FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360AB-01-09	2014	ADD. 20	47

Notes

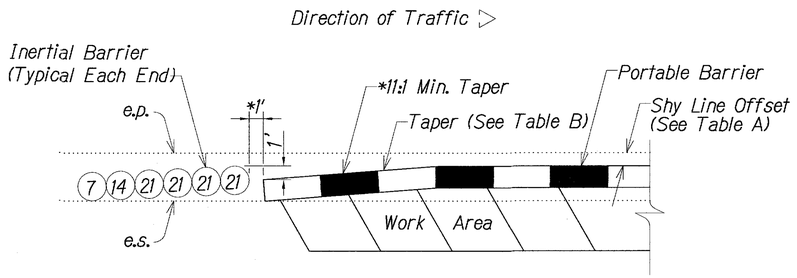
1. Typical layout will vary based on speed and manufacturer of system used. Installation shall conform to Manufacturer's recommendations..
2. Physical barriers shall be required whenever guardrails have been removed and will not be reinstalled at the end of the work day. See General Note No. 31 on Sht. N-1.
3. Physical barriers shall be portable concrete barriers.
4. Providing, transporting, placing, maintaining, relocating and removing portable concrete barriers shall be considered incidental to the various items of work. See Section 645, WORK ZONE TRAFFIC CONTROL of the Special Provisions. Upon project completion, remove and deliver portable concrete barriers to the Maui District baseyard or as instructed by the Engineer.
5. Ends of portable concrete barriers shall be hereon protected with Inertial Barriers as shown in the detail. The lead (first) inertial barrier shall have a retroreflective object marker attached to it. Furnishing and installing inertial barriers including retroreflective object markers, shall be considered incidental to the various contract items.
6. Furnishing and installing reflector markers (RM-3) over the portable barriers shall be considered incidental to the various contract items.

TABLE A
SHY LINE OFFSETS*

DESIGN SPEED (mph)	SHY LINE OFFSETS
30	3.5'
≤25	2.0'

TABLE B
MAXIMUM TAPERS
FOR CONCRETE BARRIER*

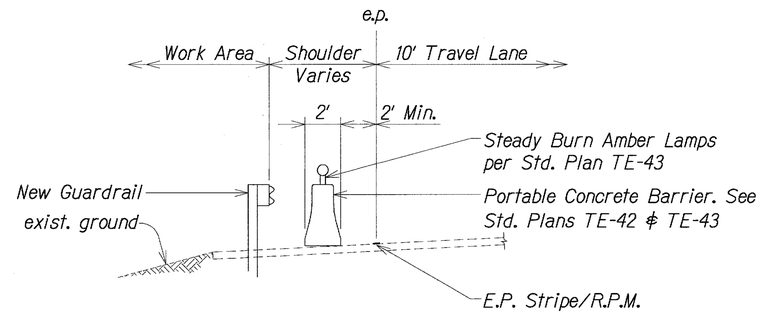
DESIGN SPEED (mph)	TAPER	
	INSIDE SHY LINE	BEYOND SHY LINE
35	15:1	9:1
≤30	13:1	8:1



Note:

The numbers inside the circle indicate weight of sand in 100 lb unit. Installation shall conform to manufacturer's recommendation.

TYPICAL DETAIL
⚠ INERTIAL BARRIER SYSTEM
Not to Scale



TYPICAL DETAIL
⚠ PORTABLE CONCRETE BARRIER
Not to Scale

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

BRIAN A. LOCK
LICENSED PROFESSIONAL ENGINEER
No. 9867-C
HAWAII, U.S.A.

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APRIL 30, 2016
WILSON OKAMOTO CORPORATION LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PORTABLE BARRIER DETAILS
HANA HIGHWAY
IMPROVEMENTS, PHASE 2A
Huelo to Hana
Project No. 360AB-01-09
Scale: Date: April 2014

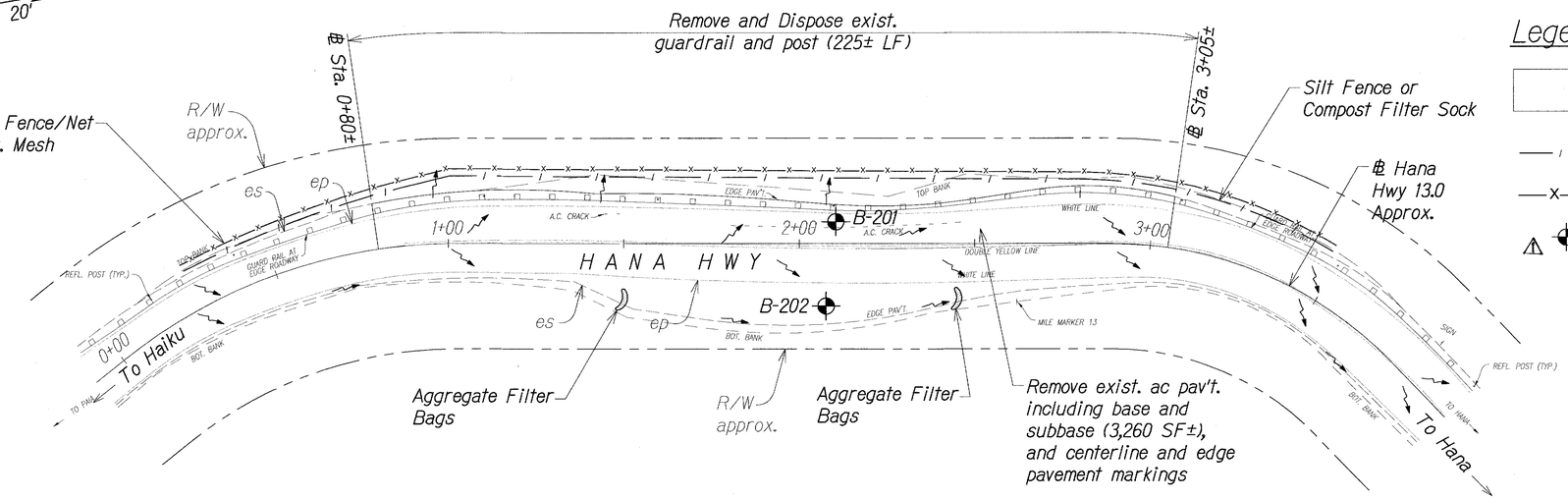
⚠	DATE	REVISION
⚠	r6/10/14	REVISED CALLOUTS

SHEET No. GRD-11 OF 11 SHEETS

ADD. 20

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360AB-01-09	2014	ADD. 24	47

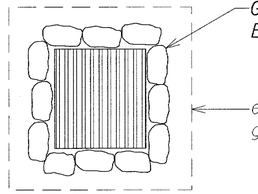
TRUE NORTH
SCALE: 1" = 20'



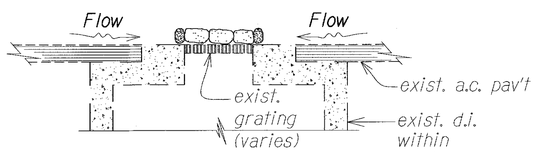
Legend:

- Remove exist. a.c. pavement structure including base and subbase
- Silt Fence or Compost Filter Sock
- Debris Fence/Net
- Approx. Boring Location

MILE POST 13.0 (℄ HANA HWY 13.0)



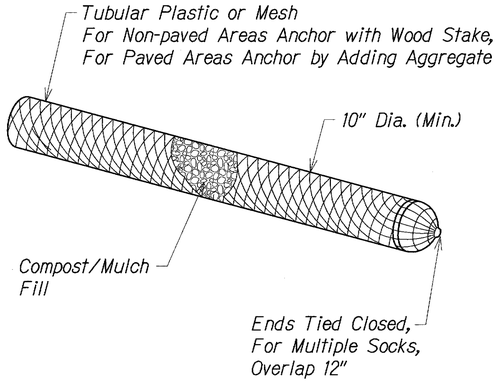
PLAN VIEW

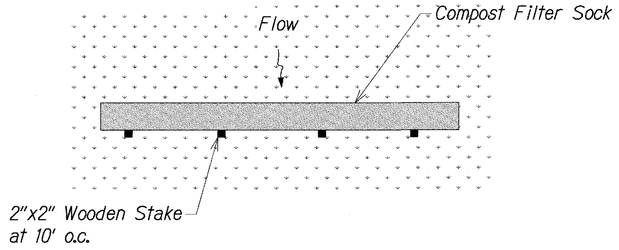


SECTION

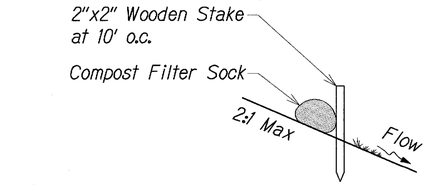
SAND OR GRAVEL BAGS AT GRATED DRAIN INLET

Not to Scale





PLAN



SECTION

COMPOST FILTER SOCK

Not to Scale

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	DRAWN BY	
NOTE BOOK	TRACED BY	
No.	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

DATE	REVISION
⚠ r6/10/14	ADDED BORING LOCATIONS

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DEMOLITION AND EROSION CONTROL PLANS

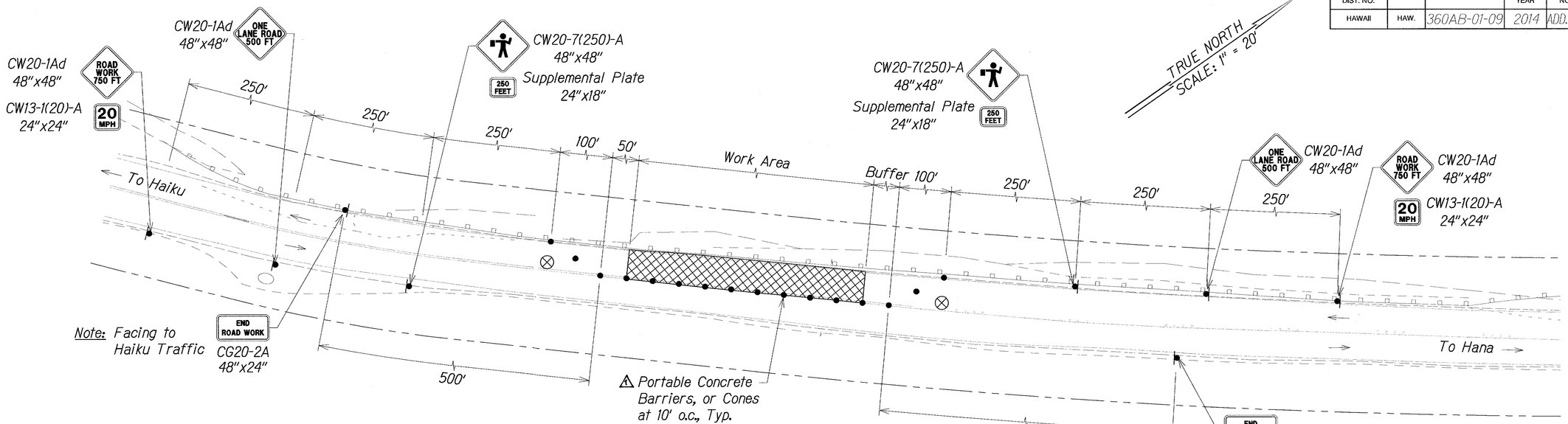
HANA HIGHWAY
IMPROVEMENTS, PHASE 2A
Huelo to Hana
Project No. 360AB-01-09

Scale: 1" = 20' Date: April 2014

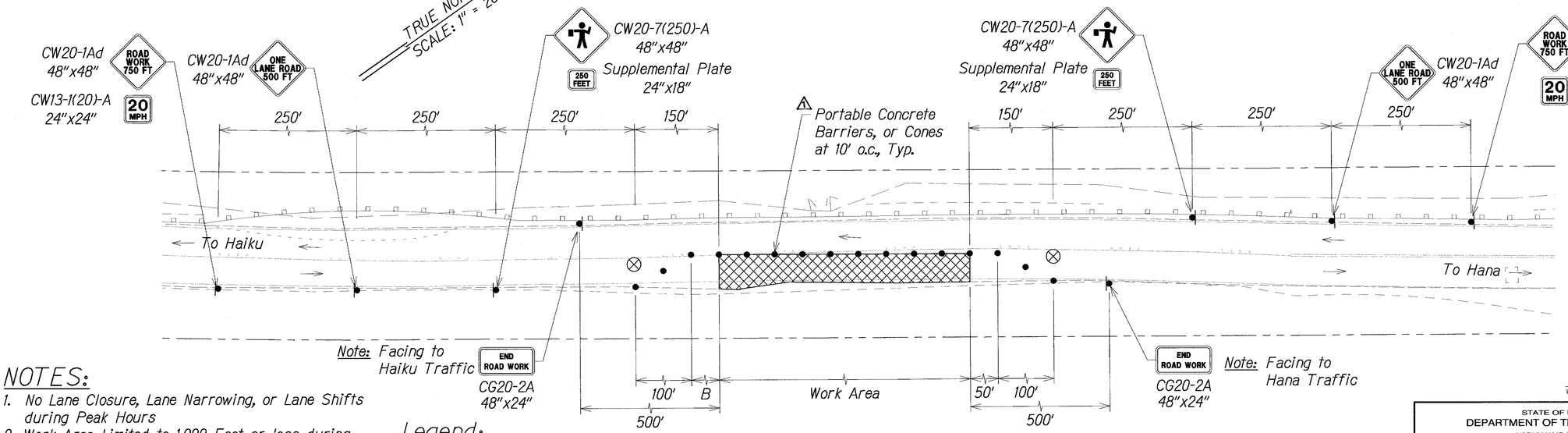
SHEET No. DP-2 OF 4 SHEETS

ADD. 24

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360AB-01-09	2014	ADD. 35	47



TYPICAL TRAFFIC CONTROL PLAN FOR WORK ON HAIKU BOUND LANE



TYPICAL TRAFFIC CONTROL PLAN FOR WORK ON HANA BOUND LANE

NOTES:

1. No Lane Closure, Lane Narrowing, or Lane Shifts during Peak Hours
2. Work Area Limited to 1,000 Feet or less during working hours
3. Place Signs on Makai Side of Road if no Room on Mauka Side
4. Install Advisory Signs According to Section 645 - Work Zone Traffic Control, a Minimum of 500 Feet Before and After the Extents of the Traffic Control.
5. For Portable Concrete Barrier Details See Standard Plans TE-42, TE-42, and Sht. GRD-11

⚠

Legend:

- Work Area
- Police Officer
- Cones and Delineators
- Sign
- Direction of Traffic

⚠	DATE	REVISION
r	6/10/14	REVISED NOTES AND CALLOUTS

ORIGINAL PLAN

NOTE BOOK No.

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

BRIAN A. LOCK
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APRIL 30, 2016
WILSON OKAMOTO CORPORATION LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC CONTROL PLANS

HANA HIGHWAY
IMPROVEMENTS, PHASE 2A
Huelo to Hana
Project No. 360AB-01-09

Scale: 1" = 20' Date: April 2014

SHEET No. TCP-1 OF 1 SHEETS

ADD. 35

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360AB-01-09	2014	ADD. 47 S-1	47

GEOLABS, INC.
Geotechnical Engineering

Soil Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			USCS	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS (MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE)	GRAVELS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (MORE THAN 12% FINES)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS (50% OR MORE OF COARSE FRACTION PASSING THROUGH NO. 4 SIEVE)	CLEAN SANDS (LESS THAN 5% FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (MORE THAN 12% FINES)	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS (50% OR MORE OF MATERIAL PASSING THROUGH NO. 200 SIEVE)	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
	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

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)
	SHELBY TUBE SAMPLE	TV	TORVANE SHEAR (tsf)
	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		
	WATER LEVEL OBSERVED IN BORING OVERNIGHT		

LOG LEGEND FOR SOIL 6193-00.GPJ GEOLABS.GDT 6/6/14

Plate A-0.1

GEOLABS, INC.
Geotechnical Engineering

Rock Log Legend

ROCK DESCRIPTIONS

	BASALT		FINGER CORAL
	BOULDERS		LIMESTONE
	BRECCIA		SANDSTONE
	CLINKER		SILTSTONE
	COBBLES		TUFF
	CORAL		VOID/CAVITY

ROCK DESCRIPTION SYSTEM

ROCK FRACTURE CHARACTERISTICS

The following terms describe general fracture spacing of a rock:

Massive:	Greater than 24 inches apart
Slightly Fractured:	12 to 24 inches apart
Moderately Fractured:	6 to 12 inches apart
Closely Fractured:	3 to 6 inches apart
Severely Fractured:	Less than 3 inches apart

DEGREE OF WEATHERING

The following terms describe the chemical weathering of a rock:

Unweathered:	Rock shows no sign of discoloration or loss of strength.
Slightly Weathered:	Slight discoloration inwards from open fractures.
Moderately Weathered:	Discoloration throughout and noticeably weakened though not able to break by hand.
Highly Weathered:	Most minerals decomposed with some corestones present in residual soil mass. Can be broken by hand.
Extremely Weathered:	Saprolite. Mineral residue completely decomposed to soil but fabric and structure preserved.

HARDNESS

The following terms describe the resistance of a rock to indentation or scratching:

Very Hard:	Specimen breaks with difficulty after several "pinging" hammer blows. Example: Dense, fine grain volcanic rock
Hard:	Specimen breaks with some difficulty after several hammer blows. Example: Vesicular, vugular, coarse-grained rock
Medium Hard:	Specimen can be broked by one hammer blow. Cannot be scraped by knife. SPT may penetrate by ~25 blows per inch with bounce. Example: Porous rock such as clinker, cinder, and coral reef
Soft:	Can be indented by one hammer blow. Can be scraped or peeled by knife. SPT can penetrate by ~100 blows per foot. Example: Weathered rock, chalk-like coral reef
Very Soft:	Crumbles under hammer blow. Can be peeled and carved by knife. Can be indented by finger pressure. Example: Saprolite

LOG LEGEND FOR ROCK 6193-00.GPJ GEOLABS.GDT 6/6/14

Plate A-0.2

GEOTECHNICAL NOTES:

1. *A geotechnical engineering report entitled "Geotechnical Engineering Exploration, Hana Highway Improvements, District of Hana, Maui, Hawaii" dated March 31, 2014 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 Civil Sheet DP-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.*

JOHN Y.L. CHEN
LICENSED PROFESSIONAL ENGINEER
No. 10029-C
HAWAII, U.S.A.

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GEOLABS, INC.
LICENSE EXPIRES 4-30-16

ORIGINAL PLAN | NOTE BOOK | No.
SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

DATE	REVISION
6/10/14	ADDED SHEET PER ADDENDUM 1

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

HANA HIGHWAY
IMPROVEMENTS, PHASE 2A
Huelo to Hana
Project No. 360AB-01-09

Scale: Date: April 2014

SHEET No. GBL-1 OF 11 SHEETS

ADD. 47 S-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360AB-01-09	2014	ADD. 47 S-2	47

GEOLABS, INC. — Geotechnical Engineering

HANA HIGHWAY IMPROVEMENTS, DISTRICT OF HANA, MAUI, HAWAII — Log of Boring 201

Approximate Ground Surface Elevation (feet): 55 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)
	40	73			10	
	51				11	
TXUU	45	69			25	2.5
	44				10	0.8
	51	74			28	>4.5
	26				30/0" Ref.	
			7	0	14	
Sieve - #200 = 23.6%	56				36	
			40	0		
					Ref/0" Ref.	
			35	7		
			90	18		
			100	38		

USCS	Description
GC??	8-inch ASPHALTIC CONCRETE
	4-inch AGGREGATE BASE COURSE
CH	Brown CLAY with traces of fine sand and gravel, stiff to very stiff, moist (residual soil)
SM	Brown angular SILTY SAND with gravel, dense, moist (saprolite)
	grades to with cobbles
	grades to with some gravel (basaltic)
	grades to dense
	Gray BASALT, severely fractured, slightly weathered, hard
SC	Brown CLAYEY SAND, medium dense, moist (clinker)
	Gray BASALT, severely fractured, slightly weathered, hard
	Brownish red BASALT, severely fractured, highly weathered, soft (clinker)
	Gray vugular BASALT, closely to moderately fractured, slightly weathered, hard
	Boring terminated at 51.5 feet

Date Started:	June 29, 2012	Water Level:	▽ ▼ 22.1 ft. 06/29/2012 1230 HRS
Date Completed:	June 29, 2012		
Logged By:	Marcus Gruver	Drill Rig:	MOBILE B-53.1
Total Depth:	51.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6193-00	Driving Energy:	140 lb. wt., 30 in. drop

HANA HIGHWAY IMPROVEMENTS, DISTRICT OF HANA, MAUI, HAWAII — Log of Boring 202

Approximate Ground Surface Elevation (feet): 55.5 *

Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)
	50	70			34	3.5
	51				11	2.0
	49	67			37	0.5
Sieve - #200 = 16.4%	48				26	
	48	72			50/6" +Ref/0" Ref.	
	52				35	

USCS	Description
GC??	5-inch ASPHALTIC CONCRETE
	7-inch AGGREGATE BASE COURSE
CH	Dark brown CLAY with traces of gravel (basaltic), hard, moist (residual soil)
	grades to stiff
	grades to hard, wet
SM	Brown SILTY SAND with some gravel, medium dense, moist to wet (saprolite)
	grades to very hard, moist
	grades to dense, moist to wet
	Boring terminated at 21.5 feet

Date Started:	July 9, 2012	Water Level:	▽ ▼ Not Encountered
Date Completed:	July 9, 2012		
Logged By:	Greg Young	Drill Rig:	MOBILE B-53.1
Total Depth:	21.5 feet	Drilling Method:	4" Auger & HQ Coring
Work Order:	6193-00	Driving Energy:	140 lb. wt., 30 in. drop

JOHN Y.L. CHEN — LICENSED PROFESSIONAL ENGINEER No. 10029-C — HAWAII, U.S.A.

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GEOLABS, INC. LICENSE EXPIRES 4-30-16

DATE	REVISION
6/10/14	ADDED SHEET PER ADDENDUM 1

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOGS

HANA HIGHWAY IMPROVEMENTS, PHASE 2A
Huelo to Hana
Project No. 360AB-01-09

Scale: Date: April 2014

SHEET No. GBL-2 OF 11 SHEETS

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