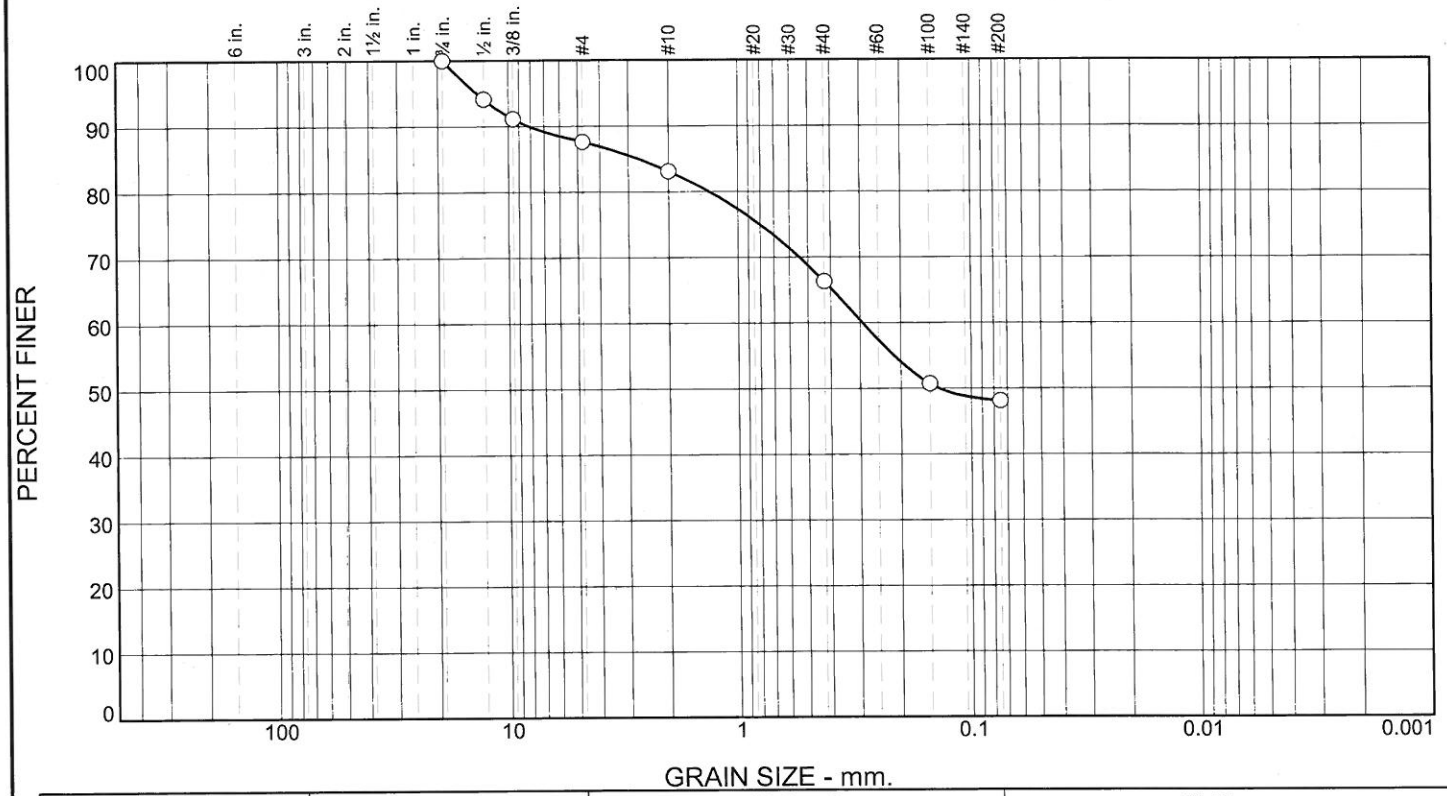
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Plate 9

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	0	12	5	17	18	48	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	63	42	2.7256	0.2922	0.1372					

	Material Description	USCS	AASHTO
○	DARK GREY-RED SILTY SAND	SM	

Project No. 399.33 **Client:** N. C. Macario & Associates

Project: AJAYAN BRIDGE REPLACEMENT

○ **Source of Sample:** 4 **Depth:** 18

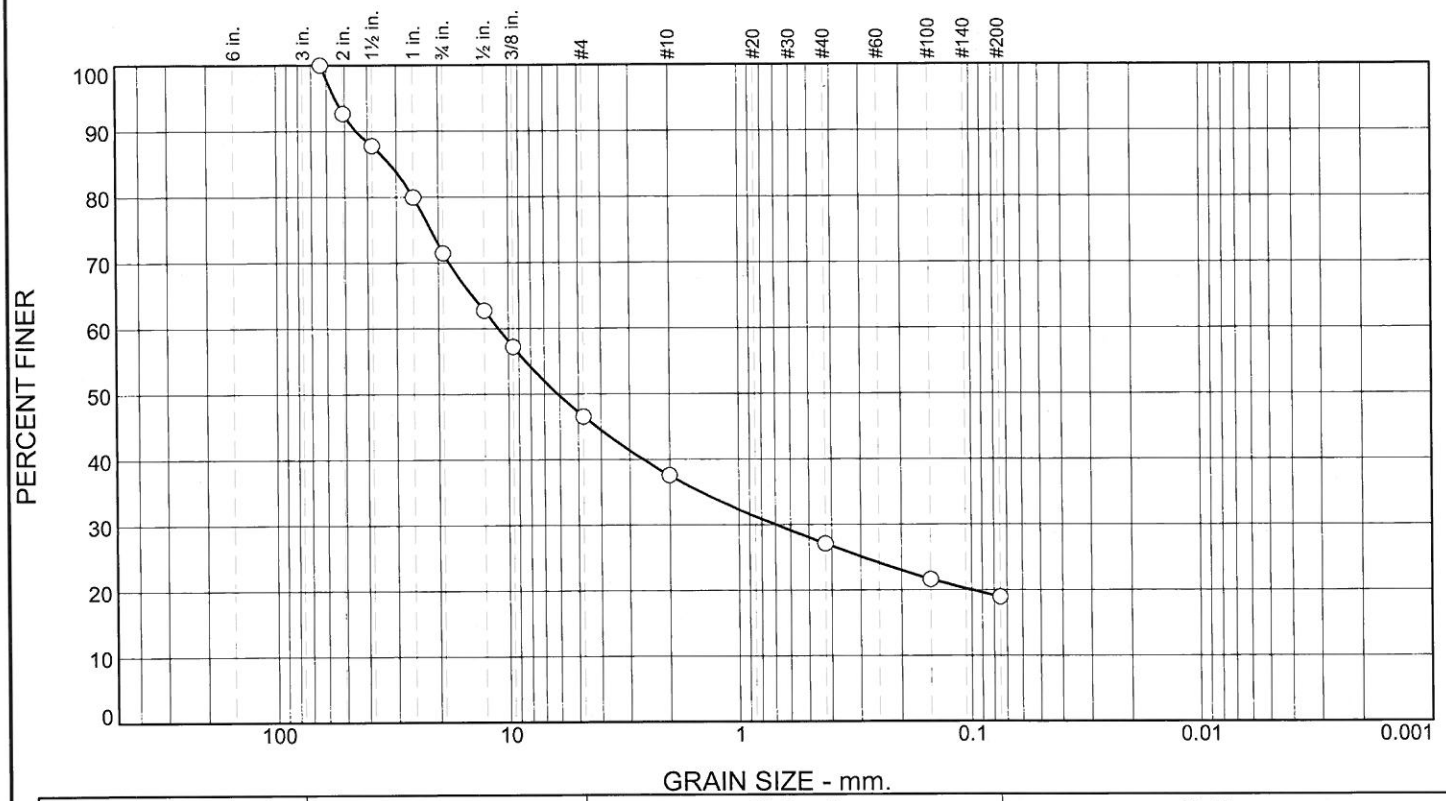
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Plate 10

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	29	24	9	11	8	19	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	43	30	31.9336	11.0354	6.1339	0.6983				

Material Description	USCS	AASHTO
○ LIGHT BROWN-WHITE SILTY LIMESTONE GRAVEL WITH SAND	GM	

Project No. 399.33 **Client:** N. C. Macario & Associates

Project: AJAYAN BRIDGE REPLACEMENT

○ **Source of Sample:** Bulk Sample **Depth:** 1.5

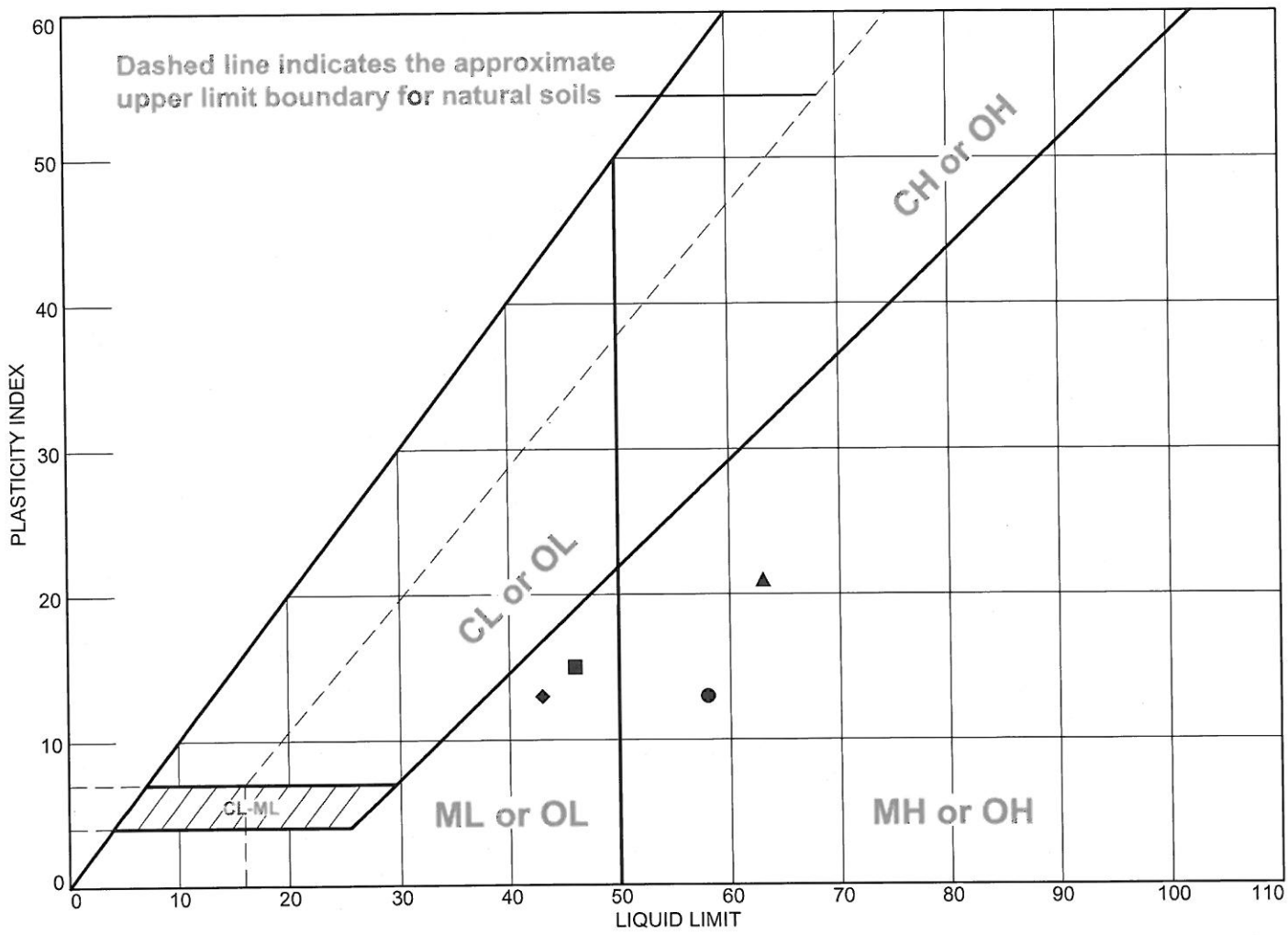
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Plate 11

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	DARK GREYISH BLACK SANDY ELASTIC SILT	58	45	13	97	92	MH
■	MOTTLED REDDISH BROWN-GREY-GREEN-WHITE SILTY SAND WITH GRAVEL	46	31	15	52	34	SM
▲	DARK GREY-RED SILTY SAND	63	42	21	66	48	SM
◆	LIGHT BROWN-WHITE SILTY LIMESTONE GRAVEL WITH SAND	43	30	13	27	19	GM

Project No. 399.33 **Client:** N. C. Macario & Associates

Project: AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

● **Source of Sample:** 2 **Depth:** 73

■ **Source of Sample:** 3 **Depth:** 8

▲ **Source of Sample:** 4 **Depth:** 18

◆ **Source of Sample:** Bulk Sample **Depth:** 1.5

Remarks:

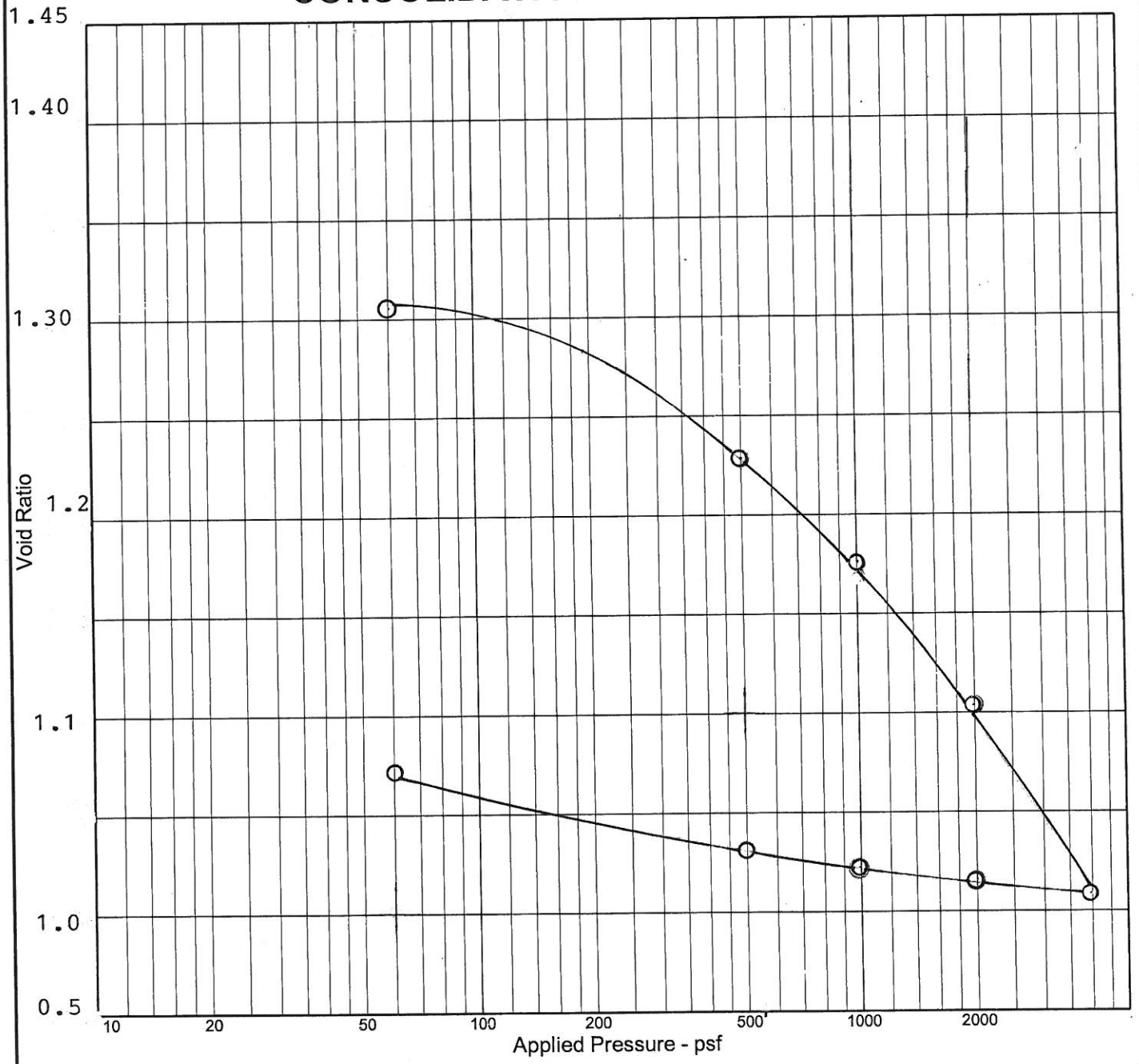
● This test was performed on sample portion passing No. 40 sieve only.

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Materials Testing Engineers

Plate 12

Tested By: C.Saspa **Checked By:** M.Rayo

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (psf)	P_c (psf)	C_c	Initial Void Ratio
Saturation	Moisture								
103.4 %	51.9 %	70.4	63	21	2.6	1428	545	0.409	1.306

MATERIAL DESCRIPTION	USCS	AASHTO
dark grey-red silty sand	SM	

Project No. 399.33 **Client:** N. C. Macario & Associates

Project: AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM

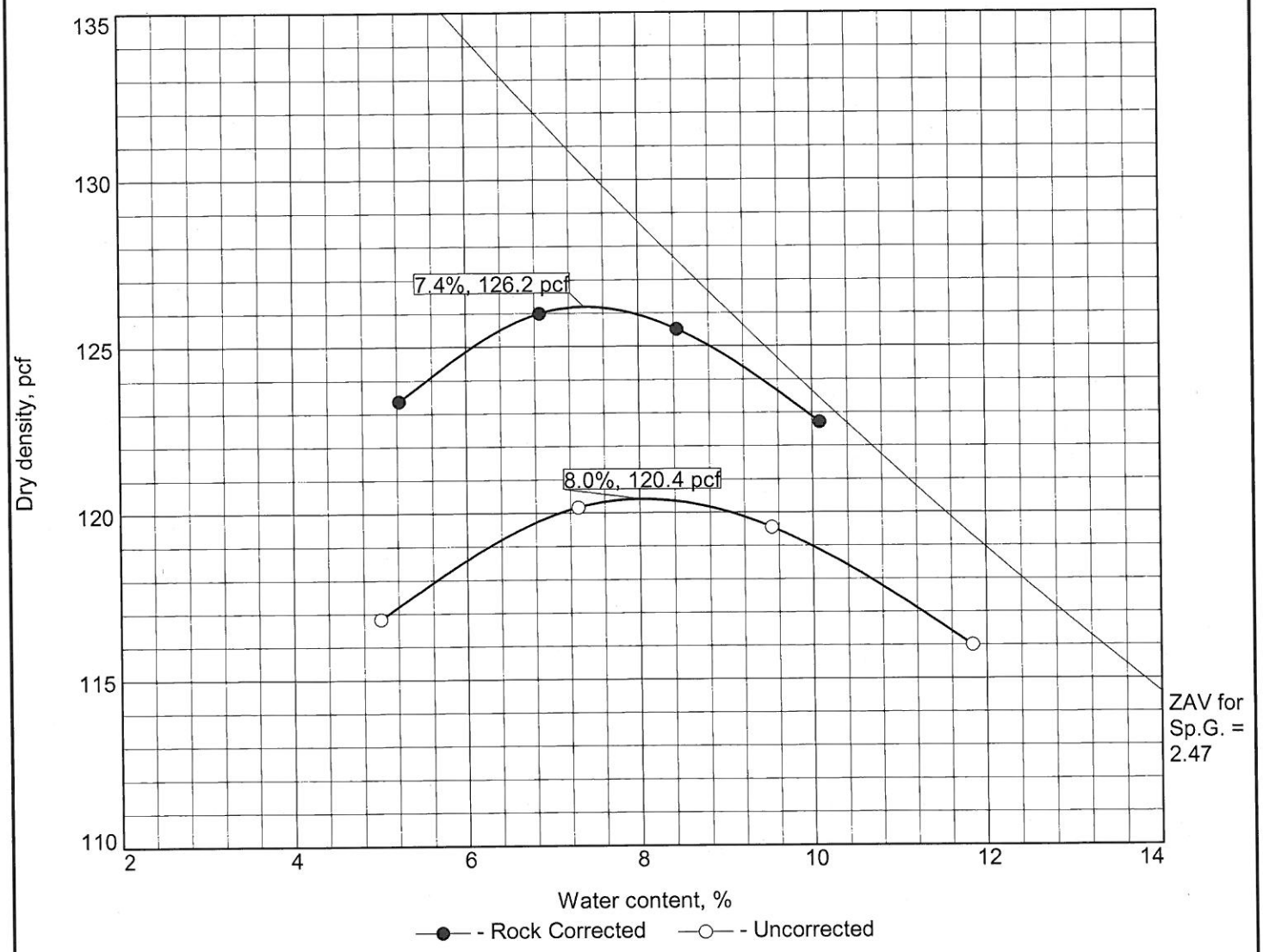
Source: 4 **Elev./Depth:** 18

Remarks:
specific gravity was assumed

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Materials Testing Engineers

Figure 13

COMPACTION TEST REPORT For Curve No. 1



Test specification: ASTM D 1557-07 Method C Modified
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
1.5	GM	A-2-7(0)	11.6	2.47	43	13	29	19

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 126.2 pcf	120.4 pcf	LIGHT BROWN-WHITE SILTY LIMESTONE GRAVEL WITH SAND
Optimum moisture = 7.4 %	8.0 %	

Project No. 399.33 **Client:** N. C. Macario & Associates
Project: AJAYAN BRIDGE REPLACEMENT
MERIZO, GUAM **Date:** 5-22-12
○ **Source of Sample:** Bulk Sample **Depth:** 1.5

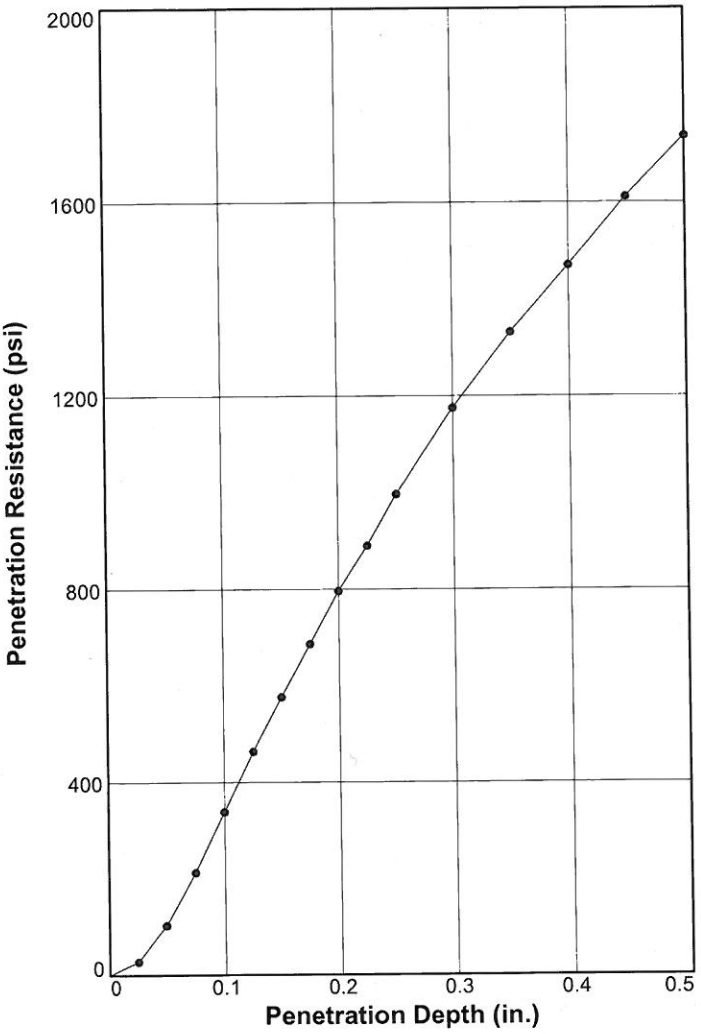
GEO-ENGINEERING & TESTING, INC.
Geotechnical & Materials Testing Engineers

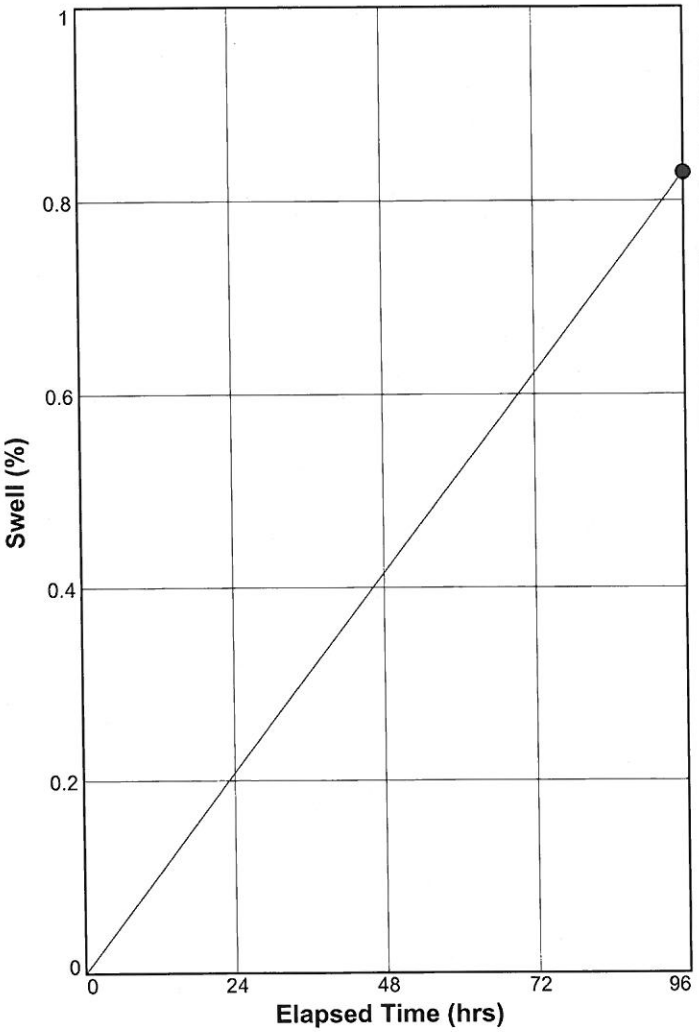
Remarks:

Plate 14

Tested By: C.Saspa **Checked By:** M.Rayo

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	120.5	95.5	9.1	119.5	94.7	12.7	46.7	59.6	0.026	10	0.8
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
LIGHT BROWN-WHITE SILTY LIMESTONE GRAVEL WITH SAND	GM	126.2	7.4	43	13

Project No: 399.33

Project: AJAYAN BRIDGE REPLACEMENT MERIZO, GUAM

Source of Sample: Bulk Sample **Depth:** 1.5

Date:

Test Description/Remarks:

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Materials Testing Engineers

Plate 15