

2020 / E206-2085
1934662



2020 OCT 23 PM 12:48

DEPT OF PLANNING
& PERMITTING
CITY & COUNTY OF HONOLULU

October 22, 2020

Kathy Sokugawa, Director
c/o Mr. Raymond Young
City & County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813
Submitted via email: ksokugawa@honolulu.gov; rcsyoung@honolulu.gov

Subject: AES West O'ahu Solar, LLC State Special Use Permit No. 2020/SUP-6, TMK 9-2-002:007 (por.)

Dear Ms. Sokugawa:

As the authorized agent for AES West O'ahu Solar, LLC, we are transmitting information related to the State Special Use Permit (SUP) application for the West O'ahu Solar Plus Storage Project (Project) and respectfully request that this documentation be incorporated into the Project record. Specifically the information presented herein is related to (1) a slight reduction of the Project area, (2) the status of the historic preservation review process, and (3) an update regarding the easement(s) to secure land rights for the Project. Each of these topics is further discussed below.

Reduction of Project Area

Based on information shared by the Department of Planning and Permitting (DPP) and upon further investigation of the underlying data, it was determined that there was a translation error in the spatial data depicting the Land Study Bureau (LSB) soil classification that was used to develop the Project design and layout, resulting in a minor overlap of the Project area with land classified as LSB Class A soils. This issue has been resolved and minor adjustments have been made to the Project boundary to ensure that no LSB Class A soils occur within the Project area.

Based on the adjustments to the boundary, the overall Project area is approximately 96.353 acres, which is a slight reduction from the 96.846-acre Project area described in the SUP application. The adjusted Project area falls entirely within the limits of the original Project area described in the Final Environmental Assessment (EA) and SUP application. Table 5 in the SUP application provides the approximate acreage of each LSB soil class within the permanent footprint of the Project facilities, as well as the approximate acreage of each LSB soil class within the overall Project area. An updated version of this table per the adjusted Project area is provided below. As referenced in the table, the Project would not involve construction of any facilities on LSB Class A soils.

Project Acreage by LSB Soil Classification

Area	LSB Soil Class (acres)					Total Area (acres)
	A	B	C	D	E	
Permanent Footprint of Project Facilities ^{1,2}	0.0	2.01	0.0	0.17	0.004	2.2
Overall Project Area	0.0	45.9	0.0	36.7	13.8	96.4
Percentage of Project Area Occupied by Project Footprint	0.0%	4.4%	0.0%	0.5%	0.03%	2.3%
¹ Additional detail regarding calculation of the permanent project footprint is provided as part of Table 2 in the SUP application. ² The area occupied by the Project components are calculated based on a 60 percent level of design. The dimensions used for these calculations will be refined through the final design process; in particular, refinements are anticipated based on Hawaiian Electric's technical review and the equipment procurement process. Any refinements are expected to be relatively minor, such that the resulting calculations would not substantively differ from those reported above.						

The site plan for the Project (provided as Attachment H in the SUP application) has been updated to reflect the corrected LSB classification data and the adjusted Project area boundary. In particular, Drawing C1 depicts the adjusted Project area boundary, including metes and bounds. Drawing C2 also presents this information along with the corrected LSB soil layer. The site plan (based on a 60-percent level of design) is shown in Drawings C2 and C3. The Project figures (provided as Attachment A in the SUP) have also been updated to reflect the adjusted Project area boundary. An additional figure (Figure 18), which shows the proximity of surrounding land uses relative to the adjusted Project area, has been included in the set of figures. Revised versions of Attachments A and H are enclosed as part of this submittal.

In light of the reduction in the Project area, each of the due diligence and supporting technical studies referenced in the SUP application was reviewed to determine whether this revision would have any bearing on the study results. Signed statements documenting that the reduction in the Project area would not materially affect the findings and conclusions of the studies are also enclosed.

Historic Preservation Review

As discussed in Section 2.7 of the SUP application, an archaeological inventory survey (AIS) was conducted by Cultural Surveys Hawai'i to identify, document and assess the significance of historic properties within the Project area. In accordance with Hawai'i Revised Statutes (HRS) § 6E and Hawai'i Administrative Rules (HAR) § 13-284, the AIS Report was submitted to the State of Hawai'i Historic Preservation Division (SHPD) on February 5, 2020. At the time the SUP application was submitted to DPP on August 31, 2020, SHPD had not yet provided a response regarding their review of the AIS Report and the effect determination for the Project. Subsequently, on September 15, 2020, SHPD contacted DPP to request a copy of the SUP application. It is understood that DPP provided SHPD with a link to the SUP application; in addition, Cultural Surveys Hawai'i also transmitted a link to the SUP application and receipt was acknowledged by SHPD. In addition, a meeting was held with SHPD staff September 25, 2020 to discuss the AIS Report. During this meeting, SHPD staff indicated that review comments on the AIS Report would be forthcoming. Copies of recent correspondence with SHPD regarding the historic preservation review process are contained in Attachment 3.

System Easement

As discussed in Section 1 of the SUP application, under an August 2019 option agreement with UH (as amended in May 2020), AES will enter into a Grant of System Easement under which AES will have the right to develop, construct, install, operate, maintain, repair, and replace the Project upon and/or remove the Project on a portion of the UH West O'ahu Mauka Lands property. The easements will include an exclusive easement for the Project facilities, a non-exclusive utility easement for Hawaiian Electric, and a non-exclusive access easement along existing shared-use access roads. As noted in the SUP application, it is anticipated that the area to be secured for the Project through the easement(s) required under the option agreement with UH will be a subset of the Project area, subject to a possible reduction of approximately 25-35 acres; the final area secured for Project use from UH will be based on the final design and engineering plans, subject to review and input by Hawaiian Electric. This area will be defined through the easement designation process, and submitted to the City and County of Honolulu and Land Court for approval. Any such reduction in the area secured for Project use from UH would not substantively change the size, scope, intensity, use, location or timing of the Project itself (as described in either the Final EA or the SUP application), nor would it change the area for which SUP approval is requested. The easements are currently being defined and it is anticipated that draft plans for the proposed easement designation areas may be provided as part of a supplemental filing for DPP's reference in advance of the formal decision making.

We appreciate your efforts in support of processing the SUP application for the West O'ahu Solar Plus Storage Project. If you have any questions regarding the information provided herein, please do not hesitate to contact me.

Sincerely,



Tetra Tech

Lisa Kettley

Agent for AES Distributed Energy

Enclosures:

Attachment H (Revised)

Attachment A (Revised)

Signed Statements Regarding Supporting Technical Studies

Correspondence with State Historic Preservation Division staff

Cc: Nick Molinari, AES Distributed Energy (West O'ahu Solar, LLC)

Signed Statements Regarding Supporting Technical Studies



October 14, 2020

Kathy Sokugawa, Director
c/o Mr. Raymond Young
City & County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: General Biological Resource and Pueo Surveys for the West O'ahu Solar Plus Storage Project, Special Use Permit No. 2020/SUP-6

Dear Ms. Sokugawa:

At the request of AES West Oahu Solar, LLC (AES), Tetra Tech, Inc. conducted a biological survey for the West O'ahu Solar Plus Storage Project (Project). The purpose of the survey was to characterize the existing habitat and assess the potential for state or federally listed threatened, endangered, or otherwise rare plants or animals to occur within the Project area. As discussed in the Special Use Permit (SUP) application, the biological survey was conducted on January 31, 2019 and February 5, 2019; a follow-up survey was conducted on November 14, 2019 to confirm the findings relative to an adjustment in the Project area boundary. As part of the general biological survey, a focused survey specifically intended to detect pueo or Hawaiian short-eared owl (*Asio flammeus sandwichensis*) was conducted within the Project area. To increase detectability, three additional pueo surveys were conducted in September, November, and December 2019. The results of these surveys are summarized in the SUP application, with additional detail in the Biological Resource Survey and Supplemental Pueo Survey Reports (Attachment E).

It is understood that AES recently adjusted the Project boundary resulting in an approximately 0.5-acre reduction of the Project area. This reduction of the Project area does not affect the findings and conclusions of the biological resource and pueo surveys, and the discussion of biological resources presented in the SUP application remains valid for the revised 96.353-acre Project area.

If you have any questions regarding the information provided herein, please contact me at Tiffany.Agostini@tetratech.com.

Sincerely,

A handwritten signature in black ink that reads 'T Agostini'.

Tetra Tech, Inc.
Tiffany Agostini
Senior Biologist

CULTURAL SURVEYS HAWAII

ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL DOCUMENTATION SERVICES — SINCE 1982

13 October 2020

Kathy Sokugawa, Director
c/o Mr. Raymond Young
City & County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Archaeological Inventory Survey (AIS) for the West O‘ahu Solar Plus Storage Project, Special Use Permit No. 2020/SUP-6

Dear Ms. Sokugawa:

At the request of AES West Oahu Solar, LLC (AES), Cultural Surveys Hawai‘i conducted an archaeological inventory survey (AIS) for the West O‘ahu Solar Plus Storage Project (Project). The purpose of the survey was to identify, document and assess the significance of historic properties within the Project area. As discussed in the Special Use Permit (SUP) application, the AIS included background research (with sources including archival documents, historic maps, Land Commission Awards [LCAs], and previous archaeological reports) to construct a history of land use and to determine if historic properties have been previously recorded in or near the Project area, as well as to formulate a predictive model of the types and locations of historic properties that would be expected to occur. The field component included a 100 percent pedestrian inspection of the Project area to identify any potential historic properties within the Project area. The results of the AIS are summarized in the SUP application, with additional detail in the AIS Report (Attachment F).

It is understood that AES recently adjusted the Project boundary resulting in an approximately 0.5-acre reduction of the Project area. This reduction of the Project area does not affect the findings and conclusions of the AIS, and the discussion of historic properties presented in the SUP application remains valid for the revised 96.353-acre Project area.

If you have any questions regarding the information provided herein, please contact me at 808-262-9972.

Sincerely,



David W. Shideler
Cultural Surveys Hawai‘i, Inc.
dshideler@culturalsurveys.com
Cell-(808) 753-0785



WWW.CULTURALSURVEYS.COM - INFO@CULTURALSURVEYS.COM

O‘ahu Island

P.O. Box 1114
Kailua, HI 96734
Ph: (808) 262-9972
Fax: (808) 262-4950

Maui Island

1860 Main Street
Wailuku, HI 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Hawai‘i Island

399 Hualani St.
Suite 124
Hilo, HI 96720
Ph. (866) 956-6478

Kaua‘i Island

2970 Kele St.
Suite 114
Līhu‘e, HI 96766
Ph. (808) 245-9374

CULTURAL SURVEYS HAWAII

ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL DOCUMENTATION SERVICES — SINCE 1982

13 October 2020

Kathy Sokugawa, Director
c/o Mr. Raymond Young
City & County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Cultural Impact Assessment (CIA) for the West O'ahu Solar Plus Storage Project, Special Use Permit No. 2020/SUP-6

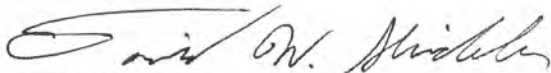
Dear Ms. Sokugawa:

At the request of AES West Oahu Solar, LLC (AES), Cultural Surveys Hawai'i conducted a cultural impact assessment (CIA) for the West O'ahu Solar Plus Storage Project (Project). The purpose of the CIA was to evaluate the potential effect of the Project on cultural beliefs, practices, and resources, including traditional cultural properties. As discussed in the Special Use Permit (SUP) application, the assessment included archival and background research, as well as community consultation to obtain input from knowledgeable individuals regarding present and past uses, cultural sites, traditional gathering practices, cultural association and any associated cultural concerns. The results of the CIA are summarized in the SUP application, with additional detail in the CIA Report (Attachment G).

It is understood that AES recently adjusted the Project boundary resulting in an approximately 0.5-acre reduction of the Project area. This reduction of the Project area does not affect the findings and conclusions of the CIA, and the discussion of cultural resources presented in the SUP application remains valid for the revised 96.353-acre Project area.

If you have any questions regarding the information provided herein, please contact me at 808-262-9972.

Sincerely,



David W. Shideler
Cultural Surveys Hawai'i, Inc.
dshideler@culturalsurveys.com
Cell (808) 753-0785



WWW.CULTURALSURVEYS.COM - INFO@CULTURALSURVEYS.COM

O'ahu Island
P.O. Box 1114
Kailua, HI 96734
Ph: (808) 262-9972
Fax: (808) 262-4950

Maui Island
1860 Main Street
Wailuku, HI 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Hawai'i Island
399 Hualani St.
Suite 124
Hilo, HI 96720
Ph. (866) 956-6478

Kaua'i Island
2970 Kele St.
Suite 114
Līhu'e, HI 96766
Ph. (808) 245-9374



October 13, 2020

Kathy Sokugawa, Director
c/o Mr. Raymond Young
City & County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Landscape Plan for the West O'ahu Solar Plus Storage Project, Special Use Permit No. 2020/SUP-6

Dear Ms. Sokugawa:

At the request of AES West Oahu Solar, LLC (AES), Mailelani Design developed a landscape plan for the West O'ahu Solar Plus Storage Project (Project). The landscape plan is summarized in the Special Use Permit (SUP) application, with further detail in Landscape Narrative (Attachment K) and Sheets L1, L2, L3 of the drawing set (Attachment H).

It is understood that AES recently adjusted the Project boundary resulting in an approximately 0.5-acre reduction of the Project area. Sheets L1, L2, L3 have been updated to reflect the revised Project area. The reduction in the Project area had no effect on the location of any of the landscape components. The landscape approach and plan presented in the SUP application remains valid for the revised 96.353-acre Project area.

If you have any questions regarding the information provided herein, please contact me at Vivian@mailelanidesign.com.

Sincerely,

Mailelani Design

Vivian Arita, PLA, ASLA, LEED® AP



October 13, 2020

Kathy Sokugawa, Director
c/o Mr. Raymond Young
City & County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Decommissioning Plan for the West O'ahu Solar Plus Storage Project, Special Use Permit No. 2020/SUP-6

Dear Ms. Sokugawa:

In March 2020, HDR developed a decommissioning plan for the West O'ahu Solar Plus Storage Project (Project). The decommissioning plan describes the general measures and procedures that should be developed and implemented to decommission and restore the site and safely dispose of or recycle Project materials. A discussion of the decommissioning plan is included in the Special Use Permit (SUP) application, with additional detail in the Decommissioning Plan (Attachment L).

It is understood that AES recently adjusted the Project boundary resulting in an approximately 0.5-acre reduction of the Project area. This reduction of the Project area does not affect the recommendations for decommissioning, and the Decommissioning Plan presented in the SUP application remains valid for the revised 96.353-acre Project area.

If you have any questions regarding the information provided herein, please contact me at David.phillips@hdrinc.com.

Sincerely,

HDR Engineering, Inc.
Dave Phillips
Power Delivery Renewables Lead

3J CONSULTING

9600 SW NIMBUS AVENUE, SUITE 100
BEAVERTON, OREGON 97008
PH: (503) 946.9365
WWW.3JCONSULTING.COM

October 14, 2020

Kathy Sokugawa, Director
c/o Mr. Raymond Young
City & County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

**Subject: Stormwater Management Plan for the West O'ahu Solar Plus Storage Project,
Special Use Permit No. 2020/SUP-6**

Dear Ms. Sokugawa,

In January 2020, 3J Consulting on behalf of HDR Engineering, Inc. developed a 60% Stormwater Management Plan for the West O'ahu Solar Plus Storage Project (Project). The memorandum discusses methodologies used in quantifying stormwater runoff for the affected areas and sizing the required stormwater management best management practices (BMPs). The design and analysis of onsite BMPs are based on the County of Honolulu's "Rules Relating to Storm Drainage Standards", "Post-Construction Water Quality Requirements" and "Storm Water BMP Guide for New and Redevelopment". The results of the analysis are described in the Special Use Permit (SUP) application, with additional detail in the 60% Stormwater Management Design Memo (Attachment N).

It is understood that AES recently adjusted the Project boundary resulting in an approximately 0.5-acre reduction of the Project area. This reduction of the Project area does not affect the findings and conclusions of the Stormwater Management Design Memo, and the discussion of Stormwater Management Design presented in the SUP application remains valid for the revised 96.353-acre Project area.

If you have any questions regarding the information provided herein, please contact me at aaron.murphy@3j-consulting.com.

Sincerely,



Aaron Murphy, PE
Sr. Project Manager
3J Consulting, Inc.

copy: File





October 14, 2020

Kathy Sokugawa, Director
c/o Mr. Raymond Young
City & County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Glare Analysis for the West O'ahu Solar Plus Storage Project, Special Use Permit No. 2020/SUP-6

Dear Ms. Sokugawa:

At the request of AES West Oahu Solar, LLC (AES), Tetra Tech conducted a glare analysis for the West O'ahu Solar Plus Storage Project (Project). As discussed in the Special Use Permit (SUP) application, the glare analysis was conducted using the Solar Glare Hazard Analysis Tool (SGHAT) software through an online tool (GlareGauge) developed by Sandia National Laboratories and hosted by ForgeSolar. The analysis included three segmented traffic routes (H-1 Freeway, Farrington Highway, and Kualaka'i Parkway), three observation points from the surrounding community (to the west, south and east), as well as the various final approach flight paths and air traffic control towers associated with Kalaeloa Airport, Daniel K. Inouye International Airport and Wheeler Army Airfield. The results of the glare analysis are summarized in the SUP application, with additional detail in the Glare Analysis Report (Attachment P).

It is understood that AES recently adjusted the Project boundary resulting in an approximately 0.5-acre reduction of the Project area. This reduction of the Project area does not affect the findings and conclusions of the glare analysis, and the discussion of potential glare impacts presented in the SUP application remains valid for the revised 96.353-acre Project area.

If you have any questions regarding the information provided herein, please contact me at Joshua.Burdett@tetrattech.com.

Sincerely,

A handwritten signature in black ink, appearing to read 'Josh Burdett', written over a light blue horizontal line.

Tetra Tech
Josh Burdett
Lead Glare Analyst



TERRANCE S. ARASHIRO, P.E.
ADRIENNE W.L.H. WONG, P.E., LEED AP
DEANNA M.R. HAYASHI, P.E.
PAUL K. ARITA, P.E.
ERIK S. KANESHIRO, L.P.L.S., LEED AP
MATT K. NAKAMOTO, P.E.
GARRETT K. TOKUOKA, P.E.

October 14, 2020

Kathy Sokugawa, Director
c/o Mr. Raymond Young
City & County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Traffic Impact Analysis Report for the West O'ahu Solar Plus Storage Project, Special Use Permit No. 2020/SUP-6

Dear Ms. Sokugawa:

In February 2020, Austin, Tsutsumi & Associates Inc. conducted a Traffic Impact Analysis Report (TIAR) for the West O'ahu Solar Plus Storage Project (Project). The purpose of the report was to document the findings of the traffic study and to evaluate impacts resulting from the proposed Project. The results of the findings are summarized in the Special Use Permit (SUP) application, with additional detail in the Traffic Impact Analysis Report (Attachment Q).

It is understood that AES recently adjusted the Project boundary resulting in an approximately 0.5-acre reduction of the Project area. This reduction of the Project area does not affect the findings and conclusions of TIAR, and the discussion of traffic impacts presented in the SUP application remains valid for the revised 96.353-acre Project area.

If you have any questions regarding the information provided herein, please contact me at eimada@atahawaii.com.

Sincerely,

Austin, Tsutsumi & Associates Inc.
Eric Imada, P.E.
Project Manager



October 14, 2020

Kathy Sokugawa, Director
c/o Mr. Raymond Young
City & County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Economic Assessment for the West O'ahu Solar Plus Storage Project, Special Use Permit No. 2020/SUP-6

Dear Ms. Sokugawa:

At the request of AES West Oahu Solar, LLC (AES), Tetra Tech conducted an economic assessment for the West O'ahu Solar Plus Storage Project (Project). As discussed in the Special Use Permit (SUP) application, the economic activity associated with the Project was modeled using IMPLAN, a commercially available economic modeling package widely used to assess the economic impacts of renewable energy and many other types of projects. Economic impacts were assessed in terms of employment, labor income, and economic output, with separate analyses presented for the construction and operation phases. The results of the economic assessment are summarized in Section 6.13 of the SUP application.

It is understood that AES recently adjusted the Project boundary resulting in an approximately 0.5-acre reduction of the Project area. This reduction of the Project area does not affect the findings and conclusions of the economic assessment, and the discussion of economic impacts presented in the SUP application remains valid for the revised 96.353-acre Project area.

If you have any questions regarding the information provided herein, please contact me at Matt.Dadswell@tetrattech.com.

Sincerely,

A handwritten signature in blue ink that reads 'Matt Dadswell'.

Tetra Tech
Matt Dadswell
Senior Economic Analyst

Correspondence with
State Historic Preservation Division Staff

David Shideler

From: David Shideler
Sent: Wednesday, September 16, 2020 2:42 PM
To: 'Susan.A.Lebo@hawaii.gov'
Subject: RE: AES West O'ahu Solar Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu, TMK: [1] 9-2-002:007 Responding to SHPD Question by supplying the SUP application

Aloha Susan:

In the context of our draft *Archaeological Inventory Survey Report for the AES West O'ahu Solar Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu, TMK: [1] 9-2-002:007 (por.)* (assigned SHPD review LOG # 2020.00290 on Feb 6, 2020), we understand from DPP that SHPD has inquired about a copy of the SUP application, so are following up with a link to the document (below) which we very much hope suffices as a "Trigger" for review of the AIS.

[SUP Application](#)

I remain unclear on when "supplemental information pertaining to a prior submittal should be submitted to DLNR.Intake.SHPD. There have been recent cases where that elicited another Log No. that seemingly proved problematic.

Sooo.... Please advise if I should submit this SUP Application.

Mahalo for all you do.

Aloha.

David Shideler
Cultural Surveys Hawai'i
PO Box 1114
Kailua, HI 96734
PH: (808) 262-9972
Cell: (808) 753-0785
Fax: (808) 262-4950
dshideler@culturalsurveys.com

David Shideler

From: Lebo, Susan A <susan.a.lebo@hawaii.gov>
Sent: Wednesday, September 16, 2020 3:55 PM
To: David Shideler
Subject: Re: AES West O'ahu Solar Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu, TMK: [1] 9-2-002:007 Responding to SHPD Question by supplying the SUP application

got it to open!

David Shideler

From: David Shideler
Sent: Monday, October 5, 2020 3:32 PM
To: 'Susan.A.Lebo@hawaii.gov'
Cc: alan.s.downer@hawaii.gov
Subject: Mahalo for the Friday September 25, 2020 teleconference regarding the AES West O'ahu Solar Project AIS and notification DPP is issuing their acceptance determination for the SUP application

Aloha Dr. Susan Lebo and Dr. Alan Downer:

Thank you for the zoom meeting discussion on Friday September 25, 2020 regarding the AES West O'ahu Solar Project, Honouliuli Ahupua'a, Ewa District, O'ahu, TMK: [1] 9-2-002:007 (por.) and the associated archaeological inventory survey (AIS) presently under SHPD review.

We appreciate your input to the discussion and look forward to receiving any comments you may have on the Draft AIS.

We understand that the City and County Department of Planning and Permitting (DPP) is issuing their acceptance determination for the application, thus starting the clock on the statutory timelines for the State Special Use Permit (SUP) process. If there is anything that we can do to further support your review, please do not hesitate to ask.

Aloha.

David Shideler
Cultural Surveys Hawai'i
PO Box 1114
Kailua, HI 96734
PH: (808) 262-9972
Cell: (808) 753-0785
Fax: (808) 262-4950
dshideler@culturalsurvevs.com

Revised Site Plan and Drawings (Attachment H)

WEST OAHU SOLAR PLUS STORAGE 12.5 MW AC COMBINED PV AND 50 MWh BESS

KAPOLEI, WEST OAHU, HAWAII

PREPARED FOR
CITY AND COUNTY OF HONOLULU DEPARTMENT OF PLANNING AND PERMITTING



Distributed Energy

AES Distributed Energy
282 Century Pl. Suite 2000
Louisville, CO 80027 USA



SYSTEM DESCRIPTION



VICINITY MAP

NOT TO SCALE



SITE MAP

1" = 500'



SHEET INDEX

C0	COVER SHEET
C1	TMK PLAN
C2	LSB SOIL UNDERLAY
C3	OVERALL SITE PLAN
C4	SITE PLAN SCHEMATICS
C9.1	CIVIL DETAIL 1
C9.2	CIVIL DETAIL 2
L1	LANDSCAPE PLAN AND SCHEMATIC IRRIGATION PLAN
L2	LANDSCAPE PLAN AND SCHEMATIC IRRIGATION PLAN
L3	LANDSCAPE DETAIL, SECTION, PLANT LIST, NOTES

SCOPE OF WORK

THIS PACKAGE PROVIDES DRAWINGS FOR THE INSTALLATION OF 17.42 MW DC, 12.5 MW AC AT POI COMBINED PHOTOVOLTAIC AND BATTERY ENERGY STORAGE SYSTEM NEAR KAPOLEI, WEST OAHU, HAWAII.

PROJECT DEVELOPER

AES WEST OAHU SOLAR
282 CENTURY PL, SUITE 2000
LOUISVILLE, CO 80027

NICK MOLINARI
BUSINESS DEVELOPMENT
(303) 524-4368

CAMERON HAUGHEY
PROJECT MANAGER
(720) 450-4360

CIVIL ENGINEER

AARON MURPHY
3J CONSULTING
9600 SW NIMBUS AVE
BEAVERTON, OR 97008

HI LICENSE - 18696-C
EXP. DATE - 04/30/22

STRUCTURAL ENGINEER

THOMAS HAMLIN
HDR, INC.
3200 EAST CAMELBACK ROAD
PHOENIX, AZ 85018
(602) 522-7737

HI LICENSE - 16088 - S
EXP. DATE - 04/30/20

ELECTRICAL ENGINEER

JAMES TRAN
HDR, INC.
1670 BROADWAY, SUITE 3400
DENVER, CO 80202
(303) 323-9796

HI LICENSE - 18163 - E
EXP. DATE - 04/30/2022

REVISIONS

REV	BY	DATE	DESCRIPTION

PE STAMP



AES WEST OAHU SOLAR
OAHU, HI

PROJECT NUMBER

19537

PHASE

LAND USE

MILESTONE

60% DESIGN

ELECTRICAL DESIGNER

STRUCTURAL DESIGNER

DATE

10-07-2020

SCALE

N/A

TITLE

COVER SHEET

DRAWING

C0

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
A. Murphy
SIGNATURE DATE: 10/22/2020 10:01 PM
LIC. EXP. DATE: 4/30/2022



Distributed Energy

AES Distributed Energy
282 Century Pl. Suite 2000
Louisville, CO 80027 USA



SYSTEM DESCRIPTION

REV	BY	DATE	DESCRIPTION



AES WEST OAHU SOLAR
OAHU, HI

PROJECT NUMBER
19537
PHASE
LAND USE
MILESTONE
60% DESIGN

ELECTRICAL DESIGNER
STRUCTURAL DESIGNER

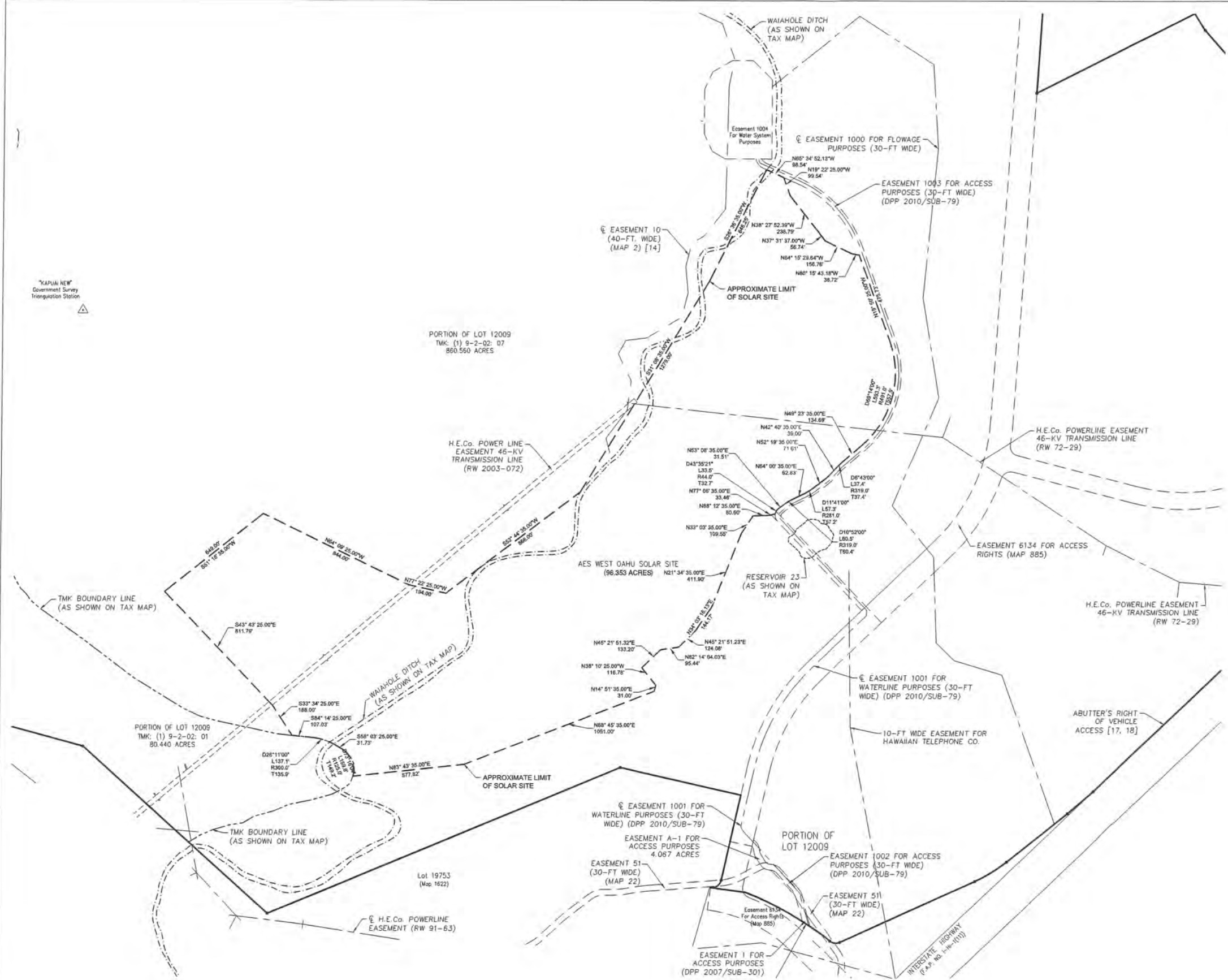
DATE 10-07-2020 SCALE 1" = 250'

TITLE
TMK PLAN

DRAWING
C1

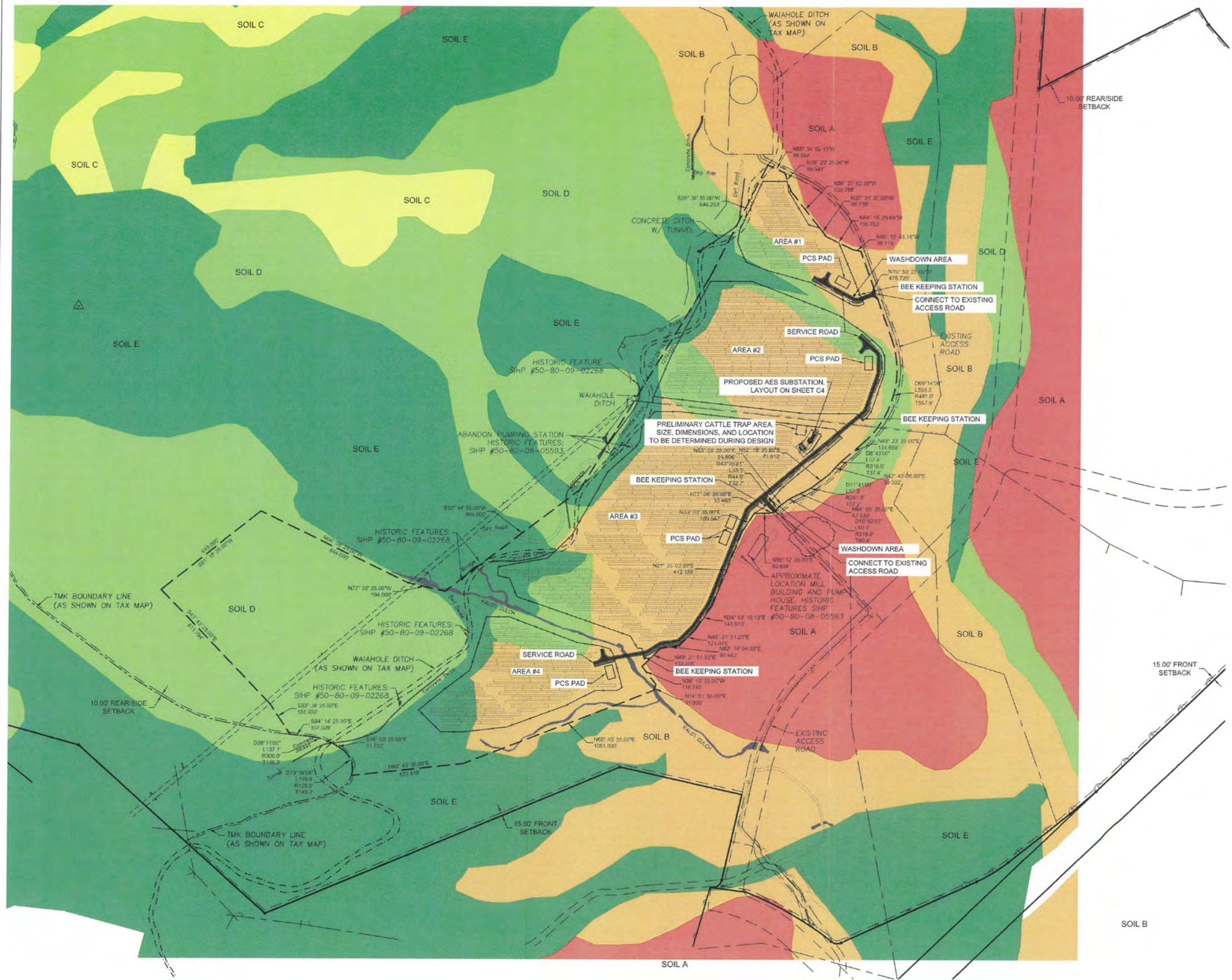
LEGEND

	BOUNDARY FOR LOT 12009
	TMK BOUNDARY
	WAIAHOLE DITCH (PER TAX MAP)
	RESERVOIR (PER TAX MAP)
	EXISTING ROW LINE
	EXISTING EASEMENT LINE
	EXISTING EASEMENT CENTER LINE
	APPROXIMATE LIMIT OF SOLAR SITE



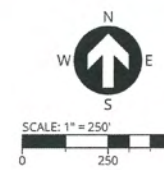
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

[Signature]
SIGNATURE
4/30/2022
LIC. EXP. DATE



LAND STUDY BUREAU (LSB) SOIL CLASSES

- LSB CLASS A
- LSB CLASS B
- LSB CLASS C
- LSB CLASS D
- LSB CLASS E



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

A. Murphy 4/30/2022
 SIGNATURE LIC. EXP. DATE
OCT 22 2020 7:01 PM

AES
 Distributed Energy
 AES Distributed Energy
 282 Century Pl. Suite 2000
 Louisville, CO 80027 USA

HR
 CONSULTING
 CIVIL ENGINEERING
 WATER EDUCATION
 PLANNING PLANNING

SYSTEM DESCRIPTION

REV	BY	DATE	DESCRIPTION



AES WEST OAHU SOLAR
 OAHU, HI

PROJECT NUMBER
 19537
PHASE
 LAND USE
MILESTONE
 60% DESIGN

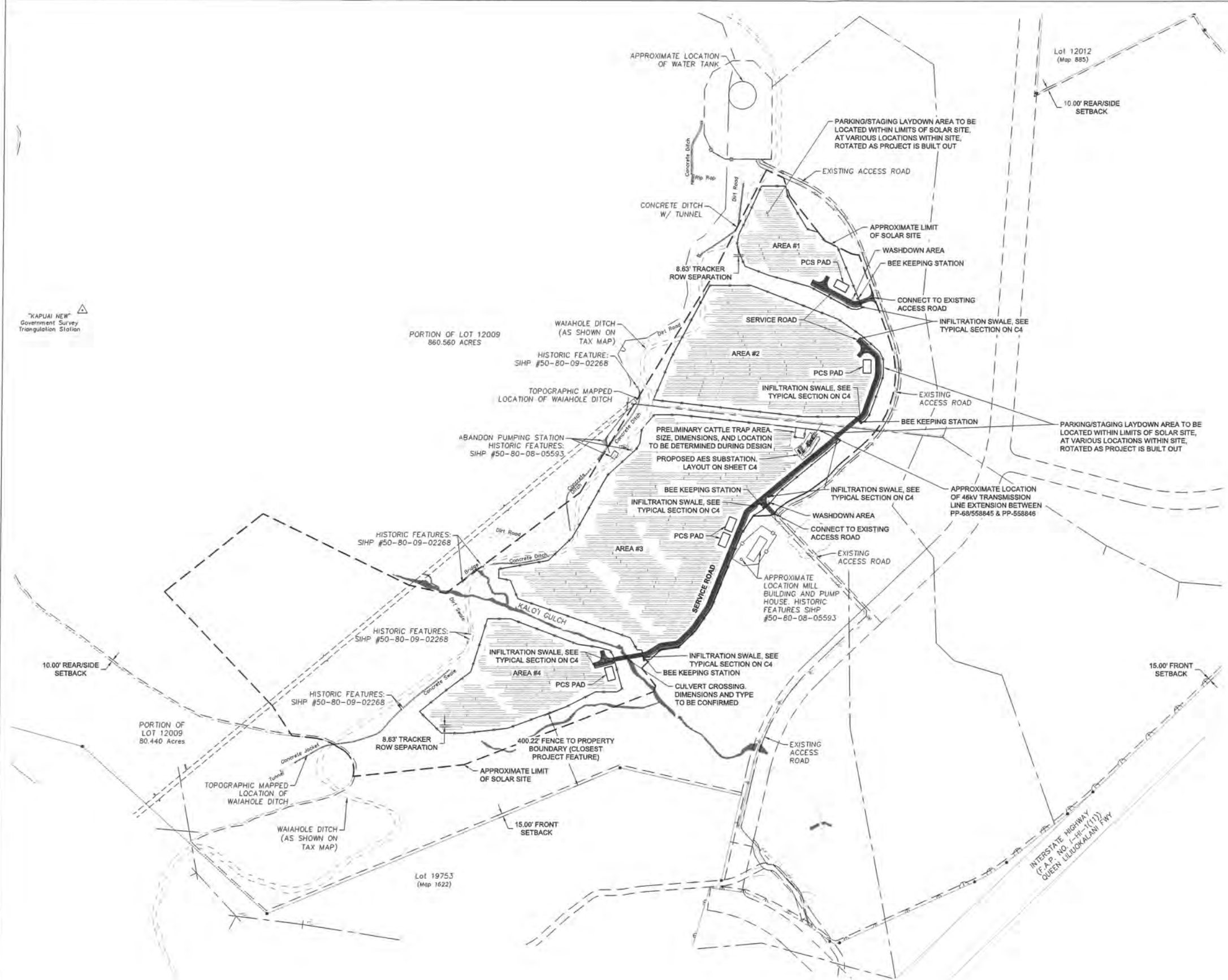
ELECTRICAL DESIGNER
STRUCTURAL DESIGNER

DATE 10-07-2020 **SCALE** 1" = 250'

TITLE
 LSB SOIL UNDERLAY

DRAWING
C2

"KAPUIA NEW"
Government Survey
Triangulation Station



LEGEND

- BOUNDARY FOR LOT 12009
- TMK BOUNDARY
- WAIAHOLE DITCH (PER TAX MAP)
- RESERVOIR (PER TAX MAP)
- EXISTING ROW LINE
- EXISTING EASEMENT CENTER LINE
- EXISTING EASEMENT LINE
- EXISTING ASPHALT
- EXISTING DIRT ROAD
- EXISTING CONCRETE DITCH
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING TRANSMISSION LINE POLE
- PROPOSED ACCESS ROAD, SEE TYPICAL SECTION ON SHEET C4
- PROPOSED PROPERTY BOUNDARY SETBACK
- PROPOSED 7' TALL STEEL FABRIC MESH SECURITY FENCE, SEE DETAIL ON SHEET C9.1
- PROPOSED PCS (POWER CONVERSION STATION) FOUNDATION AND EQUIPMENT PAD, SEE SCHEMATIC ON C4
- PROPOSED WASHDOWN AREA
- APPROXIMATE LIMIT OF SOLAR SITE

AES
Distributed Energy
AES Distributed Energy
282 Century Pl. Suite 2000
Louisville, CO 80027 USA



SYSTEM DESCRIPTION

REV	DATE	DESCRIPTION



AES WEST OAHU SOLAR
OAHU, HI

PROJECT NUMBER
19537
PHASE
LAND USE
MILESTONE
60% DESIGN

ELECTRICAL DESIGNER

STRUCTURAL DESIGNER

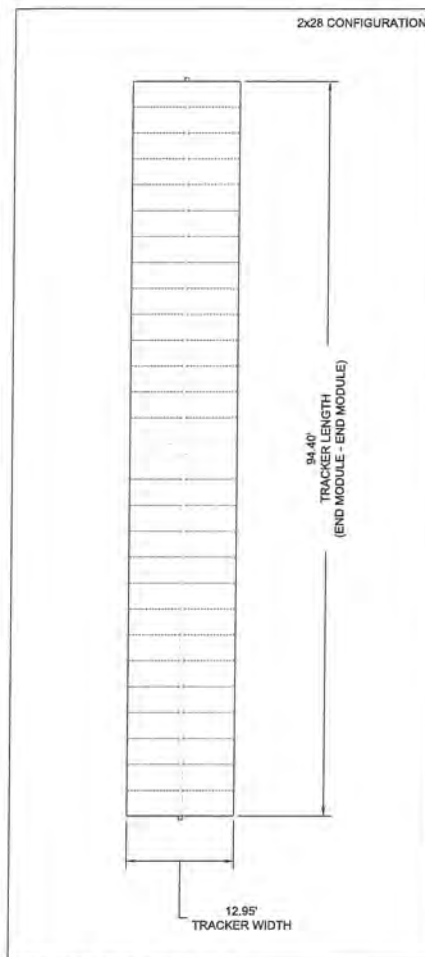
DATE 10-07-2020 SCALE 1" = 250'

TITLE
OVERALL SITE PLAN

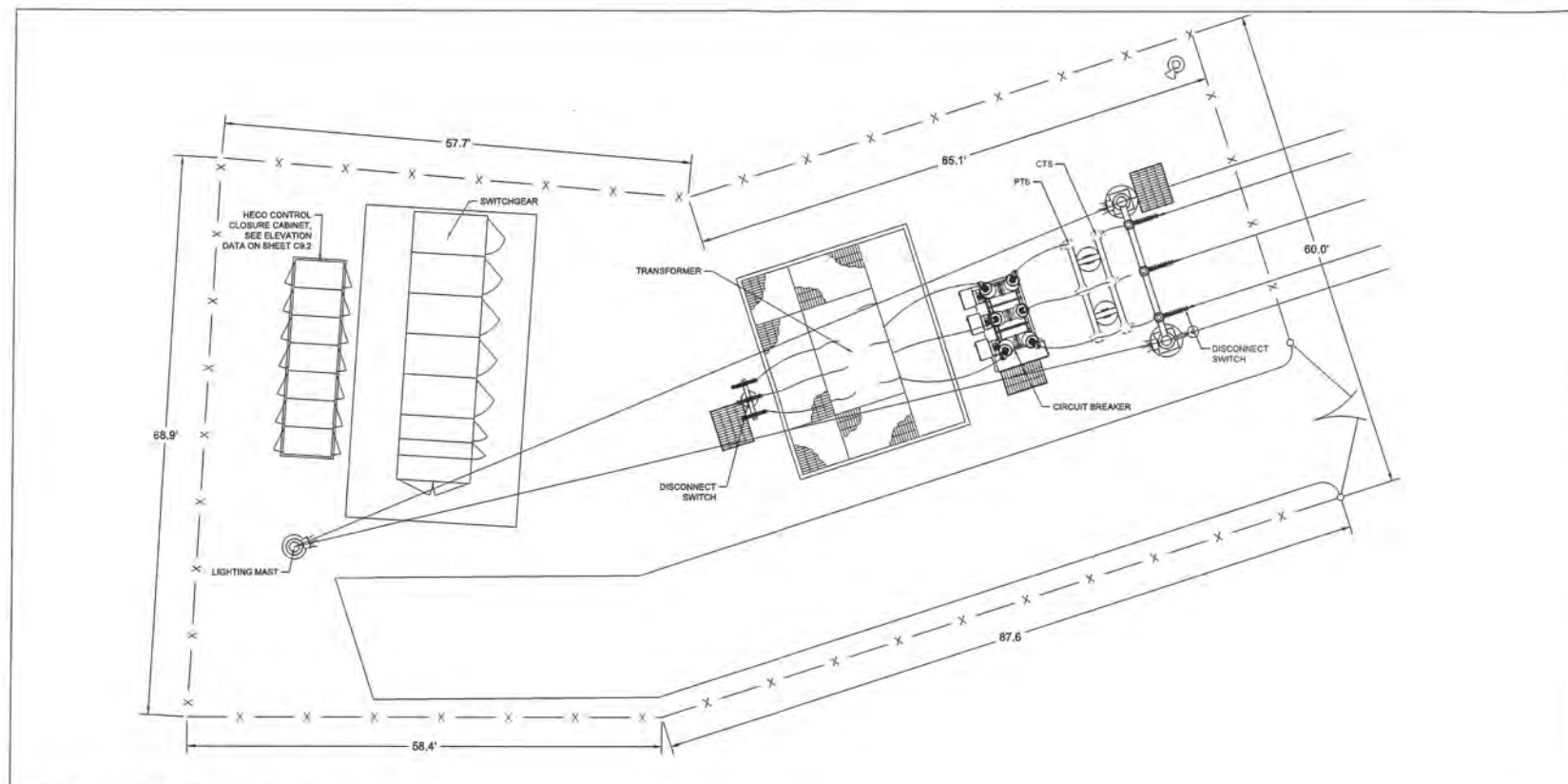
DRAWING
C3



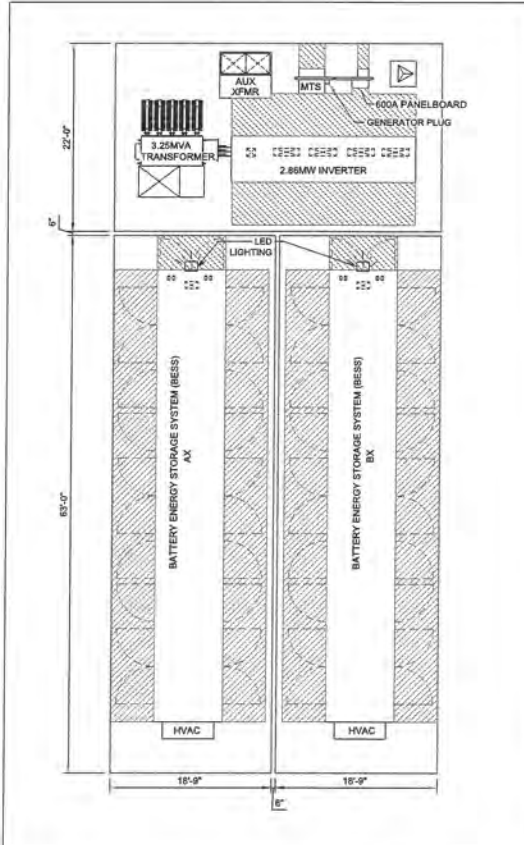
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
4/30/2022
LIC. EXP. DATE



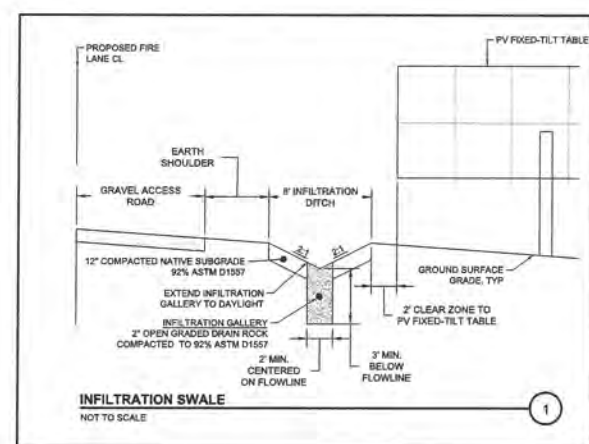
PV FIXED-TILT TABLE - SEE ELEVATION DATA ON SHEET C9.2



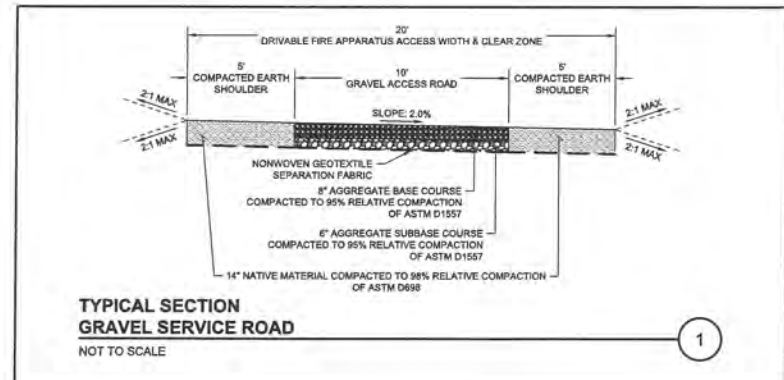
PRELIMINARY AES SUBSTATION LAYOUT - SEE ELEVATION DATA ON SHEET C9.2



POWER CONVERSION STATION (PCS) PAD LAYOUT - SEE ELEVATION DATA ON SHEET C9.2



INFILTRATION SWALE NOT TO SCALE



TYPICAL SECTION GRAVEL SERVICE ROAD NOT TO SCALE



Distributed Energy

AES Distributed Energy
282 Century Pl. Suite 2000
Louisville, CO 80027 USA



SYSTEM DESCRIPTION

REV	BY	DATE	DESCRIPTION



AES WEST OAHU SOLAR
OAHU, HI

PROJECT NUMBER
19537
PHASE
LAND USE
MILESTONE
60% DESIGN

ELECTRICAL DESIGNER
STRUCTURAL DESIGNER

DATE 10-07-2020 SCALE N/A

TITLE
SITE PLAN SCHEMATICS

DRAWING

C4

SCALE: 1" = 250'
0 250 500 FT
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
SIGNATURE: [Signature] 4/30/2022
LIC. EXP. DATE

REV	BY	DATE	DESCRIPTION



AES WEST OAHU SOLAR
OAHU, HI

PROJECT NUMBER
19537
PHASE
LAND USE
MILESTONE
60% DESIGN

ELECTRICAL DESIGNER

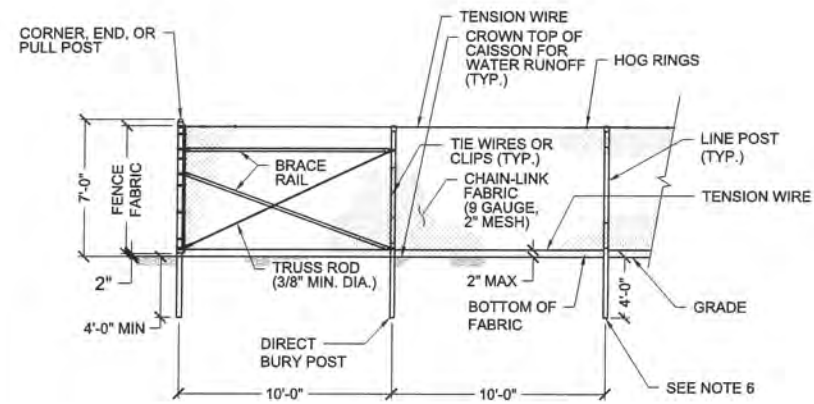
STRUCTURAL DESIGNER

DATE
10-07-2020
SCALE
N/A

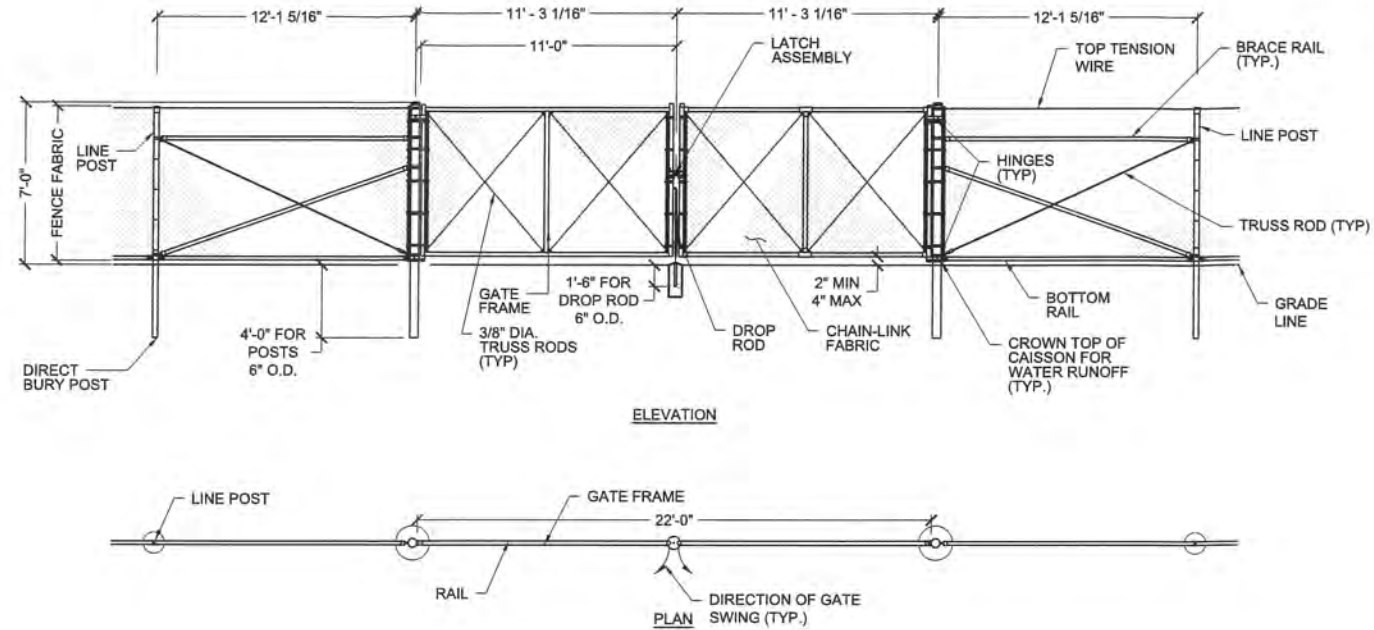
TITLE
CIVIL DETAIL 1

DRAWING

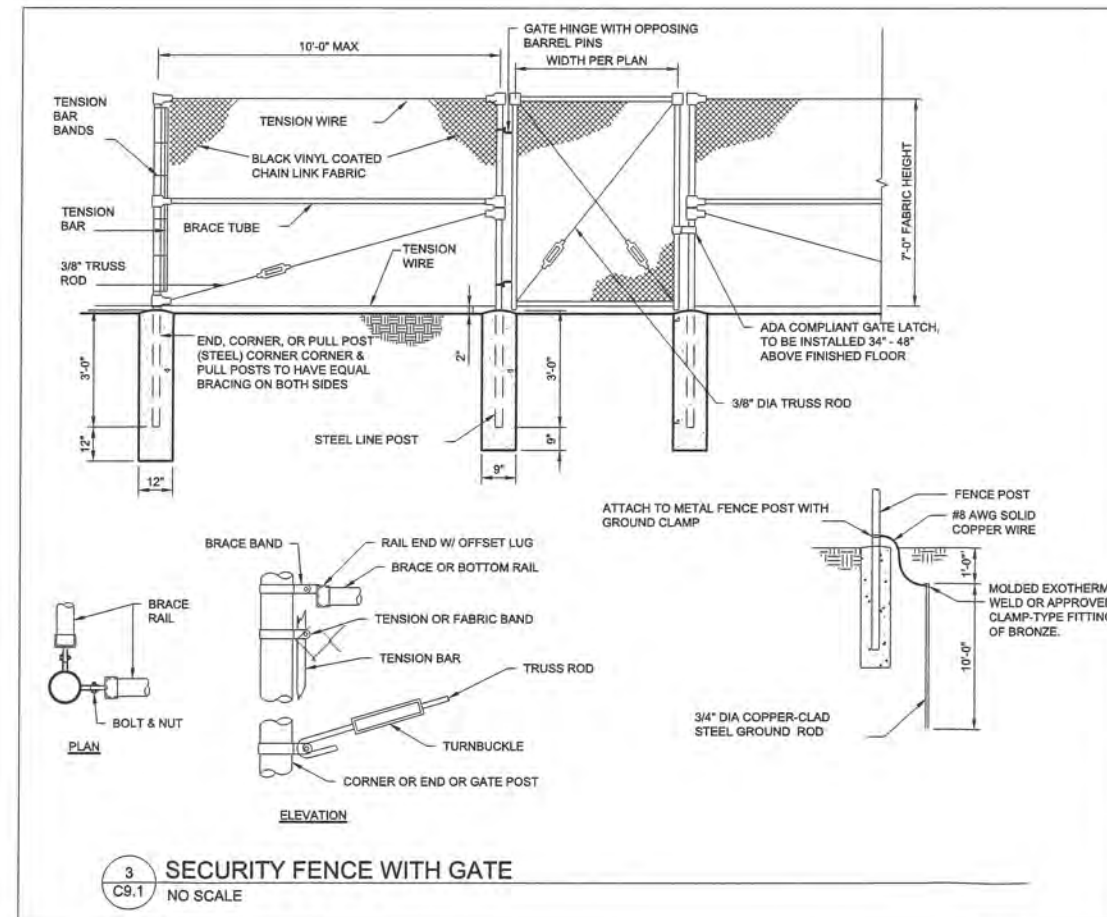
C9.1



1 PERIMETER FENCE ELEVATION
C8.1



2 TYPICAL ACCESS GATE
C8.1



3 SECURITY FENCE WITH GATE
C9.1 NO SCALE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Signature: *[Handwritten Signature]*
DATE: 4/30/2022
LIC. EXP. DATE: 4/30/2022

REV	BY	DATE	DESCRIPTION

PE STAMP



AES WEST OAHU SOLAR
OAHU, HI

PROJECT NUMBER
19537
PHASE
LAND USE
MILESTONE
60% DESIGN

ELECTRICAL DESIGNER

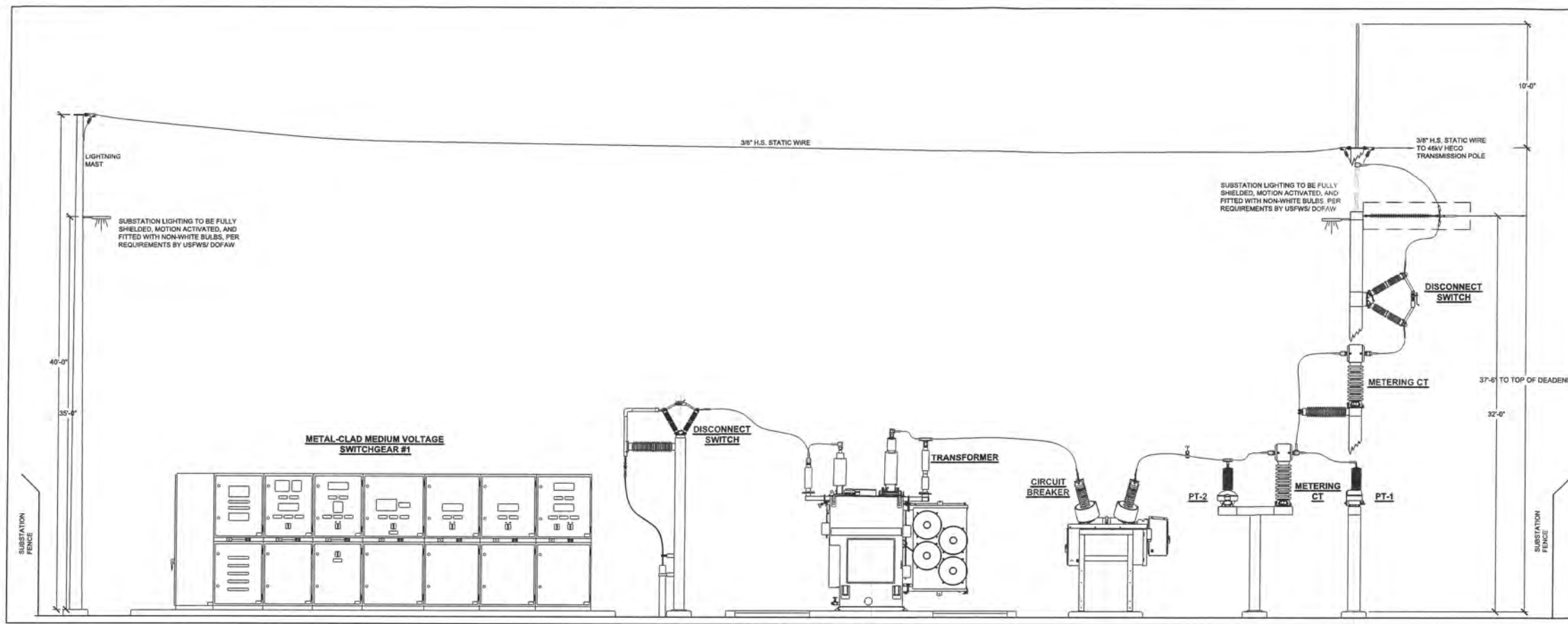
STRUCTURAL DESIGNER

DATE 10-07-2020 SCALE N/A

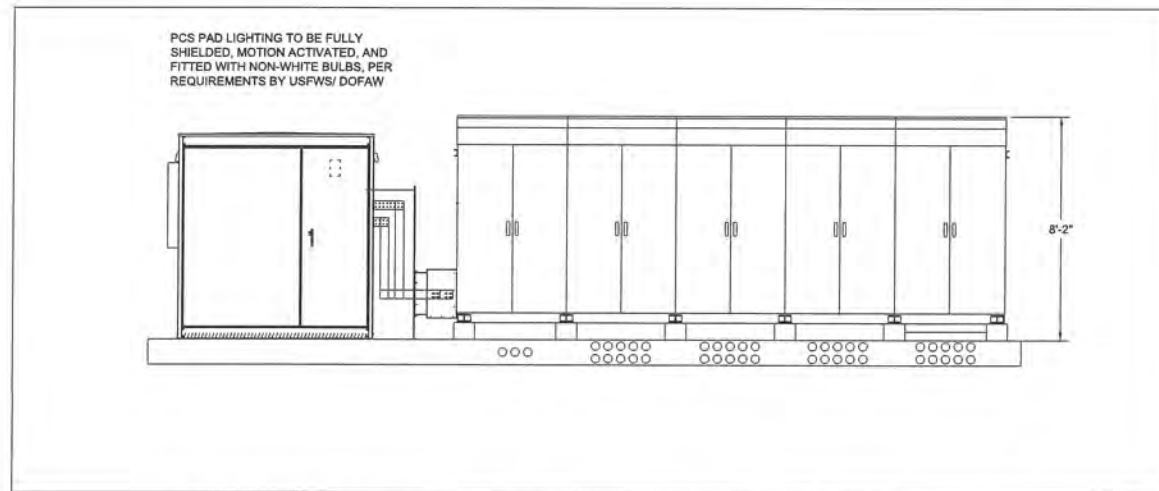
TITLE
CIVIL DETAIL 2

DRAWING

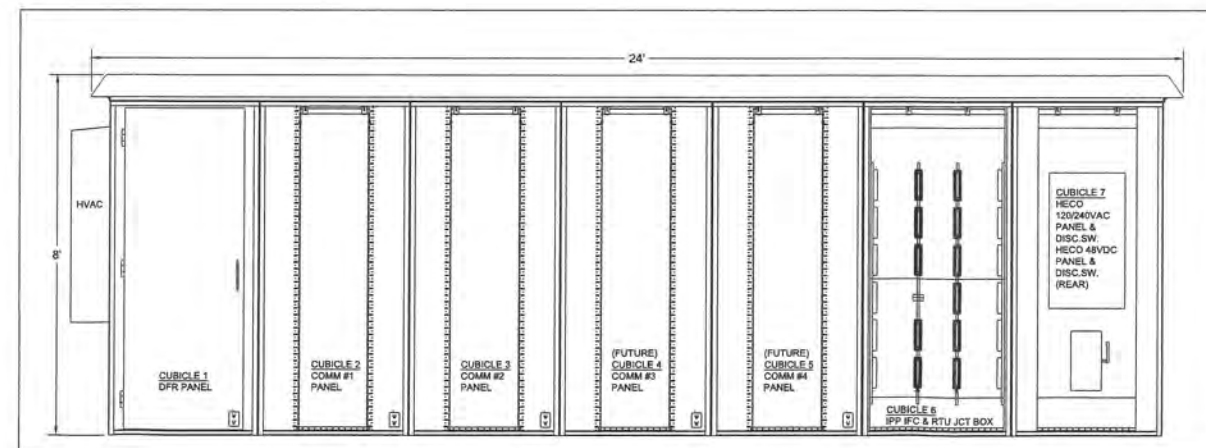
C9.2



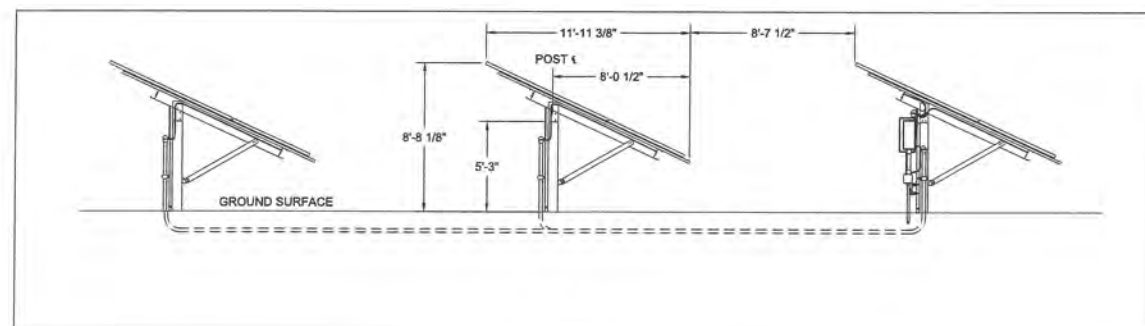
1 PRELIMINARY SUBSTATION ELEVATION
N.T.S.



2 POWER CONVERSION STATION (PCS) PAD INVERTER AND TRANSFORMER FRONT ELEVATION
N.T.S.

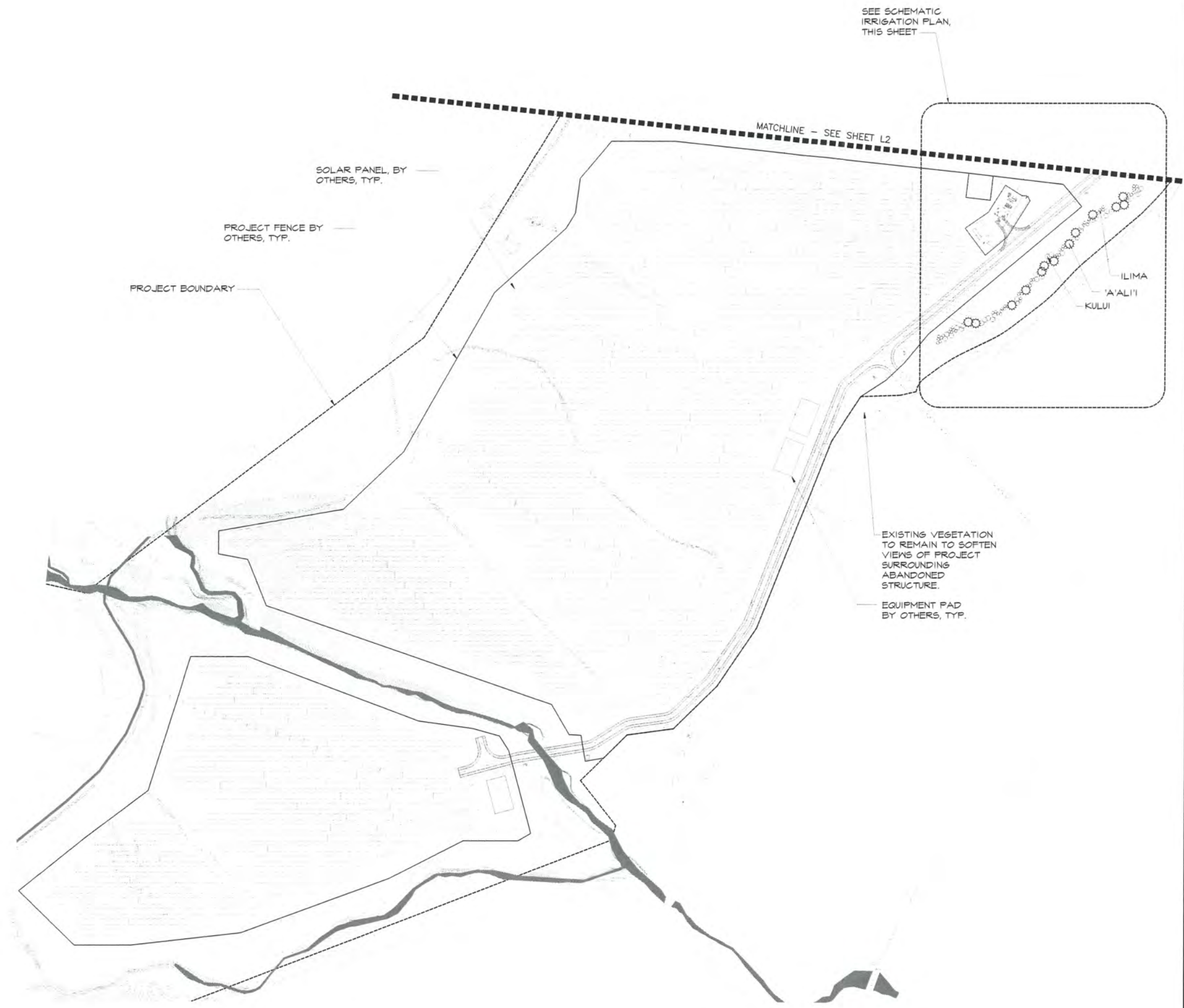


3 HECO CONTROL CLOSURE CABINET ELEVATION
N.T.S.



4 PV FIXED-TILT TABLE ELEVATION
N.T.S.

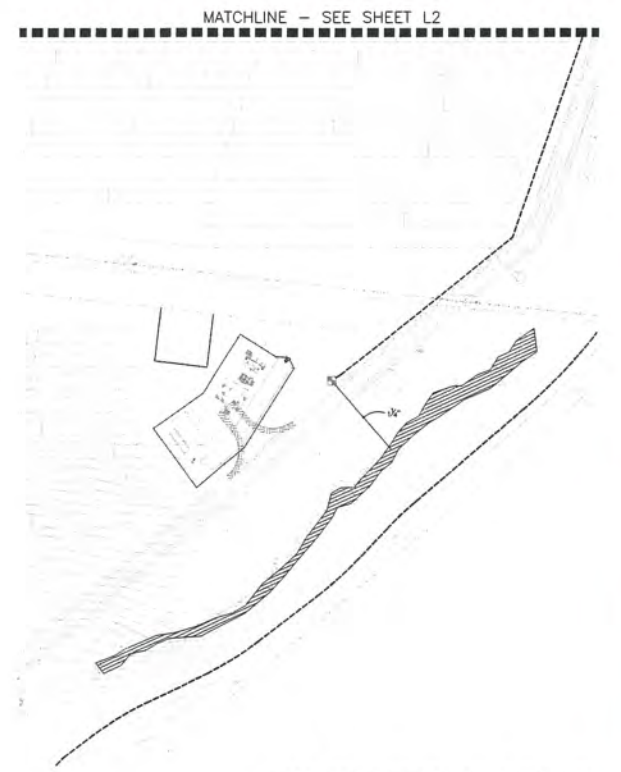
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
A. Murphy
SIGNATURE DATE: 4/30/2022
LIC. EXP. DATE



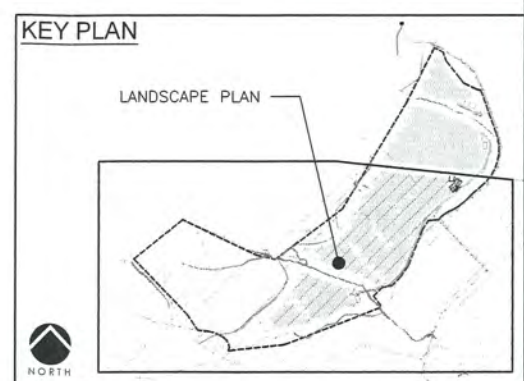
LANDSCAPE PLAN
 NORTH SCALE: 1" = 100'-0"



NOTE: SEE PLANT LEGEND ON SHEET L3 FOR PLANT NAMES, SIZES, QUANTITIES AND OTHER INFORMATION.



SCHEMATIC IRRIGATION PLAN
 NORTH SCALE: 1" = 80'-0"
 80' 0 80'



REVISION	DATE	BY
REVISION 1		
REVISION 2		
REVISION 3		
REVISION 4		
REVISION 5		
REVISION 6		



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION.
 Signature: *Vivian L. Arias* 3/30/22
 EXPIRATION DATE

AES WEST O'AHU SOLAR PLUS STORAGE PROJECT
 TMK: 9-2-002:007, Hono'uli'uli, 'Ewa, O'ahu, Hawaii

LANDSCAPE PLAN AND SCHEMATIC IRRIGATION PLAN

DATE:	JUNE 2019
SCALE:	AS NOTED
DRAWN BY:	VA
MD JOB NO.:	2007

L1
 1 of 3 SHEETS

REVISION	DATE	BY
REVISION 1		
REVISION 2		
REVISION 3		
REVISION 4		
REVISION 5		
REVISION 6		



MAILELANI DESIGN
1241 ALA ANOANO ST
HONOLULU, HI 96819



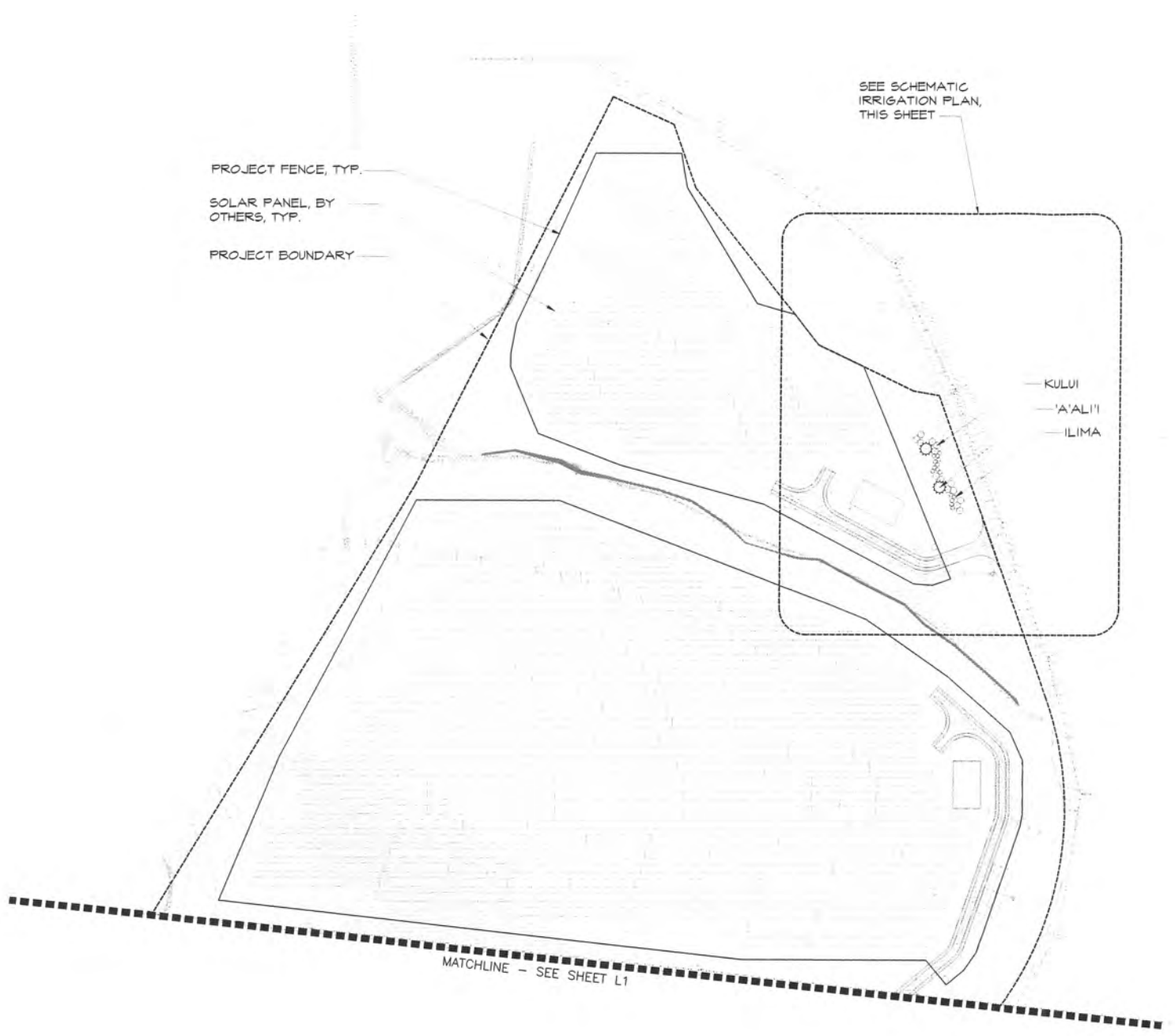
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.
Signature: *William L. Ariia* 3/30/22
EXPIRATION DATE

AES WEST O'AHU SOLAR PLUS STORAGE PROJECT
TMK: 9-2-002:007, Hono'uli'uli, 'Ewa, O'ahu, Hawaii'

LANDSCAPE PLAN AND SCHEMATIC IRRIGATION PLAN

DATE:	JUNE 2019
SCALE:	AS NOTED
DRAWN BY:	VA
MD JOB NO.:	2007

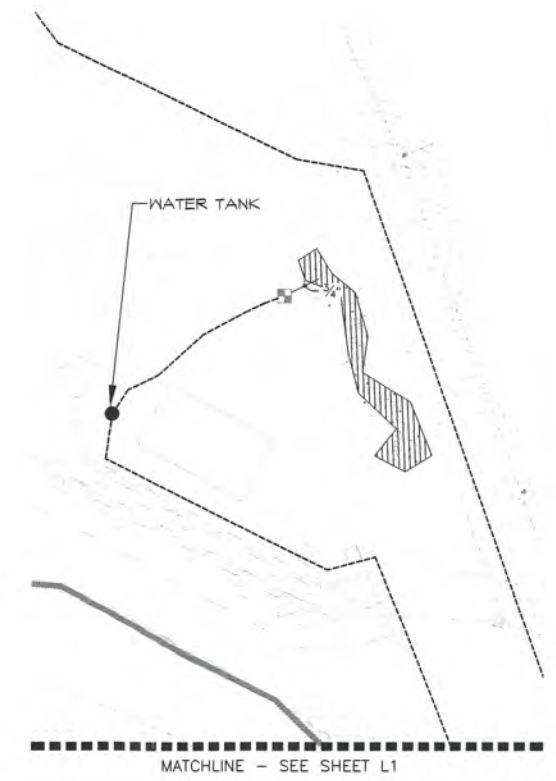
L2
2 of 3 SHEETS



LANDSCAPE PLAN
NORTH SCALE: 1" = 100'-0"

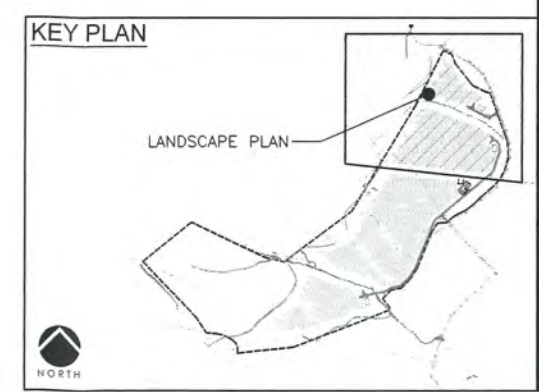


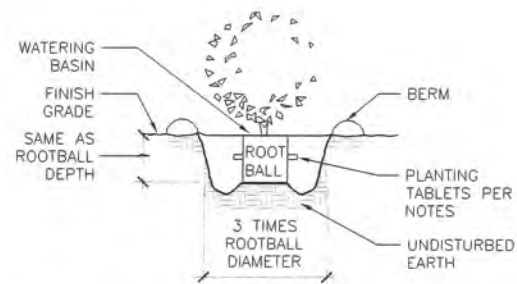
NOTE: SEE PLANT LEGEND ON SHEET L3 FOR PLANT NAMES, SIZES, QUANTITIES AND OTHER INFORMATION.



NOTE: SEE IRRIGATION EQUIPMENT LIST ON SHEET L3 FOR MORE INFORMATION.

SCHEMATIC IRRIGATION PLAN
NORTH SCALE: 1" = 50'-0"





1 SHRUB PLANTING DETAIL
NOT TO SCALE

PLANTING NOTES:

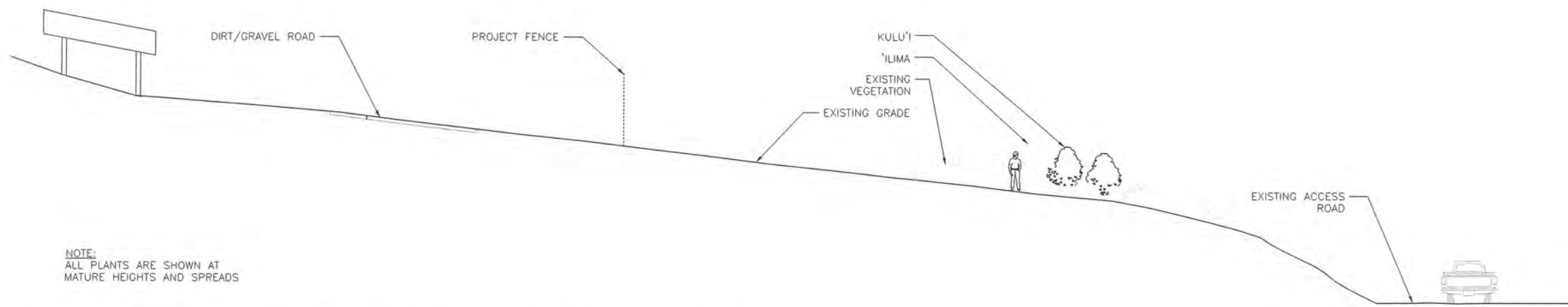
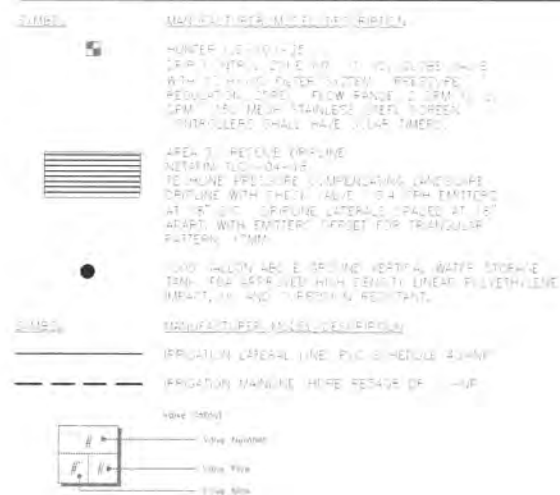
1. THE LANDSCAPE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITY LOCATIONS WITHIN THE PROJECT SITE PRIOR TO BEGINNING LANDSCAPE CONSTRUCTION ACTIVITIES.
2. PRIOR TO THE INSTALLATION OF ALL NEW SHRUBS, THE CONTRACTOR SHALL CLEAR AND GRUB EXISTING VEGETATION WITHIN A 10' DIAMETER FOR EACH NEW PLANTING.
3. ANY DAMAGE DONE TO UTILITIES BY THE LANDSCAPE CONTRACTOR DURING LANDSCAPE INSTALLATION ACTIVITIES SHALL BE REPAIRED/RESTORED TO ORIGINAL CONDITION AT NO EXPENSE TO THE OWNER.
4. REFER TO "LANDSCAPE SPECIFICATIONS" SECTION 02480 PRIOR TO THE START OF WORK. CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ALL MATERIALS, SCHEDULING, PRODUCTS, WARRANTIES AND METHODS FOR EXECUTION OF WORK WHICH MAY NOT BE INDICATED WITHIN THE DRAWINGS.
5. BACKFILL MIX SHALL CONSIST OF THREE (3) PARTS AMENDED IMPORTED PLANTING SOIL TO ONE (1) PART ORGANIC SOIL CONDITIONER (SEE SPECIFICATIONS). ADD ONE (1) POUND OF 10-30-10 FERTILIZER TO ONE (1) CUBIC YARD OF BACKFILL MIX. MIX THOROUGHLY ON PROJECT SITE PRIOR TO ANY PLANTING OPERATIONS.
6. PLANTING TABLETS FOR SHRUBS SHALL BE AS FOLLOWS:
 - A) 5 GALLON 3 TABLETS
 - B) 3 GALLON 2 TABLETS

USE SLOW RELEASE FERTILIZER TABLETS 20-10-5, 21 GRAM SIZE.
7. QUANTITIES SHOWN ON PLANT SCHEDULE ARE FOR REFERENCE ONLY. VERIFY ACTUAL QUANTITIES AS SHOWN ON PLAN TO PROVIDE FULL AND EVEN COVERAGE OF PLANTING AREAS.

PLANT SCHEDULE

SYMBOL	QTY	COMMON NAME	SCIENTIFIC NAME	SIZE	HEIGHT	SPREAD	SPACING
(Symbol)	48	YUCCA	YUCCA FILIFERA	12" H	12" H	12" W	12" X 12"
(Symbol)	15	YUCCA	YUCCA FILIFERA	12" H	12" H	12" W	12" X 12"
(Symbol)	15	YUCCA	YUCCA FILIFERA	12" H	12" H	12" W	12" X 12"

IRRIGATION SCHEDULE



NOTE:
ALL PLANTS ARE SHOWN AT MATURE HEIGHTS AND SPREADS

2 SECTION THROUGH EAST SLOPE, SHRUBS AND EXISTING ACCESS ROAD
NOT TO SCALE

REVISION	DATE	BY
REVISION 1		
REVISION 2		
REVISION 3		
REVISION 4		
REVISION 5		
REVISION 6		



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION.
SIGNATURE: [Signature] EXPIRATION DATE: 03/30/22

AES WEST O'AHU SOLAR PLUS STORAGE PROJECT
TMK: 9-2-002:007, Hono'uili'uli, Ewa, O'ahu, Hawaii
LANDSCAPE DETAIL, SECTION, PLANT LIST, NOTES AND IRRIGATION EQUIPMENT LIST

DATE:	JUNE 2019
SCALE:	AS NOTED
DRAWN BY:	VA
MD JOB NO.:	2007

L3

Revised Project Figures (Attachment A)

Figure 1
West Oahu Solar Plus Storage Project

AES Distributed Energy

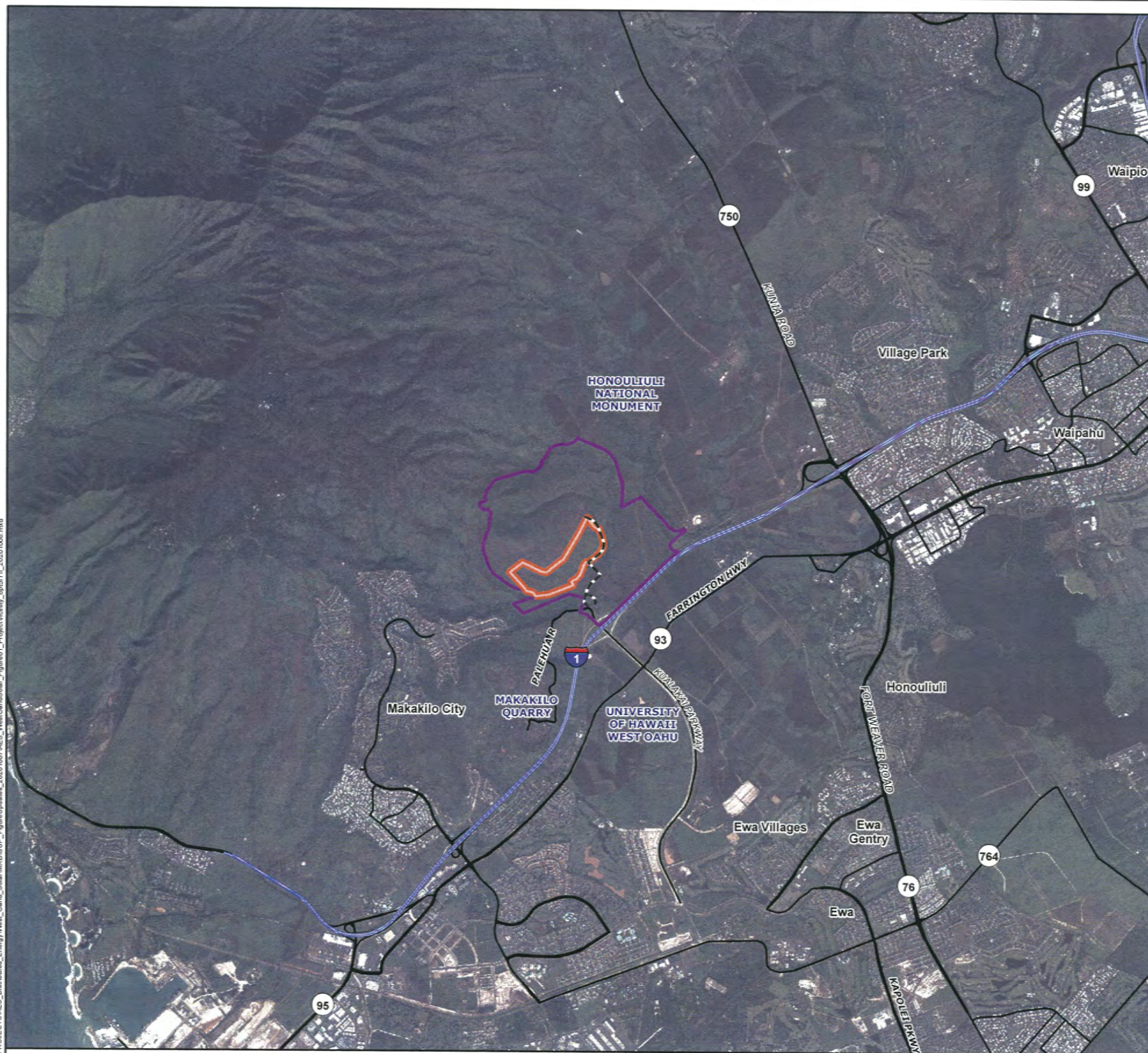
Project Vicinity

HONOLULU COUNTY, HI

-  Project Area
-  Property Boundary
-  Existing Access Road
-  Interstate Highway
-  Roadway



Reference Map



PNG: PROJECT\AES_Distributed_Energy\West_Oahu_Solar\MXD\SLIP_Figure\Updates_20201007\AES_WestOahuSolar_Figure01_ProjectVicinity_8pd111_20201008.mxd

1:65,000 WGS 1984 UTM Zone 4N

0 0.5 1 2 3 Miles

NOT FOR CONSTRUCTION

Figure 2
West Oahu Solar Plus Storage Project
AES Distributed Energy
Project Area

HONOLULU COUNTY, HI

-  Project Area
-  Property Boundary
-  Existing Access Road
-  Interstate Highway
-  Roadway



Reference Map



P:\GIS_PROJECTS\AES_Distributed_Energy\West_Oahu_Solar\MXD\SUP_FigureUpdates_20201007\AES_WestOahuSolar_Figure02_ProjectArea_Split11_20201008.mxd

Figure 3
West Oahu Solar Plus Storage Project
AES Distributed Energy
Tax Map

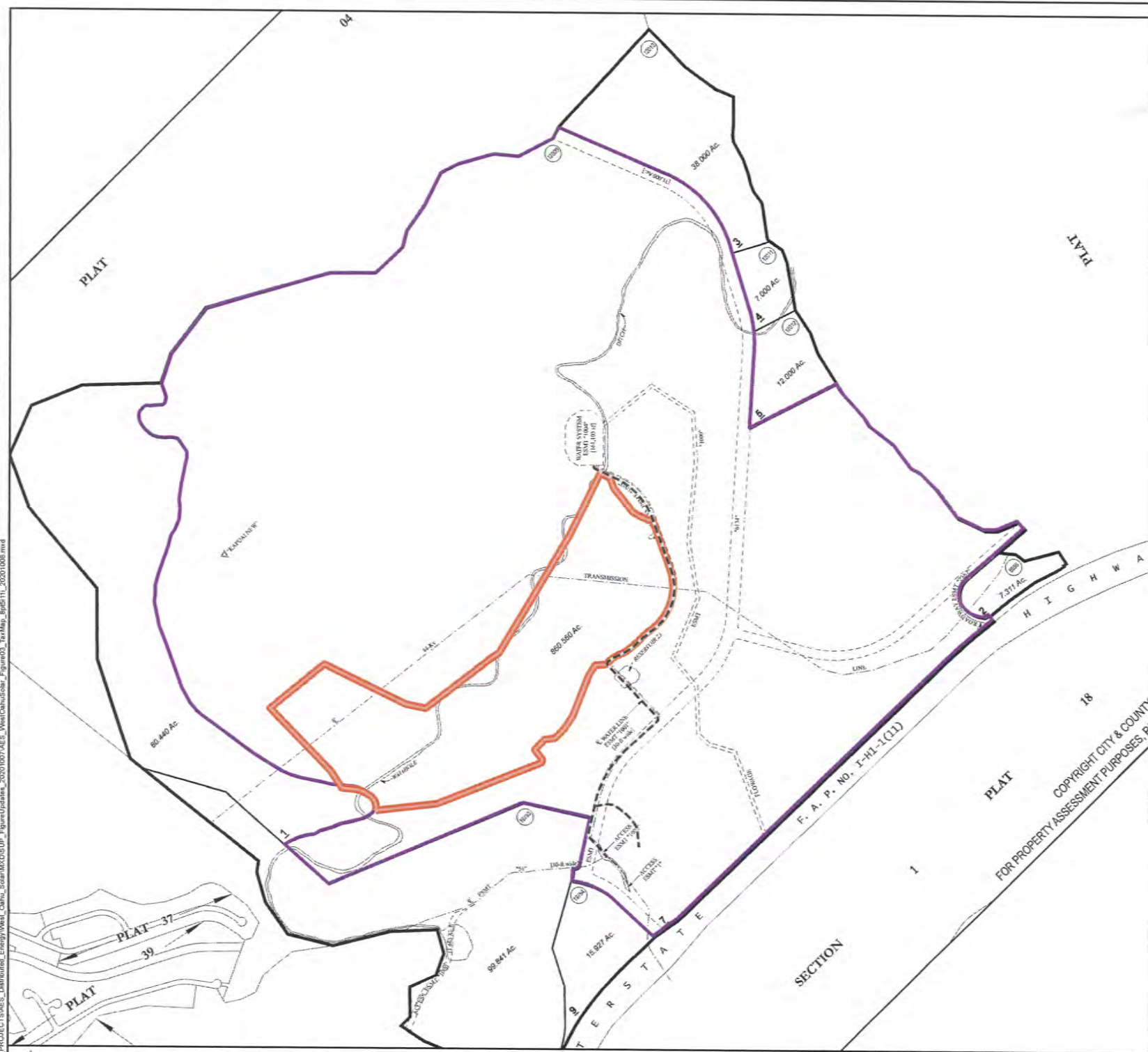
HONOLULU COUNTY, HI

-  Project Area
-  Property Boundary
-  Existing Access Road

Source:
 City and County of Honolulu
 All Rights Reserved 2016
 Zone 9, Section 2, Plat 002



Reference Map



P:\GIS_PROJECTS\AES_Distributed_Energy\West_Oahu_Solar\AX\03\UP_Figure3_TaxMap_Split11_20201008.mxd

COPYRIGHT CITY & COUNTY
 FOR PROPERTY ASSESSMENT PURPOSES, P

Figure 4

West Oahu Solar Plus Storage Project

AES Distributed Energy

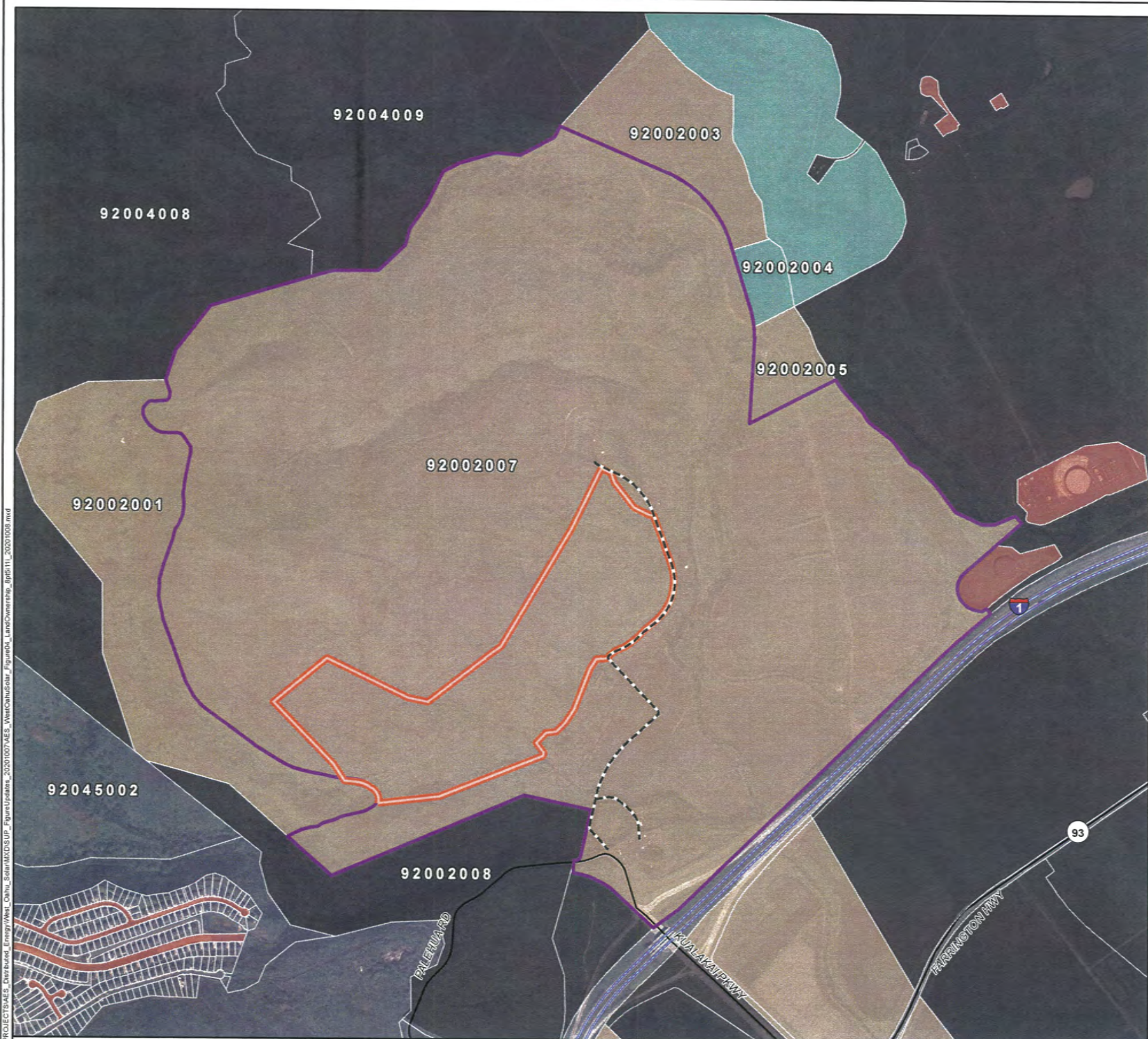
Land Ownership

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road
- TMK Boundary
- Interstate Highway
- Roadway
- Land Ownership**
- County
- Federal
- State
- Private (Large Land Owner)
- Private (Other)



Reference Map



P:\GIS\PROJECTS\AES_Distributed_Energy\West_Oahu_Solar\Map\GIS\Figure4\AES_WestOahuSolar_Figure4_LandOwnership_081111_20201008.mxd

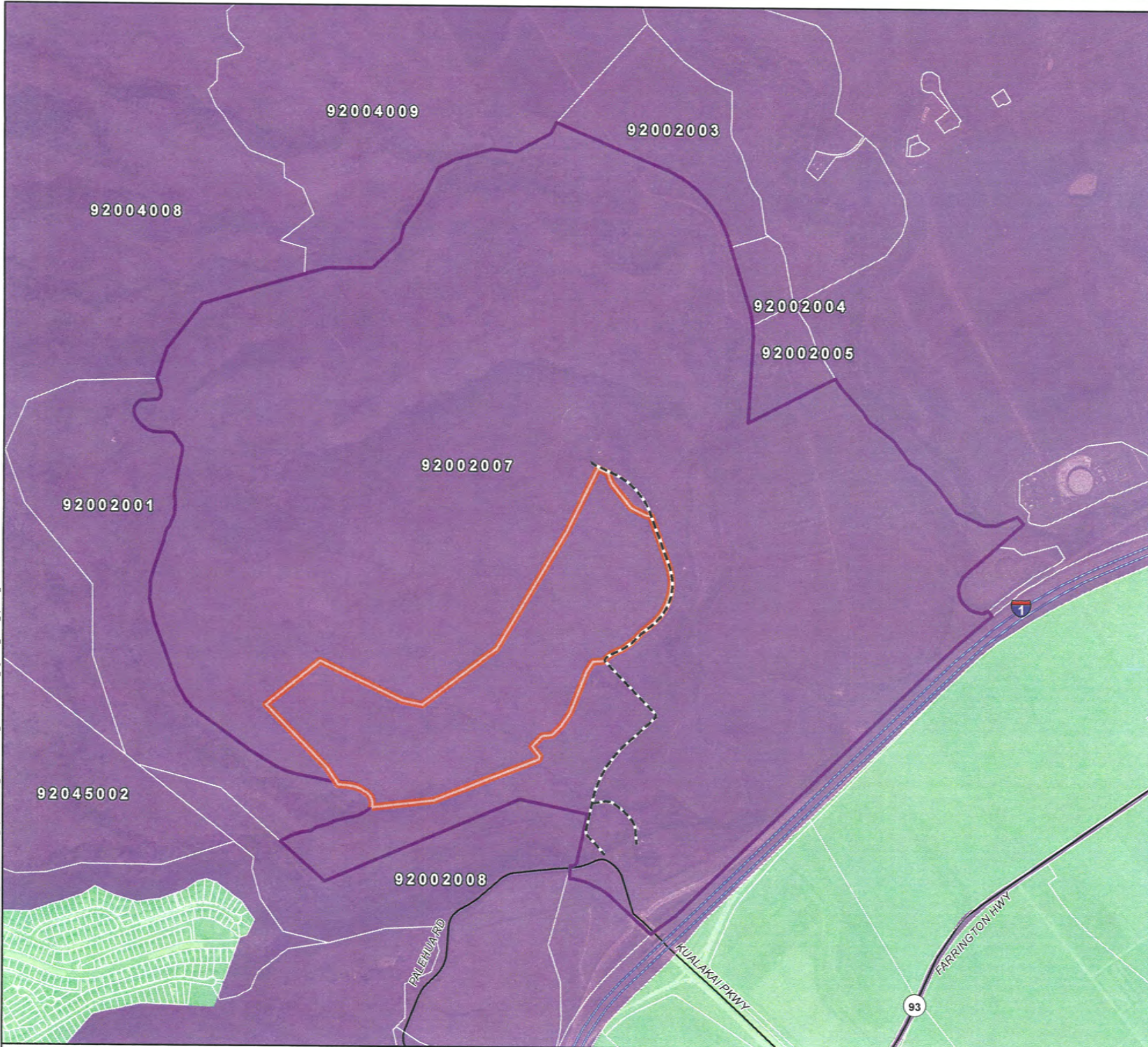
Figure 5
West Oahu Solar Plus Storage Project
AES Distributed Energy
State Land Use Districts

HONOLULU COUNTY, HI

-  Project Area
-  Property Boundary
-  Existing Access Road
-  TMK Boundary
-  Interstate Highway
-  Roadway
- State Land Use
 -  Agricultural Land Use District
 -  Urban Land Use District



Reference Map



P:\GIS_PROJECTS\AES_China\Map_Energy\West_Oahu_Solar\Map_SUP_Figures\Map_SUP_Figures05_ILUD_0511_2021000.mxd











Figure 6

West Oahu Solar Plus Storage Project

AES Distributed Energy

County Zoning

HONOLULU COUNTY, HI

-  Project Area
-  Property Boundary
-  Existing Access Road
-  TMK Boundary
-  Interstate Highway
-  Roadway
- Zoning Classes**
-  Low- and Medium-Density Apartment District
-  Restricted Agriculture District
-  General Agriculture District
-  Medium-density Apartment District
-  Mixed Use District
-  Neighborhood Business District
-  Community Business/Community Business Mixed Use District
-  General Preservation District
-  Residential District



Reference Map

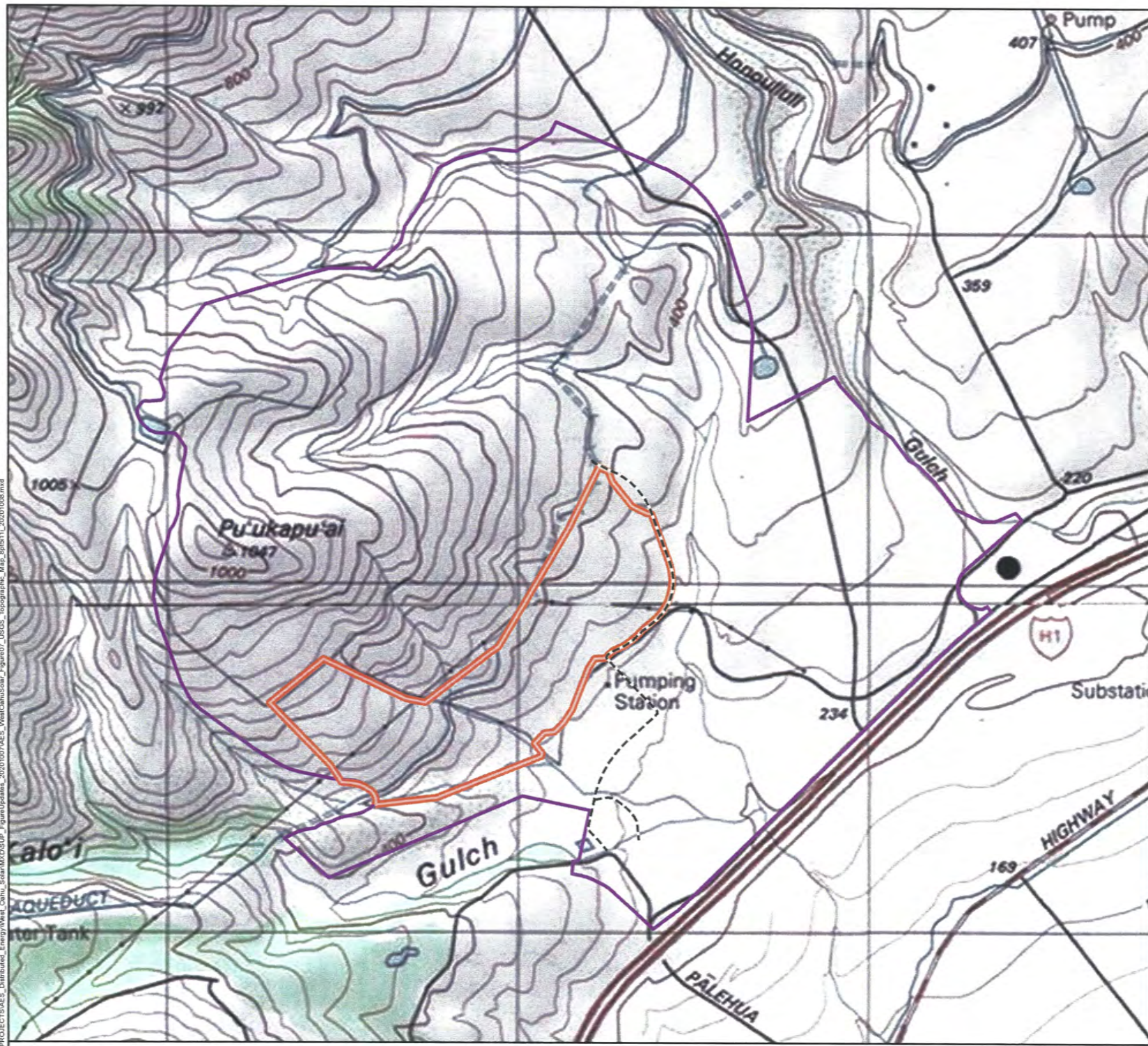


P:\GIS_PROJECTS\AES_Distributed_Energy\West_Oahu_Solar\GIS\Map_Series\Map_Series_20201007\AES_WestOahu\zoning_figure06_CountyZoning_fig0611_20201008.mxd

Figure 7
West Oahu Solar Plus Storage Project
AES Distributed Energy
USGS Topographic Map

HONOLULU COUNTY, HI

-  Project Area
-  Property Boundary
-  Existing Access Road



Reference Map



P:\GIS_PROJECTS\AES_Distributed_Energy\West_Oahu_Solar\KDC\GISUP_Figures\Map_20201007\AES_WestOahuSolar_Figure07_USGS_Topographic_Map_dpf511_20201008.mxd

NRCS Soil Types

- EaB - Ewa silty clay loam, 3 to 6 percent slopes
- HLMG - Helemano silty clay, 30 to 90 percent slopes
- KIA - Kawaihapai clay loam, 0 to 2 percent slopes, MLRA 158
- KIB - Kawaihapai clay loam, 2 to 6 percent slopes
- KlA - Kawaihapai stony clay loam, 2 to 6 percent slopes, MLRA 158
- KlB - Kawaihapai very stony clay loam, 0 to 15 percent slopes, MLRA 158
- KyA - Kunia silty clay, 0 to 3 percent slopes
- KyB - Kunia silty clay, 3 to 8 percent slopes
- MBL - Mahana-Badland complex
- McC2 - Mahana silty clay loam, 6 to 12 percent slopes, eroded
- McD2 - Mahana silty clay loam, 12 to 20 percent slopes, eroded
- McE2 - Mahana silty clay loam, 20 to 35 percent slopes, eroded
- MuB - Molokai silty clay loam, 3 to 7 percent slopes, MLRA 158
- MuC - Molokai silty clay loam, 7 to 15 percent slopes, MLRA 158
- MuD - Molokai silty clay loam, 15 to 25 percent slopes
- W - Water > 40 acres
- rRK - Rock land

Figure 8

West Oahu Solar Plus Storage Project

AES Distributed Energy

NRCS Soil Types

HONOLULU COUNTY, HI

- Project Area
- Property Boundary
- Existing Access Road
- Interstate Highway
- Roadway



Reference Map



P:\GIS_PROJECTS\AES_Distributed_Energy\West_Oahu_Solar\KDC\UP_Figures\Map8_Figure8_NRCS_EastTypes_8pt111_20201008.mxd

Figure 9

West Oahu Solar Plus Storage Project

AES Distributed Energy

Agricultural Lands of Statewide Importance

HONOLULU COUNTY, HI

-  Project Area
-  Property Boundary
-  Existing Access Road
-  Interstate Highway
-  Roadway
-  Prime Lands
-  Other Lands



Reference Map



FIG9_PROJECTDAES_Distressed_EnergyWkt_Catn_SolarWktDUP_Figure9.mxd; 20201007_AES_WestOahuSolar_Figure9_AJSH_092511_20201008.mxd

1:20,000 WGS 1984 UTM Zone 4N












0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

Figure 10
West Oahu Solar Plus Storage Project

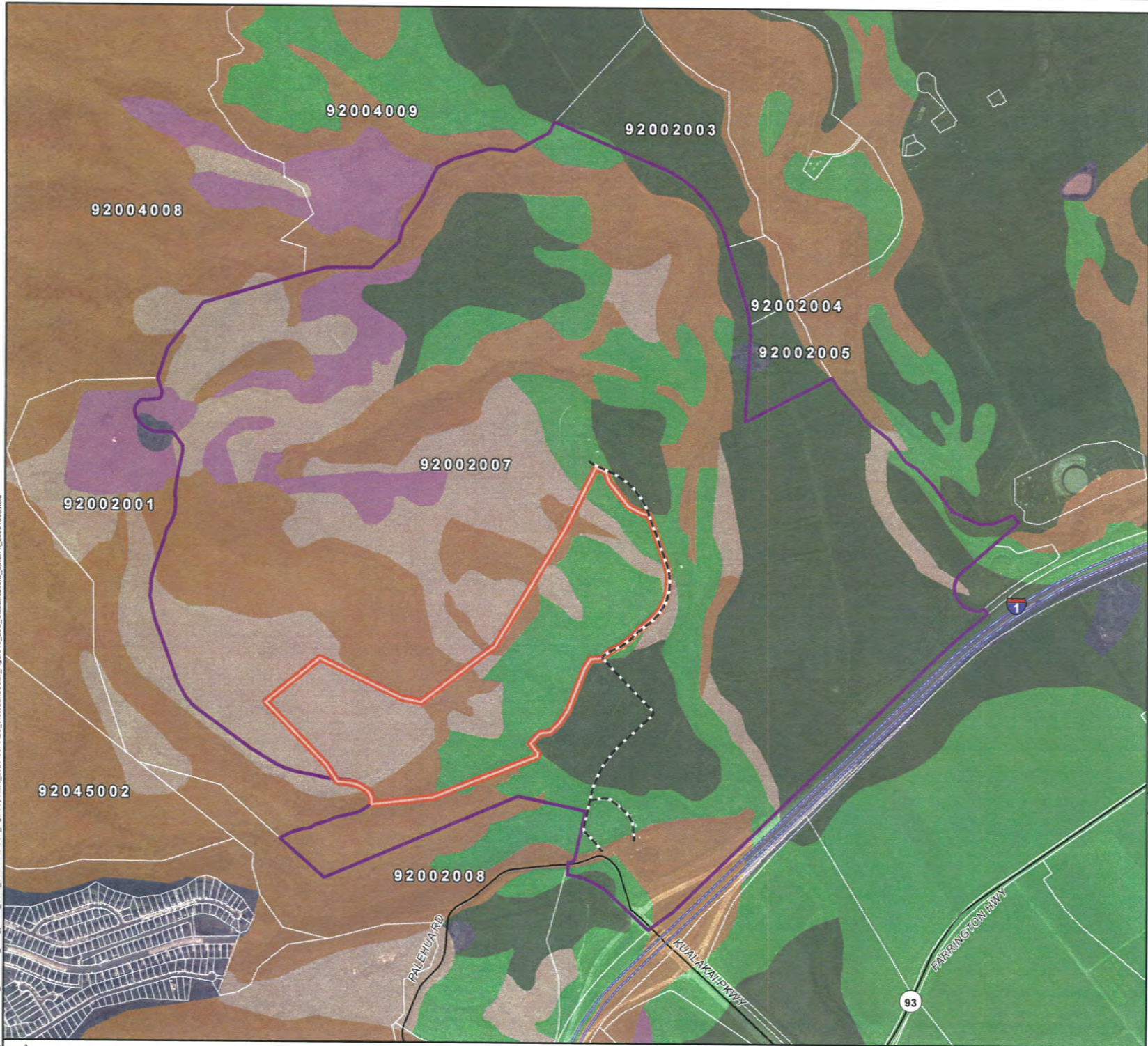
AES Distributed Energy
Land Study Bureau
Classification

HONOLULU COUNTY, HI

-  Project Area
-  Property Boundary
-  Existing Access Road
-  TMK Boundary
-  Interstate Highway
-  Roadway
- Land Study Bureau Classes**
-  A
-  B
-  C
-  D
-  E



Reference Map



P:\GIS_PROJECTS\AES_Distributed_Energy\West_Oahu_Solar\KOS\SUP_01\Map\Map_20201007\AES_WestOahuSolar_Figure 10_LCB_Classification_081511_20201008.mxd