STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ADDENDUM NO. 1

FOR

KALANIANAOLE HIGHWAY
INTERSECTION IMPROVEMENTS AT WAA STREET
PROJECT NO. 72C-01-19

DISTRICT OF HONOLULU
ISLAND OF OAHU
FY 2020

This Addendum shall make the following amendments to the Bid Documents:

A. NOTICE TO BIDDERS

Prospective bidders are hereby notified that the receiving of sealed proposals scheduled for January 16, 2020, is hereby postponed until January 23, 2020. The attached NOTICE TO BIDDERS dated 1/6/20 shall be incorporated and made a part of the NOTICE TO BIDDERS.

B. SPECIAL PROVISIONS

Delete Special Provision Section 623 – Traffic Signal System dated 7/1/18 and replace it with the attached Special Provision Section 623 – Traffic Signal System dated 1/6/20.

C. PROPOSAL SCHEDULE

Delete Page P-11 through P-15 dated 11/15/2019 and replace them with the attached page P-11 through P-15 dated 12/30/2019.

D. PLANS

Replace sheets **4, 34, 35,** and **41** with **ADD. 4, ADD. 34, ADD. 35** and **ADD. 41.** Revision to ADD. 4 is to add Board of Water Supply notes. Revisions to ADD. 34 and ADD. 35 is to show existing 16-inch water main on plans. Revision to ADD. 35 also included changes to the Enlarged Plan. Revision to ADD. 41 is to remove Note 3 in Type II Traffic Signal Base Detail.

E. ATTACHMENTS

Attached for your information:

1. Meeting minutes and signed attendance list from December 30, 2019 non-mandatory pre-bid conference.

2. Variance (Docket No. 19-NR-VN-43) for Community Noise Control, dated December 11, 2019.

3. Geotechnical Engineering Report for Waa Street Traffic Signals, dated September 12, 2019.

4. Questions from Bidders with HDOT Responses,

Please acknowledge receipt of this Addendum No. 1 by recording the date of its receipt in the space provided on Page P-4 of the Proposal.

JADE T. BUTAY
Director of Transportation

NOTICE TO BIDDERS

The receiving of sealed proposals for **KALANIANAOLE HIGHWAY, INTERSECTION IMPROVEMENTS AT WAA STREET, PROJECT NO. 72C-01-19, DISTRICTS OF HONOLULU, ISLAND OF OAHU,** at the Contracts Office, Department of Transportation, 869 Punchbowl Street, Honolulu, Hawaii 96813, scheduled for 2:00 P.M., January 16, 2020, is hereby POSTPONED UNTIL 2:00 P.M., January 23, 2020, at which time and place they will be publicly opened and read.

JADE T. BUTAY
Director of Transportation

SECTION 623 – TRAFFIC SIGNAL SYSTEM

Make the following amendment to said Section:

(I) Amend **Section 623.04 - Measurement** by replacing lines 578 to 579 to read:

"**623.04 Measurement.** The Engineer will not measure software for controller, interconnect, or electrical risers for payment.

(A) The Engineer will measure the controller assembly, foundation for traffic signal controller, traffic signal standard, foundation for traffic signal standard, pedestrian or traffic signal assembly, pedestrian pushbutton, pullbox, loop detector sensing unit, emergency vehicle preemption optical receiver, service and metering equipment assembly, and advance warning beacon assembly per each in accordance with the contract documents.

(B) The Engineer will measure camera cable, traffic signal interconnect subduct, traffic signal ductline, secondary electrical ductline and conductors per linear foot in accordance with the contract documents.

(C) The Engineer will measure Hawaiian Electric Company service connection fees and transformer installation on a force account basis according to Subsection 109.06 – Force Account Provisions and Compensation" to be paid for by the subcontractor

(II) Amend **Section 623.05 – Payment** by replacing lines 581 to 594 to read:

"**623.05 Payment.** The Engineer will pay for the controller assembly at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and mounting the controller cabinet; furnishing, assembling, wiring, software, and housing the controller and auxiliary equipment; painting the controller cabinet; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the traffic signal standard at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the traffic signal standard; wiring; bonding and grounding; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials; and other incidentals necessary to complete the work.

The Engineer will pay for the foundation for controller cabinet and traffic signal standard at the contract unit price per each complete in place. The price includes full compensation for excavating and backfilling; forming; furnishing and

placing the reinforcing steel; mixing, placing, and curing the concrete; furnishing and setting the anchor bolts; restoring the pavement; construction of a raised concrete pedestal; and furnishing equipment, tools, materials and other incidentals necessary to complete the work.

The Engineer will pay for the pedestrian and traffic signal assembly at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; assembling the signal heads; wiring; bonding and grounding; painting the signal head mounting; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the pedestrian pushbutton with instruction sign at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the pedestrian pushbutton with the instruction sign; wiring; bonding and grounding; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials; and other incidentals necessary to complete the work.

The Engineer will pay for the pullbox at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the pullbox at the designated locations; saw cutting; excavating and backfilling; restoration of concrete sidewalks, asphalt concrete pavement and landscaping; coating the frames and covers; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the loop detector sensing unit at the contract unit price per each complete in place. The price includes full compensation for saw cutting; cleaning and blowing the saw cut areas; furnishing and inserting the loop cable; splicing in the pullbox; filling the saw cut groove with epoxy sealer or hot applied rubberized sealant; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will not pay for the interconnect or electrical risers. The work includes furnishing and installing the riser; and furnishing equipment, tools, labor, materials, and other incidentals necessary to complete the work. The Engineer will consider the cost for risers as included in the contract price for the various contract items.

The Engineer will pay for the emergency vehicle preemption (EVP) optical receiver at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the EVP; wiring; bonding and grounding; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials; and other incidentals necessary to complete the work.

The Engineer will pay for the camera cable at the contract unit price per linear foot complete in place. The price includes full compensation for furnishing and installing the preemption detector cable from the detector to the cabinet; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the traffic signal ductlines at the contract unit price per linear foot complete in place. The price includes full compensation for saw cutting; trenching; excavating and backfilling, including asphalt concrete pavement, aggregate base course and aggregate subbase course for trench repair; concrete curb and/or gutter, concrete sidewalk repair and striping restoration; furnishing, installing, bonding, and grounding the conduits and interconnect subducts; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the traffic signal interconnect subduct at the contract unit price per linear foot complete in place. The price includes full compensation for furnishing and installing; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the traffic signal cables at the contract unit price per linear foot complete in place. The price includes full compensation for furnishing, installing, splicing, and taping the cable; furnishing and installing interconnect fabric subducts; making the connections; providing turn-on service; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the service and metering equipment assembly at the contract unit price per each complete in place. The price includes full compensation for furnishing and installing the meter/main safety socket box, pullbox, support structure, ground rod, conduit, conductors; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for Hawaiian Electric Company service connection fees on a force account basis according to Subsection 109.06 – Force Account Provisions and Compensation. An estimate amount for the force account is allocated in the proposal schedule under Hawaiian Electric Company Service Connection Fees. The actual amount to be paid will be the sum shown on the accepted force account records whether this sum be more or less than the estimated amount allocated in the proposal schedule.

The Engineer will pay for traffic signal pullboxes at the contract unit price per each complete in place. The price includes full compensation for furnishing and installing the pullbox, and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the secondary electrical ductline at the contract price per linear foot complete in place. The price includes full compensation for saw cutting, excavating and backfilling; furnishing, installing, grounding, terminating conductors; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will consider full compensation for additional materials and labor not shown in the contract that are necessary to complete the installation of the various systems incidental to the various contract items. The Engineer will not allow additional compensation.

The Engineer will pay for the traffic signal assembly at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the signal assembly; wiring; bonding and grounding; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials; and other incidentals necessary to complete the work.

The Engineer will pay for the Closed-Circuit Television Camera (CCTV) at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the CCTV camera; wiring; bonding and grounding; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials; and other incidentals necessary to complete the work.

The Engineer will pay for the penetration of existing pullbox at the contract unit price per each complete in place. The price includes full compensation for furnishing and installing conduits and ends incidental to the penetration; wiring; bonding and grounding; testing; finishing; submitting warranty; and furnishing equipment, tools, labor, materials; and other incidentals necessary to complete the work.

The Engineer will pay for saw cutting, excavation, backfill and restoration of the traffic signal ductlines at the contract unit price complete in place. The prince includes full compensation for saw cutting; trenching; excavating and backfilling, including asphalt concrete pavement, aggregate base course and aggregate subbase course for trench repair; concrete rub and/or gutter and concrete sidewalk repair; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the following pay items when included in the proposal schedule:

Pay Item	**Pay Unit**
Traffic Signal Cabinet and Foundation	Each

Type I Traffic Signal Standard _____	Each
Type II Traffic Signal Standard _____	Each
Foundation for Type I Signal Standard	Each
Foundation for Type II Signal Standard	Each
Traffic Signal Assembly _____	Each
Programed Visibility Traffic Signal Assembly _____	Each
Pedestrian Pushbutton with Instruction Sign	Each
Pedestrian Signal Assembly _____	Each
Type “A” Pullbox	Each
Type “B” Pullbox	Each
Type “B” Pullbox Traffic Rated	Each
Type “C” Pullbox	Each
Type “C” Pullbox Traffic Rated	Each
Loop Detector Sensing Unit (6 Ft. x 6 Ft.)	Each
EVP Optical Receiver with cabling	Each
Traffic Signal Ductline _____	L.F.
Interconnect Fabric Subduct	L.F.
EVP Cable	L.F.
Type 1 Cable – 26C#14	L.F.
Type 2 Cable – 2C#14	L.F.
Type 3 Cable – 12-2/C#19	L.F.
Type 5 Cable – 4/C #14 with #8 GND	L.F.
Type 6 Cable – Electrical Service Cable	L.F.
Electrical Pullboxes	Each

Penetrate Existing Pullbox	Each
Service and Metering Equipment Assembly	Each
Hawaiian Electric Company Service Connection Fees	Force Account”

END OF SECTION 623

PROPOSAL SCHEDULE

ITEM NO.	ITEM DESCRIPTION	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
202.0010	Removal of Existing Traffic Signs (15 each)	L.S.	L.S.	L.S.	$
202.0015	Removal of Existing Guardrail (502 L.F.)	L.S.	L.S.	L.S.	$
202.0050	Removal of Existing Curb & Gutter (370 L.F.)	L.S.	L.S.	L.S.	$
202.0025	Removal of Existing Impact Attenuator (2 Each)	L.S.	L.S.	L.S.	$
202.0030	Removal of Existing Sidewalk (10 S.Y.)	L.S.	L.S.	L.S.	$
209.0100	Installation, Maintenance, Monitoring, and Removal of BMP	L.S.	L.S.	L.S.	$
209.0020	Additional Water Pollution, Dust, and Erosion Control	F.A.	F.A.	F.A.	$ 50,000.00
606.0010	Guardrail Type Midwest Guardrail System (MGS)	190	L.F.	$	$
606.0011	MGS Transition Section to Strong Post Guardrail	2	Each	$	$
606.0015	Guardrail Type Thrie Beam	151	L.F.	$	$
606.0016	Thrie Beam Transition Section	4	Each	$	$
606.0019	Terminal Impact Attenuator Type 36" Wide Quadguard M10 (TL-3) and Quadguard Transition Panel	1	Each	$	$
606.0020	Terminal Impact Attenuator Type 90" Wide Quadguard M10 (TL-3) and Quadguard Transition Panel	1	Each	$	$
606.0025	Terminal Section Type Thrie Beam Terminal Connector	2	Each	$	$

PROPOSAL SCHEDULE

ITEM NO.	ITEM DESCRIPTION	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
623.0010	Traffic Signal Cabinet and Foundation	1	Each	$ _____	$ _____
623.0020	Type I Traffic Signal Standard, H = 10Ft	6	Each	$ _____	$ _____
623.0030	Type II Traffic Signal Standard with 45/25-Foot Mast Arm	1	Each	$ _____	$ _____
623.0040	Type II Traffic Signal Standard with 40-Ft Mast Arm	1	Each	$ _____	$ _____
623.0050	Foundation for Type I Signal Standard	6	Each	$ _____	$ _____
623.0060	Foundation for Type II Signal Standard	2	Each	$ _____	$ _____
623.0070	Traffic Signal Assembly, (1-Way, 12-Inch, 1-3 Section Vertical)	13	Each	$ _____	$ _____
623.0080	Programmed Visibility Traffic Signal Assembly, (1-Way, 12-Inch, 1-3 Section Vertical)	2	Each	$ _____	$ _____
623.0090	EVP Optical Receiver with Cabling	2	Each	$ _____	$ _____
623.1000	Pedestrian Signal Assembly, (1-Way, 12-Inch, One Vertical)	5	Each	$ _____	$ _____
623.0110	Pedestrian Push Button with Instruction Sign	5	Each	$ _____	$ _____
623.0120	Traffic Signal Ductline, 2-Inch Conduit, SCH 40 PVC, Concrete Encased	7,200	L.F.	$ _____	$ _____
623.0130	Traffic Signal Ductline, 3-Inch Conduit, SCH 40 PVC, Concrete Encased	10	L.F.	$ _____	$ _____
623.0140	Type "A" Pullbox	2	Each	$ _____	$ _____

PROPOSAL SCHEDULE

ITEM NO.	ITEM DESCRIPTION	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
623.0150	Type "B" Pullbox	1	Each	$ _____	$ _____
623.0160	Type "B" Pullbox Traffic Rated	5	Each	$ _____	$ _____
623.0170	Type "C" Pullbox	7	Each	$ _____	$ _____
623.0180	Type "C" Pullbox Traffic Rated	2	Each	$ _____	$ _____
623.0190	Type 1 Cable - 26C#14	1,200	L.F.	$ _____	$ _____
623.0200	Type 2 Cable - 2C#14	900	L.F.	$ _____	$ _____
623.0210	Type 5 Cable - 4/C #14 with #8 GND	300	L.F.	$ _____	$ _____
623.0220	Type 3 Cable - 12-2/C#19	3,000	L.F.	$ _____	$ _____
623.0230	Loop Detector Sensing Unit (6 Ft. x 6 Ft.)	34	Each	$ _____	$ _____
623.0240	EVP Cable	400	L.F.	$ _____	$ _____
623.0250	Interconnect Fabric Subduct	3,600	L.F.	$ _____	$ _____
623.0260	Service and Metering Equipment Assembly	1	Each	$ _____	$ _____
623.0270	Type 6 Cable - Electrical Service Cable	400	L.F.	$ _____	$ _____
623.0280	Electrical Pullboxes	1	Each	$ _____	$ _____

PROPOSAL SCHEDULE

ITEM NO.	ITEM DESCRIPTION	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
623.0290	Penetrate Existing Pullbox	1	Each	$	$
623.9000	Hawaiian Electric Company Service Connection Fees	F.A.	F.A.	F.A.	$ 10,000.00
629.0010	4-inch Pavement Striping (Thermoplastic)	410	L.F.	$	$
629.0030	Type "H" Pavement Marker	11	Each	$	$
629.0040	Curb, Type 2D Markings (Paint)	20	L.F.	$	$
630.0010	Street Name Sign on Traffic Signal Mast Arm	2	Each	$	$
631.0010	Regulatory Sign (10 Square Feet or Less)	4	Each	$	$
631.0015	Regulatory Sign (More than 10 Square Feet)	1	Each	$	$
631.0030	Relocation of Existing Signs	3	Each	$	$
634.0010	Portland Cement Concrete Sidewalk	11	S.Y.	$	$
636.0010	CCTV Traffic Signal Cabinet and Foundation	1	Each	$	$
636.0020	Single Camera Site Equipment, Mast Arm Mounted	1	Each	$	$
636.0030	CCTV Coaxial Cable	450	L.F.	$	$
636.0040	CCTV Power Cable	450	L.F.	$	$

PROPOSAL SCHEDULE

ITEM NO.	ITEM DESCRIPTION	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
636.0050	CCTV Control Cable	450	L.F.	$ _____	$ _____
636.0060	CCTV CAT6 Outdoor Cable	450	L.F.	$ _____	$ _____
638.0010	Curb, Type 4" Mountable Curb	80	L.F.	$ _____	$ _____
638.0015	Curb and Gutter, Type 2DG	290	L.F.	$ _____	$ _____
643.0010	Maintenance of Existing Landscape Area	F.A.	F.A.	F.A.	$ 50,000.00
644.1000	Repair of Existing Sprinkler Systems	F.A.	F.A.	F.A.	$ 2,000.00
645.0010	Traffic Control	L.S.	L.S.	L.S.	$ _____
645.0200	Additional Police Officers, Additional Traffic Control Devices, and Advertisement	F.A	F.A.	F.A.	$ 40,000.00
647.1820	Fiber Optic Cable in Conduit	3,500	L.F.	$ _____	$ _____
648.0010	Field-Posted Drawings	L.S.	L.S.	L.S.	$ _____
650.0010	Detectable Warning Mat	2	Each	$ _____	$ _____
699.0100	Mobilization (Not to Exceed 6 Percent of the Sum of All Items Excluding Bid Price of this Item)	L.S.	L.S.	L.S.	$ _____

SUM OF ALL ITEMS $ _____

NOTE: Bidders must complete all unit prices and amounts. Failure to do so may be ground for rejection of bid.

PRE-BID CONFERENCE NOTES

Project: Kalanianaole Highway
Intersection Improvements at Waa Street
Project No. 72C-01-19

Subject: Non-mandatory Pre-bid Conference

Date/Time: December 30, 2019 at 9:30 AM

Held: Kakuhihewa State Office Building
601 Kamokila Boulevard, Room 264
Kapolei, HI 96707

Present: See attached lists of attendees

Discussed:

Steven Yoshida opens meeting at 9:45 A.M. after waiting to see of others will show. The following is to be announced once the meeting began:

A. A Community Noise Control Variance has been recently secured for this project from the Department of Health. The variance is granted from February 10,2020 to January 22, 2021.

B. Archaeological Monitoring is not required for this project. However, section 107.13(B) Archaeological, Historical, and Burial Sites applies.

C. Sensitivity to Residents: Please note that this project is following a highway resurfacing project, which raised resident sensitivity to highway construction. Contractor will be expected to work with the Engineer to resolve resident complaints and concerns in an expeditious manner.

Meeting Adjourned at 9:50 A.M.

Prepared by: Steven Yoshida

PRE-BID CONFERENCE ATTENDANCE LIST

PROJECT NO.: 72C-01-19 PROJECT NAME: KALANIANAOLE HIGHWY, INTERSECTION IMPROVEMENTS AT WAA STREET

DATE: DECEMBER 30, 2019 TIME: 9:30 AM LOCATION: KAKUHIHEWA STATE OFFICE BUILDING, 601 KAMOKILA BLVD, ROOM 264, KAPOLEI, HI 96707

CALLED BY: STEVEN YOSHIDA, HDOT DESIGN PROJECT MANAGER

PLEASE PRINT

	PARTICIPANTS	COMPANY / ORGANIZATION	ADDRESS (Including City and Zip Code)	TELEPHONE NUMBER
1	Steven Yoshida	HDOT	601 Kamokila Blvd, Rm 602, Kapolei, HI 96707	692-7682
2	Randy Silva	Ronald N.S. Ho & Assoc.	2153 N. King St., Suite 201, Honolulu, HI, 96819	379-1673
3	Gavin Wong	AECOM	1001 Bishop St #1600 Honolulu HI 96814	529-7208
4	Orion Tom	HDOT	2707 Kilihau St Honolulu, HI 96819	831-6801
5	Jennifer Yoza	HDOT	2707 Kilihau St. Honolulu, HI 96819	831-6810
6	Justin Ching	HDOT	2707 Kilihau St. Honolulu, HI 96819	831-6810
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DAVID Y. IGE
GOVERNOR OF HAWAII

BRUCE S. ANDERSON, Ph.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

December 12, 2019

Courtney Cacace
Environmental Planner
AECOM
1001 Bishop Street, Suite 1600
Honolulu, Hawaii 96813

Dear Ms. Cacace:

Enclosed is the VARIANCE (Docket No. 19-NR-VN-43) for Community Noise Control which was granted on December 11, 2019. The Decision and Order specifies the conditions and restrictions that are applicable to your project.

Non-compliance with the conditions and restrictions of the Decision and Order may bring about additional restrictions, possible suspension of the variance and/or monetary fines. Should you have any questions relative to the variance, please do not hesitate to contact me at (808) 586-4700 or james.toma@doh.hawaii.gov.

Sincerely,

James E. Toma
Noise Section Supervisor
Indoor and Radiological Health Branch

STATE OF HAWAII
DEPARTMENT OF HEALTH

In the Matter of the Application For Variance for:	)	
AECOM TECHNICAL SERVICES Noise – Traffic Signal Pole Installation, Along Kalanianaole Highway, between Anali'i Steet and Wa'a Street, Honolulu, Oahu.	)	Docket No. 19-NR-VN-43 V – 1123

DECISION AND ORDER

Pursuant to Chapter 342F, Hawaii Revised Statutes (H.R.S.), and Chapter 11-46, Hawaii Administrative Rules (H.A.R.), Community Noise Control; and based upon the application and review by the Indoor and Radiological Health Branch, the variance request from the provisions of Section 11-46-6(a), H.A.R., is hereby GRANTED with the following restrictions and conditions:

1. The variance shall be granted for the installation of six (6) new traffic signal poles along Kalanianaole Highway, between Anali'i Street and Wa'a Street, Honolulu.

2. The variance shall be granted from February 10, 2020 to January 22, 2021, excluding holidays.

3. The variance shall be granted for the following days/times:

Sunday	8:00 p.m. to Midnight
Monday to Thursday	Midnight to 5:00 a.m., and 8:00 p.m. to Midnight
Friday	Midnight to 5:00 a.m.

4. The variance shall be granted with the following restriction:

   The use of the *Auger Drill-rig*, *Jackhammers and Drills* and *Concrete-saws* shall be prohibited after 10:00 p.m.

5. The applicant shall notify the Indoor and Radiological Health Branch as to the date and time of any variance hour activity as soon as the dates are confirmed, and when the project is completed.

6. The applicant shall make every effort to minimize noise emanating from the project.

7. The use of reverse signal alarms shall be prohibited from 8:00 p.m. to 7:00 a.m. Alternative methods such as utilizing a ground guide for signaling shall be employed.

8. Traffic noise from heavy vehicles travelling to and from the project site shall be minimized near residences.

9. The applicant shall have a job-site inspector to whom immediate complaints can be forwarded for prompt response, and who shall have the general responsibility of monitoring quiet work procedures.

10. Residents and businesses that may be impacted by the activity shall be given sufficient notice regarding the project. The notification for the planned nighttime activity shall contain the name and telephone number of the job-site inspector. In addition, a copy of any notifications, as well as progress reports shall be sent to the Indoor and Radiological Health Branch.

11. If the noise level is such that numerous complaints are received by the Department, the applicant shall cease operations upon receipt of an order and complete the project during hours on weekdays and weekends as directed.

12. Pursuant to Section 342F-5(d)(3), H.R.S., the applicant shall be required to perform noise sampling during the variance hours and report the results of such sampling to the Indoor and Radiological Health Branch.

13. Should the duration of the project continue beyond the expiration date, the applicant shall submit a request for extension along with an updated work schedule prior to January 22, 2021.

DATED: Honolulu, Hawaii, DEC 1 1 2019.

Lynn M Nakasone

LYNN M. NAKASONE
Environmental Health Program Administrator
Environmental Health Services Division

Geotechnical Engineering Report

Waa Street Traffic Signals

Honolulu, Oʻahu, Hawaiʻi

Prepared for

AECOM

September 12, 2019

3140-018-002

HARTCROWSER

Geotechnical Engineering Report

Waa Street Traffic Signals

Honolulu, O'ahu, Hawai'i

Prepared for
AECOM

September 12, 2019
3140-018-00

Prepared by
Hart Crowser, Inc.

GARRY E. HORVITZ
LICENSED PROFESSIONAL ENGINEER
No. 7705-C
HAWAII U.S.A.

9/12/19

Jim Jacobe
Sr. Project, Geotechnical Engineer

Garry E. Horvitz, PE
Vice President, Geotechnical Engineer

7 Waterfront Plaza
500 Ala Moana Boulevard, Suite 7-240
Honolulu, Hawaii 96813
808.587.7747

Contents

Geotechnical Engineering Report

Waa Street Traffic Signals

Honolulu, O'ahu, Hawai'i

1.0 INTRODUCTION

This report provides Hart Crowser's geotechnical engineering evaluation of the Waa Street Traffic Signal project in the suburb of Wailupe, Honolulu on the island of O'ahu, Hawai'i. The project will consist of the addition of traffic signals at the intersection of Waa Street and Kalanianaole Highway. The general project area is shown on Figure 1.

Plans indicate the two traffic signal poles will be placed in the median of Kalanianaole Highway on either side of the intersection with Waa Street.

This report documents our evaluation of the site, our assessment of surface and subsurface conditions, and our recommendations for traffic signal foundation design and construction considerations.

2.0 SCOPE OF SERVICES

The purpose of our work was to assess the existing surface, soil, and groundwater conditions at the intersection and to provide geotechnical engineering parameters for design of the traffic signal foundations. Our scope of work was completed in general accordance with the scope of services detailed in our services agreement with AECOM. A summary of our scope of work is provided below.

- Reviewed relevant, readily available geologic maps and geotechnical reports that covered the site vicinity to evaluate geologic hazards, regional soil mapping, and local soil and groundwater conditions.
- Conducted field explorations, including:
  - Drilling two borings to depths of 18.5 and 25 feet below ground surface (bgs) using a truck-mounted drill rig
  - Maintaining a log of the soils encountered in the explorations and collecting soil samples for laboratory testing
- Conducted a program of laboratory testing on select soil samples.
- Prepared this report outlining our findings and recommendations, including geotechnical design recommendations related to the following:
  - Subsurface soil and groundwater conditions
  - Traffic signal pole foundations
  - Construction considerations
- Provided project management and support services, including coordinating staff and subcontractors and conducting telephone consultations and email communications with the design team.

3.0 EXISTING INFORMATION REVIEW

3.1 Geology and Geologic Hazards

The site geology is mapped by the U.S. Geological Survey (USGS) Open-File Report 2007-1089; *Geologic Map of the State of Hawai'i* (Sherrod and others 2007). The mapping shows two geologic units underlying portions of the site.

Along most of the Waa Street and Kalanianaole Highway intersection, the mapping shows calcareous reef rock and marine sediment (Pleistocene) deposits. These are described as "chiefly emerged coral reefs… consist of coral heads and coralline algae cemented by a lime matrix" (Sherrod and others 2007). Along the southern portion of the project area, the mapping shows young (Holocene) beach deposits. This is described as "sand and gravel worked by surf into unconsolidated strand-line deposits along coastline" (Sherrod and others 2007). Our investigation confirms that the subsurface conditions generally conform to the mapped geology with some exceptions detailed below.

4.0 SITE CONDITIONS

4.1 Surface Conditions

The project area is located at the intersection of Kalanianaole Highway and Waa Street near the base of the Wiliwilinui Ridge on the southeastern coast of O'ahu. Landforms at the site generally consist of a relatively level coastal plain.

The pavements along the alignment are asphalt concrete (AC), often underlain by Portland cement concrete (PCC). We observed pavements to be in generally good condition. We generally did not observe indications of wear, such as cracking, chipping, heaving, or sunken sections within the pavement.

4.2 Subsurface Conditions

4.2.1 General

We explored subsurface soil and groundwater conditions along the project alignment by advancing two borings to depths of 25 and 18.5 feet bgs. Borings HC-1 and HC-2 were completed in July 2019. The borings were advanced using a truck-mounted drill rig subcontracted with Valley Well Drilling.

The locations of the borings are shown on Figure 2. Appendix A summarizes our exploration methods and presents our exploration logs.

All borings were advanced through the existing street pavements. The borings were cored through AC and/or PCC pavement using a 10-inch-diameter carbide cutting head driven by the drill stem.

Base materials encountered below the pavement consisted of crushed coralline aggregate with sand ranging from 8 inches to 14.5 inches in borings HC-2 and HC-1, respectively.

4.2.2 Beach Deposits

Borings encountered materials we interpret as the alluvial beach deposits mapped by Sherrod and others (2007). These materials were generally encountered below the pavement section in the borings. Typically, the beach deposits consisted of medium dense to very dense silty sandy gravel and sandy silt with gravel. N-values in the beach deposits were typically over 50 blows per foot (bpf).

4.2.3 Coral Bedrock and Marine Sediments

Below the alluvial deposits in the borings, we encountered coral bedrock, which was tan, moderately to severely fractured, slight weathered, and medium hard. Based on the topography of the alignment, we anticipate that the traffic signal foundations will encounter intact coral at the planned excavation depths.

4.2.4 Groundwater

During completion of the July 2019 explorations, no groundwater was encountered in the borings. However, we anticipate that seasonal or perched water may be present in the soils below adjacent sea level, above or within the coral bedrock, or after periods of heavy precipitation.

5.0 CONCLUSIONS

Based on our explorations, testing, and analyses, it is our opinion that the site is suitable for the proposed use, provided the recommendations in this report are included in design and construction. We offer the following general summary of our conclusions.

- The near-surface materials generally consist of predominately gravelly and sandy soils. In general, we anticipate that conventional earth moving equipment will be capable of excavating the surficial soils in the project area. However, relatively shallow bedrock is present across the site.

- The foundation excavations are likely to encounter coral bedrock at both proposed traffic signal locations. Based on drilling action, the coral encountered may not be rippable with conventional means. Excavations may require the use of carbide coring bits or other rock removal methods. We do not recommend that blasting be used due to the residential location of the project.

- Bedrock excavation methods, such as pneumatic or hydraulic hammers, cause significant vibrations that could potentially damage existing structures, pavement, and utilities in the vicinity. If the contractor selects a vibration-inducing method for excavation or trenching, we recommend vibration monitoring be performed during such operations. We also recommend that the contractor be made responsible for the means and methods used such that damage to adjacent utilities and structures is avoided.

- We did not encounter groundwater during our explorations; however, due to the relatively low elevation at the site and close proximity to the Pacific Ocean, foundation excavations may encounter the water table or perched water during construction. We anticipate sump pumps would be adequate to remove such water, if encountered.

The following sections of the report present our conclusions and recommendations for geotechnical aspects of the project. Our geotechnical exploration and engineering analysis have been performed in accordance with generally accepted geotechnical practice. We have developed our conclusions and recommendations based on our current understanding of the project. If the nature or location of the project is different than we have assumed, Hart Crowser should be notified so we can confirm or modify our recommendations.

6.0 FOUNDATION RECOMMENDATIONS

Our subsurface explorations generally encountered dense to very dense gravelly and sandy soils with occasional sandy silt and coral bedrock, which we expect will provide adequate support for the proposed traffic signal foundations. All earthwork and foundation construction should be conducted in accordance with the 2005 Standard Specifications for Road and Bridge Construction for the state of Hawai'i Department of Transportation (HDOT). Specific foundation recommendations are provided in the following sections.

6.1 Excavation

Coral formations, coralline detritus, fill, and sandy and gravelly soils were encountered in the borings at the site. The contractor should be prepared to drill through these materials for the proposed traffic signal foundations. It is our opinion that conventional earthmoving equipment in proper working condition should be capable of making necessary general excavations in the soils. However, shallow coral rock was encountered in the borings and may require rock drilling methods, such as carbide coring bits. The contractor should be responsible for determining the best method to excavate the soils and rock in the field. If the contractor is using vibration-inducing equipment to excavate, vibration monitoring should be performed in order to limit potential damage to existing structures, utilities, and pavements near the project.

The contractor should be prepared to case the foundation excavations where loose soils or groundwater seepage could cause loss of ground. Fill, sand, and gravel soils can be especially prone to caving and may require casing. The actual need for casing should be determined in the field at the time of installation.

While this report describes certain approaches to excavation, the contractor is responsible for selecting and designing the specific methods; monitoring the excavations for safety; and providing adequate protection for personnel, adjacent utilities, pavement, and other structural elements.

6.2 Traffic Signal Foundations

We understand that traffic signals will be installed in the median of Kalanianaole Highway on either side of the intersection with Waa Street. The proposed traffic signal foundations are very close to existing pavements and buried utilities. We anticipate the upper 3 feet of soils at these locations would be disturbed during repairs to the existing pavement and/or utilities. As such, we do not recommend including soil resistance in the upper 3 feet during design due to the potential for future disturbance in this zone. We recommend the unfactored LRFD (ultimate) parameters in Table 1 be used for design of the traffic signal foundations. Table 2 presents the depths the soil and rock layers were observed in the borings.

Table 1 – Traffic Signal Foundation Design Parameters

Soil or Rock Layer	Ultimate Undrained Shear Strength (psf)	Friction Angle (degrees)	Unit Weight [Above/Below GWT] (pcf)
Coral / Tuff (Bedrock)	4,000	n/a	115 / 53
Sandy Silt (ML)	1,500	n/a	105 / 43
Sand & Gravel (SP/GP/GM)	n/a	34	110 / 48

Note: No factors of safety have been applied to the design parameters in Table 1.
psf = pounds per square foot • GWT = groundwater table • pcf = pounds per cubic foot

Table 2 – Traffic Signal Foundation Soil Layer Depths

Soil or Rock Layer	Depth(s) Encountered in Boring HC-1 (feet)	Depth(s) Encountered in Boring HC-2 (feet)
Coral / Tuff (Bedrock)	4.3 – 5.0	4.5 – 5.0
Sandy Silt (ML)	5.0 – 8.5	n/a
Sand & Gravel (SP/GP/GM)	3.0 – 4.3 8.5 – 25.0	3.0 – 4.5 5.0 – 18.5

The proposed traffic signals at the site are located approximately 250 feet from the coast. While no groundwater was observed in the borings during drilling, we recommend using the nearby mean sea level as the design groundwater table for the foundations.

7.0 CONSTRUCTION OBSERVATION

Satisfactory foundation and earthwork performance depends to a large degree on quality of construction. Sufficient monitoring of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during subsurface explorations. Recognition of changed conditions often requires experience; therefore, Hart Crowser or their representative should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated.

We recommend that Hart Crowser be retained to monitor construction at the site to confirm that subsurface conditions are consistent with the site explorations and to confirm that the intent of project plans and specifications relating to earthwork and foundation construction are being met. In particular, we recommend that the subgrade preparation and placement and compaction of structural backfill, aggregate bases, and asphalt be observed and/or tested by Hart Crowser.

8.0 LIMITATIONS

We have prepared this report for the exclusive use of AECOM, the State of Hawai'i Department of Transportation, and their authorized agents for the proposed traffic signal improvement project in Honolulu, Hawai'i, in accordance with our approved scope of work. Our report is intended to provide our opinion of geotechnical parameters for design and construction of the proposed project based on exploration locations that are believed to be representative of site conditions. However, conditions can vary significantly between exploration locations and our conclusions should not be construed as a warranty or guarantee of subsurface conditions or future site performance.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty, express or implied, should be understood.

Any electronic form, facsimile, or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by Hart Crowser and will serve as the official document of record.

9.0 REFERENCES

Sherrod, D.R., J.M. Sinton, S.E. Watkins, and K.M. Brunt 2007. Geologic Map of the State of Hawai'i: U.S. Geological Survey Open File Report 2007-1089, 85 p., 1 plate, 1:100,000 scale

State of Hawai'i Department of Transportation (HDOT) 2005. Standard Specifications for Road and Bridge Construction.

State of Hawai'i Department of Transportation (HDOT) 2002. *Pavement Design Manual*, revision March 2002.

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0 1,000 2,000 4,000 Feet

Note: Feature locations are approximate.

N

Waa Street Traffic Signals
Wailupe, Hawaii

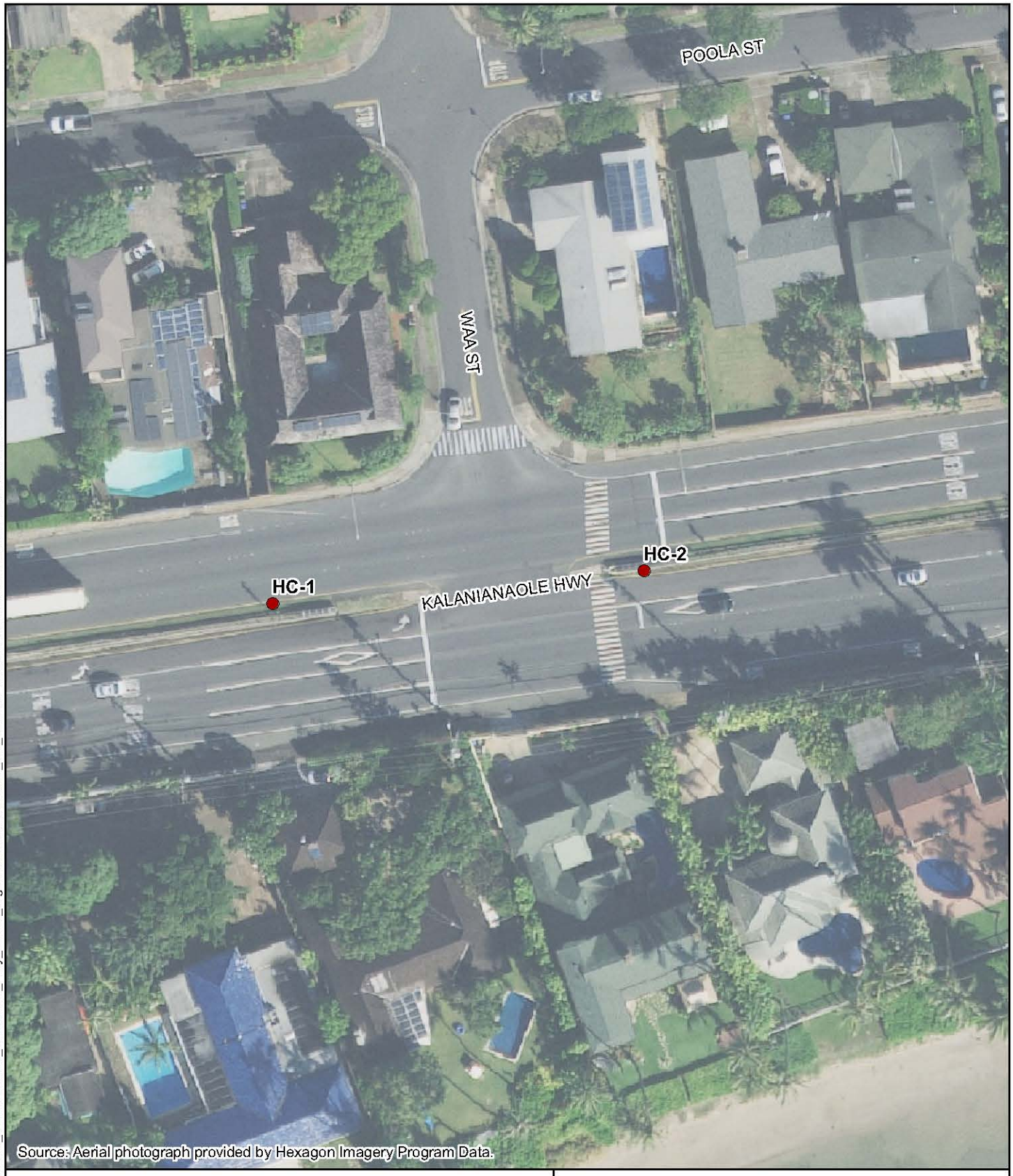
Vicinity Map

3140-018-002 9/19

HARTCROWSER

Figure 1

Document Path: F:\Notebooks\3140018002_AECOM-Waa_Street-Kal_Hwy_Traffic_Signal\GIS\3140018002_AA_VMap.mxd Date: 8/28/2019 User Name: melissaschweitzer



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Legend

- Boring

0 30 60 120 Feet

Note: Feature locations are approximate.

N

Waa Street Traffic Signals
Wailupe, Hawaii

Site Plan

3140-018-002 9/19

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Figure 2

APPENDIX A
Field Explorations

APPENDIX A

Field Explorations

This appendix documents the processes Hart Crowser used to determine the nature (and quality) of the soil and groundwater underlying the project site addressed by this report. The discussion includes information on the following subjects.

- Explorations and Their Locations
- Hollow-Stem Auger Borings
- Standard Penetration Test (SPT) Procedures

Explorations and Their Locations

Observed subsurface explorations for this project included borings HC-1 through HC-2. The exploration logs in this appendix show our interpretation of the explorations, sampling, and testing data. The logs indicate the depths where the soils change. Note that the change may be gradual. In the field, we classified the samples taken from the explorations according to the methods presented on Figure A-1 Key to Exploration Logs. This key also provides a legend explaining the symbols and abbreviations used in the exploration logs.

Figure 2 of the report shows the locations of explorations as determined by Hart Crowser field staff, based on approximate distances from existing mapped objects.

Hollow Stem Auger Borings

Two borings designated HC-1 and HC-2 were drilled between July 2 and 30, 2019, using an 8-inch-diameter hollow stem auger and NQ rock coring tools advanced with a truck-mounted drill rig subcontracted by Hart Crowser. The drilling was continuously observed by a geologic staff member from Hart Crowser and detailed field logs of the borings were prepared.

Standard Penetration Test (SPT) Procedures

Using an SPT sampler, we obtained soil samples in 2.5-foot sampling intervals from depths of 5 to 10 feet bgs and at 5-foot sampling intervals below that depth. The SPT test is an approximate measure of soil density and consistency. To be useful, the results must be used with engineering judgment in conjunction with other tests. The SPT (as described in American Society for Testing and Materials [ASTM] D 1586) was used to obtain disturbed samples. This test employs a standard 2-inch outside-diameter split-spoon sampler. Using a 140-pound manual hammer, free-falling 30 inches, the sampler is driven into the soil for 18 inches. The number of blows required to drive the sampler the last 12 inches only is the Standard Penetration Resistance. This resistance, or blow count, measures the relative density of granular soils and the consistency of cohesive soils. The blow counts are plotted on the boring logs at their respective sample depths.

Soil samples were recovered from the split-barrel samplers, field classified, and placed into watertight bags. They were then taken to our soils laboratory for further testing. Laboratory test results are included on the boring logs.

Sample Description

Identification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. ASTM D 2488 visual-manual identification methods were used as a guide. Where laboratory testing confirmed visual-manual identifications, then ASTM D 2487 was used to classify the soils.

Relative Density/Consistency

Soil density/consistency in borings is related primarily to the standard penetration resistance (N). Soil density/consistency in test pits and probes is estimated based on visual observation and is presented parenthetically on the logs.

SAND or GRAVEL Relative Density	N (Blows/Foot)	SILT or CLAY Consistency	N (Blows/Foot)
Very loose	0 to 4	Very soft	0 to 1
Loose	5 to 10	Soft	2 to 4
Medium dense	11 to 30	Medium stiff	5 to 8
Dense	31 to 50	Stiff	9 to 15
Very dense	>50	Very stiff	16 to 30
		Hard	>30

Moisture

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

USCS Soil Classification Chart (ASTM D 2487)

Major Divisions			Symbols: Graph	Symbols: USCS	Typical Descriptions
Coarse Grained Soils: More than 50% of Material Retained on No. 200 Sieve	Gravel and Gravelly Soils: More than 50% of Coarse Fraction Retained on No. 4 Sieve	Clean Gravels (<5% fines)		GW	Well-Graded Gravel; Well-Graded Gravel with Sand
				GP	Poorly Graded Gravel; Poorly Graded Gravel with Sand
		Gravels (5-12% fines)		GW-GM	Well-Graded Gravel with Silt; Well-Graded Gravel with Silt and Sand
				GW-GC	Well-Graded Gravel with Clay; Well-Graded Gravel with Clay and Sand
				GP-GM	Poorly Graded Gravel with Silt; Poorly Graded Gravel with Silt and Sand
				GP-GC	Poorly Graded Gravel with Clay; Poorly Graded Gravel with Clay and Sand
		Gravels with Fines (>12% fines)		GM	Silty Gravel; Silty Gravel with Sand
				GC	Clayey Gravel; Clayey Gravel with Sand
	Sand and Sandy Soils: More than 50% of Coarse Fraction Passing No. 4 Sieve	Sands with few Fines (<5% fines)		SW	Well-Graded Sand; Well-Graded Sand with Gravel
				SP	Poorly Graded Sand; Poorly Graded Sand with Gravel
		Sands (5-12% fines)		SW-SM	Well-Graded Sand with Silt Well-Graded Sand with Silt and Gravel
				SW-SC	Well-Graded Sand with Clay; Well-Graded Sand with Clay and Gravel
				SP-SM	Poorly Graded Sand with Silt; Poorly Graded Sand with Silt and Gravel
				SP-SC	Poorly Graded Sand with Clay; Poorly Graded Sand with Clay and Gravel
		Sands with Fines (>12% fines)		SM	Silty Sand; Silty Sand with Gravel
				SC	Clayey Sand; Clayey Sand with Gravel
Fine Grained Soils: More than 50% of Material Passing No. 200 Sieve	Silts			ML	Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
				MH	Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly Elastic Silt
	Silty Clay (based on Atterberg Limits)			CL-ML	Silty Clay; Silty Clay with Sand or Gravel; Gravelly or Sandy Silty Clay
	Clays			CL	Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly Lean Clay
				CH	Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly Fat Clay
	Organics			OL/OH	Organic Soil; Organic Soil with Sand or Gravel; Sandy or Gravelly Organic Soil
Highly Organic (>50% organic material)				PT	Peat - Decomposing Vegetation - Fibrous to Amorphous Texture

Minor Constituents

	Estimated Percentage
Sand, Gravel	
Trace	<5
Few	5 - 15
Cobbles, Boulders	
Trace	<5
Few	5 - 10
Little	15 - 25
Some	30 - 45

Soil Test Symbols

%F	Percent Passing No. 200 Sieve
AL	Atterberg Limits (%)
	Liquid Limit (LL)
	Water Content (WC)
	Plastic Limit (PL)
CA	Chemical Analysis
CAUC	Consolidated Anisotropic Undrained Compression
CAUE	Consolidated Anisotropic Undrained Extension
CBR	California Bearing Ratio
CIDC	Consolidated Drained Isotropic Triaxial Compression
CIUC	Consolidated Isotropic Undrained Compression
CK0DC	Consolidated Drained k0 Triaxial Compression
CK0DSS	Consolidated k0 Undrained Direct Simple Shear
CK0UC	Consolidated k0 Undrained Compression
CK0UE	Consolidated k0 Undrained Extension
CRSCN	Constant Rate of Strain Consolidation
DSS	Direct Simple Shear
DT	In Situ Density
GS	Grain Size Classification
HYD	Hydrometer
ILCN	Incremental Load Consolidation
K0CN	k0 Consolidation
kc	Constant Head Permeability
kf	Falling Head Permeability
MD	Moisture Density Relationship
OC	Organic Content
OT	Tests by Others
P	Pressuremeter
PID	Photoionization Detector Reading
PP	Pocket Penetrometer
SG	Specific Gravity
TRS	Torsional Ring Shear
TV	Torvane
UC	Unconfined Compression
UUC	Unconsolidated Undrained Triaxial Compression
VS	Vane Shear
WC	Water Content (%)

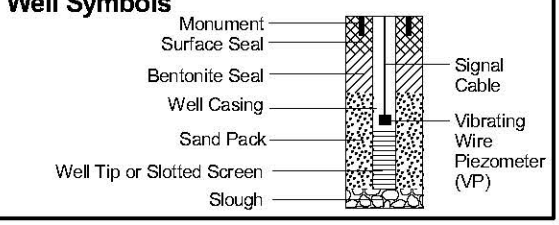
Groundwater Indicators

- Groundwater Level on Date or At Time of Drilling (ATD)
- Groundwater Level on Date Measured in Piezometer
- Groundwater Seepage (Test Pits)

Sample Symbols

- 1.5" I.D. Split Spoon
- 3.25" O.D. Split Spoon
- Modified California Sampler
- Rock Core Run
- Sonic Core
- Thin-walled Sampler
- Grab
- Cuttings
- Push Probe

Well Symbols



Rock Descriptions

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

Rock Fracture Characteristics

Term	Description
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

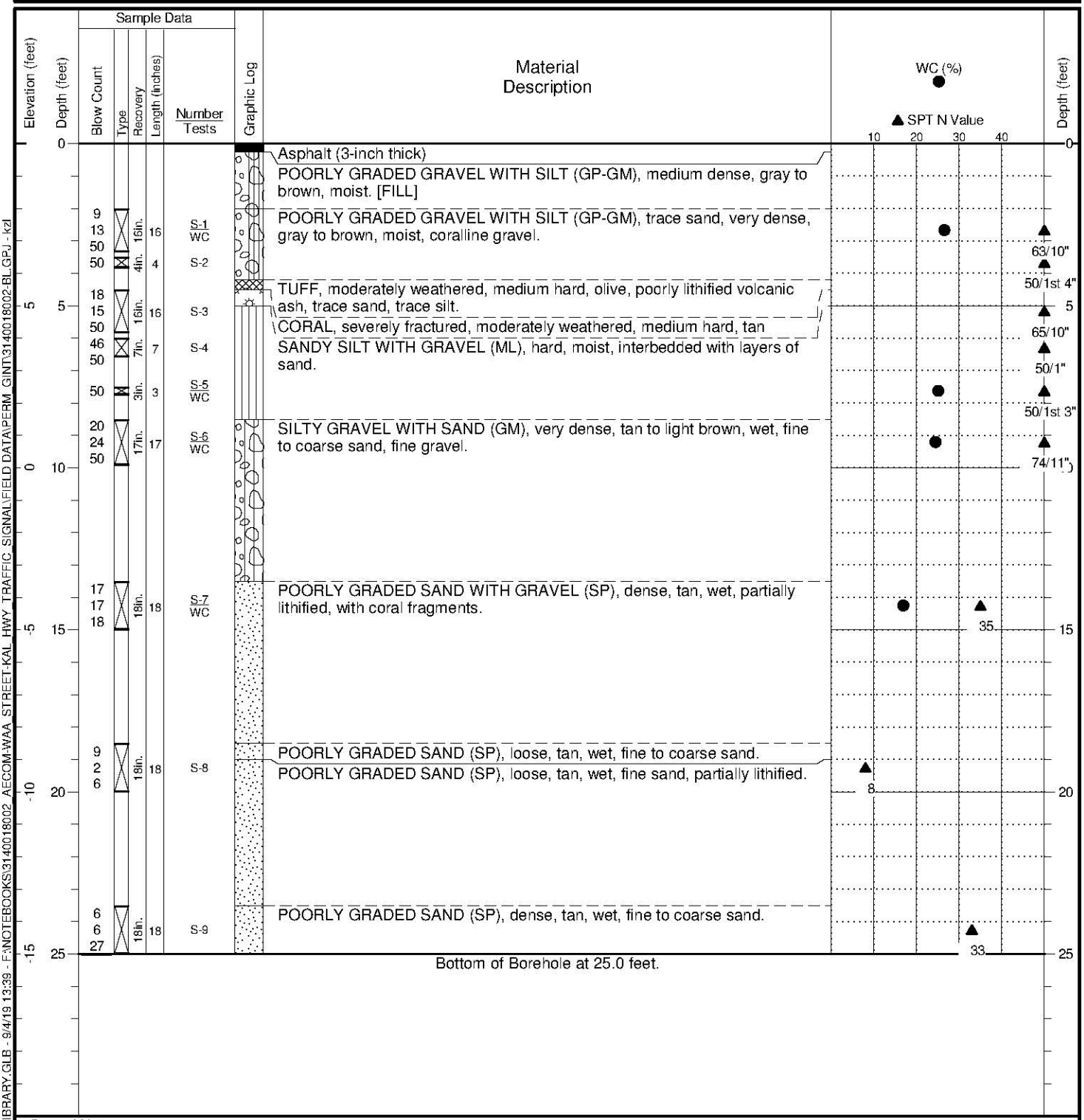
Scale of Relative Rock Weathering

Term	Description
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.

Scale of Relative Rock Hardness

Term	Field Identification
Very Soft	Crumbles under hammer blow. Can be peeled and carved by knife. Can be indented by finger pressure. Example: Saprolite
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
Medium Hard	Can be broken by one hammer blow. Cannot be scrape by knife. SPT may penetrate by ~25 blows per inch with bounce. Example: Porous rock such as clinker, cinder, and coral reef
Hard	Breaks with some difficulty after several hammer blows. Example: Vesicular, vugular, coarse-grained rock
Very Hard	Breaks with difficulty after several "pinging" hammer blows. Example: Dense, fine grain volcanic rock

Date Started: 7/2/19	Date Completed: 7/30/19	Drilling Contractor/Crew: Valley Well Drilling, LLC / Steve & Drew	
Logged by: S. Ueno	Checked by: J. Jacobe	Drilling Method: Hollow Stem Auger	
Location: Lat: 21.276178 Long: -157.763959 (WGS 84)		Rig Model/Type: Mobile B-57 / Track-mounted drill rig	
Ground Surface Elevation: 10 feet (NAVD 88)		Hammer Type:	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): NA	
		Hole Diameter:	Casing Diameter: NA
		Total Depth: 25 feet	Depth to Groundwater: Not Identified



General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HARTCROWSER	Project: Waa Street Kal Hwy Traffic Signal Location: Project No.: 3140-018-002	Boring Log **HC-1**	Figure **A-2** Sheet **1 of 1**

Date Started: 7/30/19	Date Completed: 7/30/19	Drilling Contractor/Crew: Valley Well Drilling, LLC / Steve & Drew	
Logged by: S. Ueno	Checked by: J. Jacobe	Drilling Method: Hollow Stem Auger	
Location: Lat: 21.276218 Long: -157.763470 (WGS 84)		Rig Model/Type: Mobile B-57 / Track-mounted drill rig	
Ground Surface Elevation: 10 feet (NAVD 88)		Hammer Type:	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): NA	
		Hole Diameter:	Casing Diameter: NA
		Total Depth: 18.5 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description
	0							Asphalt (3-inch thick)
								Concrete (3-inch thick)
								Base aggregate (8-inch thick)
								POORLY GRADED GRAVEL (GP), tan, moist, coralline gravel and rubble.
	5							CORAL, severely fractured, moderately weathered, medium hard, tan.
0				6in.	60	S-1		POORLY GRADED SAND WITH GRAVEL (SP), tan, wet, fine to coarse sand, with coralline fragments.
								grades to fine sand
-5	10			6in.	60	S-2		
	15			7in.	48	S-3		
		4 10 50		13in.	18	S-4		POORLY GRADED GRAVEL WITH SILT (GP-GM), tan, wet, coralline gravel.
-10	20							Bottom of Borehole at 18.5 feet.
-15	25							

SPT N Value: 10, 20, 30, 40 — ▲ 60

General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HARTCROWSER	Project: Waa Street Kal Hwy Traffic Signal Location: Project No.: 3140-018-002	Boring Log **HC-2**	Figure **A-3** Sheet **1 of 1**

QUESTIONS FROM BIDDERS WITH HDOT RESPONSES

Kalanianaole Highway
Intersection Improvements at Waa Street
Project No. 72C-01-19

January 6, 2020

Question 1 (Received on 01/02/2020): Structural drawings depict a drilled shaft caisson for "Type II" traffic signals C and G. Detail B/E013, in the electrical drawings, states that "Drilling an Equivalent Footing Will Not Be Acceptable. Footing shall be square." Could you please clarify note #3 in detail B/E013?

HDOT Response: See Plan Sheet ADD. 41.

Question 2 (Received on 01/02/2020): Could you provide a detail for the type I signal pole standard footing?

HDOT Response: The Type I traffic signal pole footing details are as shown on the State of Hawaii, Department of Transportation, Highways Division, Design Branch, Standard Plans sheet TE-32.