

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU

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HONOLULU, HAWAII 96813
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FILE COPY

MAY 23 2015

KIRK CALDWELL
MAYOR



ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

608696

May 11, 2015

Jessica Wooley, Director
Office of Environmental Quality Control
Department of Health, State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813-2437

Dear Ms. Wooley:

Subject: Central Oahu Ambulance Facility
TMK: 9-4-122: 103
Draft Environmental Assessment
Anticipated Finding of No Significant Impact

The Department of Design and Construction hereby transmits the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI) for the Central Oahu Ambulance Facility project situated at TMK: 9-4-122: 103, in the Ewa District on the island of Oahu for publication in the next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, two (2) copies of the DEA-AFONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions, please contact Curtis Kushimaejo at 768-8455.

Very truly yours,

A handwritten signature in black ink, appearing to read "for M. Kroning".

Robert J. Kroning, P.E.
Director

RJK:ln

Enclosures

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OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

**AGENCY ACTIONS
SECTION 343-5(C), HRS
PUBLICATION FORM (JANUARY 2013 REVISION)**

Project Name: Central Oahu Ambulance Facility
Island: Oahu
District: Ewa
TMK: 9-4-122: 103
Permits: Building Permits, Administrative Waiver for P-2 front yard encroachment
**Proposing/
Determination Agency** **Department of Design and Construction
City and County of Honolulu**
Mr. Curtis Kushimaejo
650 South King Street, 11th Floor
Honolulu, Hawaii 96813
T: (808) 768-8455
E: ckushimaejo@honolulu.gov
Consultant: **Environmental Communications, Inc.**
Taeyong Kim, Principal Planner
P.O. Box 236097
Honolulu, Hawaii 96823
T: (808) 528-4661
E: tkim@environcom.com

Status (check one only):

- DEA-AFNSI** Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqc@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.
- FEA-FONSI** Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
- FEA-EISPN** Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqc@doh.hawaii.gov); a 30-day consultation period ensues upon publication in the periodic bulletin.
- Act 172-12 EISPN** Submit the approving agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqc@doh.hawaii.gov). NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.
- DEIS** The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the

summary and PDF to oeqc@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.

___ FEIS

The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.

___ Section 11-200-23
Determination

The approving agency simultaneously transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the applicant. No comment period ensues upon publication in the periodic bulletin.

___ Statutory hammer
Acceptance

The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it failed to timely make a determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and that the applicant's FEIS is deemed accepted as a matter of law.

___ Section 11-200-27
Determination

The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.

___ Withdrawal (explain)

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page):

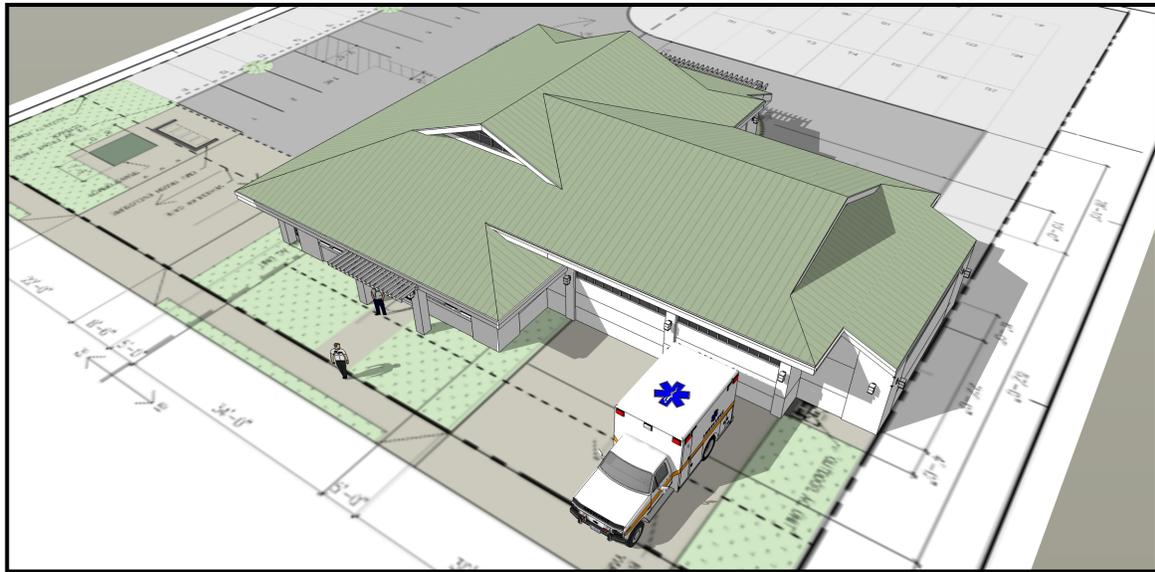
The proposed action consists of the construction of a 2,592 square foot ambulance facility and a 1,050 square foot ambulance apparatus bay that can accommodate two ambulance vehicles. Appurtenant to the ambulance facility are eight (8) standard parking stalls, one (1) accessible parking stall, and a fueling station.

The project site was initially reserved for use as a fire station but was deemed programmatically unsuitable for fire station use but was found to be well located for an emergency ambulance facility. The site is split zoned B-1 Neighborhood Business and P-2 Preservation, both which allow public facility use.

The subject facility was mandated by the State of Hawaii Department of Health Emergency Medical Services Branch. The Waipio unit is presently housed in a warehouse on Ukee Street but is not optimally configured for ambulance operations.

Draft Environmental Assessment
Honolulu Medical Services Department
Central Oahu Ambulance Facility

Waipahu, Island of Oahu
Tax Map Keys: 9-4-122: 103



Proposing Agency: Department of Design and Construction
City and County of Honolulu

March 2015

Honolulu Medical Services Department
Central Oahu Ambulance Facility
Waipahu, Island of Oahu
Tax Map Keys: 9-4-122: 103

Draft Environmental Assessment

Prepared by the Department of Design and Construction pursuant to Chapter 343, Hawaii Revised Statutes (HRS)

Notice of availability of this document will be made in the Environmental Notice published by the Office of Environmental Quality Control. Written comments regarding this document will be included in the Final Environmental Assessment.

For additional information concerning this document please contact:

Mr. Taeyong Kim
Environmental Communications, Inc.
P.O. Box 236097
Honolulu, HI 96823
Email: tkim@envirocom.com

A copy of any comments or requests should be made to:

Director
Attn: Curtis Kushimaejo
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, HI 96813
Email: ckushimaejo@honolulu.gov

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- A. Project Drawings for Nuuanu Pali Drive and Old Pali Road Storm Drainage Improvements
- B. Soil Assessment Central Oahu (Wapio) Ambulance Facility Ukee Street at Koliana Street, Waipahu, Hawaii

I. PROJECT SUMMARY

PROPOSING AGENCY:	Department of Design and Construction 650 South King Street, 11 th Floor Honolulu, Hawaii 96813
PROJECT NAME:	Central Oahu Ambulance Facility
PROJECT LOCATION:	Vacant parcel located between Kamehameha Highway and Ukee Street Waipio Gentry, Waipahu, Oahu, Hawaii
TAXMAPKEY/ OWNERSHIP:	9-4-122: 103 / City and County of Honolulu
AREA:	26,249 square feet (0.6026 acres)
ZONING:	13,800 square feet in B-1 Neighborhood Business 12,450 square feet in P-2 Preservation
STATE LAND USE:	Urban District
CURRENT LAND USE:	The project site consists of vacant, maintained land that is intended for development but is not presently developed. The site is open and grassed and is regularly maintained. It is not used for any recreational purpose.
PROJECT SCOPE:	<p>The proposed action consists of the construction of a 2,592 square foot ambulance facility and a 1,050 square foot ambulance apparatus bay that can accommodate two ambulance vehicles. Appurtenant to the ambulance facility are eight (8) standard parking stalls, one (1) accessible parking stall, and a fueling station.</p> <p>The subject facility was mandated by the State of Hawaii Department of Health Emergency Medical Services Branch. The Waipio unit is presently housed in a warehouse on Ukee Street but is not optimally configured for ambulance operations.</p>
PROJECT COST/PHASING	The estimated construction cost for the project is \$2,900,000.00.

The proposed project will be conducted in a single continuous phase with a projected commencement date of the Summer 2016 and a completion date in the Spring of 2017. The improvements should be completed in approximately 9 months.

PERMITS AND APPROVALS

City and County of Honolulu Building Permits
Administrative Waiver for setback in P-2

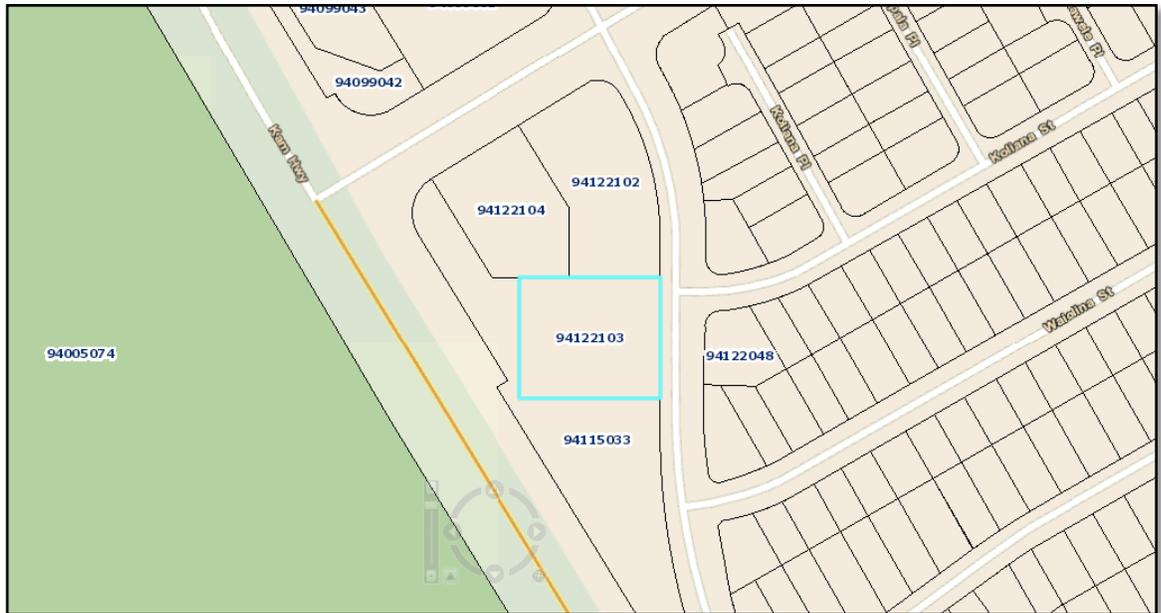
II. PROPOSED PROJECT AND STATEMENT OF OBJECTIVES

A. Project Location

The subject project consists of a vacant parcel adjacent to business uses located immediate to the north and single family residential use located to the east, Waipio Gentry development in Waipahu, Oahu, Hawaii. The site is vacant but is grassed and maintained. The project parcel is located immediately makai (south) of the Shell Food Mart building, and immediately mauka (north) of a undulating landscaped berm area that screens the Waipio Gentry residential area from Kamehameha Highway. Kamehameha Highway and the Central Oahu Park lie directly to the west. The project site is identified as Tax Map Key: 9-4-122: 103 and is not presently assigned with a street number.

The surrounding neighborhood generally consists of industrial retail uses to the north and single-family residential dwellings to the east. These areas are part of the master planned Gentry Waipio community. The Patsy T. Mink Central Oahu Regional Park lies to the west and south. Farther to the north and west lies the Kipapa Gulch, and farther east lies the undeveloped Wiawa area and farther south lies the older subdivision of Crestview.

Figure 1: TMK Map



Source: City and County of Honolulu, Honolulu Land Information System (HoLIS)

Figure 2: Aerial Map of Project Area



Source: City and County of Honolulu, Honolulu Land Information System (HoLIS)

B. Project Description

The proposed project consists of the construction of a 2,592 square foot ambulance facility and a 1,050 square foot ambulance apparatus bay that can accommodate two ambulance vehicles. Appurtenant to the ambulance facility are seven (7) standard parking stalls, one (1) accessible parking stall, and an emergency power and fueling station. The side and back yards will be secured by a six-foot high chain link fence.

Two separate curb cuts will be required for the facility. The first will be a 24-foot deep concrete pavement that will be used as an entry in to the ambulance bay. The second will be a vehicle gate that will provide access to the employee parking area. Both ingress/egress points will be connected by a paved connection point behind the main ambulance facility and will allow the ambulance vehicles free movement within the project site. The ambulance vehicles will enter from the parking lot and enter the ambulance bay from the rear and exit through the driveway. Ambulance circulation is one-way only. Areas not used for parking, driveway or building will be covered with gravel beds or maintained grass lawn. The gravel beds may serve as overflow parking if necessary.

The ambulance facility will consist of a single story building with a shallow spread footing and reinforced concrete slabs on grade. The building will consist of load bearing cast-in-place concrete walls finished in EFS. The roof of the building will be constructed with plywood sheathing placed on steel roof trusses. So major grading will be required for the building.

The building will include the following uses:

- Reception area
- Supervisor's office
- Guest/front office toilet
- Staff rooms (2) serving as overnight accommodations
- Kitchen
- Male and female staff bathrooms with showers
- Staff work room
- Decontamination room
- Electrical, Telecommunications, and Janitor's rooms
- Ambulance bay
- Oxygen room accessed through ambulance bay
- Storage room accessed through ambulance bay

The facility is accessible from all four sides of the building but only the Ukee Street (front) access is available to the public.

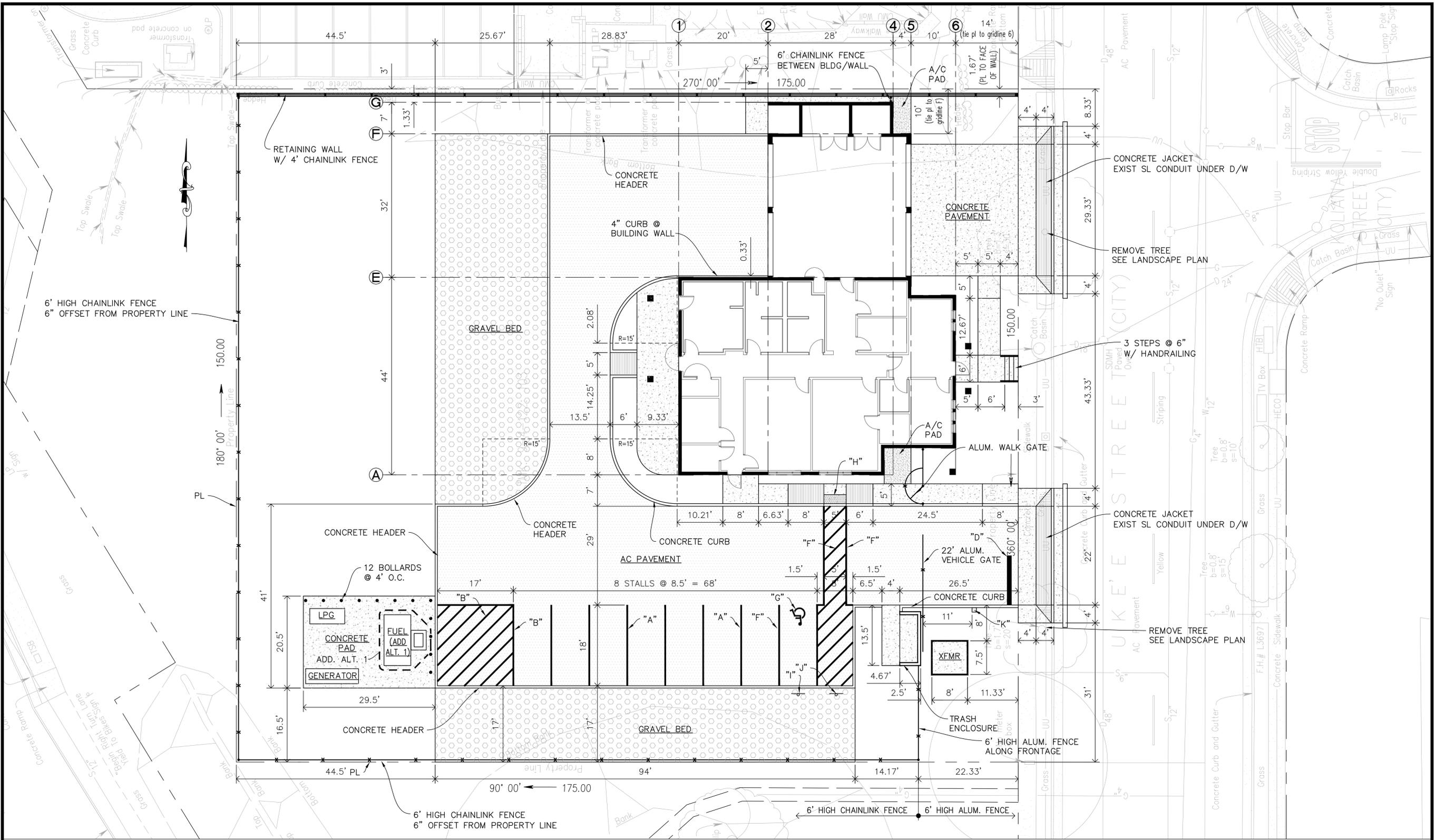
An electrical transformer and a trash enclosure will be located towards the southeastern corner of the project site. A concrete pad located towards the southwestern corner of the site will support a fueling station for the ambulance vehicles, an emergency backup generator and an LPG tank

Architectural details of the building are consistent with the residential character of the neighborhood. The building features a double hip roof clad with composition shingles, an EFS finish on the walls and a trellis at the entry. A deep front yard setback maintains an open character at this transitional location in contrast to the more intense commercial use located immediately north of the project site. The deep driveway fronting the ambulance service bays allows the ambulance vehicle to fully exit the building without encroaching in to the pedestrian sidewalk fronting the facility.

Two existing pink tecoma trees must be removed to prevent interference with the driveways however these trees will be replaced with two new pink tecoma trees located further north and south of the current locations, and two additional trees will be paced on either side of the building entry. Other landscaping will include pink asystasia, croton mame, ti, and zoysia grass. An irrigation system will be provided for all landscaping.

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P:\2777 Central Oahu Ambulatory Facility\DWG\CENTRAL OAHU AMBULANCE FACILITY SITE PLAN.dwg Plotted:2/20/2015 10:23 AM



NOTES:

- FOR CONCRETE CURB & GUTTER SEE DPW STD DETAIL R-4A.
- FOR CONCRETE SIDEWALK SEE DPW STD DETAIL R-28.
- FOR CONCRETE DRIVEWAY APRON SEE DPW STD DETAIL R-29A DATED JULY 2009.
- FOR CURB AND GUTTER RESTORATION SEE DETAIL 1/C-500
- FOR SIDEWALK RESTORATION SEE DETAIL 2/C-500
- PROVIDE CONTRACTION JOINTS AS PER THE ENGINEERING AND POLICY MEMORANDUM NO CEB-1-09 DATED 4/6/2009
- ALUMINUM FENCE AT FRONT SHALL BE AMERISTAR ECHELON PLUS: MAJESTIC/3-RAIL PANELS/4" AIR SPACE/FLUSH BOTTOM/6' HEIGHT/BRONZE COLOR. INSTALL PER MANUFACTURE INSTRUCTIONS.
- ALUMINUM WALK GATE SHALL BE AMERISTAR ECHELON PLUS: MAJESTIC/3-RAIL SINGLE SWING GATE/FLUSH BOTTOM/6' HEIGHT/4-OPENING/BRONZE COLOR. PROVIDE HARDWARE AND INSTALL PER MANUFACTURE INSTRUCTIONS.
- ALUMINUM VEHICLE GATE SHALL BE AMERISTAR TRANSPORT II SLIDING CANTILEVER GATE: MAJESTIC/BRONZE COLOR/22' CLEAR OPENING. WITH AMERISTAR 9150AGS SLIDE GATE OPERATOR: 1HP/115VAC/7A/LOOP DETECTOR/STAINLESS STEEL CHAIN. PROVIDE HARDWARE AND INSTALL PER MANUFACTURE INSTRUCTIONS.

SITE PLAN
SCALE: 1" = 10'

PARKING NOTES:

- "A" 4" WHITE STRIPE
- "B" 4" YELLOW STRIPE
- "C" WORD "LOADING" IN 12" YELLOW LETTERS
- "D" 12" WHITE STOP BAR
- "E" PAVEMENT ARROW
- "F" 4" BLUE STRIPE
- "G" BLUE ISA PAVEMENT SYMBOL
- "H" DETECTABLE WARNING STRIP
- "I" VAN ACCESSIBLE PARKING SIGN & POST
- "J" ACCESS AISLE SIGN & POST
- "K" VEHICLE ACCESS READER



APPROVED:

CHIEF, CIVIL ENGINEERING BRANCH, DPP

CHIEF, TRAFFIC REVIEW BRANCH, DPP

DATE

DATE

NO.	REVISION	DATE	DESCRIPTION

HARVEY K. HIDA
 LICENSED PROFESSIONAL ENGINEER
 No. 4363-C
 HAWAII, U.S.A.

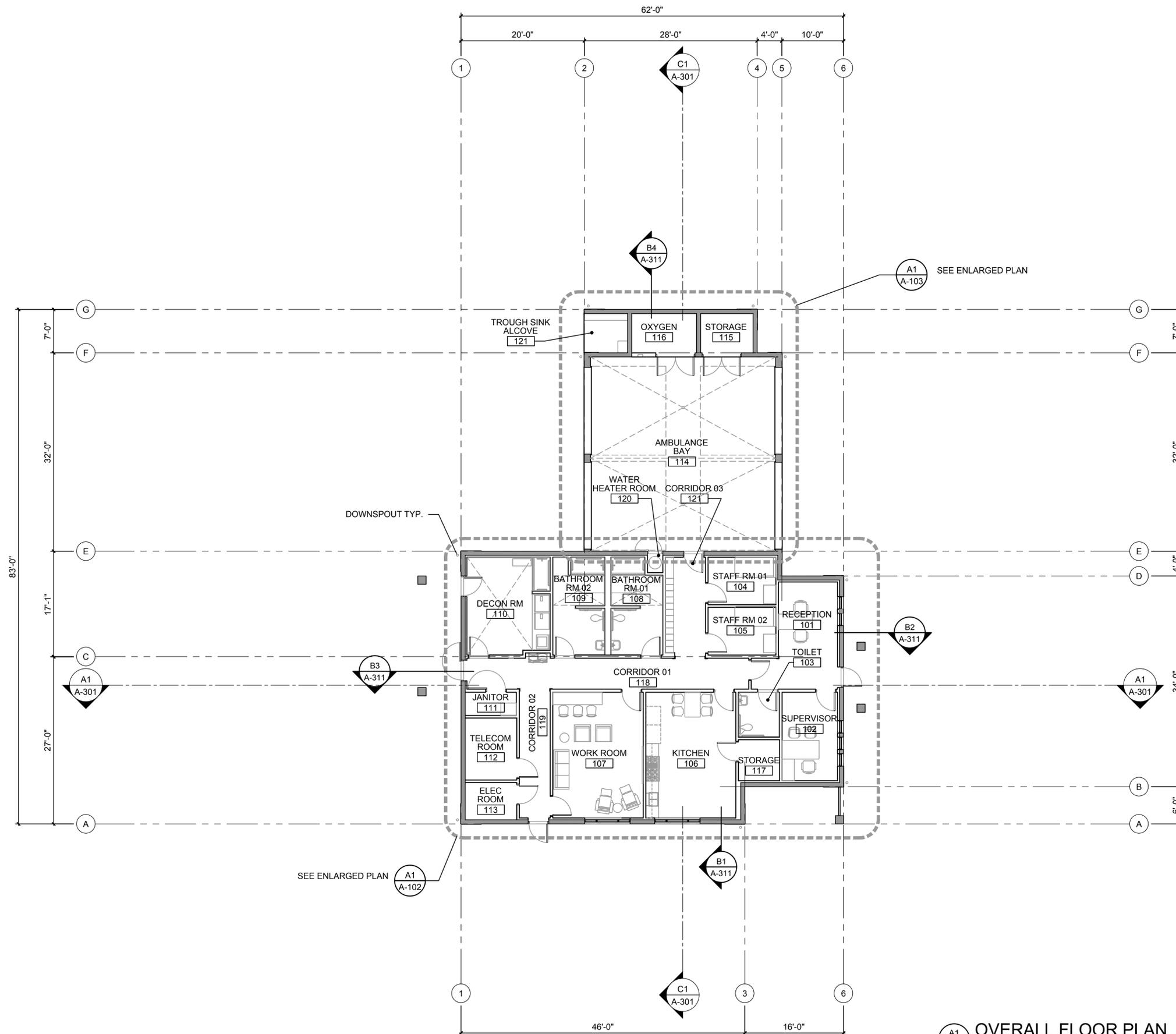
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.
 Signature: *Harvey K. Hida*
 Date: APRIL 30, 2016
 Exp. Date:

ACCEPTED BY: _____
Chief, Traffic Review Branch

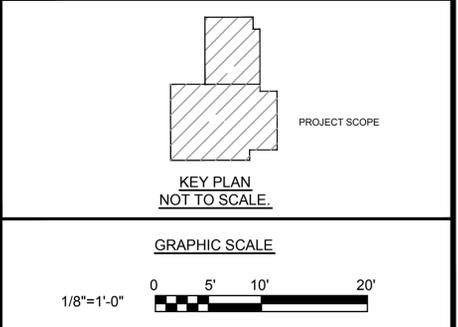
DEPARTMENT OF DESIGN AND CONSTRUCTION
 CITY & COUNTY OF HONOLULU
CENTRAL OAHU AMBULANCE FACILITY
CITY AND COUNTY HONOLULU MEDICAL SERVICES
 WAIKO, OAHU, HAWAII
 9-4-122-103
 SITE PLAN

DESIGN BY: CYO
DRAWN BY: CYO/RH
CHECKED BY: HKH
DATE: 2015
PROJECT NO.: XX-XX-XX
DRAWING NO.: C-102
SHEET NO. XX OF XX
FILE DRAW FOLDER

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OVERALL FLOOR PLAN
SCALE: 1/8" = 1'-0"



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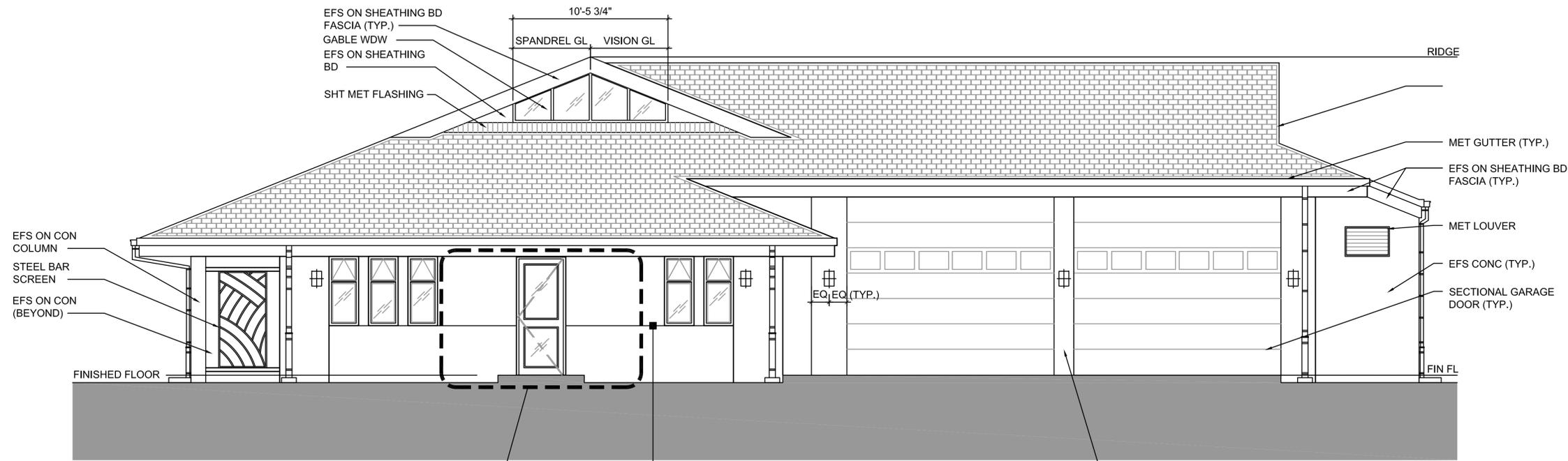
Signature: _____ Date: _____
Exp. Date: _____

ACCEPTED BY: _____
Chief, Mechanical/Electrical Division
Chief, Facilities Division

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU
CENTRAL OAHU AMBULANCE FACILITY
CITY AND COUNTY HONOLULU MEDICAL SERVICES
WAIPIO, OAHU, HAWAII
9-4-122-103
OVERALL FLOOR PLAN

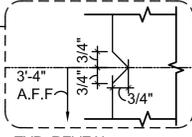
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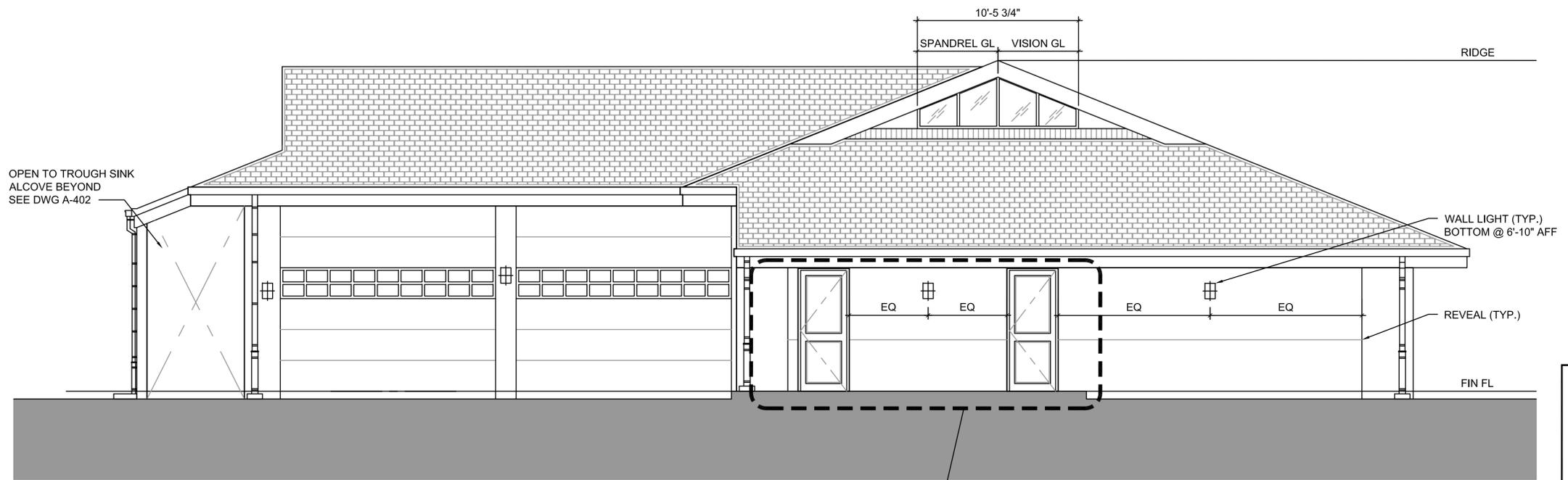
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A-505



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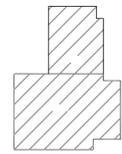
C1
A-201 1/4" = 1'-0"
EAST ELEVATION



TRELLIS & COLUMNS NOT SHOWN FOR CLARITY SEE TRELLIS DET.

B1
A-505

A1
A-201 1/4" = 1'-0"
WEST ELEVATION



KEY PLAN
NOT TO SCALE.

GRAPHIC SCALE



REV.	DATE	DESCRIPTION	BY	CHKD.	APP'D.

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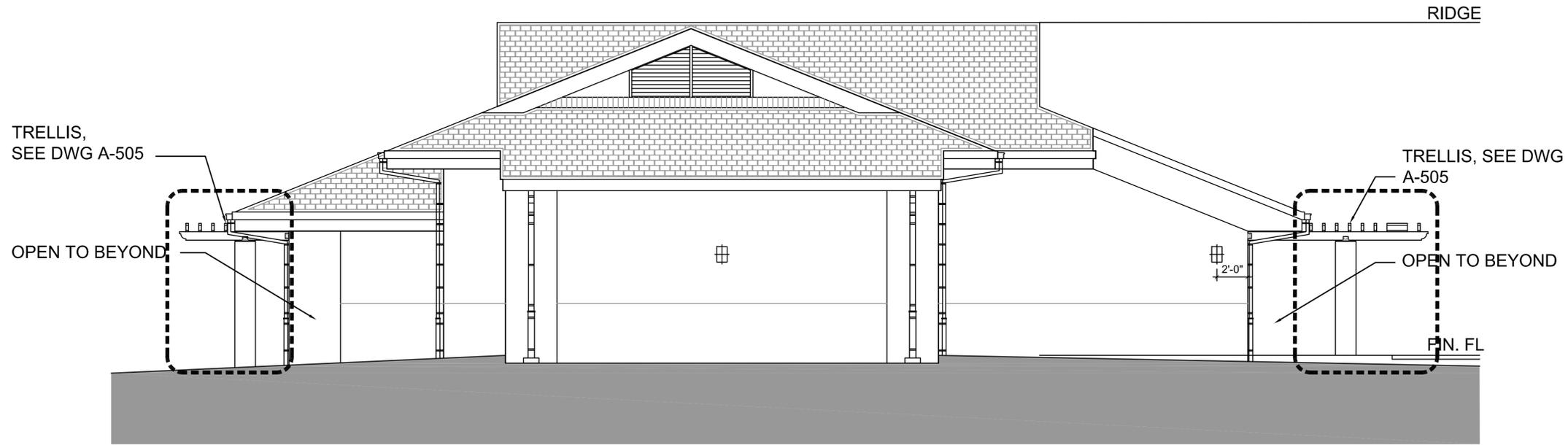
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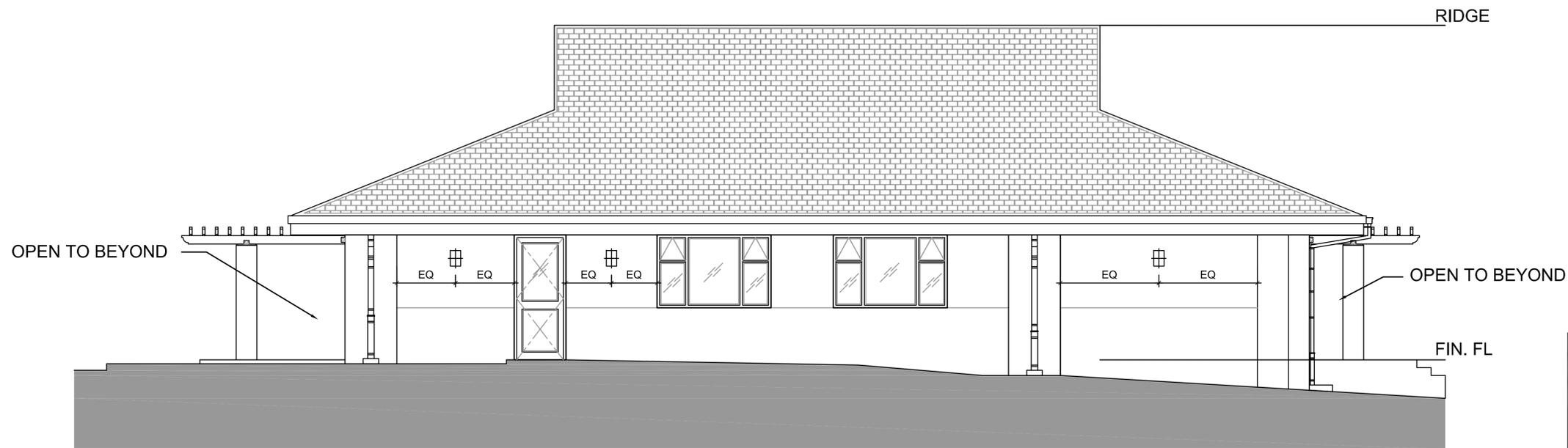
DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU
CENTRAL OAHU AMBULANCE FACILITY
CITY AND COUNTY HONOLULU MEDICAL SERVICES
WAIPIO, OAHU, HAWAII
9-4-122-103
EXTERIOR ELEVATIONS

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C1 NORTH ELEVATION
A-202 1/4" = 1'-0"



A1 SOUTH ELEVATION
A-202 1/4" = 1'-0"

KEY PLAN
NOT TO SCALE.

GRAPHIC SCALE

1/4" = 1'-0" 0 5' 10'

DATE	REVISION	DESCRIPTION	APPROVED

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

Signature _____ Date _____
Exp. Date _____

ACCEPTED BY: _____
Chief Architect/Architect/Designer _____
Chief/Interior Designer _____

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU

CENTRAL OAHU AMBULANCE FACILITY

CITY AND COUNTY HONOLULU MEDICAL SERVICES

WAIPIO, OAHU, HAWAII 9-4-122-103

EXTERIOR ELEVATIONS

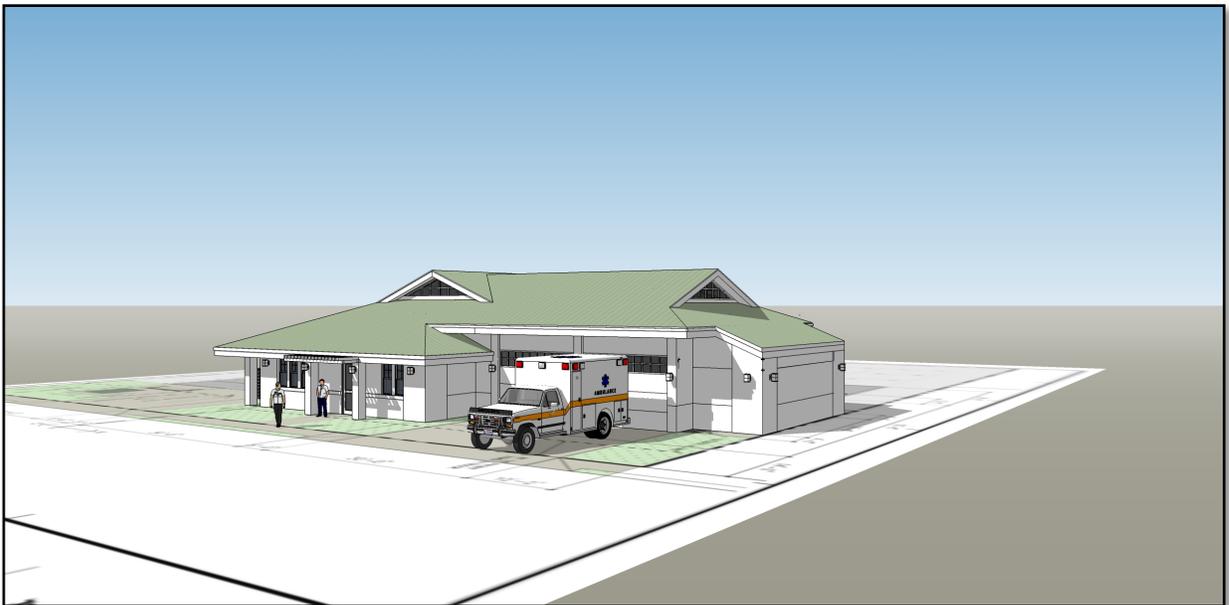
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CHECKED BY: DH
DATE: 2015
PROJECT NO.: XX-XX-XX
DRAWING NO.: **A-202**
SHEET NO. X OF XX
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Figure 7: Aerial Perspective



Source: Design Partners, Inc.

Figure 8: Right Corner Perspective



Source: Design Partners, Inc.

Figure 9: Left Corner Perspective



Source: Design Partners, Inc.

C. Project Objective and Need for Action

The Waipio EMS Unit is one of 20 ambulance units operated by the City and County of Honolulu, Honolulu Emergency Services Department. This unit was mandated and is operationally funded by the Emergency Medical Service System but was never provided a permanent facility from which to operate. The Waipio Unit was formerly housed at the Kaiser Waipio Clinic but demand for space by other uses of the clinic required that the Waipio Unit move to a rented warehouse located at 94-404 Ukee Street from which is presently operates.

The objective of the proposed action is to provide a permanent facility for this Unit which has a service coverage area from Pearl City to Wahiawa. This unit also provides coverage to areas even further than the planned service area and has proven to be a very busy unit with over 75% utilization. Consequently, the need for a permanent, full service facility is imperative.

Availability of the project site for City and County of Honolulu use and its well suited location make the project site both functional and economically feasible for the planned project. While not subject of this Environmental Assessment, the northwest corner of the project site is also being considered for the future development of an Emergency Operations Center. This possible future use is presently only a concept and has not been funded, however, sufficient land area is available on the project site to accommodate both structures and their appurtenant support uses.

The subject Environmental Assessment is prepared in conformance with Chapter 343 Hawaii Revised Statutes, as the project will involve the use of County lands and funds. The project parcel is owned by the City and County of Honolulu and funding of all improvements will be provided the City and County of Honolulu as well.

D. Alternatives Considered

The current Waipio Unit location is not considered a permanent solution in providing a working and service facility for this busy unit. The present location is not owned by the City and County of Honolulu nor does it meet the functional requirements for an efficient service facility. Because it is under private ownership, operations from the warehouse are subject to potential escalation rate changes, impermanent tenure, and potential conflict with neighboring property owners. For this reason, only permanent facilities were considered in housing this unit.

No other City owned properties were available within the Waipio community except for the Patsy T. Mink Central Oahu Regional Park. A maintenance facility at this location was considered and rejected due to a conflict in use, the level of activity at the park, and the lack of safe and direct access to major thoroughfares. Use of this site would also require that traffic gates be opened for egress, locked again as the ambulance leaves the facility, opened again upon return, and locked once more. This process would severely hamper response time. A facility at this location would also be housed in a trailer with no toilet facilities. For this reason, locating the EMS Unit within the park was considered and rejected.

No action is not considered an alternative as the current Waipio Unit has proven to be one of the busier locations with heavy demand for services. By law, emergency response is required and any decrease in services is not in the public interest and jeopardizes health, safety and welfare of the surrounding community.

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III. DESCRIPTION OF ANTICIPATED IMPACTS AND MITIGATION MEASURES

A. Environmental Setting

The project site consists of vacant maintained land owned by the City and County of Honolulu. The site has been reserved for future development and has been assigned to serve as an ambulance facility. The site is contiguous to the master planned Gentry Waipio community and is well integrated both in landscaping and in proposed use. The site is well located to provide its emergency response service to Central Oahu with its proximity to Kamehameha Highway and the H-2 freeway.

B. Surrounding Uses

The area surrounding the project site is characterized by single-family dwelling use. While fully developed, the surrounding areas are generally of low intensity use and residential in character. The proposed improvements are consistent with the immediate surroundings as well as the general character of the entire district.

The Kamehameha Highway boundary of the site is located along an expansive grassed buffer area with a sidewalk that continues on to Ka Uka Boulevard. A bus stop is located along Kamehameha Highway. The Patsy T. Mink Central Oahu Regional Park, a 269-acre public park is located directly across Kamehameha Highway. Kamehameha Highway consists of two travel lanes and a turning lane in both directions fronting the project site.

The north boundary of the project site abuts a Shell Food Mart convenience store and fuel station. A McDonald's restaurant is located at the corner of Kamehameha Highway and Ka Uka Boulevard. Further north lay the Gentry Business Park which consists of industrial and commercial uses with the exception of the Hawaii Okinawa Center which is located near the Kamehameha Highway and Ka Uka Boulevard intersection.

Located to the east across Ukee Street lies a single-family dwelling residential subdivision. Koliana Street is located across the project property. The Ukee Street boundary is includes a sidewalk, curb, gutter and grass border that is planted with pink tecoma trees. Ukee Street is marked as a single lane in both directions but the wide shoulders provide ample access to move around left-turning vehicles.

The southern boundary of the project site abuts a large landscape buffer that separates Kamehameha Highway from the residential development. This landscaped area consists of African tulip, ficus and pink tecoma trees and maintained grass lawn space.

Figure 10: View from Ukee Street to Kamehameha Highway



Source: Environmental Communications, Inc.

Figure 11: View towards Ka Uka Boulevard



Source: Environmental Communications, Inc.

C. Environmental Considerations

1. Geological Characteristics

Topography

The project improvement area consists of a site that is relatively flat with a gentle slope from west to east and from north to south. The project parcel is devoid of any structures, geographic features, landscaping, drains, swales or other variations from the smooth grassed surface. No trees are located on the property however two Pink Tecoma trees are located in the grass buffer located along the Ukee Street sidewalk.

The general vicinity is characterized by low-rise commercial and residential development, generous open spaces and landscaping. The Patsy T. Mink Regional Park also allows for expansive views of the Waianae Range.

Climate

The geography of the Waipio area is typically warm and tropical in climate. Prevailing trade winds arrive from the northeast. According to the National Weather Service Honolulu Office, over a period of 30 years, normal monthly high temperatures range from 80 degrees in January to a high of 89 degrees in August for an average of 84 degrees. Normal month low temperatures range from a low of 65 degrees in February and a high of 74 degrees in August for a monthly average of 70 degrees. The mean annual precipitation in the project area is 108 inches typically ranging from a low of 6.44 inches in June to a high of 11.81 inches in March. For comparison, the annual average rainfall in Honolulu is 70 inches per year.

Soil Conditions

According to the *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii* by the US Department of Agriculture Soil Conservation Service, the project site is located primarily on soils classified as Molokai silty clay loam, 3 to 7 percent slopes (MuB).

A geotechnical survey entitled *Geological Investigation Honolulu Emergency Services Dept. Central Oahu Ambulance Facility, Waipio, Oahu, Hawaii TMK: 9-4-122: 103* was prepared by Hirata & Associates, Inc. in September 2014. This study, which is included in its entirety as Appendix A, is summarized as follows.

Boring B1 encountered an isolated area of surface fill consisting of medium dense silty coralline sand with gravel extending to a depth of about 1 foot, Underlying the silty sand, and at the surface in the remaining borings, was reddish brown clayey silt. The clayey silt was in a stiff

condition and extended to the maximum depths drilled. Laboratory testing on the clayey silt indicated a low expansion potential. A boulder was encountered in the clayey silt stratum in boring B1 at a depth of about 6 feet. Cobbles were encountered in the clayey silt stratum in boring B5 at a depth of about 2.5 feet. Neither groundwater nor seepage water was encountered in the borings.

Based on our exploratory fieldwork and laboratory testing, we believe that from a geotechnical viewpoint, the site can generally be developed as planned. Footing excavations are expected to expose the stiff reddish brown clayey silt. Conventional spread footings or thickened slab foundations founded directly on the undisturbed clayey silt may be used to support the ambulance facility. Building slabs-on-grade will only require the standard 4-inch gravel cushion and vapor barrier. Slabs subjected to vehicle or forklift loading will require a minimum 6 inches of aggregate base course in lieu of the 4-inch gravel cushion.

A soil assessment titled *Soil Assessment Central Oahu (Waipio) Ambulance Facility Ukee Street at Koliiana Street, Waipahu, Hawaii* was prepared by EnvironMETeo Services. This study is included in its entirety as Appendix B. The summary and conclusion of this study stated:

EMET services collected three multi-increment soil samples at the planned site of a new ambulance facility for Central Oahu and tested the samples for a list of common COPCs. Acenaphthene and four pesticides were detected in one or more of the soil samples at concentrations that are less than Department of Health standards. Other COPCs were not detected in the samples. Statistical analysis of the analytical data verify that the sampling methods and procedures produced samples were representative of the surface soil at the site.

Air Quality and Noise Environment

The ambient air quality of the project site is typical of the low-density residential character of the site. No point source pollution sources have been identified in the general area and typical trade winds ensure that air quality remains within acceptable standards as recorded by the Department of Health air quality monitors.

Air quality impacts from the construction and operation of the ambulance facility are expected to be minimal to insignificant. During the construction period, gasoline or diesel powered heavy equipment will be required for the demolition and construction of the improvements. Air quality degradation from the operation of this equipment will be negligible and temporary. No long-term air impacts will occur as a result of the project.

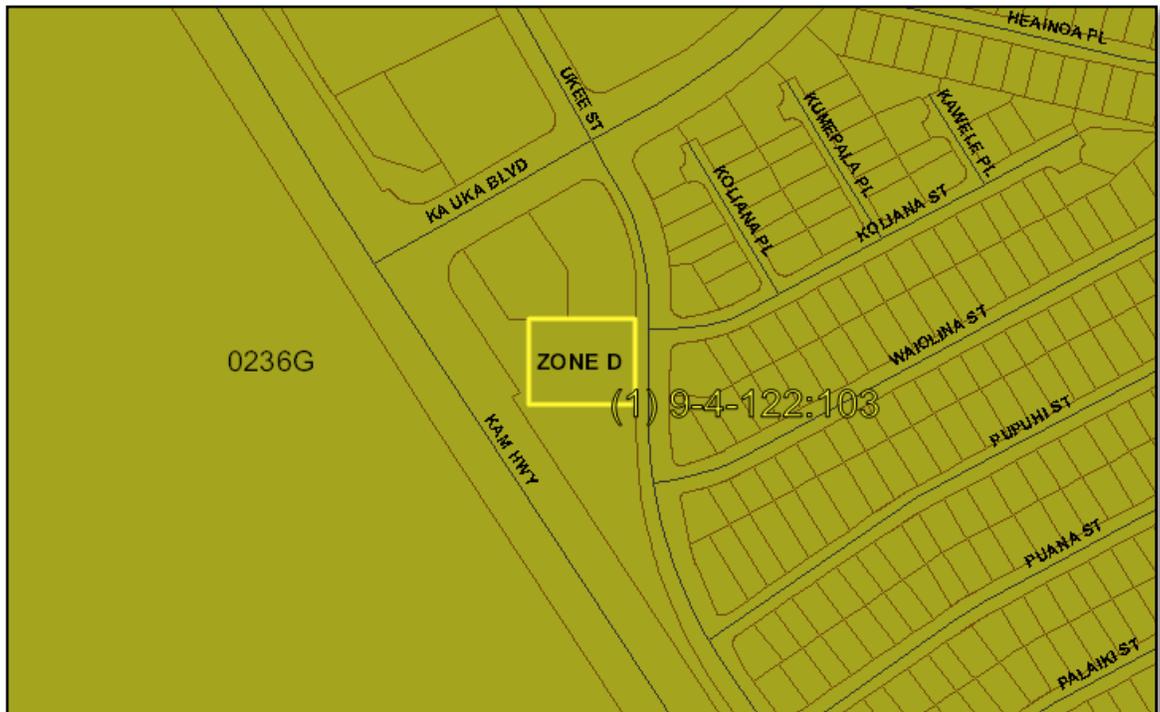
The noise environment will be affected during the construction period. Heavy equipment will be used during site grading and construction. All activities will continue to adhere to State Department of Health community noise standards. Upon completion of all construction related activities, no long-term noise impacts are expected from the facility itself. Operation of the ambulance vehicles will generate noise when the vehicle sirens are activated. Ambulance vehicles are presently stationed further north on Ukee Street in the commercial area however the present location is directly across the street from a single-family residential area and may cause some noise disruption if sirens are activated immediately outside of the ambulance facility. Emergency response vehicles are required to turn on their lights and sirens when responding to an emergency call. The Ukee Street / Ka Uka Boulevard intersection located approximately 250 feet from the facility and provides the major thoroughfare to major arterial roadways in each direction. Noise disruption from emergency calls will be temporary and brief.

2. Water Resources

Hydrologic Hazards and Resources

According to Panel 15003C0236G of the Federal Emergency Management Agency Flood Insurance Rate Map, the entire project area is located in Zone D. This flood zone is classified as unstudied areas where flood hazards are undetermined, but flooding is possible (Figure 12).

Figure 14: Flood Hazard Map



Source: City and County of Honolulu

Special Management Area

The project site is not located within the Special Management Area (SMA).

Water Quality

The project will not adversely affect water quality. The proposed improvements will be surrounded by gravel or grassed areas where high permeability will be maintained. Storm drainage is expected to be retained on-site or discharged in to the municipal storm drain system at the Ukee frontage of the property.

During the construction phase, best management practices will be used to keep the site clean and prevent any adverse discharges from affecting adjacent properties or the storm drain system. These measures will include an erosion plan consisting of construction access pads, catch basin inlet filters and compost filters along the project perimeter.

3. Archaeological, Cultural, Botanical and Faunal Resources

Archaeological and Historic Resources

The project site was formerly in agricultural use and had been severely disturbed during its active cultivation period. It is highly unlikely that any archaeological artifacts remain in the project site. Subsequent to its period of active agricultural production, the site was graded as part of the Gentry Waipio development.

In the 1976 Revised Environmental Impact Statement for Gentry Waipio, the section on historical or archaeological sites state that:

There are no known sites of historical, archaeological or religious significance on the project site. This finding was reached as a result of research into the records of Bishop Museum, and the Hawaii State Archives. The nearest site of any importance appears at the location of the Battle of Kipapa. This ancient battlefield is located four miles to the northwest of the subject property. Two ancient Heiaus now destroyed, are located approximately one mile north on the floor and side of Kipapa Gulch. Journals indicate that the area was not forested during the days of early settlers. The Panakauahi Gulch, located mauka of the H-2 Freeway, is now a thick and heavily forested area that was planted in the late 1920's under the direction of Dr. Lyon who later became Director of Foster Botanical Garden.

Cultural Resources

The project site has been open space use since the development of the Gentry-Waipio master planned community. Prior use in pineapple production would not

have allowed for any native cultural practices to occur on the project site since the turn of the 20th century. There are no current cultural practices in the project area and no need for access, therefore, no impact on cultural practices.

Flora

The project site is entirely covered with maintained lawn grass. No other vegetation is found within the parcel. No rare, threatened or endangered species of flora were observed within the project site. Areas immediately outside of the project parcel are landscaped with pink Tecoma, ficus, and African Tulip trees.

The proposed action will include landscape improvements that will remove two existing Pink Tecoma trees located along the Ukee Street sidewalk. These trees will be replaced by additional White Tecoma trees, and other landscape materials around the ambulance facility. An irrigation system will be provided for all new plantings.

Fauna

The site does not serve as an endangered wildlife habitat although avifauna, feral cats, and rodents may be found on-site.

4. Infrastructure and Utilities

The proposed improvements are not expected to have a significant impact on existing infrastructure and utilities. No sewer, water, electrical or other utilities will be impacted or require relocation. No disruption in utility services is anticipated. All required utilities are available via underground connection points along Ukee Street.

Vehicular Access and Traffic Conditions

Vehicular access to the project site will be through Ukee Street. Ukee Street is a two-lane road within a very wide right-of-way that is not marked for parking. Ukee Street runs parallel with Kamehameha Highway but the proposed facility will not provide entry or exit on to the Highway. The project site is located approximately 250-feet from the Ukee Street / Ka Uka Boulevard intersection. Ka Uka Boulevard offers close and direct access to Kamehameha Highway to the west and the H-2 Freeway to the east. This provides excellent response time to all areas north and south of the project site. Ukee Street also provides immediate access to north and south Waipo Town.

During the construction period, traffic diversion may be required for utilities connection. A permit for work with the roadway will be obtained prior to the commencement of work and per applicable regulations, work within the street will be conducted between the hours of 8:30 am and 3:30 p.m. Appropriate

signage, and an off-duty police officer will be provided for additional traffic management, and access will be maintained for through traffic and affected driveways.

Water

The proposed improvements will not have any impact on municipal potable water resources. Only minor increase demand for potable water will be required.

Wastewater

The municipal wastewater system will not be significantly impacted by the proposed improvements.

Drainage

Storm drainage is largely expected to be retained on site. Expanses of grass and gravel covered areas account for almost one half the entire project parcel. Drainage from the driveway areas will be conveyed by the curb cuts in to the municipal storm drain system.

Solid Waste

The project area is served by the municipal refuse service however commercial waste collection services will be used for ordinary trash. Medical waste will be disposed in hazardous medical waste collection bags can collected by an approved commercial service. Any construction waste associated with the project will be removed by the project contractor and disposed at an approved waste disposal site.

Telephone and Electrical Services

Telephone and electrical services are readily available through Ukee Street connection points.

5. Public Facilities

The proposed project will not have any significant impact on public facilities including schools, police, and fire services. Construction of a permanent ambulance facility will significantly increase the ability to provide emergency medical services within the region.

The Waikele Fire Station Number 42 provides fire protection and first response emergency and rescue service to the project area. The station is located at 94-840 Luniaina Street, approximately 1.9 miles from the project site. Response time to

the site is approximately 5 minutes. An engine company No. 42 serves this station.

Police service in the project area is part of the Honolulu Police Department's District 3, Sector 1. The district's administrative offices are located at the Pearl City Police Station located at 1100 Waimano Home Road.

The project will not increase any demand for educational or recreational facilities.

D. Social and Economic Characteristics

The proposed action will not have significant social impact to the surrounding area. The construction of a permanent facility that is highly visible to the community provide a sense of safety that is beneficial as a significant component of community.

The project will have some beneficial economic impacts. The construction of the improvements will create short-term employment, the purchase of goods and services, the generation of excise and income taxes, and other secondary and tertiary effects as a result of the project expenditures.

In the short-term, some traffic disruption will occur as a result of the construction in and along Ukee Street when utility connections are made. The selected contractor will be required to provide appropriate traffic controls to ensure safe passage around the work areas.

The long-term operations of a permanent ambulance facility is fully warranted given the level of service required in this vicinity. The facility should be considered a long-term asset of the community.

E. Relationship to Plans, Codes and Ordinances

The project property is owned by the City and County of Honolulu and was originally intended for a fire station. The site was later deemed of insufficient size for a fire station and was reallocated for use as an ambulance facility. The site is split zoned with the northern half designated as B-1 Neighborhood Business and the southern half designated at P-2 General Preservation on the City and County of Honolulu Zoning Map. The proposed ambulance facility is considered a public use and structure which is allowed as a principal use in both B-1 and P-2 districts.

The City and County of Honolulu *General Plan Objectives and Policies* Section VIII Public Safety specifically addresses emergency services. Objective B - To protect the people of Oahu and their property against natural disasters and other

emergencies, traffic and fire hazards, and unsafe conditions, is supported by the following policies.

Policy 8 - Provide adequate search and rescue and disaster response services.

Policy 9 - Design safe and secure public buildings.

Policy 10 - Provide adequate staff to supervise activities at public facilities.

Policy 11 - Develop civil defense plans and programs to protect and promote public health, safety and welfare of the people.

Policy 12 - Provide educational materials on civil defense preparedness, fire protection, traffic hazards and other unsafe conditions.

The State Land Use Boundary Maps show the project locations to be in Urban use. The project is not located within the Special Management Area (SMA).

The project is also consistent with the objectives of the Hawaii State Plan particularly with respect to the objectives and policies of the economy. The provided services support trade, visitor and transportation industries and are a critical service to Hawaii.

The *Central Oahu Sustainable Communities Plan* provides the basic planning framework for development and preservation within the Central Oahu District. Chapter 4.8 of this document addresses Public Safety Facilities. This document states:

The expected population growth and development of new communities and community facilities in Central Oahu will result in a need for additional emergency medical service facilities and response units. The specific needs will depend on the size, demographics, and location of the future population. The State Department of Health has identified a need for three new stand-alone emergency medical services facilities in Central Oahu by 2010.

Furthermore, Table 4.4 provide a list of existing and planned public safety facilities in the Central Oahu Sustainable Communities Plan Area. This table shows that four (4) rapid response units (RRU) were to be provided by 2002. The proposed project will have the capability to house two units in furthering the objectives of this plan.

The proposed improvements will require ministerial permits and an administrative waiver from the Department of Planning and Permitting.

Department of Planning and Permitting

- Administrative waiver to allow a structural column, screening fence and roof in the P-2 zone front yard
- Grubbing, Grading and Stockpiling Permit

- Building Permit for Building, Electrical, Plumbing, Sidewalk and Demolition Work
- Sewer Connection Permit

Board of Water Supply

- Water and Water System Requirements

Work on the proposed improvements will not commence until all permits have been obtained and the environmental assessment process is completed.

F. Probable Impact on the Environment

The proposed improvements will result in any change in use and intensity of the project site. The proposed action is a long-term public facility improvement project that has been planned for this specific parcel but was delayed until adequate funding had been encumbered. The project is an essential facility that is located in an effective response area and will minimally impact the adjacent Neighborhood Business district. The noise associated with the ambulance vehicles is a necessary impact but it will be very short in duration as the facility is located very close to access roads that will be minimally disrupted by the associated siren noise.

The proposed improvements will have short-term construction related impacts. Traffic will be impacted during work within and along the roadway but traffic control measures will ensure that there is no major inconveniences to local traffic. Beyond the inconvenience of some minor traffic disruption and associated noise from the use of heavy equipment, no adverse long-term impacts are expected. Any traffic diversions and roadway construction must conform with applicable State and County construction regulations. Work will also be limited to daytime non-peak traffic hours.

Benefits beyond an improved drainage system is the creation of short-term and employment both on and off property, the generation of additional revenues to the State of Hawaii and City and County of Honolulu and the resultant secondary and tertiary spending and tax collections that will likely be experienced in the community. Most significantly, the completed project will provide a permanent facility to an essential community service that has been planned for over 10 years.

G. Adverse Impacts Which Cannot be Avoided

Adverse impacts that cannot be avoided are generally related to short-term construction activities. These impacts can be minimized by sound construction practices, adherence to applicable construction regulations as prescribed by the

Department of Health, and coordination with applicable State and County agencies.

Minor grading will be required for the construction of the project improvements. This work will create dust, noise and a minor traffic nuisance during the course of construction. Paving of the roadways will also require the use of heavy machines that will enter the project site. Traffic control measures will be used to minimize the disruption of traffic during the construction period.

H. Alternatives to the Proposed Action

No other City owned properties were available within the Waipio community except for the Patsy T. Mink Central Oahu Regional Park. A maintenance facility at this location was considered and rejected due to a conflict in use, the level of activity at the park, and the lack of safe and direct access to major thoroughfares. Use of this site would also require that traffic gates be opened for egress, locked again as the ambulance leaves the facility, opened again upon return, and locked once more. This process would severely hamper response time. A facility at this location would also be housed in a trailer with no toilet facilities. For this reason, locating the EMS Unit within the park was considered and rejected.

No action is not considered an alternative as the current Waipio Unit has proven to be one of the busier locations with heavy demand for services. By law, emergency response is required and any decrease in services is not in the public interest and jeopardizes health, safety and welfare of the surrounding community.

I. Mitigation Measures

Long-term impacts resulting from the proposed improvements are expected to be minimal or positive based upon the subject environmental assessment. Long-term air and noise impacts are not expected to change significantly after improvements are completed. Traffic conditions will not change, as there will not be any new demand for access to the project site. Short-term construction-related noise and air quality impact mitigation measures include general good housekeeping practices and avoidance of a prolonged construction period. The contractor will be directed to use best management practices (BMP) wherever applicable.

Examples of BMPs that may be implemented include watering during demolition, clearing and grubbing to control fugitive dust and the containment and controlled release of any runoff during the construction period. All waste materials will be securely contained and appropriately disposed.

BMP and erosion control measures include the use of compost filter socks the use of a sand bag cofferdam, and the addition of a stabilized construction entrance/exit point. Compost filter socks will be used at the catch basin inlets as well as around the perimeter of work areas. The construction ingress/egress

located at the entrance to the property will be stabilized with a fabric barrier topped with large aggregate which will be removed when construction is completed.

J. Irreversible and Irretrievable Commitment of Resources

Implementation of the proposed project will result in the irreversible and irretrievable commitment of resources in the use of non-recyclable energy expenditure and labor. Materials used for new construction may have salvage value; however, it is unlikely that such efforts will be cost-effective. The expenditure of these resources is offset by gains in construction-related wages, increased tax base and tertiary spending.

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IV. REASONS SUPPORTING FINDING OF NO SIGNIFICANT IMPACT

As stated in Section 11-200-12, EIS Rules, Significance Criteria: in determining whether an action may have a significant effect on the environment, every phase of a proposed action shall be considered. The expected consequences of an action, both primary and secondary, and the cumulative as well as the short-term and long-term effects must be assessed in determining if an action shall have significant effect on the environment. Each of the significance criteria is listed below and is followed by the means of compliance or conflict (if extant).

- Involves the loss or destruction of any natural or cultural resource.

The proposed action will not involve the loss or destruction of any natural or cultural resource. The project site is presently a vacant open space but this area is owned by the City and County of Honolulu and was always planned as a location for an emergency service public facility.

- Curtails the range of beneficial uses of the environment.

The proposed installation will not curtail any beneficial uses of the environment. The project area is not generally used by the public nor is it used as a recreational or cultural resource by the public.

- Conflicts with the State's long-term goals or guidelines as expressed in Chapter 343, Hawaii Revised Statutes.

The proposed action is consistent with the goals and guidelines expressed in Chapter 343, Hawaii Revised Statutes. The proposed action is triggered by the use of City and County of Honolulu owned lands and by the use of County funds. The subject Environmental Assessment has been developed in compliance with the Chapter 343.

- Substantially affects the economic or social welfare of the community or state.

The proposed action will make a positive contribution to the welfare of the County and State by creating employment during the construction period and will also benefit the State through increased tax revenue. Most significantly, the completed project will make a major contribution to the social, health and safety welfare of the general public.

- Substantially affects public health.

The proposed is an essential component in maintaining the health, safety and welfare of the general public. The provision of emergency medical services in a

central location with good access to the entire service area is a major benefit to the public and therefore affects public health positively.

- Involves substantial or adverse secondary impacts, such as population changes or effect on public facilities.

The proposed action will not produce secondary impacts resulting in population changes or significantly increase use of public facilities.

- Involves substantial degradation of environmental quality.

The proposed improvements will not involve the substantial degradation of environmental quality. The improvements proposed will have short-term impact on the environment; however, this is temporary in nature.

- Cumulatively have a considerable effect upon the environment or involve a commitment for larger actions.

The proposed action is not a first phase of any larger action nor will it have a considerable effect on the environment. The project is expected to remain for the long-term however the possibility of expanded services on the project site remains a possibility due to the availability of unused space on the site. Should any future expansion or other public service or facility be added to the project parcel, it will be subject to a separate environmental review.

- Affect rare, threatened or endangered species, or their habitats.

The proposed action will not affect any rare, threatened or endangered species of flora or fauna. The project improvements are not anticipated to create any additional wildlife habitat. Any loss of wildlife is largely associated with introduced wildlife that are found in the project area but are not associated with the proposed action.

- Detrimentially affect air or water quality or ambient noise levels.

The proposed action is not expected to negatively impact ambient air or water quality. Long-term ambient noise will increase due to the use of sirens in an area adjacent to residential use. This impact is necessary and unavoidable but is offset by the invaluable and essential service for the general welfare of the public. This noise impact is very short in duration.

Minimal impacts on air, noise and water quality are anticipated during construction. These impacts will be limited by best management construction practices and compliance with Department of Health construction mitigation standards.

- Affect scenic vistas and viewplanes identified in County or State plans or studies.

The proposed action will not affect any scenic vistas or view planes identified by the County or State.

- Require substantial energy consumption.

The project will not increase energy consumption. Energy utilization during the construction phase will increase through the use of fossil fuels used by construction vehicles. Operation of the infrastructure will not require any energy.

- Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

The project is not located in an environmentally sensitive location.

Anticipated Finding of No Significant Impact

Based on the above stated criteria, the Department of Design and Construction anticipates that the proposed project will not have any significant adverse environmental impacts and that an Environmental Impact Statement will not be required for the proposed action. This Draft Environmental Assessment will be subject to public review and prescribed by Chapter 343 Hawaii Revised Statutes.

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V. LIST OF PARTIES CONSULTED PRIOR TO DEVELOPMENT OF THE DRAFT ENVIRONMENTAL ASSESSMENT

Agencies with ministerial or specific interests regarding the proposed project were contacted or their public information was used to develop the subject Draft Environmental Assessment.

Honolulu Emergency Medical Services Department
City and County of Honolulu

Department of Design and Construction
City and County of Honolulu

Department of Planning and Permitting
City and County of Honolulu

Fire Department
City and County of Honolulu

Police Department
City and County of Honolulu

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VI. LIST OF AGENCIES, ORGANIZATIONS AND INDIVIDUALS TO BE CONSULTED DURING THE DRAFT ENVIRONMENTAL ASSESSMENT PROCESS

Federal

1. Environmental Protection Agency

State of Hawaii Agencies

1. Dept. of Agriculture
2. Dept of Business, Economic Development and Tourism, Office of Planning
3. Dept of Health, Environmental Planning Office
4. Dept of Health, Clean Air Branch
5. Dept of Health, Clean Water Branch
6. Dept of Health, Noise, Radiation and Indoor Noise Branch
7. Dept. of Health, Office of Hazard Evaluation and Emergency Response
8. Dept. of Land and Natural Resources
Historic Preservation Division
12. Dept. of Transportation
13. Office of Environmental Quality Control
14. Office of Hawaiian Affairs
15. University of Hawaii, Environmental Center

City and County of Honolulu Agencies

1. Board of Water Supply
2. Department of Environmental Services
3. Department of Planning and Permitting
4. Department of Transportation Services
5. Fire Department
6. Police Department

Libraries

1. Hawaii State Library
2. Mililani Public Library
3. Pearl City Public Library

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APPENDIX A

**GEOTECHNICAL INVESTIGATION HONOLULU EMERGENCY
SERVICES DEPT. CENTRAL OAHU AMBULANCE FACILITY
WAIPIO, OAHU, HAWAII TMK: 9-4-122:103**

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**GEOTECHNICAL INVESTIGATION
HONOLULU EMERGENCY SERVICES DEPT.
CENTRAL OAHU AMBULANCE FACILITY
WAIPIO, OAHU, HAWAII
TMK: 9-4-122: 103**

for

DESIGN PARTNERS INCORPORATED

**HIRATA & ASSOCIATES, INC.
W.O. 14-5702
September 26, 2014**



Hirata & Associates

Geotechnical
Engineering

Hirata & Associates, Inc.

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September 26, 2014
W.O. 14-5702

Mr. Duane Hamada

Design Partners Incorporated
1580 Makaloa Street, Suite 1100
Honolulu, Hawaii 96814

Dear Mr. Hamada:

Our report, "Geotechnical Investigation, Honolulu Emergency Services Dept., Central Oahu Ambulance Facility, Waipio, Oahu, Hawaii, TMK: 9-4-122: 103" dated September 26, 2014, our Work Order 14-5702 is enclosed. This investigation was conducted in general conformance with the scope of services presented in our proposal dated July 3, 2014.

Our borings generally encountered surface soil classified as reddish brown clayey silt. The clayey silt was in a stiff condition and extended to the maximum depths drilled. Laboratory testing on the clayey silt indicated a low expansion potential. Occasional cobbles and boulders were encountered in the clayey silt stratum. Neither groundwater nor seepage water was encountered.

Conventional spread footings of thickened slab foundations founded directly on the undisturbed reddish brown clayey silt may be used to support the proposed ambulance facility. Building **slabs-on-grade** will only require the standard 4-inch gravel cushion and vapor barrier. Slabs subjected to vehicle loading should be underlain by a minimum 6 inches of aggregate base course in lieu of the 4-inch gravel cushion. The following parameters may be used in design of foundations.

- Allowable bearing value = 3,000 psf.
- Coefficient of friction = 0.4
- Passive earth pressure = 300 pcf

We appreciate this opportunity to be of service. Should you have any questions concerning this report, please feel free to call on us.

Very truly yours,

HIRATA & ASSOCIATES, INC.

Paul S. Morimoto

President

PSM:TS

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GEOTECHNICAL INVESTIGATION
HONOLULU EMERGENCY SERVICES DEPT.
CENTRAL OAHU AMBULANCE FACILITY
WAIPIO, OAHU, HAWAII
TMK: 9-4-122: 103

INTRODUCTION

This report presents the results of our geotechnical investigation performed for the proposed Central Oahu Ambulance Facility, in Waipio, Hawaii. Our scope of services for this study included the following:

- A visual reconnaissance of the site and its vicinity to observe existing conditions which may affect the project. The general location of the project site is shown on the enclosed Location Map, Plate A2.1.
- A review of available in-house soils information pertinent to the site and the proposed project.
- Drilling and sampling 6 exploratory borings to depths ranging from approximately 6.5 to 15.5 feet. A description of our field investigation is summarized on Plates A1.1 to A1.2. The approximate exploratory boring locations are shown on the enclosed Boring Location Plans, Plate A2.2, and the soils encountered in the borings are described on the Boring Logs, Plates A4.1 through A4.6.
- Drilling two percolation test holes to depths of approximately 5 feet. The approximate test hole locations are shown on Plate A2.2. Falling head percolation tests were performed in the test holes and results are presented on Department of Health Site Evaluation/Percolation Test forms, Plates A5.1 and A5.2.
- Laboratory testing of selected soil samples. Testing procedures are presented in the Description of Laboratory Testing, Plates B1.1 through B1.3. Test results are presented in the Description of Laboratory Testing, and on the Unified Soil Classification System Sheet (Plate A3.2), Boring Logs (Plates A4.1 through A4.6), Consolidation Test reports (Plates B2.1 and B2.2), Direct Shear Test reports (Plates B3.1 and B3.2), Modified

Proctor Test report (Plate B4.1), and CBR Test report (Plate B5.1).

- Engineering analyses of the field and laboratory data.
- Preparation of this report presenting geotechnical recommendations for the design of foundations, including seismic considerations, resistance to lateral pressures, retaining walls, slabs-on-grade, flexible and rigid pavement, and site grading.

PROJECT CONSIDERATIONS

Information regarding the proposed project was provided by personnel from your office.

Although preliminary plans for the proposed free-standing ambulance facility were not available at the time of this proposal, we understand that the facility will consist of a single story structure with a footprint area on the order of 3,300 square feet. The facility will generally include a reception area, work areas, locker rooms and restrooms, a kitchen, storage and supply rooms, a decontamination room, and a garage. The garage will consist of 2 bays and will house an ambulance and a Mobile Command Unit vehicle. We anticipate that the final structural loads will be relatively light.

Finish grades were not available at the time of this report. Based on the existing topography of the site, grading is expected to consist primarily of shallow cuts and fills in the order of about 4 feet.

SITE CONDITIONS

The project site is located west of Uke'e Street, south of its intersection with Ka Uka Boulevard. The property is bordered on the north by a commercial subdivision, on the west by Kamehameha Highway, and on the south by an undeveloped parcel of land.

The project area is currently vacant of structures, and relatively level with the exception of gentle sloping gradients located along the northern and southern boundaries.

SOIL CONDITIONS

Boring B1 encountered an isolated area of surface fill consisting of medium dense silty coralline sand with gravel extending to a depth of about 1 foot,

Underlying the silty sand, and at the surface in the remaining borings, was reddish brown clayey silt. The clayey silt was in a stiff condition and extended to the maximum depths drilled. Laboratory testing on the clayey silt indicated a low expansion potential. A boulder was encountered in the clayey silt stratum in boring B1 at a depth of about 6 feet. Cobbles were encountered in the clayey silt stratum in boring B5 at a depth of about 2.5 feet.

Neither groundwater nor seepage water was encountered in the borings.

CONCLUSIONS AND RECOMMENDATIONS

Based on our exploratory fieldwork and laboratory testing, we believe that from a geotechnical viewpoint, the site can generally be developed as planned. Footing excavations are expected to expose the stiff reddish brown clayey silt. Conventional spread footings or thickened slab foundations founded directly on the undisturbed clayey silt may be used to support the ambulance facility. Building slabs-on-grade will only require the standard 4-inch gravel cushion and vapor barrier. Slabs subjected to vehicle or forklift loading will require a minimum 6 inches of aggregate base course in lieu of the 4-inch gravel cushion.

Foundation

Conventional shallow footings, such as spread footings or thickened slab foundations, bearing directly on the stiff reddish brown clayey silt layer may be used to support the proposed ambulance facility. Foundations on the clayey silt may be designed for an allowable bearing value of 3,000 pounds per square foot. The recommended allowable bearing value is for the total of dead and frequently applied live loads, and may be increased by one-third for short duration loading which includes the effect of wind and seismic forces.

Spread footings should be a minimum 16 inches in width; thickened slab foundations should be a minimum 12 inches wide. The bottom of foundation excavations should be thoroughly tamped and cleaned of loose material prior to placement of reinforcing steel and concrete.

Seismic Design

Based on the borings drilled as part of this study and our knowledge of the deep soil conditions in the area, the subsurface soils can be characterized as a stiff soil profile. Therefore, based on the 2012 International Building Code, Site Class D is recommended for this site.

Lateral Design

Resistance to lateral loading may be provided by friction acting at the base of foundations, and by passive earth pressure acting on the buried portions of foundations.

A coefficient of friction of 0.4 may be used with the dead load forces for the clayey silt. Passive earth pressure may be computed as an equivalent fluid having a density of 300 pounds per cubic foot with a maximum earth pressure of 3,000 pounds per square foot. Unless covered by pavement or concrete slabs, the upper 12 inches of soil should not be considered in computing lateral resistance.

Retaining Wall

Although a final site plan was not available at the time of this report, we understand that retaining walls may be used to accommodate grade changes throughout the site. Retaining wall foundations may be designed using recommendations in the *Foundations*, *Seismic Design*, and *Lateral Designs* sections of this report.

For active earth pressure considerations, equivalent fluid pressures of 40 and 55 pounds per cubic foot may be used for freestanding and restrained or at-rest conditions, respectively.

Surcharge stresses due to vehicle loads within a horizontal distance equal to the depth of the retained height should also be considered in the design of retaining walls. For uniform surcharge stresses, a rectangular distribution with uniform pressure equal to 50 percent of the vertical surcharge pressure acting on the entire height of the wall may be used.

To prevent buildup of hydrostatic pressures, retaining walls should be well-drained. The standard practice consists of placing a minimum 12-inch thick layer of free-draining gravel at the back of the wall. The gravel should extend from the

base of the wall, around subdrains and/or weepholes, and up to within 12 inches of finish grade.

Alternatively, prefabricated drainage geocomposites such as Miradrain or J-drain, may be used in lieu of the free-draining gravel. As with the free-draining gravel, the draining geocomposites should be placed at the back of the wall, be connected with the weepholes and/or subdrains (in accordance with manufacturer's specifications), and extend to within 12 inches of finish grade. For freestanding walls, the drainage system should be covered by at least 12 inches of low permeability soil. If the backfill is covered by interior or exterior concrete slabs, the gravel fill should extend to the bottom of slab cushion.

Foundation Settlement

Although structural loads were not available at the time of this report, based on the stiff condition of the underlying clayey silt, neither excessive total nor differential settlement is anticipated.

Slabs-on-Grade

To provide uniform support, building slabs-on-grade should be underlain by a minimum 4 inches of gravel cushion, such as #3 Fine (ASTM C 33, No. 67) and a vapor barrier placed over the cushion material. Slabs which will be subjected to vehicle loading should be underlain by a minimum 6 inches of aggregate base course in lieu of the 4-inch gravel cushion.

The slab subgrade should be scarified to a minimum depth of 6 inches, moisture conditioned to about 2 percent above optimum moisture content, and compacted to between 90 and 95 percent compaction as determined by ASTM D 1557.

The base course section should be compacted to a minimum 95 percent compaction as determined by ASTM D 1557. The gravel cushion should be compacted to a level surface using a vibratory compactor.

Pavement Design

We understand that pavement areas will primarily be subjected to passenger and ambulance vehicles with a maximum GVW of about 20,000 pounds. Based on the results of our laboratory testing, paved areas may be designed using the following sections:

Flexible Pavement

3.0"	Asphaltic Concrete
6.0"	Base Course (CBR =85 minimum)
<u>6.0"</u>	<u>Select Borrow (CBR = 25 minimum)</u>
15.0"	Total Thickness

Rigid Pavement

6.0"	Portland Cement Concrete
<u>6.0"</u>	<u>Base Course (CBR = 85 minimum)</u>
12.0"	Total Thickness

The exposed subgrade should be scarified to a minimum depth of 6 inches, moisture conditioned to about 2 percent above optimum moisture content, and compacted to between 90 and 95 percent compaction as determined by ASTM D 1557. The base course and select borrow should be compacted to a minimum 95 percent compaction as determined by ASTM D 1557.

Site Grading

Site Preparation - The project site should be cleared of all vegetation, including large roots, and other deleterious material. In areas requiring fill placement, the exposed subgrade should be scarified to a minimum depth of 6 inches, moisture conditioned to about 2 percent above the optimum moisture content, and compacted to between 90 and 95 percent compaction as determined by ASTM D 1557.

Structural Excavations - Based on our exploratory borings, it is our opinion that excavations into the clayey silt can generally be accomplished using conventional excavating equipment.

Temporary cuts into the clayey silt should be stable at slope gradients of 1H:1V or flatter. It should be the Contractor's responsibility to conform to all OSHA safety standards for excavations.

Onsite Fill Material - The onsite reddish brown clayey silt will be acceptable for reuse in compacted fills and backfills, except in the free-draining gravel at the back of retaining walls. Rock fragments larger than 3 inches in maximum dimension should be removed prior to reuse.

Imported Fill Material - Imported structural fill should be well-graded, non-expansive granular material. Specifications for imported granular structural fill should indicate a maximum particle size of 3 inches, and state that between 8 and 20 percent of soil by weight shall pass the #200 sieve. In addition, the plasticity index (P.I.) of that portion of the soil passing the #40 sieve shall not be greater than 10. Imported structural fill should have a CBR expansion value no greater than 1.0 percent and a minimum CBR value of 15 percent, when tested in accordance with ASTM D 1883.

Compaction - Structural fill and backfill should be placed in horizontal lifts restricted to 8 inches in loose thickness and compacted to between 90 and 95 percent compaction as determined by ASTM D 1557.

Fill placed in areas which slope steeper than 5H:1V should be continually benched as the fill is brought up in lifts.

ADDITIONAL SERVICES

We recommend that we perform a general review of the final design plans and specifications. This will allow us to verify that the foundation design and earthwork recommendations have been properly interpreted and implemented in the design plans and construction specifications.

For continuity, we recommend that we be retained during construction to (1) observe footing excavations prior to placement of reinforcing steel and concrete, (2) review and/or perform laboratory testing on import borrow to determine its acceptability for use in compacted fills, (3) observe structural fill placement and perform compaction testing, and (4) provide geotechnical consultation as required.

Our services during construction will allow us to verify that our recommendations are properly interpreted and included in construction, and if necessary, to make modifications to those recommendations, thereby reducing construction delays in the event subsurface conditions differ from those anticipated.

LIMITATIONS

The boring logs indicate the approximate subsurface soil conditions encountered only at those times and locations where our borings were made, and may not represent conditions at other times and locations.

This report was prepared specifically for Design Partners Incorporated and their sub-consultants for design of the proposed Central Oahu Ambulance Facility. The boring logs, laboratory test results, and recommendations presented in this report are for design purposes only, and are not intended for use in developing cost estimates by the contractor.

During construction, should subsurface conditions differ from those encountered in our borings, we should be advised immediately in order to re-evaluate our recommendations, and to revise or verify them in writing before proceeding with construction.

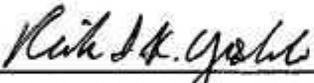
Our recommendations and conclusions are based upon the site materials observed, the preliminary design information made available, the data obtained from our site exploration, our engineering analyses, and our experience and engineering judgment. The conclusions and recommendations in this report are professional

Hirata & Associates, Inc.

opinions which we have strived to develop in a manner consistent with that level of care, skill, and competence ordinarily exercised by members of the profession in good standing, currently practicing under similar conditions in the same locality. We will be responsible for those recommendations and conclusions, but will not be responsible for the interpretation by others of the information developed. No warranty is made regarding the services performed, either express or implied.

Respectfully submitted,

HIRATA & ASSOCIATES, INC.



Rick Yoshida, Project Manager

RIKY:TS



"This work was prepared by
me or under my supervision.
Expiration Date of License;
April 30, 2016

APPENDIX A

FIELD INVESTIGATION

DESCRIPTION OF FIELD INVESTIGATION

GENERAL

The site was explored on August 1 and 6, 2014, by performing a visual reconnaissance of the site and drilling 6 test borings to depths ranging from about 5 to 15.5 feet with a truck-mounted Mobile B-80 drill rig. In addition, 2 percolation test holes were drilled to depths of about 5 feet and tested in general accordance with Department of Health guidelines.

During drilling operations, the soils were continuously logged by our field engineer and classified by visual examination in accordance with the Unified Soil Classification System. The boring logs indicate the depths at which the soils or their characteristics change, although the change could actually be gradual. If the change occurred between sample locations, the depth was interpreted based on field observations. Classifications and sampling intervals are shown on the boring logs. A Boring Log Legend is presented on Plate A3.1, and the Unified Soil Classification System is shown on Plate A3.2. The soils encountered are logged on Plates A4.1 to A4.6.

Borings were located in the field by measuring/taping offsets from existing site features shown on plans provided by your office. The surface elevations at the boring sites were estimated based on the Topographic Survey provided by your office on August 11, 2014. The accuracy of the boring locations shown on Plate A2.2, and the boring elevations shown on Plates A4.1 through A4.6 are therefore approximate, in accordance with the field methods used.

SOIL SAMPLING

Representative and bulk soil samples were recovered from the borings for selected laboratory testing and analyses. Representative samples were recovered by driving a 3-inch O.D. split tube sampler a total of 18 inches with a 140-pound hammer dropped from a height of 30 inches. The number of blows required to

September 26, 2014

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Plate A 1.2

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drive the sampler the final 12 inches are recorded at the appropriate depths on the boring logs, unless noted otherwise. A bulk soil sample was recovered from boring B5 at a depth of about 0.5 feet below ground surface. The location of boring B5 is shown on Plate A2.2.



PROJECT SITE



Reference: Topographic Quadrangle Map prepared by the United States Department of the Interior Geologic Survey
 Waipahu Quadrangle, Hawaii-Honolulu: Co., Hawaii. 1998.

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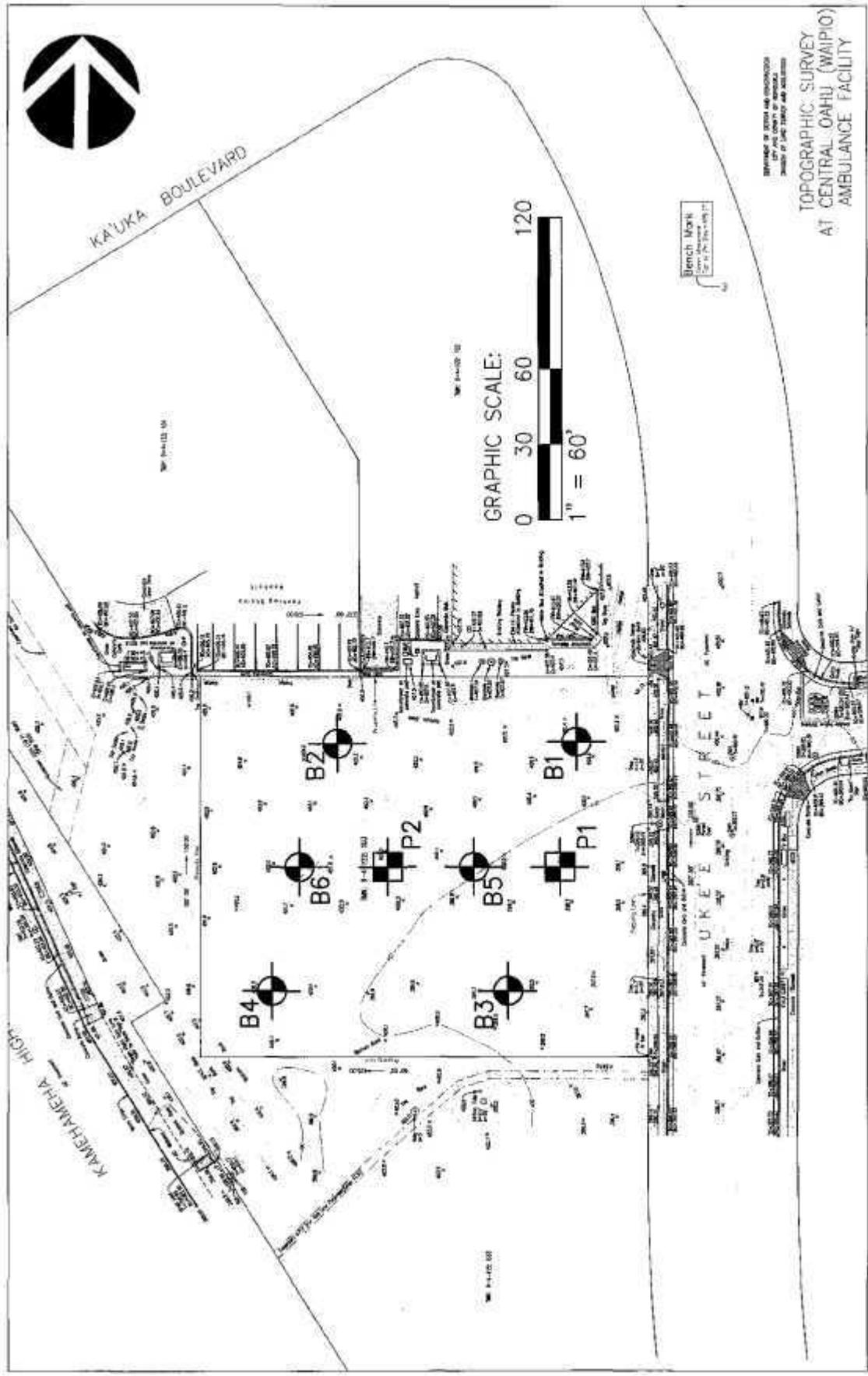
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LOCATION MAP



KA'UKA BOULEVARD

KANEHANGA HIGH



GRAPHIC SCALE:
 0 30 60 120
 1" = 60'

TOPOGRAPHIC SURVEY
 AT CENTRAL OAHU (WAIPIO)
 AMBULANCE FACILITY

Reference: Topographic Survey provided by Design Partners, Inc. on August 11, 2014.

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Legend:
 approximate location of borings

 approximate location of perforation tests

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BOILING LOCATION PLAN

MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of the material is LARGER than No. 200 sieve size.)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines.)	GW Well graded gravels, gravel-sand mixtures, little or no fines.
			GP Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines.)	GM Silty gravels, gravel-sand-silt mixtures.
			GC Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size.)	CLEAN SANDS (Little or no fines.)	SW Well graded sands, gravelly sands, little or no fines.
			SP Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amt. of fines.)	SM Silty sands, sand-silt mixtures.
			SC Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of the material is 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.	
		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 GREATER than 50.)	MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	
		CH Inorganic clays of high plasticity, fat clays.	
		OH Organic clays of medium to high plasticity, organic silts. ' ' : : • • ' ' • •	
HIGHLY ORGANIC SOILS		PT Peat and other highly organic soils.	
		FRESH TO MODERATELY WEATHERED BASALT	
		VOLCANIC TUFF / HIGHLY TO COMPLETELY WEATHERED BASALT	
		CORAL	

SAMPLE DEFINITION;		
 2" O.D. Standard Split Spoon Sampler	 Shelby Tube	RQD Rock Quality Designation
 3" O.D. Split Tube Sampler	 NX / 4" Coring	 Water Level

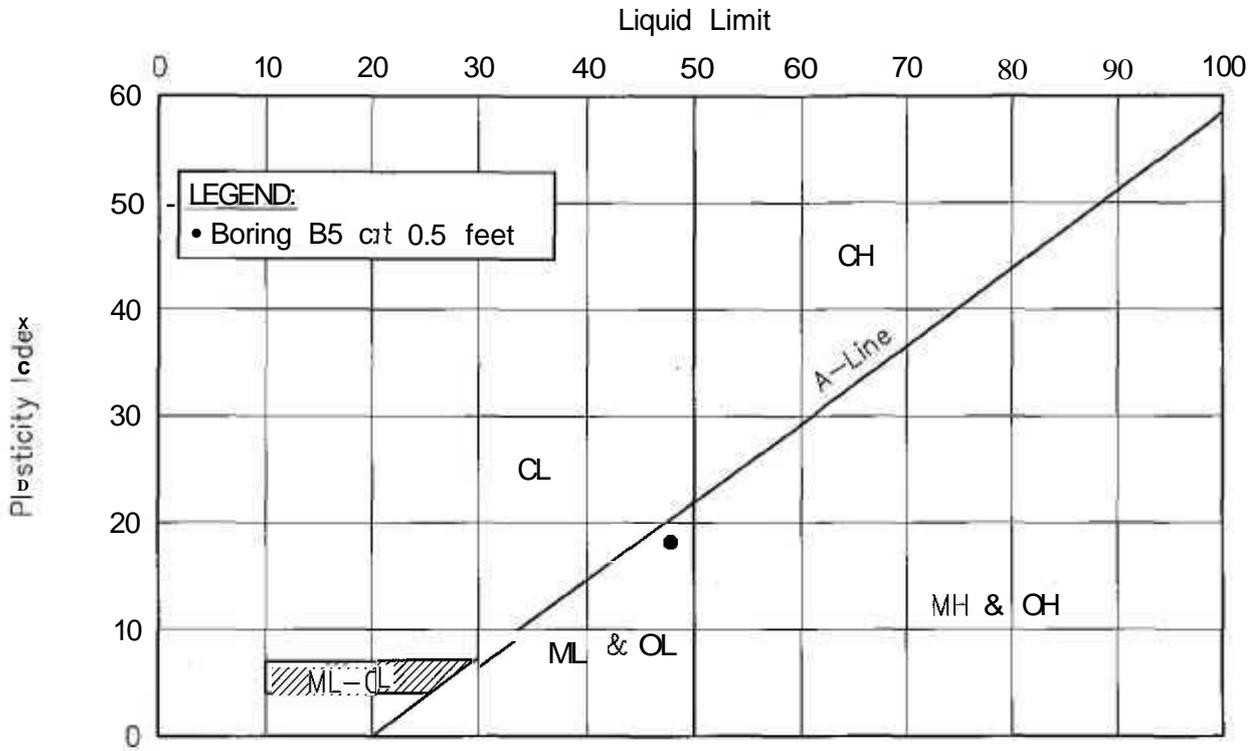
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BORING LOG LEGEND

PLASTICITY CHART



GRADATION CHART

COMPONENT DEFINITIONS BY GRADATION	
COMPONENT	SIZE RANGE
Boulders	Above 12 in.
Cobbles	3 in. to 12 in.
Gravel	3 in. to No. 4 (4.76 mm)
Coarse gravel	3 in. to 3/4 in.
Fine gravel	3/4 in. to No. 4 (4.76 mm)
Sand	No. 4 (4.76 mm) to No. 200 (0.074 mm)
Coarse sand	No. 4 (4.76 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and clay	Smaller than No. 200 (0.074 mm)

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UNIFIED SOIL CLASSIFICATION SYSTEM

Plate A3.2

BORING LOG

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BORING NO. B1 DRIVING WT. 140 lb. START DATE 8/1/14
 SURFACE ELEV. 401±* DROP 30 in. END DATE 8/1/14

DEPTH IN U	G F F F	S A M P E	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
						Silty SAND (SM) - Tan, moist, medium dense. (Fill)
		<input type="checkbox"/>	30	93	29	Clayey SILT (ML) - Reddish brown, moist, stiff.
		<input type="checkbox"/>	27	94	29	
- 5 -		<input type="checkbox"/>	21/6" 50/2"	94	25	Boulder at 6 to 7.5 feet.
		<input type="checkbox"/>				Grayish brown mottling from 9 feet.
- 10 -		<input type="checkbox"/>	99/10"	91	30	
		<input type="checkbox"/>				
- 15 -		<input type="checkbox"/>	52	88	35	
						End boring at 15.5 feet.
- 20 -						Neither groundwater nor seepage water encountered.
- 25 -						* Elevations based on Topographic Survey provided by Design Partners, Inc. on August 11, 2014.
- 30 -						

BORING LOG

W.O. 14-5702

BORING NO. B2 DRIVING WT. 140 lb. STAFF DATE 8/1/14
 SURFACE ELEV. 404± DROP 30 in. END DATE 8/1/14

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
						Clayey SILT (ML) - Reddish brown, moist, stiff.
		•	97/11"	85	20	
- 5 -		□	63/6"	90	21	
		□	86	101	22	
- 10 -						
		□	101	95	29	
- 15 -						End boring at 14.5 feet.
- 20 -						Neither groundwater nor seepage water encountered.
- 25 -						
- 30 -						

BORING LOG

W.O. 14-5702

BORING NO. B3 DRIVING WT. 140 lb. START DATE 8/1/14 ;
 SURFACE ELEV. 399± DROP 30 in. END DATE 8/1/14

DEPTH FOOT	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
						Clayey SILT (ML) — Reddish brown, moist, stiff.
		n	62	81	20	
- 5 -		<input type="checkbox"/>	60/6"	83	23	
		<input type="checkbox"/>	96/4"	97	24	
- 10 -		<input type="checkbox"/>	50/6"	94	28	
- 15 -						End boring at 14 feet.
- 20 -						Neither groundwater nor seepage water encountered.
- 25 -						
- 30 -						

BORING LOG

W.O. 14-5702

BORING NO. B4 DRIVING WT. 140 lb. START DATE 8/1/14
 SURFACE ELEV. 400.5± DROP 30 in. END DATE 8/1/14

DEPTH IN U	GRAFI	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
						Clayey SILT (ML) - Reddish brown, moist, stiff.
		<input type="checkbox"/>	22	87	25	
		<input type="checkbox"/>	40	92	31	
5		D	77	90	30	
		<input type="checkbox"/>	73	92	29	
10						End boring at 15.5 feet. Neither groundwater nor seepage water encountered.
		p	34	88	37	
15						
20						
25						
30						

BORING LOG

W.O. 14-5702

BORING NO. B5 DRIVING WT. 140 lb. START DATE 8/1/14
 SURFACE ELEV. 400± DROP 30 in. END DATE 8/1/14

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						
		•	31	90	27	Clayey SILT (ML) - Reddish brown, moist, stiff.
	○ ○ ○	•	58	86	28	Cobbles from 2.5 to 3 feet.
5		□	63	89	30	
						End boring at 6.5 feet.
-10-						
						Neither groundwater nor seepage water encountered.
15						
20						
25						
30						

BORING LOG

W.O. 14-5702

BORING NO. B6 DRIVING; WT. 140 lb. START DATE 8/1/14
 SURFACE ELEV. 402.2± DROP 30 in. END DATE 8/1/14

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Clayey SILT (ML) - Reddish brown, moist, stiff.
			96/5"	81	21	
			68/6"	94	14	
5						End boring at 5 feet.
-10-						Neither groundwater nor seepage water encountered.
-15-						
-20-						
-25-						
-30-						

SITE EVALUATION/PERCOLATION TEST

Date/Time: August 6, 2014/ 8:30 AM
 Test performed by: Hirata & Associates, Inc.
 Owner: City and County of Honolulu
 Tax Map Key: 9-4-122: 103
 Test Number: P1

Elevation: 399± ft.
 Depth to Groundwater Table: >15.5 ft. below grade (Based on boring B1)
 Depth to Bedrock (if observed): >15.5 ft. below grade (Based on boring B1)
 Diameter of Hole: 4 in.
 Depth to Hole Bottom: 5 ft. below grade

Depth (inches)	Soil Profile (Color, texture, other)
<u>0-60</u>	<u>Clayey SILT (ML) - Reddish brown, moist, stiff.</u>

PERCOLATION READINGS

Time 12 inches of water to seep away: >30 min.
 Time 12 inches of water to seep away: >30 min.

 For percolation tests in sandy soils, record time intervals and water drops every 10 minutes for at least 1 hour.

• For percolation tests in non-sandy soils, presoak the test hole for at least 4 hours. Record time intervals and water drops at least every 10 minutes for 1 hour; or if the time for the first 6 inches to seep away is greater than 30 minutes, record time intervals and water drops at least every 30 minutes for 4 hours or until 2 successive drops do not vary by more than 1/16 inch.

Time interval	Drop in inches	Time interval	Drop in inches
<u>30 min.</u>	<u>9 1/8</u>	<u>30 min.</u>	<u>3</u>
<u>30 min.</u>	<u>4 1/2</u>	<u>30 min.</u>	<u>3</u>
<u>30 min.</u>	<u>3 1/4</u>	<u> </u>	<u> </u>
<u>30 min.</u>	<u>3</u>	<u> </u>	<u> </u>

Percolation Rate (time/final water level drop): 10 min/in

As the engineer responsible for gathering and providing site information and percolation test results, I attest to the fact that above site information is accurate and that the site evaluation was conducted in accordance with the provisions of Chapter 11-62, "Wastewater Systems" and the results were acceptable.



Rick I.K. Yoshida
 Engineer's Signature/Stamp

SITE EVALUATION/PERCOLATION TEST

Date/Time: August 6, 2014/8:35 AM
 Test performed by: Hirata & Associates, Inc.
 Owner: City and County of Honolulu
 Tax Map Key: 9-4-122: 103
 Test Number: P2

Elevation: 400.5± ft.
 Depth to Groundwater Table: >14.5 ft. below grade (Based on boring B2)
 Depth to Bedrock (if observed): >14.5 ft. below grade (Based on boring B2)
 Diameter of Hole: 4 in.
 Depth to Hole Bottom: 5 ft. below grade

Depth (inches)	Soil Profile (Color, texture, other)
<u>0-60</u>	<u>Clayey SILT (ML) - Reddish brown, moist, stiff.</u>

PERCOLATION READINGS

Time 12 inches of water to seep away: >30 min.
 Time 12 inches of water to seep away: >30 min.

 For percolation tests in sandy soils, record time intervals and waterdrops every 10 minutes for at least 1 hour.

/ For percolation tests in non-sandy soils, presoak the test hole for at least 4 hours. Record time intervals and water drops at least every 10 minutes for 1 hour; or if the time for the first 6 inches to seep away is greater than 30 minutes, record time intervals and water drops at least every 30 minutes for 4 hours or until 2 successive drops do not vary by more than 1/16 inch.

Time interval	Drop in inches	Time interval	Drop in inches
<u>30 min.</u>	<u>5 1/8</u>	<u>30 min.</u>	<u>3</u>
<u>30 min.</u>	<u>4 1/2</u>	<u>30 min.</u>	<u>3</u>
<u>30 min.</u>	<u>3 1/4</u>	<u> </u>	<u> </u>
<u>30 min.</u>	<u>3</u>	<u> </u>	<u> </u>

Percolation Rate (time/final water level drop): 10 min/in

As the engineer responsible for gathering and providing site information and percolation test results, I attest to the fact that above site information is accurate and that the site evaluation was conducted in accordance with the provisions of Chapter 11-62, "Wastewater Systems" and the results were acceptable.



faiL I.K. Yoshida
 Engineer's Signature/Stamp

APPENDIX B

LABORATORY TESTING

DESCRIPTION OF LABORATORY TESTING

CLASSIFICATION

Field classification was verified in the laboratory in accordance with the Unified Soil Classification System. Laboratory classification was determined by both visual examination and Atterberg Limit tests performed in general accordance with ASTM D 4318. The results of Atterberg Limit tests are plotted on Plate A3.2. The final classifications are shown at the appropriate locations on the Boring Logs, Plates A4.1 through A4.6.

MOISTURE-DENSITY

Representative samples were tested for field moisture content and dry unit weight. The dry unit weight was determined in pounds per cubic foot while the moisture content was determined as a percentage of dry weight. Samples were obtained using a 3-inch O.D. split tube sampler. Test results are shown at the appropriate depths on the Boring Logs, Plates A4.1 through A4.6.

CONSOLIDATION

Selected representative samples were tested for their consolidation characteristics. The test samples were 2.42 inches in diameter and 1 inch high. Porous stones were placed in contact with the top and bottom of the test samples to permit addition and release of pore fluid. Loads were then applied in several increments in a geometric progression, and the resulting deformations recorded at selected time intervals. Test results are plotted on the consolidation Test Reports, Plates B2.1 and B2.2.

SHEAR TEST

Shear tests were performed in the Direct Shear Machine which is of the strain control type. Each sample was sheared under varying confining loads in order to

determine the Coulomb shear strength parameters, cohesion and angle of internal friction. Test results are presented on Plates B3.1 and B3.2.

SWELL TEST

Swell tests were performed on representative samples by placing a 90 psf surcharge load on the one-inch high specimens. The samples were inundated with water, and total expansion recorded after a period of at least 24 hours. Test results were recorded as a percentage of original height and are summarized in the following table:

Sample	Sample Type	Recorded Expansion	Moisture Content Prior to Test
B1 @ 3'	Representative	0.1%	29%
B2 @ 2'	Representative	0.5%	20%
B4 @ 3'	Representative	0.1%	31%

PROCTOR TEST

A Modified Proctor test was performed in general accordance with ASTM D 1557 on a bulk sample obtained from boring B5 at a depth of about 0.5 feet. The test is used to determine the optimum moisture content at which the soil compacts to 100 percent dry density. Results are shown on Plate B4.1.

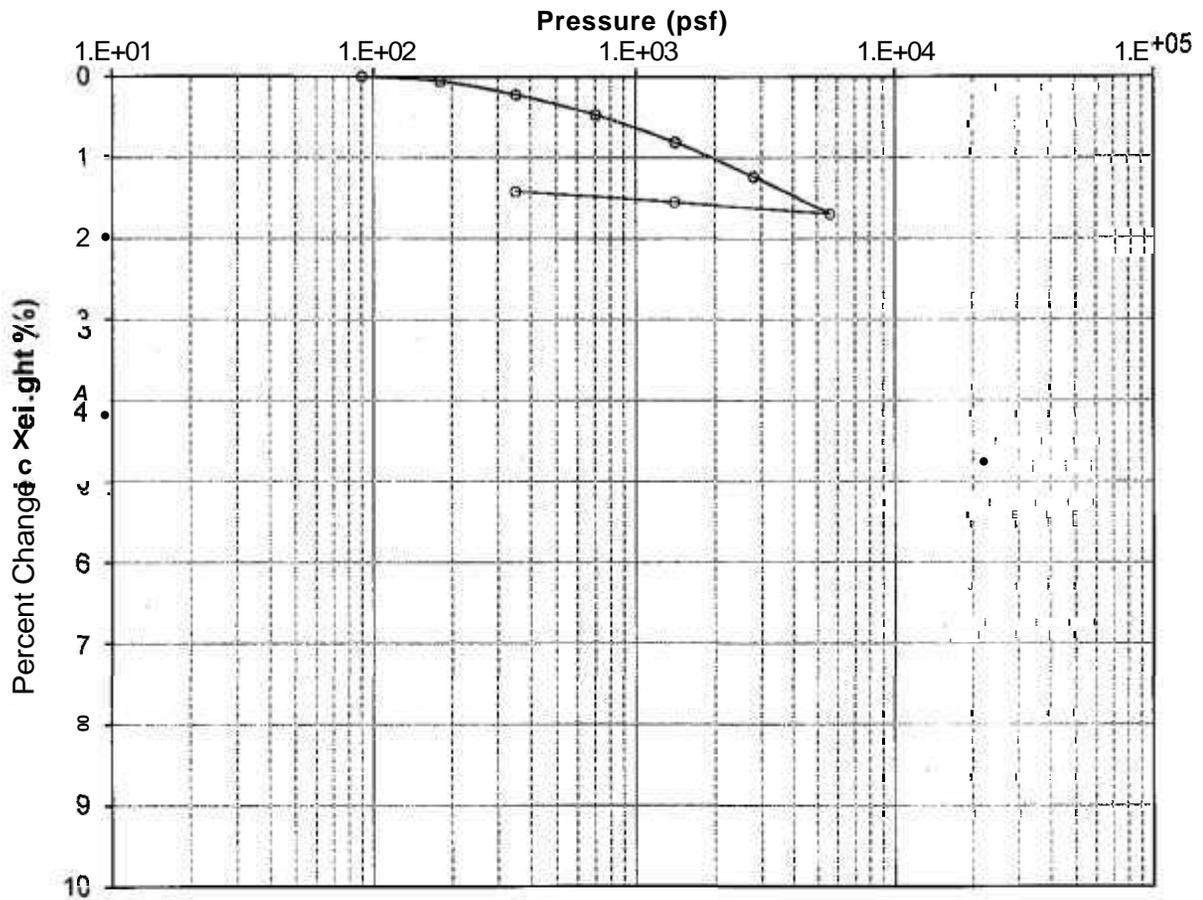
CALIFORNIA BEARING RATIO TEST

A CBR test was performed on a bulk sample obtained from boring B5 at a depth of about 0.5 feet, in general accordance with ASTM D 1883. The test is used to evaluate the relative quality of subgrade soils to be used in the design of flexible pavement. Results are shown on Plate B5.1.

EXPANSION INDEX TEST

An expansion index test was performed in general accordance with ASTM D 4829. A surcharge load of 144 psf was placed on a 1-inch high by 4-inch diameter specimen which was molded to about 50 percent saturation. The sample was inundated with water, and total expansion recorded after volumetric equilibrium was reached. An expansion index test performed on a bulk soil sample obtained from boring B5 at a depth of about 0.5 feet resulted in an expansion index of 27, corresponding to a low expansion potential.

Consolidation Test Results



Sample Description

Boring No.: B2 Depth (ft): 4
 Soil Description: Reddish brown clayey silt

	Moisture Content (%)	Dry Density (pcf)
Initial	21.0	90.0
Final	19.0	91.3

Remark:

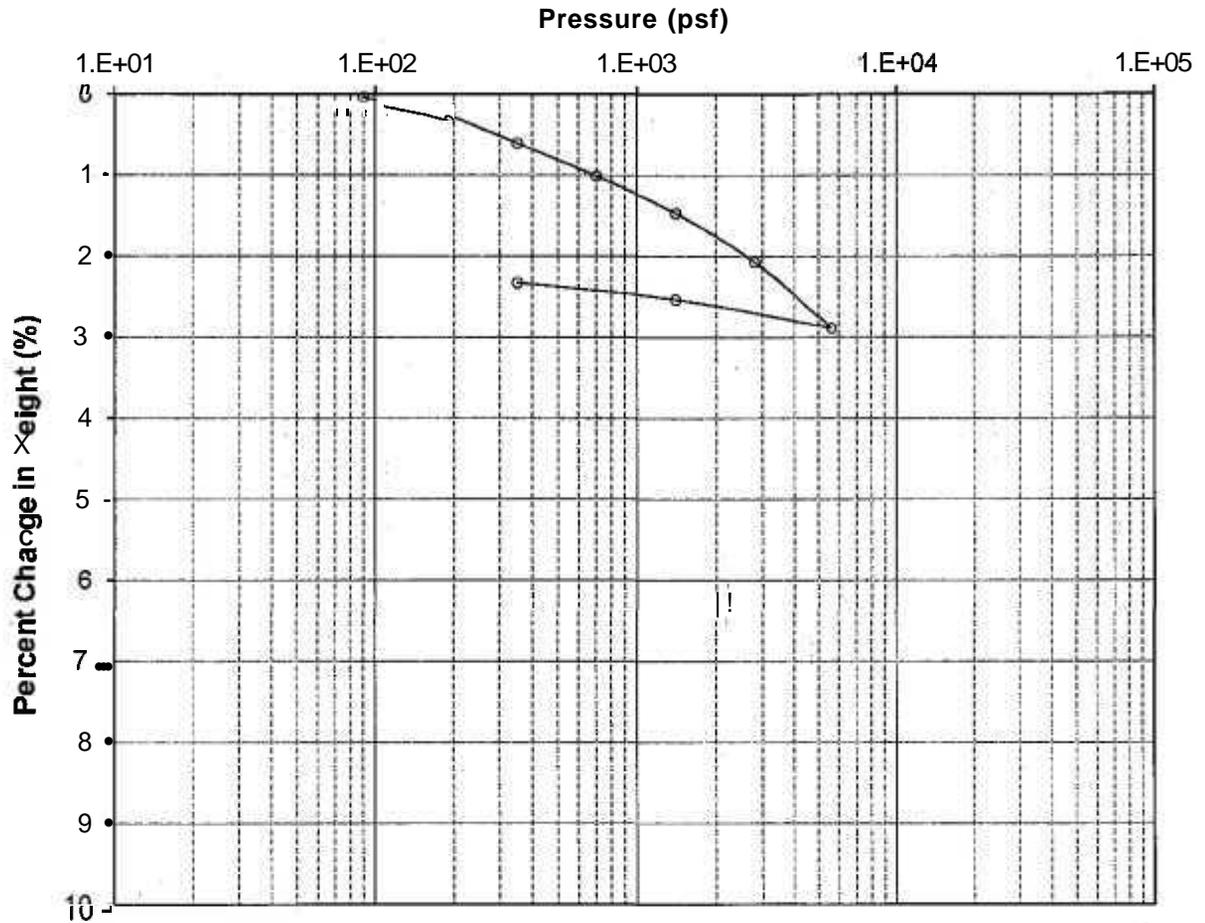
W.O. 14-5702

Central Oahu Ambulance Facility

Hirata & Associates, Inc.

CONSOLIDATION TEST

Consolidation Test Results



Sample Description

Boring No.: B6 Depth (ft): 2
 Soil Description: Reddish brown clayey silt

	Moisture Content (%)	Dry Density (pcf)
Initial	21.0	81.0
Final	17.2	82.9

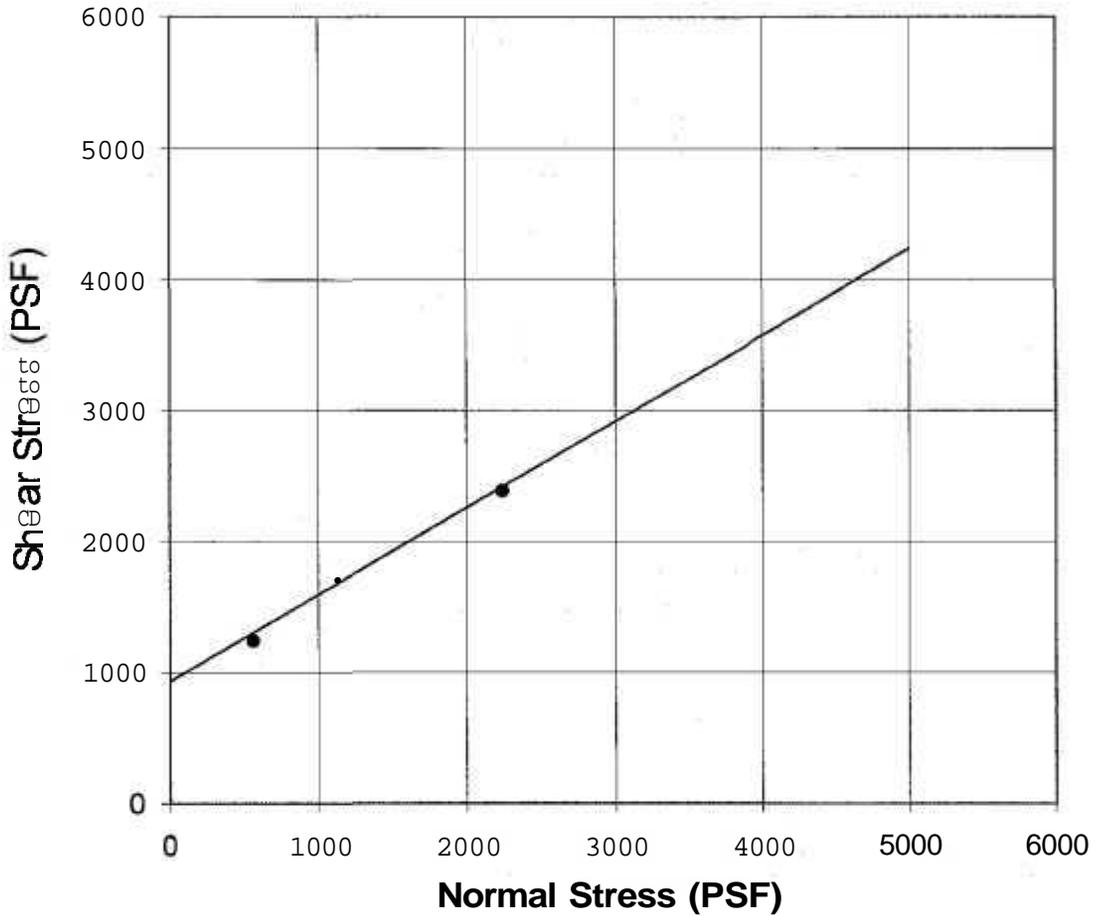
W.O. 14-5702

Central Oahu Ambulance Facility

Hirata & Associates, Inc.

CONSOLIDATION TEST

Direct Shear Test Results



Sample Description

Boring No.: B1	Depth (ft): 3
Soil Description: Reddish brown clayey silt	
Strength Intercept (C): 933.4 PSF	(Peak Strength)
Friction Angle (ϕ): 33.5 DEG	(Peak Strength)

Remark:

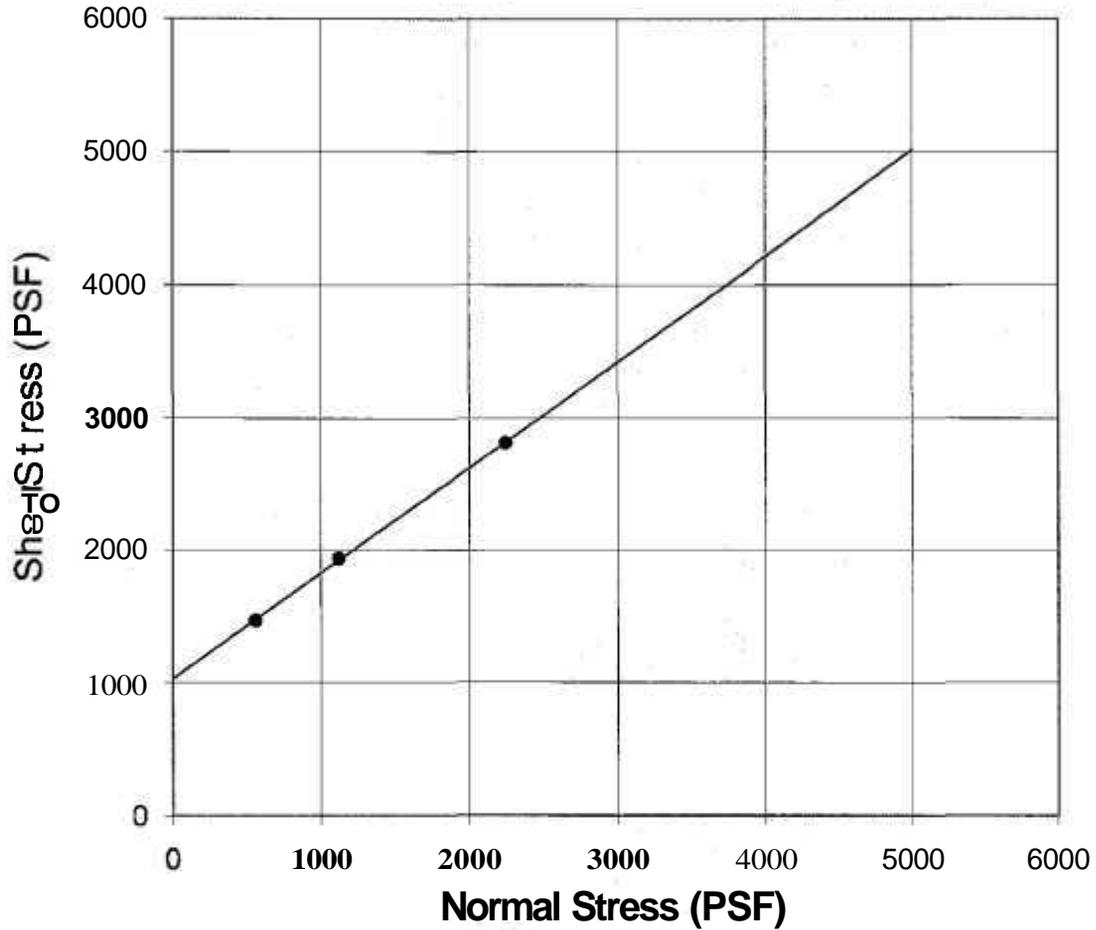
W.O. 14-5702

Central Oahu Ambulance Facility

Hirata & Associates, Inc.

DIRECT SHEAR TEST

Direct Shear Test Results



Sample Description

Boring No.: B4 **Depth (ft):** 5
Soil Description: Reddish brown clayey silt
Strength Intercept (C): 1033.4 PSF **(Peak Strength)**
Friction Angle (ϕ): 38.5 DEG **(Peak Strength)**

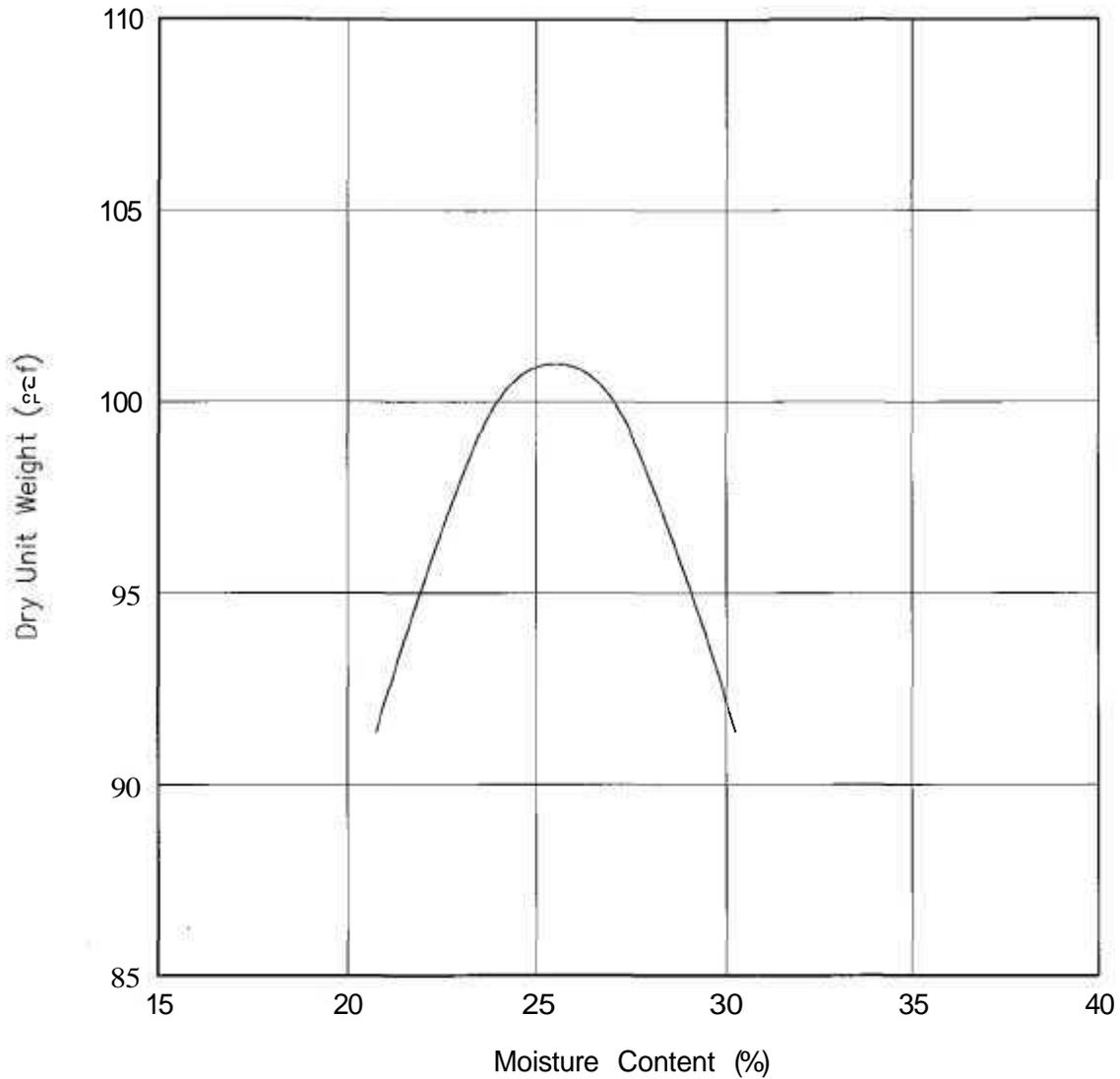
Remark:

W.O. 14-5702

Central Oahu Ambulance Facility

Hirata & Associates, Inc.

DIRECT SHEAR TEST



Soil Data

Location: Boring B5 at 0.5 feet

Description: Reddish brown clayey silt

Test Results

Maximum Dry Density: 101 pcf

Optimum Moisture Content: 25.5%

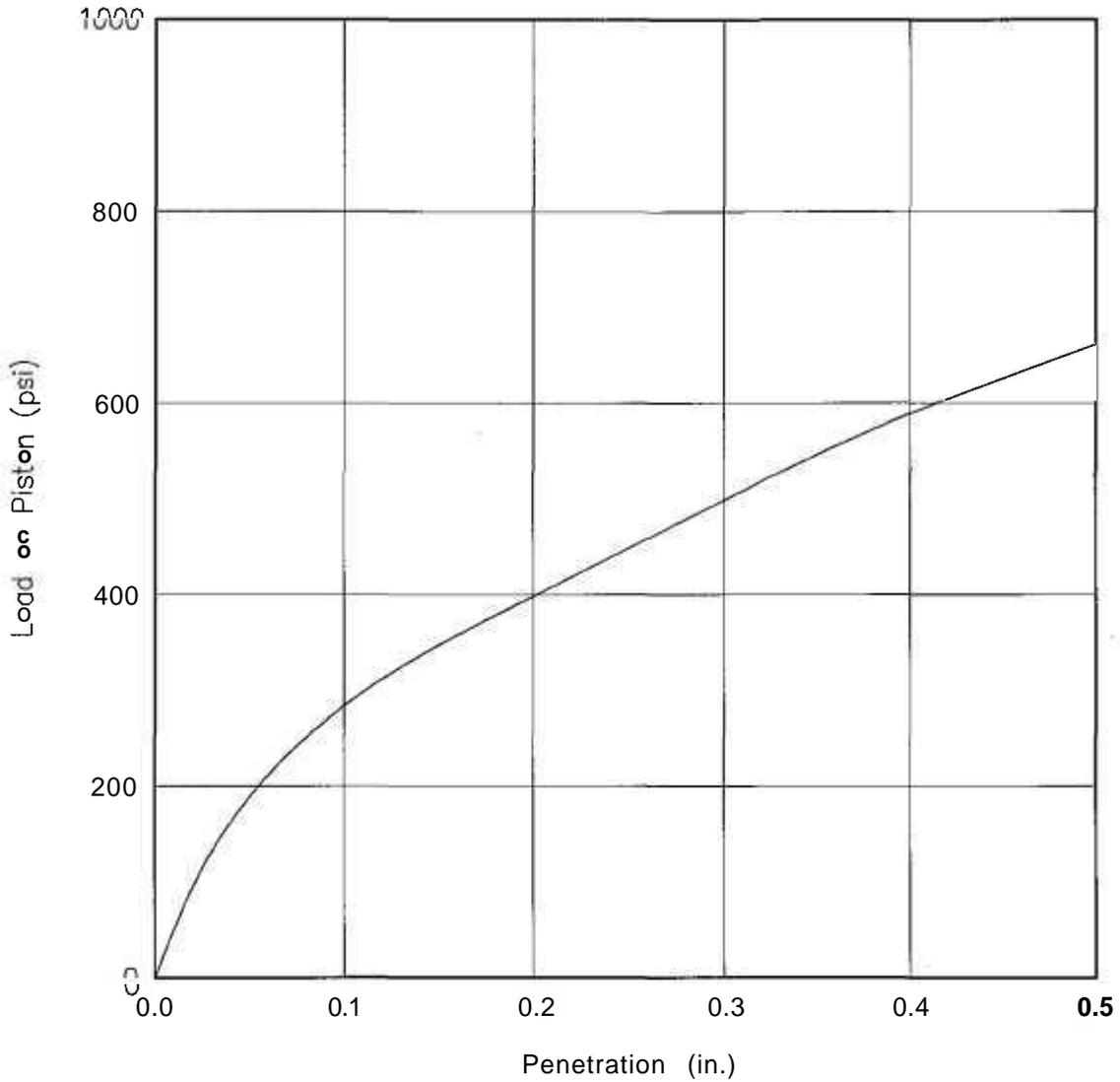
W.O. 14-5702

Central Oahu Ambulance Facility

Hirata & Associates, Inc.

MODIFIED PROCTOR CURVE

Plate B4.1



Soil Data

Location: Boring B5 at 0.5 feet
 Description: Reddish brown clayey silt
 Sample Dry Density: 101 pcf
 Sample Moisture Content: 25.5%

Test Results

CBR Value: 29%
 Expansion: 0.3%

W.O. 14-5702

Central Oahu Ambulance Facility

Hirata & Associates, Inc.

CBR STRESS PENETRATION CURVE

Plate B5.1

APPENDIX B

SOIL ASSESSMENT CENTRAL OAHU (WAIPIO) AMBULANCE FACILITY UKEE STREET AT KOLIANA STREET WAIPAHU, HAWAII

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EnvironMETeo Services, Inc.
Environmental / Industrial Health & Safety

**SOIL ASSESSMENT
CENTRAL OAHU (WAIPIO) AMBULANCE FACILITY
UKEE STREET AT KOLIANA STREET
WAIPAHU, HAWAII**

EMET ID: 1406245

SEPTEMBER 15, 2014

**FOR
DESIGN PARTNERS INCORPORATED**



**Soil Assessment
Central Oahu (Waipio) Ambulance Facility
Ukee Street at Koliana Street
Waipahu, Hawaii**

September 15, 2014

Prepared for:

**Design Partners Incorporated
1580 Makaloa Street, Suite 1100
Honolulu, Hawaii 96814**

Attention: Mr. Duane T. Hamada

Prepared by:

**EnvironMETeo Services, Inc.
94-520 Ukee Street, Suite A
Waipahu, Hawai'i 96797
(808)671-8383
EMET ID: 1406245**

A handwritten signature in black ink, appearing to read "Clifford How", is written over a horizontal line.

Clifford How

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Table 2.	Summary of Analytical Data Statistics

List of Figures

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APPENDIX A - ANALYTICAL LABORATORY REPORT



**SOIL ASSESSMENT
CENTRAL OAHU (WAIPIO) AMBULANCE FACILITY
UKEE STREET AT KOLIANA STREET
WAIPAHU, HAWAII**

1.0 INTRODUCTION

This report summarizes our assessment of surface soil for its content of common contaminants at the planned site of a new ambulance facility for Central Oahu. The site is located on Ukee Street at the intersection with Koliانا Street, Waipio, Waipahu, Hawaii. The site is a vacant parcel covered with a grass lawn. The tax map key for the site is (1) 9 - 4 - 122: 103, and the City and County of Honolulu is the owner of the site.

Our geologist visited the site on August 13, 2014 to collect samples of the soil.

2.0 SOIL SAMPLING AND LABORATORY TESTING

On August 13, 2014, a geologist with EnvironMETeo Services, Inc. (EMET) collected three multi-increment samples of the surface soil ranging to a few inches below grade with hand tools. Each soil sample comprised 30 increments of soil of approximately 45 grams each, which were placed in sealable plastic bags, chilled in a cooler with ice, and delivered to the ESN Pacific environmental chemistry laboratory in Honolulu. The three samples were independently located and each comprised increments from the nodes of a 30-by-30-foot grid covering the entire site.

ESN Pacific analyzed the sample for the following contaminants of potential concern (COPCs):

Total petroleum hydrocarbons:
 quantified as gasoline (TPH-g)
 quantified as diesel fuel (TPH-d)
 quantified as lubricating oil (TPH-o)

Volatile Organic Compounds:
 Benzene
 Ethylbenzene
 Toluene
 Xylenes
 Methyl tertiary butyl ether

Polynuclear aromatic compounds (PAHs):

- Acenaphthene
- Benzo(a)pyrene
- Fluoranthene
- Naphthalene

RCRA Metals:

- Arsenic
- Barium
- Cadmium
- Chromium
- Lead
- Mercury
- Selenium
- Silver

Organochlorine pesticides

Herbicides

The ESN Pacific report is included in Appendix A. A summary of the data is presented in Table 1.

Petroleum hydrocarbons and petroleum-related volatile organic compounds were not detected in the soil samples.

Arsenic, barium, cadmium, chromium, and lead were each detected in one or two of the samples at concentrations that are less than their respective environmental action level¹ (EAL). Mercury, selenium, and silver were not detected in the samples. Metals are naturally-occurring elements in soil and rock.

Of the four PAHs on the list of COPCs, acenaphthene was detected in one of the three samples at a concentration less than the EAL. Acenaphthene was not detected in the other two samples, and the other PAHs were not detected in any of the samples.

¹ **Tier 1** Environmental Action Levels (EALs) were developed by the Department as standards of comparison for many chemical contaminants to evaluate their hazard to health and the environment. Media with concentrations above the EALs may pose such a hazard, and media with concentrations below the EALs generally do not pose a hazard and require no further evaluation or action. Reference: Hawai'i Department of Health 2011, *Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Fall 2011)*: Hawai'i Department of Health, Hazard Evaluation and Emergency Response, <http://hawaii.gov/health/environmental/hazard/index.html>.

Table 1 Analytical Data for Soil Samples

Analyte	EPA Test Method Number	EAL ¹	Sample C&C EMS 01	Sample C&C EMS 02	Sample C&C EMS 03
<u>Petroleum</u>					
TPH-g	8015 Mod	100	< 10	<10	< 10
TPH-d	8015B	100	<50	<50	<50
TPH-o	8015B	500	< 100	<100	< 100
<u>VOCs</u>					
Benzene	8260C	0.30	<0.02	<0.02	<0.02
Ethylbenzene	8260C	3.7	<0.05	<0.05	<0.05
Toluene	8260C	3.2	<0.15	<0.15	<0.15
Xylenes	8260C	2.1	<0.05	<0.05	<0.05
MTBE	8260C	0.028	<0.05	<0.05	<0.05
<u>Metals</u>					
Arsenic	601 OB	24	18	<5.0	10
Barium	601 OB	1,000	160	<50	170
Cadmium	601 OB	14	1.4	<1.0	1.6
Chromium	601 OB	1,100	580	<5.0	550
Lead	6010B	200	18	<5.0	21
Mercury	7471A	4.7	<0.05	<0.05	<0.05
Selenium	6010B	78	<20	<20	<20
Silver	6010B	78	<20	<20	<20
<u>PAHs</u>					
Acenaphthene	8270C SIM	12	0.12	<0.02	<0.02
Benzo(a)pyrene	8270C SIM	0.15	<0.02	<0.02	<0.02
Fluoranthene	8270C SIM	460	<0.02	<0.02	<0.02
Naphthalene	8270C SIM	4.4	<0.02	<0.02	<0.02
<u>Organochlorine</u>					
<u>Pesticides</u>					
Chlordane (tech)	8081A	16	0.062	0.056	0.081
Dieldrin	8081A	1.5	0.008	0.008	0.009
DDE	8081A	1.4	0.053	0.078	0.052
DDT	8081A	1.7	0.016	0.017	0.017
Other pesticides	8081A	c/s	ND	ND	ND
Herbicides	8151A	c/s	ND	ND	ND

Notes:

¹Tier 1 Environmental Action Level for areas of unrestricted land use, above drinking water aquifers, and more than 150 meters from the nearest surface water body

Data are concentrations expressed in milligrams per kilogram. Bold Font indicates concentration is greater than the EAL. "<" means less than the laboratory reporting limit indicated. "ND" means not detected. "c/s" means compound specific. "NS" means no standard. "J" indicates values that are less than the laboratory's reporting limit but greater than the method detection limit

Technical chlordane, dieldrin, dichlorodiphenyldichloroethylene (DDE), and dichlorodiphenyl-trichloroethylene (DDT) were detected in the samples at concentrations that are less than their respective EALs.

Laboratory results for analytes with concentrations greater than laboratory detection limits from the triplicate MI soil samples were analyzed statistically to evaluate the consistency of the data. Results of the statistical calculations are presented in Table 2.

Relative standard deviations (RSDs) for the detected analytes are 24.2 percent or less. RSDs less than 35 percent indicates the amount of estimated error in the data is within a reasonable range and generally validates the multi-increment sampling procedure.

Table 2 Summary of Analytical Data Statistics

Analyte	Mean	Standard Deviation (SD)	Relative SD	Mean + SD	95% UCL	Mean + 95% UCL	EAL ¹
Chlordane (tech)	0.066	0.0131	19.7%	0.079	0.022	0.088	16
Dieldrin	0.0083	0.00058	6.93%	0.0089	0.00097	0.0093	1.5
DDE	0.061	0.0147	24.2%	0.076	0.0248	0.086	1.4
DDT	0.017	0.00058	3.46%	0.018	0.00097	0.018	1.7

Notes:

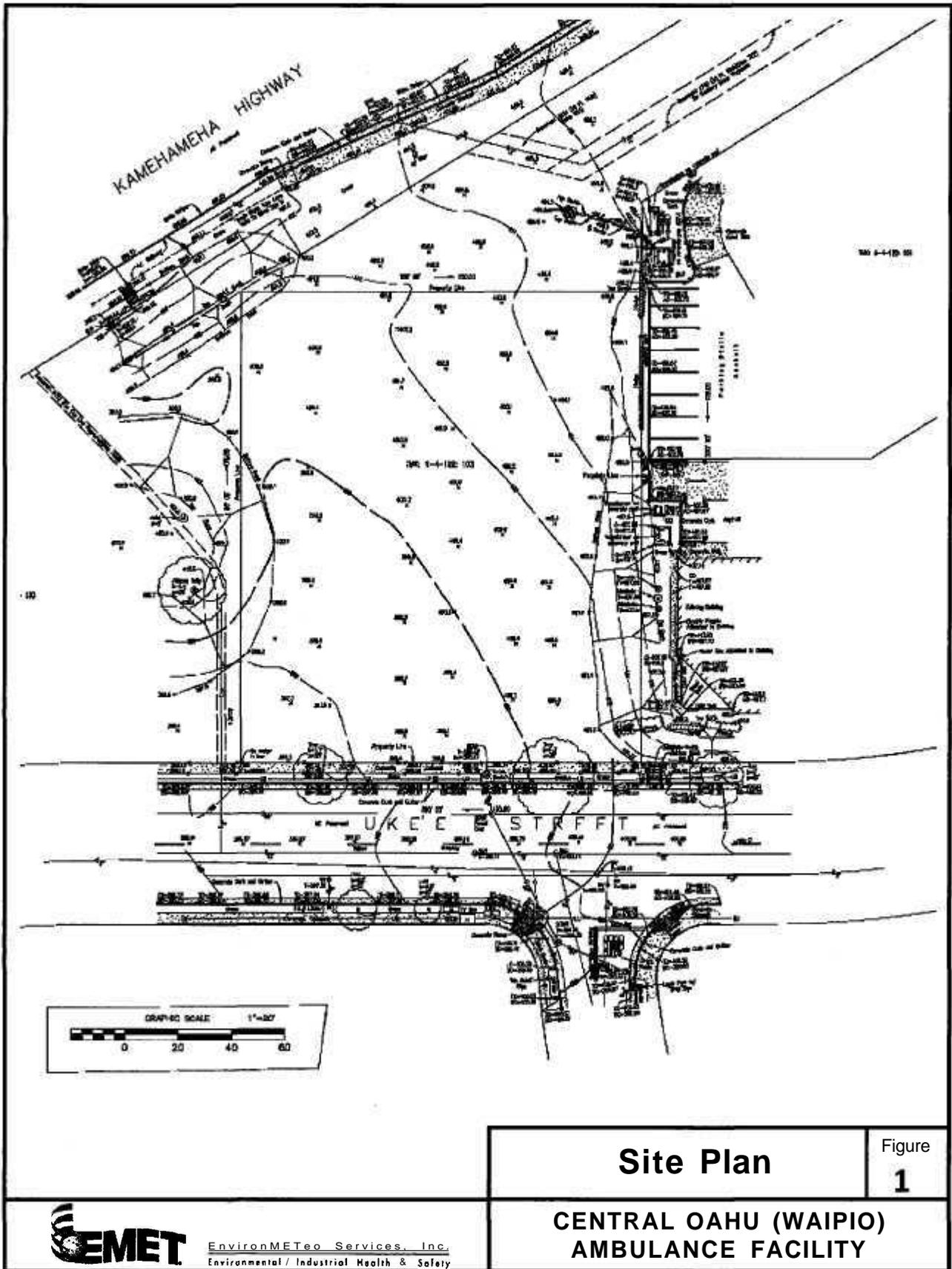
Values for soil (other than number of samples and relative standard deviation) are expressed in milligrams per kilogram.

¹Tier 1 EAL = Hawai'i Department of Health Tier 1 Environmental Action Level for areas of unrestricted use above drinking water resources and more than 150 meters to a surface water body. Reference: *Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater* (Summer 2008).

²Hawaii Department of Health considers a more appropriate environmental standard for mineral oil in soil is 5,000 mg/kg, provided the oil has not been subjected to high temperatures. Transformer oil used by Hawaiian Electric is mineral oil. Ref: *Long-Term Management of Petroleum-Contaminated Soil and Groundwater*, HDOH June 2007.

3.0 SUMMARY AND CONCLUSIONS

EMET services collected three multi-increment soil samples at the planned site of a new ambulance facility for Central Oahu and tested the samples for a list of common COPCs. Acenaphthene and four pesticides were detected in one or more of the soil samples at concentrations that are less than Department of Health standards. Other COPCs were not detected in the samples. Statistical analysis of the analytical data verify that the sampling methods and procedures produced samples were representative of the surface soil at the site.



APPENDIX A
ANALYTICAL LABORATORY REPORT



Environmental Services Network

August 28, 2014

Clifford How
EMET Services, Inc
94-520 Ukee St. #A
Waipahu, HI 96797

SUBJECT: DATA REPORT - 1406245, C&C EMS Facility

ESN Project# D1408130316

Mr. How:

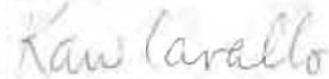
Please find enclosed field logs for sampling services from the above referenced project for EMET Services, Inc. Also please find enclosed a data report for the samples analyzed from the above referenced project for EMET Services, Inc. The samples were received intact. Applicable detection limits, QA/QC data, and any issues encountered during analysis are included in the report.

The following tests were conducted:

- Multi-increment sample processing by Hawaii DOH Method.
- Analyses for aromatic volatile organics by EPA 5035/8260.
- Analyses for TPH as gasoline by EPA method 5035/8015 mod.
- Analyses for TPH as diesel by EPA 8015 mod.
- Analyses for TPH as oil by EPA 8015 mod.
- Analyses for organochlorine pesticides by EPA 8081 mod.
- Analyses for polynuclear aromatic hydrocarbons by EPA 8270.
- Analyses for total RCRA 8 by EPA 6020.
- Analyses for herbicides by EPA 8151.

ESN appreciates the opportunity to have provided analytical services to EMET Services, Inc on this project. If you have any further questions relating to the data or report, please do not hesitate to contact us.

Sincerely,



Karen Carvalho
Operations Manager

ESN Pacific
2020-B Kahai Street
Honolulu, HI 96819

Ph: (808) 847-0067
esn@esnpacific.com



ESN PACIFIC'S CHAIN-OF-CUSTODY RECORD

CLIENT: EMET Services
 ADDRESS: 94-520 Uke'e Street Ste A, Waipahu
 PHONE: 808 671 8383 FAX:
 EMAIL: rsoroos@hawaii.com | chiphore@emst.com
 CLIENT PROJECT #: 1406245 Project Manager: Chiffleur

TAT (circle one): 24-hr. 48-hr. Other: 1 week
 DATE: 08/13/14 PAGE 1 OF 1
 ESN PROJECT #: 1540930316
 LOCATION/PROJECT NAME: C9C EMS facility
 COLLECTOR: RS, Mts, Tech DATE COLLECTED: 08/13/14

Sample ID#	Depth	Time	Sample Type	Container Type	8290 HVOC at 50357 Y N	8290 BTX at 50357 Y N	8015 TPH-Diesel	8015 TPH-Gas at 50357 Y N	8081 Chk. Particles	8270 PAH DOH4	8270 PAH EPA-16	1010 Fluor. (ppm)	Total Metals	TCP	MI Sample Prep	Comments	# of Containers
1 C9C EMS #1	2"	12:00	Silt	Zip lock	X	X	X	X	X	X	X	X	X	X	X		1
2 C9C EMS #2	↓	↓	↓	↓	X	X	X	X	X	X	X	X	X	X	X		1
3 C9C EMS #3	↓	↓	↓	↓	X	X	X	X	X	X	X	X	X	X	X		1
4																	
5																	
6																	
7																	
8																	
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10																	
11																	
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17																	
18																	
19																	
20																	

RELINQUISHED BY: (Signature) [Signature] DATE/TIME 08/13/14 RECEIVED BY: (Signature) [Signature] DATE/TIME 8/13/14
 RELINQUISHED BY: (Signature) _____ DATE/TIME _____ RECEIVED BY: (Signature) _____ DATE/TIME _____

SAMPLE DISPOSAL INSTRUCTIONS: _____ ESN @ \$5.00/sample or _____ Return to Client
 LABORATORY NOTES: _____
 SAMPLE RECEIPT: _____
 TOTAL # OF CONTAINERS _____
 COOS LV: N | M _____
 SEALS INTACT Y/N/NA _____
 RECEIVED TEMP: _____



Environmental Services Network

**NON-VOLATILE
MULTI-INCREMENT PREPARATION**

DATE: 8/14/2014

PREPARED BY: A. Crowell, Z. Tullis

ESN PROJECT: D1408130316

EMET Services, Inc. personnel collected multi-increment samples in the field for analysis. The samples were delivered to ESN's lab for preparation and analyses, according to DOH's Multi-Increment Sampling Plan (HEER TGM, Section 4.2).

(Dry weights)

Sample ID#	Sample Weight (g)
C&C EMS 01	1333.3
C&C EMS 02	1482.1
C&C EMS 03	1345.4

SAMPLE PREP PROCESS SUMMARY:

- Each sample was emptied from their containers on to its own clean, flat baking pan. The sample was spread out evenly across the pan no more than 1" high in thickness.
- Sample trays were placed on separate oven racks and air-dried overnight or until no significant moisture remained as determined by appearance.
- Sample trays were removed and weighed to determine sample's total dry weight (see above table).
- Sieved entire dried sample through a #10 mesh sieve rendering particles less than two-millimeters in size. Clumps of dirt were crushed until able to pass through the sieve, rocks and other debris were set aside.
- Sieved samples were spread out evenly on flat baking pans.
- A small flat spatula was used to randomly scoop up 30 to 50 small increments to fill sample containers. Care was taken during this step to ensure that samples contained a good distribution of particle sizes. If duplicate or triplicate analysis is requested, additional samples are collected at this time. Remaining sample was returned to resealable (i.e. Zip-Loc) bags.



Environmental Services Network

**VOLATILE
MULTI-INCREMENT PREPARATION**

DATE: 8/14/2014

PREPARED BY: K. Carvallo

ESN PROJECT: D1408I30316

EMET Services, Inc. personnel collected multi-increment samples in the field for analysis. The samples were delivered to ESN's lab for preparation and analyses, according to DOH's Multi-Increment Sampling Plan (HEER TGM. Section 4.2).

Sample ID#	Final Weight (g)	Jar Weight (g)	Methanol Volume (mL)	Calculated Sample Weight (g)
C&C EMS 01	602.4	498.3	104	104.1
C&C EMS 02	492.6	360.0	133	132.6
C&C EMS 03	630.1	492.3	138	137.8

SAMPLE PREP (FIELD METHANOL PRESERVATION) PROCESS SUMMARY:

- A pre-determined volume of extraction fluid (i.e. methanol) large enough to accommodate the multiple increments of soil was added to clean containers (100 mL).
- Samples were collected in pre-weighed clean containers using a five-gram Lock N⁷ LoadTM soil sample coring device.
- After sampling the containers were weighed in the lab to determine sample weight
- Additional methanol was added in order to bring the methanol to sample weight ratio to 1:1.



Environmental Services Network

EMET Environmental Services PROJECT #1406245
C&C EMS Facility

ESN Project #D1408130316

ORGANOCHLORINE PESTICIDES ANALYSES OF SOILS BY EPA 8081A MODIFIED

SAMPLE NUMBER	Method Blank	C&C EMS 01	C&C EMS 01 Dup	C&C EMS 02	C&C EMS 03	PQL	MDL
DATE SAMPLED	-	8/13/2014	8/13/2014	8/13/2014	8/13/2014		
DATE EXTRACTED	8/20/2014	8/20/2014	8/20/2014	8/20/2014	8/20/2014		
DATE ANALYZED	8/26/2014	8/26/2014	8/26/2014	8/28/2014	8/28/2014		
Alpha-BHC	nd	nd	nd	nd	nd	0.005	0.002
Beta-BHC	nd	nd	nd	nd	nd	0.005	0.003
Gamma-BHC (Lindane)	nd	nd	nd	nd	nd	0.005	0.002
Delta-BHC	nd	nd	nd	nd	nd	0.005	0.002
Heptachlor	nd	nd	nd	nd	nd	0.005	0.002
Aldrin	nd	nd	nd	nd	nd	0.005	0.002
Heptachlor epoxide	nd	nd	nd	nd	nd	0.005	0.002
Gamma-Chlordane	nd	nd	nd	nd	0.004 J	0.005	0.002
Endosulfan I	nd	nd	nd	nd	nd	0.005	0.002
Alpha-Chlordane	nd	nd	nd	nd	0.005	0.005	0.002
Dieldrin	nd	0.008 J	0.006 J	0.008 J	0.009 J	0.010	0.003
p,p'-DDE	nd	0.053	0.040	0.078	0.052	0.010	0.003
Endrin	nd	nd	nd	nd	nd	0.010	0.003
Endosulfan II	nd	nd	nd	nd	nd	0.010	0.005
p,p'-DDD	nd	nd	nd	nd	nd	0.010	0.003
Endrin aldehyde	nd	nd	nd	nd	nd	0.010	0.006
Endosulfan sulfate	nd	nd	nd	nd	nd	0.010	0.005
p,p'-DDT	nd	0.016	0.011	0.017	0.017	0.010	0.005
Endrin ketone	nd	nd	nd	nd	nd	0.010	0.005
Methoxychlor	nd	nd	nd	nd	nd	0.010	0.009
Chlordane (technical)	nd	0.062	0.055	0.056	0.081	0.050	0.020
Toxaphene	nd	nd	nd	nd	nd	0.050	0.010
	(mo/kg)	(mo/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)

FLAGS

SURROGATE RECOVERY (%)	133%	123%	131%	86%	132%
ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (TCMX): 65%- 135%					

J: The analyte was positively identified, but the associated numerical value is an estimate (below PQL).

QA/QC DATA - LABORATORY CONTROL SPIKE ANALYSES

	Laboratory Control Spike		
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Beta-BHC	0.050	0.058	116.6%
p,p'-DDE	0.100	0.117	117.4%
Endrin ketone	0.100	0.084	83.8%

% Recovery LIMITS: 80% TO 120%
RPD LIMIT: 20%

ANALYSES PERFORMED AND REVIEWED BY : K. Carvallo

2020 Kahai Street, Honolulu, Hawaii 96819



ESN NORTHWEST CHEMISTRY LABORATORY

EMET Services
PROJECT C&C EMS Facility
PROJECT #1406245
ESN PROJECT #D1408130316
Hawaii

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnw.com

**Analysis of Gasoline Range Organics in Soil
by Method 8015 Modified**

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Gasoline Range Organics (mg/kg)
Method Blank	8/21/2014	8/21/2014	113	nd
LCS	8/21/2014	8/21/2014	106	113%
C&C EMS 01	8/15/2014	8/21/2014	107	nd
C&C EMS 02	8/15/2014	8/21/2014	110	nd
C&C EMS 03	8/15/2014	8/21/2014	112	nd
Reporting Limits				10

"nd" Indicates not detected at the listed detection limits

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 50% TO 150%



ESN NORTHWEST CHEMISTRY LABORATORY

EMET Services
PROJECT C&C EMS Facility
PROJECT #1406245
ESN PROJECT #D1408130316
Hawaii

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnw.com

**Analysis of Diesel Range Organics & Lube Oil Range Organics in Soil
by Method 8015 Modified**

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Diesel Range Organics (mg/kg)	Lube Oil Range Organics (mg/kg)
Method Blank	8/18/2014	8/18/2014	87	nd	nd
LCS	8/18/2014	8/18/2014	107	92%	---
C&C EMS 01	8/18/2014	8/18/2014	89	nd	nd
C&C EMS 02	8/18/2014	8/18/2014	79	nd	nd
C&C EMS 03	8/18/2014	8/18/2014	81	nd	nd
Reporting Limits				50	100

"nd" Indicates not detected at the listed detection limits.

"—" Indicates not tested for component.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 50% TO 150%



ESN NORTHWEST CHEMISTRY LABORATORY

EMET Services
PROJECT C&C EMS Facility
PROJECT #1406245
ESN PROJECT #D1408130316
Hawaii

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Olympia, WA 98501
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Analysis of Volatile Organic Compounds in Soil by Method 8260C/5035

Sample Number	Date Prepared	Date Analyzed	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	Surrogate Recovery (%)
Method Blank	8/21/2014	8/21/2014	nd	nd	nd	nd	nd	113
LCS	8/21/2014	8/21/2014	122%	107%	120%	114%	110%	105
LCSD	8/21/2014	8/21/2014	114%	101%	111%	111%	111%	101
C&C EMS 01	8/15/2014	8/21/2014	nd	nd	nd	nd	nd	107
C&C EMS 02	8/15/2014	8/21/2014	nd	nd	nd	nd	nd	110
C&C EMS 03	8/15/2014	8/21/2014	nd	nd	nd	nd	nd	112
Reporting Limits			0.02	0.05	0.05	0.15	0.05	

"nd" Indicates not detected at the listed detection limits.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (**Bromofluorobenzene**)& LCS : 65% TO 135%



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Analysis of Polynuclear Aromatic Hydrocarbons in Soil by Method 8270

Analytical Results

	RL	MB	LCS	C&C EMS-01	C&C EMS-02	C&C EMS-03	MS	MSD	RPD
Date extracted		08/18/14	08/18/14	08/18/14	08/18/14	08/18/14	08/18/14	08/18/14	08/18/14
Date analyzed		08/18/14	08/18/14	08/18/14	08/18/14	08/18/14	08/18/14	08/18/14	08/18/14
Moisture, %	(mg/kg)			17%	17%	16%			
Naphthalene	0.02	nd	109%	0.12	nd	nd	116%	98%	17%
Acenaphthene	0.02	nd	111%	nd	nd	nd			
Fluoranthene	0.02	nd	132%	nd	nd	nd			
Benzo(a)pyrene*	0.02	nd	116%	nd	nd	nd			
Total Carcinogens				nd	nd	nd			
<u>Surrogate recoveries:</u>									
2-Fluorobiphenyl		104%	102%	93%	81%	83%	95%	86%	
p-Terphenyl-d14		102%	103%	104%	91%	94%	103%	96%	

Data Qualifiers and Analytical Comments

* - Carcinogenic Analyte

nd - not detected at listed reporting limits

Results reported on dry-weight basis

Acceptable Recovery limits: 50% TO 150%

Acceptable RPD limit: 35%



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Total Metals in Soil by EPA-6020 Series

Sample Number	Date Analyzed	Lead (Pb) (mg/kg)	Cadmium (Cd) (mg/kg)	Chromium (Cr) (mg/kg)	Arsenic (As) (mg/kg)	Silver (Ag) (mg/kg)	Barium (Ba) (mg/kg)	Selenium (Se) (mg/kg)	Mercury (Hg) (mg/kg)
Method Blank	8/20/2014	nd	nd	nd	nd	nd	nd	nd	nd
C&C EMS 01	8/20/2014	18	1.4	580	18	nd	160	nd	nd
C&C EMS 01 Duplicate	8/20/2014	20	1.6	590	17	nd	170	nd	nd
C&C EMS 02	8/20/2014	nd	nd	nd	nd	nd	nd	nd	nd
C&C EMS 03	8/20/2014	21	1.6	550	10	nd	170	nd	nd
Reporting Limits		5.0	1.0	5.0	5.0	20	50	20	0.5

"nd" Indicates not detected at listed detection limits

QA/QC Data - Total Metals EPA-6020

Sample Number: C&C EMS 01

	Matrix Spike			Matrix Spike Duplicate			RPD (%)
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	
Lead	90.5	80.5	89.0	93.9	91.1	97.0	8.68
Cadmium	90.5	79.6	88.0	93.9	81.3	86.6	1.57
Chromium	90.5	136	150M	93.9	141	150M	0.08
Arsenic	90.5	84.7	93.6	93.9	84.4	90	4.04
Silver	90.5	76.8	84.9	93.9	77.3	82.3	3.04
Barium	90.5	92.5	102	93.9	110	117	13.6
Selenium	90.5	73.8	81.5	93.9	74.2	79.0	3.15
Mercury	9.05	7.12	78.7M	9.39	7.77	82.7	5.05

Laboratory Control Sample

	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Lead	100	94.7	94.7
Cadmium	100	99.2	99.2
Chromium	100	112	112
Arsenic	100	98.0	98.0
Silver	100	99.0	99.0
Barium	100	99.5	99.5
Selenium	100	95.5	95.5
Mercury	10.0	9.11	91.1

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 80%-120%

ACCEPTABLE RPD IS 35%

M - Matrix Spike recovery failed due to matrix interference



Analytical Resources, Incorporated
Analytical Chemists and Consultants

22 August 2014

Karen Carvallo
ESN Pacific
2020 B Kahai St.
Honolulu, HI 96819

RE: Client Project: **EMET-1406245**, D1408130316
ARI Job No.: YW86

Dear Karen:

Please find enclosed the original chain of custody documentation and the final results for the samples from the project referenced above.

Three soil samples were received on August 18, 2014. The samples were analyzed for herbicides as requested.

There were no problems associated with these analyses.

A copy of these reports will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.


Mark D. Harris
Project Manager
markh@arilabs.com
206/695-6210

cc: file YW86

Enclosures

MDH/mdh



ESNP^ CIFIC SC X^ IN-OF-CUSTOMY RECORD

Yuse

CLIENT: Es~ Pacific
 ADDRESS: 980 B Kahala St Honolulu, HI 96819
 PHONE: 808 70067
 FAX: 8088470917
 EMAIL: es@esnpacific.com
 CLIENT PROJECT #: _____
 Project Manager: K. Carver

TAT: _____ DAY: _____
 DATE: 5/4/14 PAGE 1 OF 1
 ESN PROJECT # D1408130316
 COUNTY/PROJECT NAME: EMET - 140845, CC ESN Facility
 COLLECTOR: _____ DATE COLLECTED: 5/8

Sample ID#	Depth	Time	Sample Type	Container Type	Comments	# of Containers
1C&C EMS 01	2"	12:00	MIS	tu be	X	1
2C&C EMS 02	2"	12:00	MIS	tu be	X	1
3C&C EMS 03	2"	12:00	MIS	tu be	X	1
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

RECEIVED BY (Signature) DATE/TIME: _____
 RECEIVED BY (Signature) DATE/TIME: _____
 RECEIVED BY (Signature) DATE/TIME: _____

LAB RATION NOTES:
 TOTAL # OF CONTAINERS: 3
 NO. SEALS N
 SERIALS ACTVA
 RECEIVED TEMP:



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Cooler Receipt Form

ARI Client: ESN

Project Name: EMET - J 400034 CAMP

COC No(s): _____ (NA)

Delivered by Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: YW86

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.)? YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 1.9
Time: 14:30

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 9287952

Cooler Accepted by: TS Date: 8-18-14 Time: 16:30 14:31

Complete custody forms and attach all shipping documents

Log-in Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: NA YES NO

Was Sample Split by ARI: NA YES NO Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: AV Date: ftJMj/4 Time: 1510

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

			Small → "sm" (<2 nun)
			Peabubbles → "pb" (2to < 4 mm)
			Large → "lg" (4 to < 6 mm)
			Headspace → "hs" (> 6 mm)

0016F
3/2/10

Cooler Receipt Form

Revision 014

YW86: 00003



Sample ID Cross Reference Report



ARI Job No: YW8 6
Client: ESN Pacific
Project Event: D1408130316
Project Name: EMET-1406245,C&C EMS Facility

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. C&C EMS 01	YW86A	14-16967	Soil	08/13/14 12:00	08/18/14 14:30
2. CSC EMS 02	YW86B	14-16968	Soil	08/13/14 12:00	08/18/14 14:30
3. CSC EMS 03	YW86C	14-16969	Soil	08/13/14 12:00	08/18/14 14:30

Printed 08/18/14 Page 1 of 1

YW86 : 00004



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Data Reporting Qualifiers

Effective 12/31/13

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but $>$ the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of **ARI's** Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.



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- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference
- X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**
- Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**



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Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting



ORGANICS ANALYSIS DATA SHEET
 Herbicides by **SW8151A GC/ECD**
 Extraction Method: **SW3550C**
 Page 1 of 1

Sample ID: **MB-082014**
 METHOD BLANK

Lab Sample ID: **MB-082014**
 LIMS ID: **14-16967**
 Matrix: **Soil**
 Data Release Authorized: *mw*
 Reported: **08/22/14**

QC Report No: **YW86-ESN Pacific**
 Project: **EMET-1406245, C&C EMS Facility**
 D1408130316
 Date Sampled: **NA**
 Date Received: **NA**

Date Extracted: **08/20/14**
 Date Analyzed: **08/21/14 16:41**
 Instrument/Analyst: **ECD1/YZ**
 Percent Moisture: **NA**

Sample Amount: **15.0 g-dry-wt**
 Final Extract Volume: **50 mL**
 Dilution Factor: **1.00**

CAS Number	Analyte	RL	Result
93-72-1	2,4,5-TP (Silvex)	8.3	< 8.3 U
93-76-5	2,4,5-T	8.3	< 8.3 U
1918-00-9	Dicamba	17	< 17 U
94-75-7	2,4-D	33	< 33 U
94-82-6	2,4-DB	170	< 170 U
75-99-0	Dalapon	33	< 33 U
94-74-6	MCPA	8,300	< 8,300 U
120-36-5	Dichloroprop	33	< 33 U

Reported in $\mu\text{g}/\text{kg}$ (ppb)

Herbicide Surrogate Recovery

2,4-Dichlorophenylacetic Acid 110%

FORM I

YW86:00008



ORGANICS ANALYSIS DATA SHEET
 Herbicides by SW8151A GC/ECD
 Extraction Method: SW3550C
 Page 1 of 1

Sample ID: C&C EMS 01
 SAMPLE

Lab Sample ID: YW86A
 LIMS ID: 14-16967
 Matrix: Soil
 Data Release Authorized: *mw*
 Reported: 08/22/14

QC Report No: YW86-ESN Pacific
 Project: EMET-1406245, C&C EMS Facility
 D1408130316
 Date Sampled: 08/13/14
 Date Received: 08/18/14

Date Extracted: 08/20/14
 Date Analyzed: 08/21/14 17:54
 Instrument/Analyst: ECD1/YZ
 Percent Moisture: 13.4%

Sample Amount: 13.0 g-dry-wt
 Final Extract Volume: 50 mL
 Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
93-72-1	2,4,5-TP (Silvex)	9.6	< 9.6 U
93-76-5	2,4,5-T	9.6	< 9.6 U
1918-00-9	Dicamba	20	< 20 U
94-75-7	2,4-D	38	< 38 U
94-82-6	2,4-DB	200	< 200 U
75-99-0	Dalapon	82	< 82 Y
94-74-6	MCPA	9,600	< 9,600 U
120-36-5	Dichloroprop	38	< 38 U

Reported in µg/kg (ppb)

Herbicide Surrogate Recovery

2,4-Dichlorophenylacetic Acid 103%

FORM I

YW86 : 00009



ORGANICS ANALYSIS DATA SHEET
 Herbicides by SW8151A GC/ECD
 Extraction Method: SW3550C
 Page 1 of 1

Sample ID: C&C EMS 02
 SAMPLE

Lab Sample ID: YW86B
 LIMS ID: 14-16968
 Matrix: Soil
 Data Release Authorized: *mmw*
 Reported: 08/22/14

QC Report No: YW86-ESN Pacific
 Project: EMET-1406245, C&C EMS Facility
 D1408130316
 Date Sampled: 08/13/14
 Date Received: 08/18/14

Date Extracted: 08/20/14
 Date Analyzed: 08/21/14 18:30
 Instrument/Analyst: ECD1/YZ
 Percent Moisture: 12.9%

Sample Amount: 13.1 g-dry-wt
 Final Extract Volume: 50 mL
 Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
93-72-1	2,4,5-TP (Silvex)	9.5	< 9.5 U
93-76-5	2,4,5-T	9.5	< 9.5 U
1918-00-9	Dicamba	19	< 19 U
94-75-7	2,4-D	38	< 38 U
94-82-6	2,4-DB	190	< 190 U
75-99-0	Dalapon	92	< 92 Y
94-74-6	MCPA	9,500	< 9,500 U
120-36-5	Dichloroprop	38	< 38 U

Reported in $\mu\text{g}/\text{kg}$ (ppb)

Herbicide Surrogate Recovery

2,4-Dichlorophenylacetic Acid 97.0%

FORM I

YW86: 00017

feSMET



ORGANICS ANALYSIS DATA SHEET
Herbicides by SW8151A GC/ECD
Extraction Method: SW3550C
Page 1 of 1

Sample ID: C&C EMS 03
SAMPLE

Lab Sample ID: YW86C
LIMS ID: 14-16969
Matrix: Soil
Data Release Authorized: *THW*
Reported: 08/22/14

QC Report No: YW86-ESN Pacific
Project: EMET-1406245, C&C EMS Facility
D1408130316
Date Sampled: 08/13/14
Date Received: 08/18/14

Date Extracted: 08/20/14
Date Analyzed: 08/21/14 19:05
Instrument/Analyst: ECD1/YZ
Percent Moisture: 13.3%

Sample Amount: 13.1 g-dry-wt
Final Extract Volume: 50 mL
Dilution Factor: 1.0 0

CAS Number	Analyte	RL	Result
93-72-1	2,4,5-TP (Silvex)	9.5	< 9.5 U
93-76-5	2,4,5-T	9.5	< 9.5 U
1918-00-9	Dicamba	19	< 19 U
94-75-7	2,4-D	38	< 38 U
94-82-6	2,4-DB	190	< 190 U
75-99-0	Dalapon	67	< 67 Y
94-74-6	MCPA	9,500	< 9,500 U
120-36-5	Dichloroprop	38	< 38 U

Reported in $\mu\text{g}/\text{kg}$ (ppb)

Herbicide Surrogate Recovery

2,4-Dichlorophenylacetic Acid 79.8%

FORM I

YW86:01011



SW8151A/HERBICIDE SOIL SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: YW86-ESN Pacific
Project: EMET-1406245,C&C EMS Facility
D1408130316

<u>Client ID</u>	<u>DCPA</u>	<u>TOT OUT</u>
MB-082014	110%	0
LCS-082014	106%	0
C&C EMS 01	103%	0
C&C EMS 02	97.0%	0
C&C EMS 03	79.8%	0

QC LIMITS

(DCPA) = 2,4-Dichlorophenylacetic Acid

(62-141)

Log Number Range: 14-16967 to 14-16969

FORM-II SW8151A

Page 1 for YW86

YW86: 00012



ORGANICS ANALYSIS DATA SHEET
 Herbicides by SW8151A GC/ECD
 Page 1 of 1

Sample ID: LCS-082014
 LAB CONTROL

Lab Sample ID: LCS-082014
 LIMS ID: 14-16967
 Matrix: Soil
 Data Release Authorized: *gww*
 Reported: 08/22/14

QC Report No: YW86-ESN Pacific
 Project: EMET-1406245,C&C EMS Facility
 D1408130316
 Date Sampled: 08/13/14
 Date Received: 08/18/14

Date Extracted: 08/20/14
 Date Analyzed: 08/21/14 17:16
 Instrument/Analyst: ECD1/YZ

Sample Amount: 15.0 g-dry-wt
 Final Extract Volume: 50 mL
 Dilution Factor: 1.00

Analyte	Lab Control	Spike Added	Recovery
2,4,5-TP (Silvex)	352	333	106%
2,4,5-T	85.7	83.3	103%
Dicamba	162	167	97.0%
2,4-D	315	333	94.6%
2,4-DB	2150	1670	129%
Dalapon	230	333	69.1%
Dichloroprop	258	333	77.5%

Herbicide Surrogate Recovery

2,4-Dichlorophenylacetic 106%

Results reported in µg/kg (ppb)

FORM III

YW86: 00013



End of Report

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