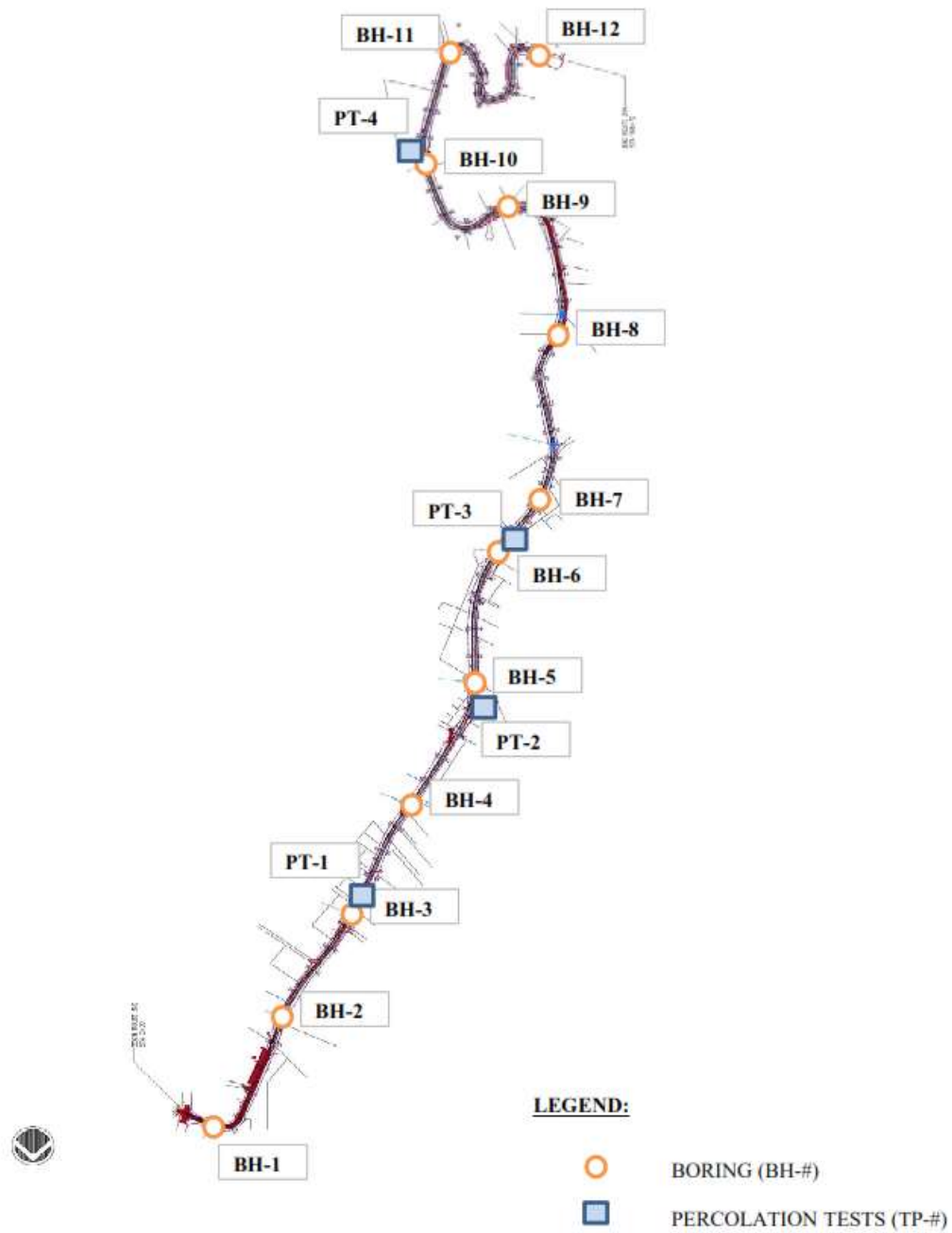


**ROUTE 310 (TAPOCHAU ROAD), ROUTE 38
(CHALAN GALAIDE) IMPROVEMENTS &
WATERLINE REPLACEMENTS, SAIPAN
Project No. TQ-THS-0310 (301)**

APPENDIX A

FIELD EXPLORATION BORING LOGS



Source: PEGS, LLC Boring Plan 2021

EXPLORATION LOCATION MAP
 DPW ROUTE 310 & CHALAN GALAIDE ROADWAY IMPROVEMENTS
 MT. TAPOCHAU, SAIPAN, CNMI

MGS
 MANAGAN GEOTECH SERVICES
 FIGURE 1A

MGS
MARILYN GUTENBERG SERVICES
FIGURE 1B

SOIL CLASSIFICATION CHART

Major Divisions			Symbol	Typical Names	Other Criteria
COARSE GRAINED SOILS More than 50% of material larger than No. 200 sieve size	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravel Little or no fines (<5%)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$Cu > 4$ and $1 <= Cc = 3$
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting Cu and Cc criteria for GW
		Gravels with Fines Appreciable amount of fines (>12%)	GM	Silty gravels, gravel-sand-silt mixtures	Atterberg limit below A-line or $PI < 4$
			GC	Clayey gravels, gravel-sand-silt mixtures	Atterberg limit above A-line with $PI > 7$
	Sands More than 50% of coarse fraction passing No. 4 sieve	Clean Gravel Little or no fines (<5%)	SW	Well-graded sands, gravelly sands, little or no fines	$Cu > 6$ and $1 <= Cc = 3$
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting Cu and Cc criteria for SW
		Gravels with Fines Appreciable amount of fines (>12%)	SM	Silty sands, sand-silt mixture	Atterberg limit below A-line or $PI < 4$
			SC	Clayey sands, sandy-clay mixture	Atterberg limit above A-line with $PI > 7$
FINE GRAINED SOILS More than 50% of material smaller than No. 200 sieve size	Silts and Clays Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	Atterberg limit below A-line
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clay	Atterberg limit above A-line
			OL	Organic silts and organic silty clays flow plasticity	Atterberg limit below A-line
	Silts and Clays Liquid limit larger than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	Atterberg limit below A-line
			CH	Inorganic clays of high plasticity, fat clays	Atterberg limit above A-line
			OH	Organic clays of high plasticity, organic silts	Atterberg limit below A-line
			HIGHLY ORGANIC SOILS		Pt

Notes: 1. $Cu = D_{60}/D_{10}$, $Cc = (D_{30})^2/(D_{60} \times D_{10})$ where D_{60} , D_{30} and D_{10} are diameters associated with 60%, 30% and 10% smaller in gradation curves.
2. Dual symbols are used to indicate borderline classification such as GM-SM.

LOG LEGEND



Bulk/Grab/Hand Auger Sample



2-inch Split Spoon

SA

Sieve Analysis

-#200

Percent Passing No. 200 Sieve

Proctor

Laboratory Compaction of Soils

CBR

California Bearing Ratio

SOIL CLASSIFICATION CHART AND LOG LEGEND







DPW ROUTE 310 & CHALAN GALAIDE ROADWAY IMPROVEMENTS
MT. TAPOCHAU, SAIPAN, CNMI

MGS
MARIANAS GEOTECH SERVICES
FIGURE 2

LOG OF BORING BH-1

PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS
 CLIENT: PEGS, LLC
 LOCATION: MT. TAPOCHAU, SAIPAN, MP
 DRILLER: MGS, LLC
 DRILL EQUIP: DIEDRICH D-25D
 GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015
 DATE: 3/10/21
 ELEVATION: -
 LOGGED BY: MGS, LLC
 HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.
 DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0					2.5-INCH ASPHALT CONCRETE PAVEMENT					
3	1		35		WHITE SANDY GRAVEL (GM), DENSE, MOIST	9.4	96.5			
6					BECOMES LIGHT BROWN					
9	2		12		BECOMES MEDIUM DENSE	8.7				
12					BECOMES LIGHT BROWN TO WHITE					
12					LIGHT BROWN CORALLINE LIMESTONE, WEAK					
15	3		30/3"		BECOMES MODERATELY HARD TO HARD	7.6				
15					BORING BH-1 COMPLETED AT 14.25 FEET BGS ON 3/10/21.					
18										
21										



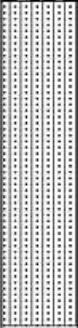

(NO FREE WATER ENCOUNTERED)

FIGURE 5

LOG OF BORING BH-2

PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS
 CLIENT: PEGS, LLC
 LOCATION: MT. TAPOCHAU, SAIPAN, MP
 DRILLER: MGS, LLC
 DRILL EQUIP: DIEDRICH D-25D
 GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015
 DATE: 3/10/21
 ELEVATION: -
 LOGGED BY: MGS, LLC
 HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.
 DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0	1		35		WHITE SILTY SANDY GRAVEL (GM), MEDIUM DENSE, DRY TO MOIST BECOMES DARK BROWN, DENSE	2.9				
3					LIGHT BROWN TO WHITE SILTY SAND WITH GRAVEL (SM), DENSE, DRY TO MOIST					
6	2		34			8.8				
9					BH-2 COMPLETED AT 8 FEET BGS ON 3/10/21.					
12										
15										
18										
21										




(NO FREE WATER ENCOUNTERED)

FIGURE 6

LOG OF BORING BH-3

PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS
 CLIENT: PEGS, LLC
 LOCATION: MT. TAPOCHAU, SAIPAN, MP
 DRILLER: MGS, LLC
 DRILL EQUIP: DIEDRICH D-25D
 GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015
 DATE: 3/11/21
 ELEVATION: -
 LOGGED BY: MGS, LLC
 HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.
 DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0					WHITE SANDY GRAVEL (GM), LOOSE, DRY					
1	1				WHITE CORALLINE LIMESTONE, MODERATELY HARD					SAMPLER BENDING/ REFUSAL
3										
6										
9										
12										
15										
18										
21										

(NO FREE WATER ENCOUNTERED)

FIGURE 7

LOG OF BORING BH-4

PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS
 CLIENT: PEGS, LLC
 LOCATION: MT. TAPOCHAU, SAIPAN, MP
 DRILLER: MGS, LLC
 DRILL EQUIP: DIEDRICH D-25D
 GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015
 DATE: 3/10/21
 ELEVATION: -
 LOGGED BY: MGS, LLC
 HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.
 DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0					WHITE SANDY GRAVEL (GM), MEDIUM DENSE, MOIST					
3	1		15/1"		WHITE CORALLINE LIMESTONE, MODERATELY HARD TO HARD					REFUSAL
6										
9	2		20/2"		BORING BH-4 COMPLETED AT 8.5 FEET BGS ON 3/10/ 21.					REFUSAL
12										
15										
18										
21										





(NO FREE WATER ENCOUNTERED)

FIGURE 8

LOG OF BORING BH-5

PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS
 CLIENT: PEGS, LLC
 LOCATION: MT. TAPOCHAU, SAIPAN, MP
 DRILLER: MGS, LLC
 DRILL EQUIP: DIEDRICH D-25D
 GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015
 DATE: 3/10/21
 ELEVATION: -
 LOGGED BY: MGS, LLC
 HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.
 DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0					LIGHT BROWN TO WHITE SANDY GRAVEL (GM), MEDIUM DENSE, DRY TO MOIST					ENCOUNTERED ABANDONED 4-INCH LINE AT 16-INCH BGS
					GRAYISH BROWN SAND (SP), MEDIUM DENSE, MOIST					
3	1		55/10"		ORANGISH YELLOWISH WHITE CORALLINE LIMESTONE, WEAK TO HARD BECOMES HARD	10.1	94.8			
6										
9										
12					BH-5 COMPLETED AT 10 FEET BGS ON 3/10/21.					
15										
18										
21										

(NO FREE WATER ENCOUNTERED)

FIGURE 9

LOG OF BORING BH-6

PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS
 CLIENT: PEGS, LLC
 LOCATION: MT. TAPOCHAU, SAIPAN, MP
 DRILLER: MGS, LLC
 DRILL EQUIP: DIEDRICH D-25D
 GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015
 DATE: 3/10/21
 ELEVATION: -
 LOGGED BY: MGS, LLC
 HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.
 DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0					LIGHT TO DARK BROWN SANDY GRAVEL (GM), MEDIUM DENSE, DRY TO MOIST					
3	1		15		DARK BROWN SANDY SILT WITH GRAVEL (MH), MEDIUM STIFF, MOIST BECOMES STIFF	51.7	56.3	61	18	#200=90.3% PROCTOR, CBR
6										
9	2		13			56.2				
12										
15					SOME GRAVEL					
18										
21					BORING BH-6 COMPLETED AT 19.5 FEET BGS ON 3/10/21.					

(NO FREE WATER ENCOUNTERED)

FIGURE 10

LOG OF BORING BH-7

PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS
 CLIENT: PEGS, LLC
 LOCATION: MT. TAPOCHAU, SAIPAN, MP
 DRILLER: MGS, LLC
 DRILL EQUIP: DIEDRICH D-25D
 GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015
 DATE: 3/11/21
 ELEVATION: -
 LOGGED BY: MGS, LLC
 HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.
 DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0					LIGHT BROWN SANDY GRAVEL (GM), LOOSE, DRY					
	1	■			DARK BROWN CLAYEY SILT (MH), MEDIUM STIFF, MOIST	1.1	134.8			SAMPLER BENDING/ REFUSAL
3					PINKISH WHITE CORALLINE LIMESTONE, MODERATELY HARD					
6										
	2	■	10/0"							REFUSAL
9					BH-7 COMPLETED AT 7 FEET BGS ON 3/11/21.					
12										
15										
18										
21										

(NO FREE WATER ENCOUNTERED)

FIGURE 11

LOG OF BORING BH-8

PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS

CLIENT: PEGS, LLC

LOCATION: MT. TAPOCHAU, SAIPAN, MP

DRILLER: MGS, LLC

DRILL EQUIP: DIEDRICH D-25D

GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015





DATE: 3/10/21

ELEVATION: -

LOGGED BY: MGS, LLC

HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.

DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0					YELLOWISH LIGHT BROWN SILTY SAND WITH GRAVEL (SM), MEDIUM DENSE, DRY TO MOIST					
					BECOMES LIGHT BROWN					
3	1		37/6"		BECOMES VERY DENSE	8.5				REFUSAL
6					DARK BROWN SANDY CLAYEY SILT (MH), STIFF, MOIST					
9	2		27		BECOMES VERY STIFF	45.3				
					PINKISH WHITE CORALLINE LIMESTONE, WEAK	5.7	91.0			
					BORING BH-8 COMPLETED AT 10 FEET BGS ON 3/10/21.					
12										
15										
18										
21										





(NO FREE WATER ENCOUNTERED)

FIGURE 12

LOG OF BORING BH-9

PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS
 CLIENT: PEGS, LLC
 LOCATION: MT. TAPOCHAU, SAIPAN, MP
 DRILLER: MGS, LLC
 DRILL EQUIP: DIEDRICH D-25D
 GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015
 DATE: 3/10/21
 ELEVATION: -
 LOGGED BY: MGS, LLC
 HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.
 DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0					VEGETATION WITH TOP SOIL					
3	1		9		REDDISH BROWN SILT (ML), STIFF, MOIST	46.5	71.5	49	6	
6										
9	2		40/5"		LIGHT BROWN TO WHITE CORALLINE LIMESTONE, MODERATELY HARD	9.1				REFUSAL
12										
15										
18										
21					BORING BH-9 COMPLETED AT 8.5 FEET BGS ON 3/10/21.					

(NO FREE WATER ENCOUNTERED)

FIGURE 13

LOG OF BORING BH-10

PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS

CLIENT: PEGS, LLC

LOCATION: MT. TAPOCHAU, SAIPAN, MP

DRILLER: MGS, LLC

DRILL EQUIP: DIEDRICH D-25D

GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015





DATE: 3/10/21

ELEVATION: -

LOGGED BY: MGS, LLC

HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.

DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0					LIGHT BROWN SANDY GRAVEL (GM), MEDIUM DENSE, DRY TO MOIST					
3	1		13		REDDISH BROWN SILT (ML), STIFF, MOIST	36.5		48	11	
9	2		2		BECOMES VERY SOFT					
					BORING BH-10 COMPLETED AT 10.5 FEET BGS ON 3/10/21.					POSSIBLE VOID AT 9.5' TO 10.5'
12										
15										
18										
21										

(NO FREE WATER ENCOUNTERED)







FIGURE 14

Marianas Geotech Services, LLC

LOG OF BORING BH-11

PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS
 CLIENT: PEGS, LLC
 LOCATION: MT. TAPOCHAU, SAIPAN, MP
 DRILLER: MGS, LLC
 DRILL EQUIP: DIEDRICH D-25D
 GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015
 DATE: 3/10/21
 ELEVATION: -
 LOGGED BY: MGS, LLC
 HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.
 DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0					LIGHT BROWN SANDY GRAVEL (GM), MEDIUM DENSE, DRY TO MOIST					
3	1				DARK BROWN CLAYEY SILT (MH), STIFF, MOIST POSSIBLE COBBLE					SAMPLER BENDING
6					SOME GRAVEL					
9	2				POSSIBLE COBBLE					SAMPLER BENDING
12					BORING BH-11 COMPLETED AT 9.5 FEET BGS ON 3/10/21.					
15										
18										
21										

(NO FREE WATER ENCOUNTERED)

FIGURE 15

LOG OF BORING BH-12

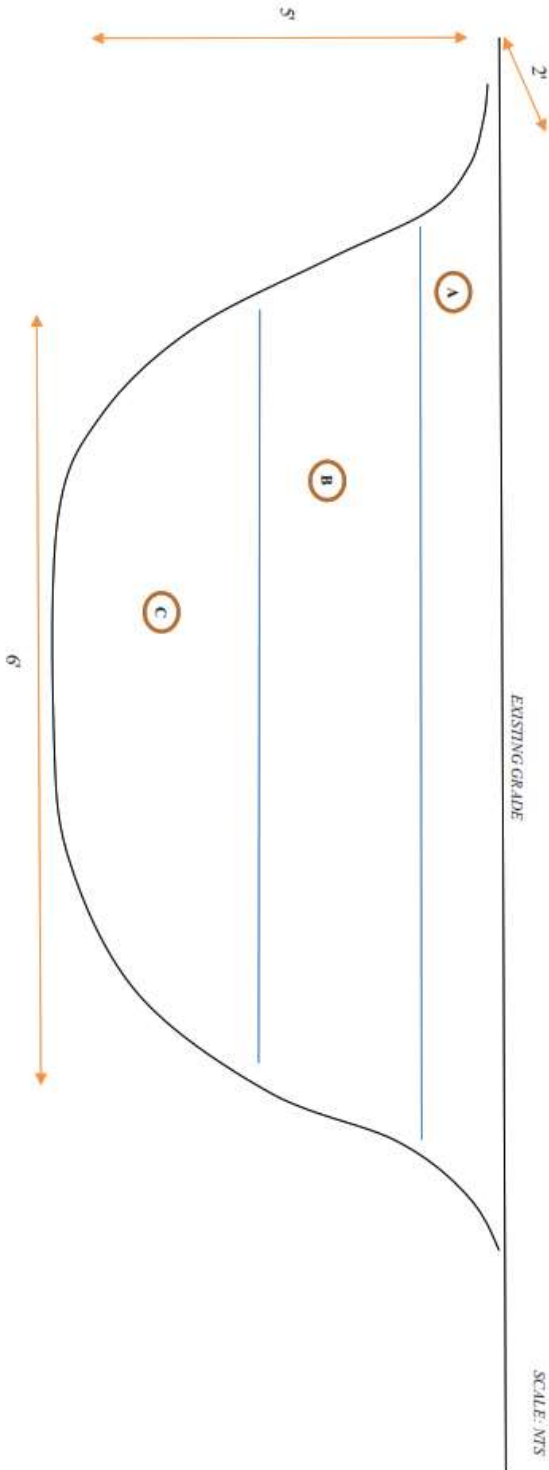
PROJECT: DPW ROUTE 310 ROADWAY IMPROVEMENTS
 CLIENT: PEGS, LLC
 LOCATION: MT. TAPOCHAU, SAIPAN, MP
 DRILLER: MGS, LLC
 DRILL EQUIP: DIEDRICH D-25D
 GROUNDWATER LEVEL / DATE: -

PROJECT NO.: 20-015
 DATE: 3/11/21
 ELEVATION: -
 LOGGED BY: MGS, LLC
 HAMMER TYPE / WEIGHT / DROP: AUTO / 140 LB / 30 IN.
 DRILLING METHOD: 4.5 IN. SSA

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLING RESISTANCE	GRAPHIC LOG	DESCRIPTION	WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT	PLASTICITY INDEX	OTHER TESTS AND REMARKS
0					VEGETATION WITH SANDY TOP SOIL					
					BLACK SANDY SILT WITH GRAVEL (ML), MEDIUM DENSE, MOIST					
					GRAYISH BROWN SANDY GRAVEL (GM), MEDIUM DENSE, MOIST					
3										
	1		5/0"		WHITE CORALLINE LIMESTONE, HARD					REFUSAL
6					BORING BH-12 COMPLETED AT 5.5 FEET ON 3/11/21.					
9										
12										
15										
18										
21										

(NO FREE WATER ENCOUNTERED)

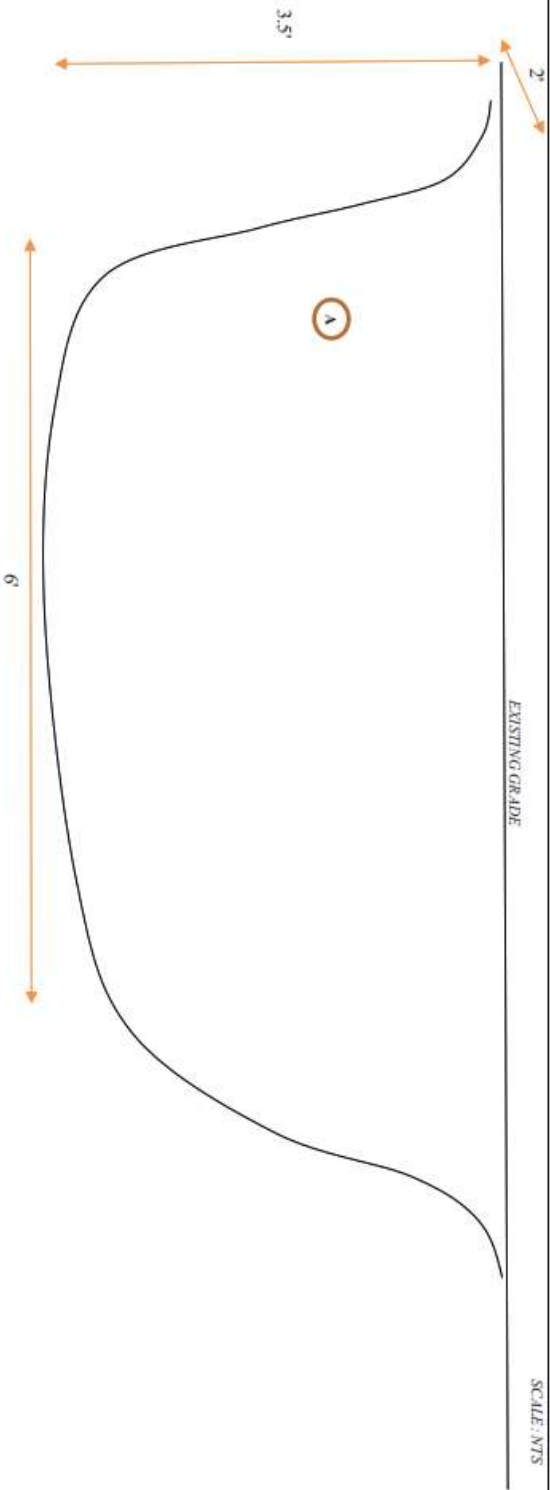
FIGURE 16

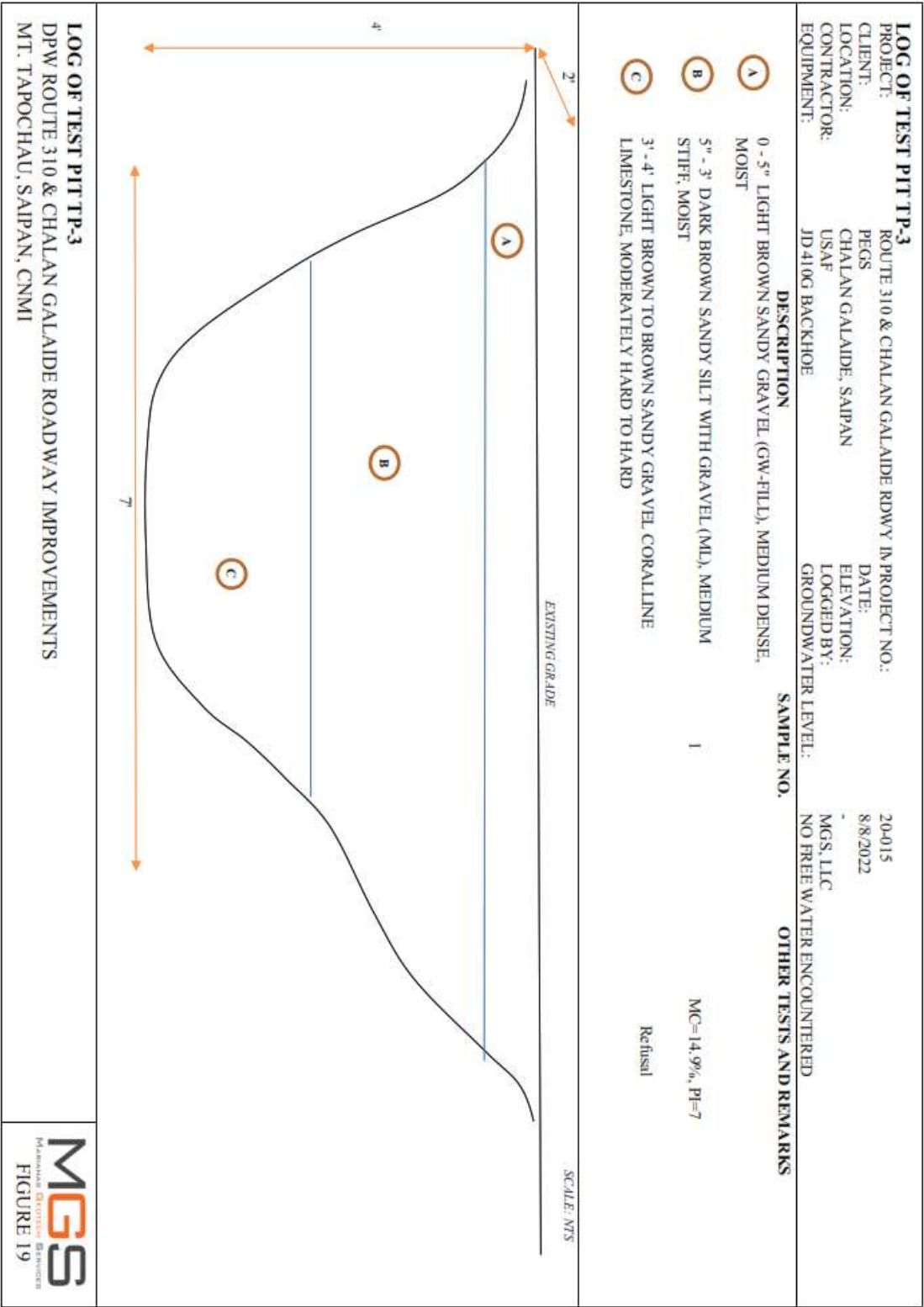
LOG OF TEST PIT TP-1			
PROJECT: ROUTE 310 & CHALAN GALAIDE RDWY IN PROJECT NO.:		204015	
CLIENT: PEGS	DATE:	8/8/2022	
LOCATION: CHALAN GALAIDE, SAIPAN	ELEVATION:	-	
CONTRACTOR: USAF	LOGGED BY: MGS, LLC	NO FREE WATER ENCOUNTERED	
EQUIPMENT: JD410G BACKHOE	GROUNDWATER LEVEL:		
DESCRIPTION	SAMPLE NO.	OTHER TESTS AND REMARKS	
<div><div>A</div>0 - 6" PINKISH WHITE SANDY GRAVEL (FILL), MEDIUM DENSE, MOIS</div>	1	MC=12.3%, #200= 5.3%, SA	
<div><div>B</div>6" - 3' BROWN SANDY CLAYEY SILTY GRAVEL (GP-GM), MEDIUM DENSE, MOIST</div>		Refusal	
<div><div>C</div>3' - 5' PINKISH WHITE TO LIGHT BROWN SANDY GRAVEL CORALLINE LIMESTONE, MODERATELY HARD TO HARD</div>			
			
LOG OF TEST PIT TP-1			
DPW ROUTE 310 & CHALAN GALAIDE ROADWAY IMPROVEMENTS			
MT. TAPOCHAU, SAIPAN, CNMI			
<div>MGS</div> <div>MARIANNE BERTSCH-BROWDER</div> <div>FIGURE 17</div>			

LOG OF TEST PIT TP-2

PROJECT:	ROUTE 310 & CHALAN GALAIDE RDWY IN PROJECT NO.:	20-015
CLIENT:	PEGS	DATE:
LOCATION:	CHALAN GALAIDE, SAIPAN	ELEVATION:
CONTRACTOR:	USAF	LOGGED BY:
EQUIPMENT:	JD 410G BACKHOE	GROUNDWATER LEVEL:

DESCRIPTION	SAMPLE NO.	OTHER TESTS AND REMARKS
0 - 3.5' WHITE TO LIGHT BROWN SANDY GRAVEL CORALLINE LIMESTONE, MODERATELY HARD	1	MC = 5.4%, #200 = 7.2%, S.A. Refusal





LOG OF TEST PIT TP-3
DPW ROUTE 310 & CHALAN GALAIDE ROADWAY IMPROVEMENTS
MT. TAPOCHAU, SAIPAN, CNMI

MGS
MARSHALL GEOTECHNICAL SERVICES
FIGURE 19