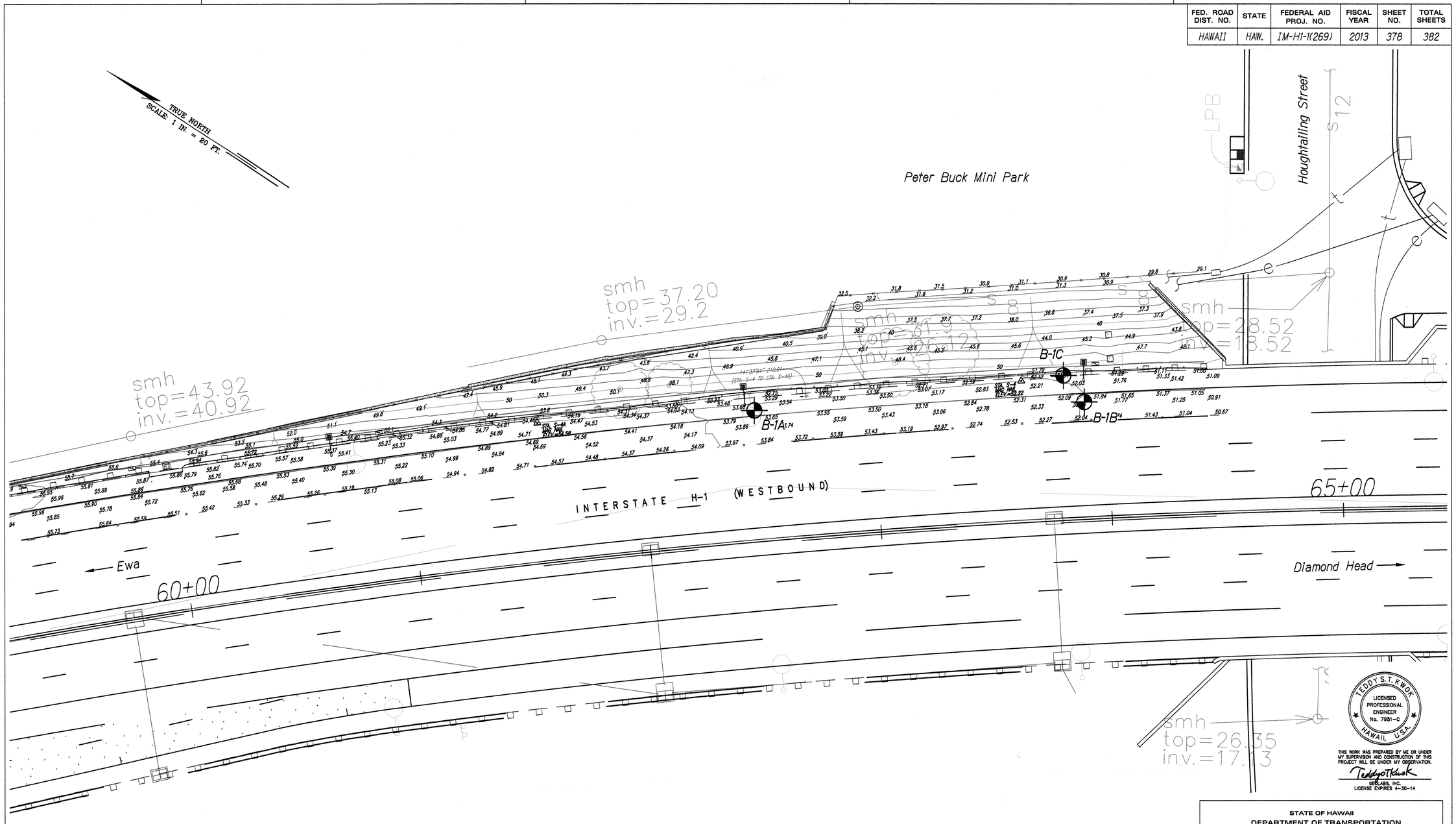
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(269)	2013	378	382



SURVEY PLOTTED BY _____ DATE
DRAWN BY _____
TRACED BY _____
DESIGNED BY _____
QUANTITIES BY _____
CHECKED BY _____

ORIGINAL PLAN
NOTE BOOK _____ No. _____

Legend:

Approximate Boring Location

0 10 20 40 60 Ft.
Graphic Scale

TEDDY S.T. KWOK
LICENSED PROFESSIONAL ENGINEER
No. 7951-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Teddy S.T. Kwok

GEOLABS, INC.
LICENSE EXPIRES 4-30-14

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

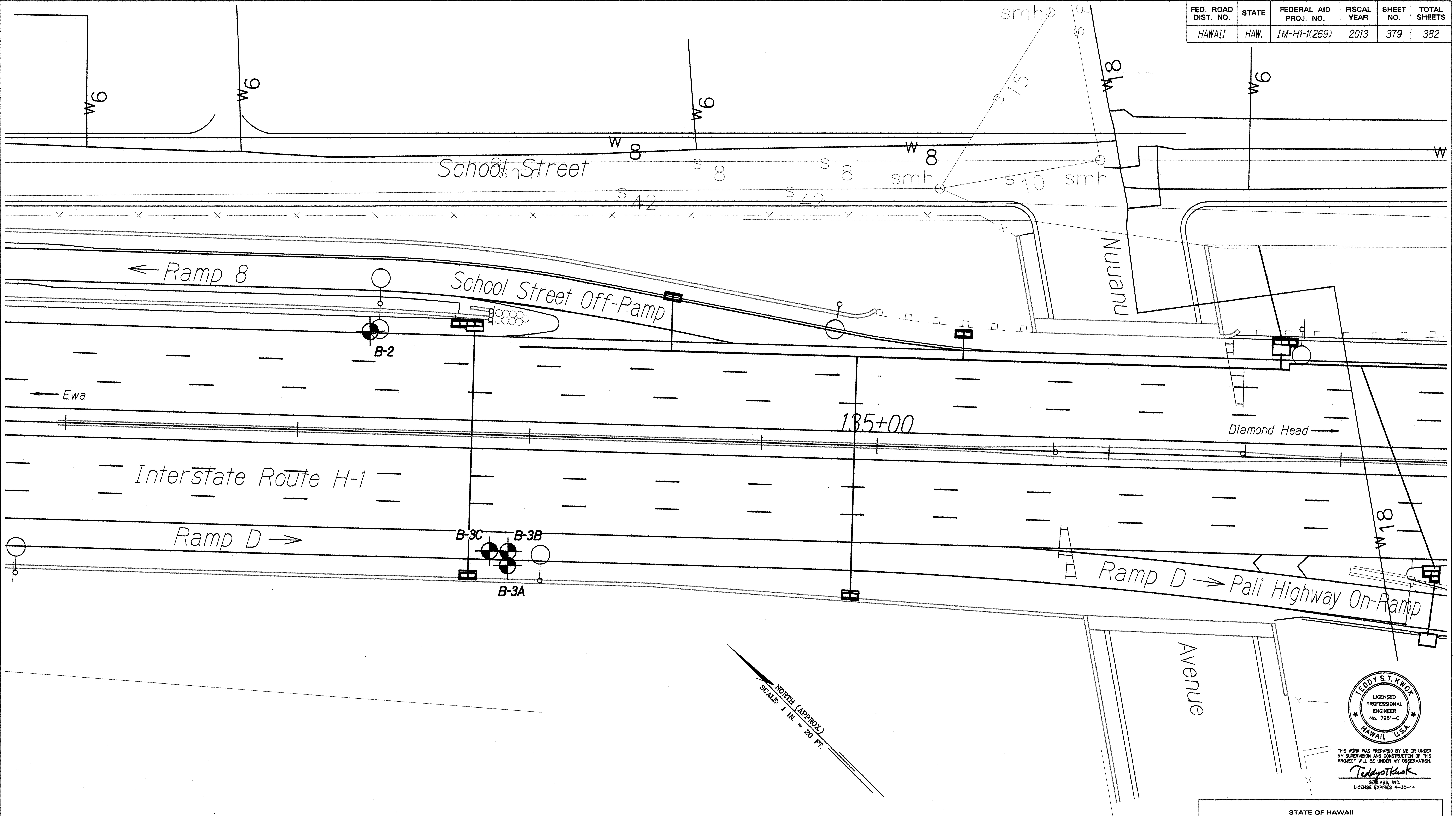
BORING LOCATION PLAN

INTERSTATE ROUTE H-1 REHABILITATION
Middle Street to Vicinity of Ward Avenue
FAP NO. IM-H1-1(269)

Scale: As Shown Date: April 26, 2013

SHEET No. B-1 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(269)	2013	379	382



Legend:

Approximate Boring Location

0 10 20 40 60 Ft.

Graphic Scale

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LICENSED PROFESSIONAL ENGINEER
No. 7951-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4-30-14

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOCATION PLAN

INTERSTATE ROUTE H-1 REHABILITATION
Middle Street to Vicinity of Ward Avenue
FAP NO. IM-H1-1(269)

Scale: As Shown Date: April 26, 2013

SHEET No. B-2 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(269)	2013	380	382

GEOLABS, INC.

Geotechnical Engineering

Soil Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			USCS	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS	GRAVELS	CLEAN GRAVELS	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	LESS THAN 5% FINES	GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
		MORE THAN 12% FINES	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS	CLEAN SANDS	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE	50% OR MORE OF COARSE FRACTION PASSING THROUGH NO. 4 SIEVE	LESS THAN 5% FINES	SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
		MORE THAN 12% FINES	SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS	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
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
50% OR MORE OF MATERIAL PASSING THROUGH NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE	MH	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

LOG LEGEND FOR SOIL 6788-00.GPJ GEOLABS.GDT 2/15/13

LEGEND

	(2-INCH) O.D. STANDARD PENETRATION TEST	LL	LIQUID LIMIT (NP=NON-PLASTIC)
	(3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE	PI	PLASTICITY INDEX (NP=NON-PLASTIC)
S	SHELBY TUBE SAMPLE	TV	TORVANE SHEAR (tsf)
G	GRAB SAMPLE	PEN	POCKET PENETROMETER (tsf)
	CORE SAMPLE	UC	UNCONFINED COMPRESSION (psi)
▽	WATER LEVEL OBSERVED IN BORING AT TIME OF DRILLING	UU	UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)
▼	WATER LEVEL OBSERVED IN BORING AFTER DRILLING		

Plate A

GEOTECHNICAL NOTES:

1. A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Pavement Distresses Near Houghtailing Street and Nuuanu Avenue, Interstate Route H-1 Rehabilitation, Middle Street to Vicinity of Ward Avenue, FAP No. IM-H1-1(269), Honolulu, Oahu, Hawaii" dated April 26, 2013 has been prepared by Geolabs, Inc. A copy of the report is on file at the office of the Engineer for review by the Contractor.
2. For boring locations, see Sheets B-1 and B-2.
3. The information presented in the logs of borings depict the subsurface conditions encountered at that specified location and at the time of the field exploration only. Variations of subsoil conditions from those depicted in the logs of borings may occur between and beyond the borings.
4. The penetration resistance shown on the logs of borings indicate the number of blows required for the specific sampler type used. The blow counts may need to be factored to obtain the Standard Penetration Test (SPT) blow counts.
5. The data given is for general information only. Bidders shall examine the site and the boring data and draw their own conclusions therefrom as to the character of materials to be encountered. The Engineer will not assume responsibility for variations of subsoil quality or conditions other than at the boring locations shown and at the time the borings were taken.

ORIGINAL PLAN

SURVEY PLOTTED BY _____ DATE
DRAWN BY _____
TRACED BY _____
DESIGNED BY _____
QUANTITIES BY _____
CHECKED BY _____

NOTE BOOK _____ No. _____

TEDDY S.T. KWOK
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Teddy S.T. Kwok

GEOLABS, INC.
LICENSE EXPIRES 4-30-14

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOG LEGEND & NOTES

INTERSTATE ROUTE H-1 REHABILITATION
Middle Street to Vicinity of Ward Avenue
FAP NO. IM-H1-1(269)

Scale: As Shown Date: April 26, 2013

SHEET No. B-3 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(269)	2013	381	382

GEOLABS, INC.
Geotechnical Engineering

PAVEMENT DISTRESSES NEAR HOUGHTAILING STREET AND NUUANU AVENUE
INTERSTATE ROUTE H-1 REHABILITATION
HONOLULU, OAHU, HAWAII

Log of Boring 1A

Approximate Ground Surface Elevation (feet): 101.5 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
	10	97			50			GW	4-inch ASPHALTIC CONCRETE
	30				13	3.5			Brown SANDY GRAVEL, dense to very dense, dry (base course/fill)
LL=86 PI=50 TXUU	29	85			15		5	CH	Brown SILTY CLAY with a little gravel, stiff, moist (fill)
					57		10	GP	Dark gray GRAVEL, dense, dry (fill)
	3							GW	Tan SANDY GRAVEL, dense, dry (fill)
	6								
Sieve - #200 = 22.2%	19	72			34		15	GM	Dark gray SILTY GRAVEL with sand, dense, dry (fill)
LL=104 PI=73	24				28		20	CH	Brown SILTY CLAY with some gravel, very stiff, moist (fill)
					15/0" Ref.		25		
	28	88			34	>4.5	30	CH	Reddish brown SILTY CLAY, hard, moist (residual soil)
									Boring terminated at 30.5 feet

* Elevations estimated from Topographic Survey Map transmitted by Parsons Brinckerhoff, Inc. on December 24, 2012.

Date Started:	December 17, 2012	Water Level: ▽	Not Encountered
Date Completed:	December 17, 2012	Drill Rig:	CME-45C TRUCK
Logged By:	Greg Young	Drilling Method:	4" Solid Stem Auger
Total Depth:	30.5 feet	Driving Energy:	140 lb. wt., 30 in. drop
Work Order:	6788-00		

BORING LOG DOT 6788-00.GPJ GEOLABS.GDT 2/15/13

GEOLABS, INC.
Geotechnical Engineering

PAVEMENT DISTRESSES NEAR HOUGHTAILING STREET AND NUUANU AVENUE
INTERSTATE ROUTE H-1 REHABILITATION
HONOLULU, OAHU, HAWAII

Log of Boring 1B

Approximate Ground Surface Elevation (feet): 100 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
TXUU	15	114			30			CH	4-inch ASPHALTIC CONCRETE
									Brown SILTY CLAY with some gravel, very stiff, damp (fill)
LL=84 PI=54	32				8		5		grades to medium stiff
	14	105			58		10		grades to hard
	30				27		15		grades to very stiff
TXUU	31	85			14		20		grades to grayish brown, stiff
LL=67 PI=46	9				17		25		grades to very stiff
TXUU	32	81			27		30	CH	Reddish brown SILTY CLAY, stiff, damp (residual soil)
					16/0" Ref.		35		Boring terminated at 37 feet
							40		

Date Started:	December 19, 2012	Water Level: ▽	Not Encountered
Date Completed:	December 19, 2012	Drill Rig:	CME-45C TRUCK
Logged By:	C. Song	Drilling Method:	4" Solid Stem Auger
Total Depth:	37 feet	Driving Energy:	140 lb. wt., 30 in. drop
Work Order:	6788-00		

BORING LOG DOT 6788-00.GPJ GEOLABS.GDT 2/15/13

GEOLABS, INC.
Geotechnical Engineering

PAVEMENT DISTRESSES NEAR HOUGHTAILING STREET AND NUUANU AVENUE
INTERSTATE ROUTE H-1 REHABILITATION
HONOLULU, OAHU, HAWAII

Log of Boring 2

Approximate Ground Surface Elevation :

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	USCS	Description
									2-inch ASPHALTIC CONCRETE
								GW	Gray SANDY GRAVEL (BASALTIC), dense, wet (base course)
Sieve - #200 = 9.3%	13	106			20/2"		1	GP-GM	Reddish gray poorly graded GRAVEL (BASALTIC) with sand and some clay, very dense, wet (fill)
							2		Boring terminated at 1.8 feet
							3		
							4		

Date Started:	December 17, 2012	Water Level: ▽	Not Encountered
Date Completed:	December 17, 2012	Drill Rig:	CME-45C TRUCK
Logged By:	D. Gremminger	Drilling Method:	4" Solid Stem Auger
Total Depth:	1.8 feet	Driving Energy:	140 lb. wt., 30 in. drop
Work Order:	6788-00		

BORING LOG DOT 1A1.F 6788-00.GPJ GEOLABS.GDT 2/15/13

ORIGINAL PLAN
SURVEY PLOTTED BY: DATE
DRAWN BY:
TRACED BY:
DESIGNED BY:
QUANTITIES BY:
CHECKED BY:
NOTE: SCALE
No.

TEDDY S. T. KWOK
LICENSED PROFESSIONAL ENGINEER
No. 7951-C
HAWAII, U.S.A.

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Teddy S.T. Kwok
GEOLABS, INC.
LICENSE EXPIRES 4-30-14

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
Middle Street to Vicinity of Ward Avenue
FAP NO. IM-HI-1(269)

Scale: As Shown Date: April 26, 2013

SHEET No. B-4 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(269)	2013	382	382

GEOLABS, INC.
Geotechnical Engineering

PAVEMENT DISTRESSES NEAR HOUGHTAILING STREET AND NUUANU AVENUE
INTERSTATE ROUTE H-1 REHABILITATION
HONOLULU, OAHU, HAWAII

Log of Boring 1C

Approximate Ground Surface Elevation (feet): 99 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
	10	93			8					CL	2-inch ASPHALTIC CONCRETE
LL=44	13				9						Brown SANDY CLAY with traces of gravel, medium stiff to stiff, dry to damp (fill)
PI=21	30	78			19		5				
TXUU	35				14						Boring terminated at 8 feet
							10				
							15				
							20				
							25				
							30				
							35				

Date Started:	December 19, 2012	Water Level: ▽	Not Encountered
Date Completed:	December 19, 2012		
Logged By:	C. Song	Drill Rig:	CME-45C TRUCK
Total Depth:	8 feet	Drilling Method:	4" Solid Stem Auger
Work Order:	6788-00	Driving Energy:	140 lb. wt., 30 in. drop

BORING LOG DOT IAM.F 6788-00.GPJ GEOLABS.GDT 2/12/13

GEOLABS, INC.
Geotechnical Engineering

PAVEMENT DISTRESSES NEAR HOUGHTAILING STREET AND NUUANU AVENUE
INTERSTATE ROUTE H-1 REHABILITATION
HONOLULU, OAHU, HAWAII

Log of Boring 3B

Approximate Ground Surface Elevation :

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											6-inch ASPHALTIC CONCRETE
							1			GW	Gray SANDY GRAVEL (BASALTIC), very dense, wet (base course)
							2			GM	Gray SILTY GRAVEL (BASALTIC) with some sand (basaltic) and clay, very dense, wet (fill)
							3				Boring terminated at 3.5 feet
							4				
							5				

Date Started:	December 17, 2012	Water Level: ▽	0.8 ft. 12/17/2012 1044 HRS
Date Completed:	December 17, 2012		
Logged By:	D. Gremminger	Drill Rig:	CME-45C TRUCK
Total Depth:	3.5 feet	Drilling Method:	4" Solid Stem Auger
Work Order:	6788-00	Driving Energy:	140 lb. wt., 30 in. drop

BORING LOG DOT IAM.F 6788-00.GPJ GEOLABS.GDT 2/12/13

GEOLABS, INC.
Geotechnical Engineering

PAVEMENT DISTRESSES NEAR HOUGHTAILING STREET AND NUUANU AVENUE
INTERSTATE ROUTE H-1 REHABILITATION
HONOLULU, OAHU, HAWAII

Log of Boring 3A

Approximate Ground Surface Elevation :

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											6-inch ASPHALTIC CONCRETE
							1			GW	Brownish gray SANDY GRAVEL (BASALTIC), dense, wet (base course)
Sieve - #200 = 13.0%	13	127			58		2			GM	Gray SILTY GRAVEL (BASALTIC) with sand (basaltic) and some clay, very dense, wet (fill)
					15/0" Ref.		3				Boring terminated at 3.5 feet
							4				
							5				

Date Started:	December 17, 2012	Water Level: ▽	Not Encountered
Date Completed:	December 17, 2012		
Logged By:	D. Gremminger	Drill Rig:	CME-45C TRUCK
Total Depth:	3.5 feet	Drilling Method:	4" Solid Stem Auger
Work Order:	6788-00	Driving Energy:	140 lb. wt., 30 in. drop

BORING LOG DOT IAM.F 6788-00.GPJ GEOLABS.GDT 2/12/13

GEOLABS, INC.
Geotechnical Engineering

PAVEMENT DISTRESSES NEAR HOUGHTAILING STREET AND NUUANU AVENUE
INTERSTATE ROUTE H-1 REHABILITATION
HONOLULU, OAHU, HAWAII

Log of Boring 3C

Approximate Ground Surface Elevation :

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
											6-inch ASPHALTIC CONCRETE
							1			GW	Gray SANDY GRAVEL (BASALTIC), dense, wet (base course)
Sieve - #200 = 10.8%	12	134			63		2			GP-GM	Gray poorly graded GRAVEL (BASALTIC) with sand (basaltic) and some clay, very dense, wet (fill)
							3				
							4				Boring terminated at 3.8 feet
							5				

Date Started:	December 17, 2012	Water Level: ▽	2.2 ft. 12/17/2012 1050 HRS
Date Completed:	December 17, 2012		
Logged By:	D. Gremminger	Drill Rig:	CME-45C TRUCK
Total Depth:	3.8 feet	Drilling Method:	4" Solid Stem Auger
Work Order:	6788-00	Driving Energy:	140 lb. wt., 30 in. drop

BORING LOG DOT IAM.F 6788-00.GPJ GEOLABS.GDT 2/12/13

ORIGINAL PLAT
SURVEY PLOTTED BY ____ DATE
DATA INPUT BY ____
TRACED BY ____
NOTE BOOK DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____
No. ____

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HIGHWAYS DIVISION

BORING LOGS

INTERSTATE ROUTE H-1 REHABILITATION
Middle Street to Vicinity of Ward Avenue
FAP NO. IM-HI-1(269)

Scale: As Shown Date: April 26, 2013

SHEET No. B-5 OF 5 SHEETS

382