BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAI'I

In the Matter of the Application of HAWAIIAN ELECTRIC COMPANY, INC. for approval to commit funds in excess of $2,500,000 (excluding customer contributions) for Project Item Y00291, Auiki Substation, and related approvals.	)	Docket No. 2018-0185

APPLICATION OF HAWAIIAN ELECTRIC COMPANY, INC.

VERIFICATION

EXHIBITS A-K

and

CERTIFICATE OF SERVICE

Joseph P. Viola
Vice President
Regulatory Affairs
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawai'i 96840

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APPLICATION

TO THE HONORABLE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAI‘I:

HAWAIIAN ELECTRIC COMPANY, INC. (“Hawaiian Electric” or the “Company”) respectfully requests that the Commission: (1) approve the commitment of approximately $15.2 million in funds for the construction and installation of project Item Y00291, the Auiki Substation, line extensions and related equipment (the “Auiki Substation Project” or “Project”); (2) determine that the Project’s 46 kilovolt (“kV”) transmission line extensions be constructed as proposed above and below the surface of the ground; and (3) determine that a public hearing is not required under Section 269-27.5 of the Hawai‘i Revised Statutes (“HRS”).

EXECUTIVE SUMMARY

The Auiki Substation Project is needed to address reliability and safety risks associated with forecasted overload conditions on Hawaiian Electric’s distribution system in the Kalihi Kai/Palama area of O‘ahu. The Company’s existing Kalihi Kai/Palama area distribution system contains insufficient capacity to serve near-term electrical loads, which are expected to increase

significantly over the next three years. Current estimates indicate that by 2021, these loads will have increased by over 12 megavolt-amperes ("MVA"), resulting in both emergency and normal circuit overload conditions.

These overload conditions are projected to occur as a result of new loads arising in connection with the State of Hawai'i's Honolulu Harbor Kapalama Container Terminal Development project requiring 9.3 MVA of firm additional load in the 2021 timeframe, and 3.1 MVA of demand associated with Honolulu Authority for Rapid Transit ("HART") project traction power systems and associated infrastructure in 2020. An additional 5.0 MVA of load is also anticipated in the 2026 timeframe.

The proposed Auiki Substation Project consists of the Auiki Substation and associated transformers, transmission and distribution 46 kV and 11.5 kV circuits, SCADA and telecommunications facilities, and related land rights required for the Project. Upon its planned January 2021 in-service date, the Project will alleviate normal overload conditions, provide backup reliability and minimize distribution circuit installation costs, while providing added capacity to serve forecasted near-term projected loads.

The Project is the most cost-effective alternative for addressing the overload conditions in the Kalihi Kai/Palama area, and is currently estimated to cost approximately $15.2 million. The Project's location near the Kalihi Kai/Palama load center and 46 kV lines will help to reduce installation costs. Moreover, this option includes provisions to support future area load growth. Further, land for the substation has already been identified and reserved at the future Kapalama Terminal Yard site.

I

REQUESTED APPROVALS

Hawaiian Electric respectfully requests that the Commission issue a decision and order:

(1) approving the commitment of funds, currently estimated at $15.2 million for the construction and installation of project Item Y00291, Auiki Substation Project, in accordance with Paragraph 2.3(g)(2) of the Commission's General Order No. 7 ("G.O. 7"), as amended by Decision and Order No. 21002 ("D&O 21002"), filed May 27, 2004 in Docket No. 03-0257;[1]

(2) determining that the proposed 46 kV sub-transmission lines, as described in Sections V.B and VII.B below, be constructed above and below the surface of the ground pursuant to HRS § 269-27.6(a); and

(3) determining that a public hearing is not required for the Project, as described in Sections V.B and VII.A below, consistent with HRS § 269-27.5, for the overhead construction of a 46 kV transmission line through a residential area.

II

APPLICANT

Hawaiian Electric, whose principal place of business and whose executive offices are located at 900 Richards Street, Honolulu, Hawai‘i, is a corporation duly organized under the laws of the Kingdom of Hawai‘i on or about October 13, 1891, and now exists under and by virtue of the laws of the State of Hawai‘i. Hawaiian Electric is an operating public utility engaged in the production, purchase, transmission, distribution and sale of electricity on the

[1] Pursuant D&O 21002, the G.O. 7 capital expenditures threshold was increased from $500,000 to $2.5 million, excluding customer contributions. The capital cost of the subject Project is greater than $2.5 million (excluding customer contributions); therefore, Commission approval of the capital expenditures is required.

island of O‘ahu.

III

CORRESPONDENCE

Correspondence and communications regarding this Application should be addressed to:

Kevin M. Katsura
Manager – Regulatory Non-Rate Proceedings
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawai‘i 96840-0001

IV

EXHIBITS

The following exhibits are provided in support of this Application:

Exhibit A	Substation Distribution Planning Study
Exhibit B	Project Models and Illustrations
Exhibit C	Auiki Substation Land & Easement Acquisitions
Exhibit D	Cost Estimate
Exhibit E	Bill Impact and Revenue Requirement
Exhibit F	Load Profile Documentation
Exhibit G	Project Alternatives
Exhibit H	Underground/Overhead Transmission-Distribution Analysis
Exhibit I	DoT Harbors Division Support Letter
Exhibit J	Underground/Overhead Correspondence
Exhibit K	Confidentiality Justification Table[2]

[2] Exhibits A, F and J contain confidential information, which if disclosed publicly could disadvantage and competitively harm the Company, its employees, or third-party contractors. Exhibit K is being provided in order to

V

PROJECT DESCRIPTION

As further detailed in Exhibit A, the scope of the proposed Auiki Substation Project consists of the Auiki Substation and associated transformers, transmission and distribution 46 kV and 11.5 kV circuits,[3] and SCADA and telecommunications facilities on currently unimproved State of Hawai‘i land, formerly known as the Kapalama Military Reservation. More specifically, the scope of the Project includes:

- construction of a new two-unit expandable system distribution substation (including the installation of two 46/12 kV, 10/12.5 MVA transformers and other equipment) on land within the Kapalama Terminal Yard Redevelopment area in the Kalihi Kai/Palama area;
- installation of four self-supporting steel poles on Auiki Street, extending 1,296 circuit-feet of Iwilei 1 46 kV overhead conductor from the intersection of Puuhale Road and Auiki Street to the new Auiki Substation;
- installation of approximately 865 circuit-feet of Iwilei 2 46 kV overhead conductor along Mary Street;
- extension of 1,165 circuit-feet of Halawa 3 46 kV overhead conductor from the existing Kapalama Substation on Kalihi Street to the new Auiki Substation;

identify the redacted information and basis for confidentiality for each Exhibit in accordance with Section IV (Guidance Reg[a]rding the Frustration Exception to the UIPA) of the Commission's Order No. 34367 filed in Docket No. 2016-0328 on January 30, 2017. The Company will file unredacted versions of any pages from which confidential information has been redacted upon issuance of an appropriate protective order in this docket.

[3] For purposes of this Application, the terms "11.5 kV" and "12 kV" are used interchangeably.

- removal of 350 circuit-feet of Iwilei 2 46 kV overhead conductor from the intersection of Mokauea Street and Mary Street to Auiki Street to eliminate two 46 kV overhead conductors from crossing;
- installation of approximately 285 circuit-feet of overhead All Dielectric Self Supporting ("ADSS") fiber optic cable from Hoe Street near Kalihi Street to the new Auiki Substation;
- installation of approximately 200 circuit-feet of Iwilei 2 46 kV underground cable on Auiki Street; and
- acquisition of the lease land rights for the new substation, and the easements, as needed, for these lines and equipment.

A. Auiki Substation and Installation of Auiki Substation Transformers 1 & 2 (P0004261)

The system substation development involves the engineering, design, fine grading and development of a 133-foot by 225-foot portion of the former Kapalama Military Reservation adjoining Auiki Street, now controlled by the State of Hawai'i Department of Land and Natural Resources ("DLNR") and State of Hawai'i Department of Transportation, Harbors Division ("DoT"), and known as the Kapalama Terminal Yard. As illustrated in Exhibit B, the new Auiki Substation Project will include the installation of:

- two three-phase, 10/12.5 MVA, 46/12 kV transformers;
- two 15 kV metal-clad outdoor switchgears;
- three 46 kV switches, operators and associated structures;
- 46 kV bus conductors and connectors;
- two sets of lightning arresters;
- a battery cabinet;

- a communication cabinet;
- a security cabinet;
- an auto-transfer junction box; and
- a perimeter chain link fence with drive gates and man gates.

The Project site will also require fine grading, geotechnical filling and civil work, construction of an access road, and drainage alteration activities as part of the substation construction. The Substation Installation will include:

- two transformer pads;
- two switchgear pads;
- four sets of switch structure foundations;
- a battery cabinet pad;
- a communication cabinet;
- a security cabinet pad; and
- associated ducts and handholes/manholes.

B. 46 kV and 12 kV Substation Lines (P0004262)

The scope of the Auiki Substation Project also includes the extensions of the Halawa 3 and Iwilei 1 46 kV sub-transmission lines to feed the Auiki Substation. These have been designed as overhead extensions to pole termination and risers within the substation itself, in order to reduce risks and the cost associated with existing underground oil pipelines located beneath the Kapalama Terminal Yard and Auiki Street sidewalk. A third 46 kV circuit (Iwilei 2) will be partially re-routed underground to avoid an overhead conflict with Iwilei 1.

The Iwilei 1 46 kV circuit will extend approximately 1,296 feet from the intersection of Puuhale Road and Auiki Street to the new Auiki Substation. The Halawa 3 46 kV circuit will be

extended approximately 1,165 circuit-feet from the existing Kapalama Substation on Kalihi Street to the new Auiki Substation.

The Iwilei 2 46 kV circuit will require re-routing an existing portion of the overhead circuit on Mokauea Street along Mary Street and extending the circuit overhead by 865 circuit-feet, and approximately 200 feet of underground cabling from the corner of Mokauea Street and Auiki Street to the existing Iwilei 2 46 kV overhead circuit on Road 2 within the Kapalama Terminal Yard. The re-routed Iwilei 2 46 kV sub-transmission line will riser down on a new steel pole on Auiki Street, then extend underground across Auiki Street through DLNR property to Road 2.

The underground construction will include approximately 350 linear feet (two 46 kV circuits) of 1,500 thousand circular mils ("MCM") Aluminum ("AL"), cross linked polyethylene ("XLPE"), with copper tape shield, 46 kV underground cables. The two 46 kV sub-transmission overhead extensions include installing new wood poles along Auiki Street, Mary Street and Kalihi Street, and approximately 2,461 circuit feet of 336 MCM all aluminum 46 kV overhead conductors on four new self-supporting steel poles, and ending at the new Auiki Substation. As shown in Exhibits A and B, the two 46 kV extensions will require the design, fabrication and installation of a total of four new 65-foot steel poles.

C. SCADA and Telecommunications (P0004260)

Telecommunications supporting the Supervisory Control and Data Acquisition ("SCADA")/Remote Terminal Unit ("RTU") equipment is another component of this Project, and includes the overhead installation of approximately 285 circuit-feet of DNA-28551 Mini-Span® ADSS fiber optic cable. SCADA is a fundamental component of Hawaiian Electric's Grid Modernization Strategy ("GMS"), which can improve the operational efficiency of and

visibility into the Company's electric system. SCADA communications installed in connection with this Project will help support the Company's future GMS communication efforts.

As shown in Exhibit B, approximately 285 circuit-feet of overhead ADSS cable will be installed as underbuilt to the existing Sand Island 11.5 kV overhead line, which will be extended to the Auiki Substation.

D. Land Lease and Easement Acquisition

The new substation will be sited on approximately 29,925 square feet of land within portions of Tax Map Key 1-2-025:011 and 1-2-025:054. This property is currently owned by the DLNR, and managed by the Department of Transportation ("DoT") Harbors Division. Hawaiian Electric has obtained engineering right-of-access from DLNR to complete due diligence necessary for engineering and design activities. As shown in Exhibit B, the substation site area is currently zoned for Industrial use.

As shown in Exhibit C, in addition to the 29,925 square feet of land to be leased long-term, there will be a 10-foot-wide by 200-foot-long underground easement for the re-routing of Iwilei 2 46 kV circuit, and a number of 25-foot-wide non-exclusive perpetual overhead transmission line easements that will also be acquired for the overhead line extensions connecting to the existing 46 kV transmission line, and distribution lines. Hawaiian Electric will work with DLNR and DoT Harbors Division to obtain appropriate land rights for leases and easements. In addition, new 12 kV underground ducts within the Kapalama Terminal Yard will be built by the DoT Harbors Division, but cabled separately by Hawaiian Electric to secondary metered loads within the yard. All duct design and installation, along with civil engineering within the Kapalama Terminal Yard, will be completed by others.

The lease and easement costs for land uses are not capital costs but expenses, and

therefore are not included in costs of this Project.

E. Project Cost and Bill Impact

The total cost of the Project is currently estimated to be $15.2 million, as shown in Exhibit D. The Company plans to recover these costs through a combination of the Decoupling Rate Adjustment Mechanism (RAM) and base rates. Assuming an average monthly usage of 500 kWh, the impact of the Project on a typical residential customer's bill is estimated to be $0.08, as shown in Exhibit E.

F. Project Schedule

As shown in the table below, given the material lead times and the City and State permits and approvals required for this Project, Hawaiian Electric anticipates placing the Auiki Substation in service by January 2021. Construction of the substation, 46 kV and 12 kV lines is planned to commence in September 2019, assuming approval of this Application by August 31, 2019.

Project Milestone	Milestone Date
Commission Application Submitted	August 2, 2018
Finalize Designs	January 31, 2019
Procure Materials	May 31, 2019
Commission Application Approved	August 31, 2019
Construction Begin	September 30, 2019
Substation Energized	January 31, 2021

VI

PROJECT JUSTIFICATION

Over the next three years, Hawaiian Electric's existing distribution system does not have adequate capacity to serve the projected electrical loads in the Kalihi Kai/Palama area; emergency and normal overload conditions are forecasted to occur in 2021. As discussed below, the Auiki Substation Project is needed to address these customers' needs in a safe, reliable and cost-effective manner.

A. Load Growth in the Kalihi Kai/Palama Area

Hawaiian Electric performed the load analysis provided in Exhibit A to determine whether the Company's existing electrical infrastructure has adequate distribution and sub-transmission capacity to serve the projected load growth of the Kalihi Kai/Palama area, and customer requests. As shown in Exhibit F, based on the latest load development schedules provided by customers with Hawaiian Electric service requests, the analysis indicates that there is insufficient distribution capacity to serve the projected loads. Specifically, electrical service requirements are projected to increase significantly, by over 12 MVA by 2021, resulting in an emergency and normal overload condition.

The overload conditions are projected to occur in part, as a result of the State of Hawai'i's Kapalama Terminal Yard project. The load projections include 3.1 MVA of Honolulu Authority for Rapid Transit ("HART") project traction power systems in 2020, 9.3 MVA of firm additional load in 2021 based on known customer demand at the Kapalama Terminal Yard, and an additional 5.0 MVA of load in the 2026 timeframe. Some of the other customers that are served by or expected to be served by this circuit include: Pasha Hawaii, Young Brothers, U.S. Customs and Border Protection, Hawaii Fueling Facilities Corporation and organizations

supporting Transit Oriented Developers. Therefore, ensuring safe and reliable service to these customers will help to support various elements of the State's critical transportation infrastructure.

As shown in Exhibit F and Exhibit A, this projected load growth will require additional substation and circuit capacity to avoid damage to a distribution transformer or distribution circuit; premature equipment failure/replacement of units; safety risks to employees, large commercial shipping providers, governmental agencies and the general public; and added costs to customers.[4] As indicated in Exhibit I, the DoT Harbors Division fully supports the Auiki Substation Project as critical to the occupancy and success of the State's Kapalama Container Terminal project.

To determine whether existing infrastructure could support the forecasted incremental load increases, total annual forecasted loads were compared to existing equipment operational limitations.

To forecast electrical loads for distribution transformers and circuits, a Substation Loading and Capability Analysis ("SLACA") load forecast program was utilized by Hawaiian Electric's Distribution Planning Department. These new loads were chronologically placed on distribution circuits in the study area based on the circuit's geographic location and projected available capacity. SLACA studies and area reviews were performed to identify possible normal and emergency overload conditions on respective transformers and circuits in the study area. This analysis determined that normal and emergency distribution transformer and circuit overloads are projected to occur in 2021. The normal and emergency overload conditions are listed in Table 2 and Table 3 of Exhibit A.

[4] The Auiki Substation Project and other related projects are included in the Reliability category of Hawaiian Electric's *PSIP Update Report: December 2016*, filed December 23, 2016 in Docket No. 2014-0183 ("PSIP").

B. Alternatives Analysis

As explained in Exhibit A and Exhibit G, Hawaiian Electric analyzed three alternatives to the Auiki Substation Project to potentially mitigate the load growth situation in the Kalihi Kai/Palama area: (1) construction of a new dedicated distribution substation at the Kapalama Terminal Yard; (2) installation of two additional 46-12 kV, 10/12.5 MVA distribution transformers at the existing Waiakamilo Substation; and (3) a non-transmission alternative including siting and installation of a battery energy storage system ("BESS") with three 3,000 kW/six-hour batteries.

1. Dedicated Substation

Construction of a dedicated substation is not feasible due to the constraints imposed by the DoT and the limitations of providing substation and circuit capacity for load growth outside of the Kapalama Terminal property.[5]

2. Existing Substation

The use of an existing substation has a comparatively smaller scope for the substation work as compared to the new substation option. However, extensive 12 kV circuit installation work would be required due to the existing substation being remote from the new load.[6] Installation of capacity at the existing Waiakamilo Substation would be more costly than the proposed Project. Being remote to the new loads, this option would entail 12 kV circuit installation work that is not only more extensive, but would also be impacted by the HART project, and therefore introduce constructability and schedule risks.

[5] A dedicated substation was not evaluated further, as initial customer requests did not request primary service, but requested secondary service to individual tenant meters. This is consistent with Hawaiian Electric's Rule 13 on line extensions and substations. It also aligns with the Company's Rule 14 on *Service Connections and Facilities on Customer's Premises*, which allows Company discretion to provide secondary conductor to meet customer demand.
[6] Since Option 1 was eliminated from consideration, cost estimates were only developed for the other two options (see Exhibit A Distribution Planning Study, Table 4).
[6] See PSIP Appendix J.

3. Non-Transmission Alternative – BESS

Non-Transmission Alternatives were considered during the Distribution Planning Study. Based on demand and load profiles within customer requests, maximum demand and energy requirements were identified to identify functional requirements of a BESS. In the modelled scenario, the battery would work in conjunction with the existing transformer handling any load in excess of the normal limit, providing additional capacity on the circuit. The solution would require and utilize three 3,000 kW/six-hour batteries. Costs were aggregated based on PSIP utility scale BESS cost estimates and interconnection costs, and far exceeded the cost for the system substation alternative proposed at the Kapalama Terminal Yard.

4. Selection of the Auiki Substation Project

Based on consideration of the alternatives above, construction of a new system Auiki Substation and installation of two 46/12 kV, 10/12.5 MVA transformers is the most cost-effective and practical option for meeting customers' needs in the Kalihi Kai/Palama area.

The Project will resolve all current distribution transformer and circuit needs in the area under normal and emergency overload conditions, while providing added capacity to serve the majority of the near-term projected load. In addition, the Project's location near the load center will result in minimal sub-transmission work and distribution circuit installation costs. Due to being located near 46 kV circuits, the Project will also result in minimal 12 kV sub-transmission circuit installation costs. Moreover, this option includes provisions to expand the substation from two to four transformers, which will allow for future load growth. Further, land for the substation has already been identified at the future Kapalama Terminal Yard site, and DoT has agreed to support Hawaiian Electric's request for a substation footprint lease, and various easements for access and lines, through the DLNR.

VII

46 KV TRANSMISSION LINES

A. HRS § 269-27.5 – Public Hearing

Hawaiian Electric requests that the Commission determine that a public hearing is not required, consistent with HRS § 269-27.5, for the overhead construction of a 46 kV transmission line through a residential area.[7]

The 46 kV sub-transmission line interconnecting the Auiki Substation with the grid does not run through a residential area and accordingly, the Company does not believe that HRS § 269-27.5 requires a public hearing in this instance. As shown in Exhibit B, the new overhead 46/12 kV line extensions will be constructed along Auiki Street, Mary Street and Kalihi Street, which are currently zoned as I-2 and I-3 Industrial.[8] The closest existing presumed residence to the proposed substation is approximately 350 feet away on Hoe Street, and separated from the Project site by a large multi-story industrial warehouse and Auiki Street.

Nonetheless, if the Commission determines that a public hearing is required, then Hawaiian Electric respectfully requests that the Commission hold a public hearing.

B. HRS § 269-27.6 – Construction of 46 kV Line

Hawaiian Electric also requests that the Commission determine that the proposed 46 kV sub-transmission lines, as described in this Application, be constructed above and below the surface of the ground pursuant to HRS § 269-27.6(a) based on the following:

[7] HRS § 269-27.5 provides:

> Construction of high-voltage electric transmission lines; hearing**.** Whenever a public utility plans to place, construct, erect, or otherwise build a new 46 kilovolt or greater high-voltage electric transmission system above the surface of the ground through any residential area, the public utilities commission shall conduct a public hearing prior to its issuance of approval thereof. Notice of the hearing shall be given in the manner provided in section 269-16 for notice of public hearings.

[8] The zoning for the area where the overhead 46 kV line extensions and new substation and all associated 46 and 12 kV line extension/relations will be located is currently zoned as Industrial.

1. HRS § 269-27.6(a)(1) – Whether a Benefit Exists that Outweighs the Costs of Placing the Electric Transmission System Underground

There is not a benefit in this instance that outweighs the cost of placing the transmission system underground. As explained in Exhibit H, the estimated cost of the overhead line construction for the Project is $3.3 million. As shown in Exhibit H, the estimated construction cost of a comparable underground 46 kV sub-transmission line extension is approximately four times the cost of overhead construction, or $14.3 million. The proposed 46 kV line will be in an area that already has existing overhead transmission lines. As a result, the visual impact will not be significantly increased and the benefits of undergrounding, if any, do not outweigh the costs.

2. HRS § 269-27.6(a)(2) – Whether There is a Governmental Public Policy Requiring the Electric Transmission System to be Placed, Constructed, Erected or Built Underground and the Governmental Agency Establishing the Policy Commits Funds for the Additional Costs of Undergrounding

To the best of Hawaiian Electric's knowledge, there is no existing governmental public policy requiring the undergrounding of the 46 kV line tap.

3. HRS § 269-27.6(a)(3) – Whether any Governmental Agency or Other Parties are Willing to Pay for the Additional Costs of Undergrounding

To the best of Hawaiian Electric's knowledge, there is no governmental agency or other party willing to pay for the additional costs of undergrounding the 46 kV line tap. Hawaiian Electric sent letters to the City and County of Honolulu, DoT Harbors and Highways Divisions and DLNR, to discuss their willingness to fund the underground transmission lines. (See Exhibit J.)

4. HRS § 269-27.6(a)(4) – The Recommendation of the Division of Consumer Advocacy of the Department of Commerce and Consumer Affairs, which Shall be Based on an Evaluation of the Factors Set Forth Under this Subsection

The recommendations of the Consumer Advocate will be stated upon completion of its investigation.

5. HRS § 269-27.6(a)(5) – Any Other Relevant Factors

To the best of Hawaiian Electric's knowledge, there are no other factors relevant to the Commission's determination with respect to this issue.

6. HRS §§ 269-27.6(b) and (c)

Subsections (b) and (c) of HRS § 269-27.6, which apply to 138 kV and greater lines, do not apply to this Project.

VIII

NON-TRANSMISSION ALTERNATIVES

The *Commission's Inclinations on the Future of Hawaii's Electric Utilities* included the following Commission guidance with regard to transmission planning and the future development of new transmission projects on Hawai'i's grids:

> **New transmission projects must consider non-transmission alternatives** – New, replacement or upgrade high-voltage transmission projects generally represent significant, lumpy capital investments that will be given careful scrutiny. Non-transmission alternatives (NTAs) such as local peaking or back-up generators, energy storage, demand response and smart grid resources are technically and commercially available alternatives that must be evaluated as part of any economic justification for new transmission system projects.[9]

As discussed above, a non-transmission alternative of a BESS tailored to this load was analyzed in the distribution planning study (see Exhibit A). However, the study results recommended the building of a new substation to serve the Kapalama Terminal Yard and Kalihi Kai/Palama area because it is most cost-effective solution to continue to reliably serve current and future customers.

[9] See Exhibit A to Decision and Order No. 32052, filed April 28, 2014 in Docket No. 2012-0036 (regarding Integrated Resource Planning) at 84.

IX

CONCLUSION

WHEREFORE, Hawaiian Electric respectfully requests that the Commission:

(1) approve the commitment of funds, currently estimated at $15.2 million, for the construction and installation of the Auiki Substation Project, in accordance with G.O. 7 Paragraph 2.3(g)(2), as amended by D&O 21002;

(2) determine that the proposed 46 kV sub-transmission lines, as described herein, be constructed above and below the surface of the ground pursuant to HRS § 269-27.6(a);

(3) determine that a public hearing is not required, as described herein, consistent with HRS § 269-27.5, for the overhead construction of a 46 kV transmission line through a residential area; and

(4) grant the Company such other and further relief as may be just and equitable in the premises.

DATED: Honolulu, Hawai'i August 2, 2018.

HAWAIIAN ELECTRIC COMPANY, INC.

By _____
Joseph P. Viola
Vice President, Regulatory Affairs
Hawaiian Electric Company, Inc.

VERIFICATION

STATE OF HAWAI'I)
) ss.
CITY AND COUNTY OF HONOLULU)

JOSEPH P. VIOLA, being first duly sworn, deposes and says: That he is Vice President – Regulatory Affairs of Hawaiian Electric Company, Inc., Applicant in the above proceeding; that he makes this verification for and on behalf of Hawaiian Electric and is authorized so to do; that he has read the foregoing Application, and knows the contents thereof; and that the same are true of his own knowledge except as to matters stated on information or belief, and that as to those matters he believes them to be true.

Joseph P. Viola

DEBORAH ICHISHITA NOTARY 04-409 PUBLIC STATE OF HAWAII

Subscribed and sworn to before
me this 2nd day of August, 2018.

Deborah Ichishita
DEBORAH ICHISHITA
Notary Public, First Circuit,
State of Hawai'i

My Commission expires July 18, 2020

Doc. Date: 8/2/2018 # Pages: 98
Name: DEBORAH ICHISHITA First Circuit
Doc. Description Verification of
Joseph P. Viola for Application,
Exhibits A-K
Deborah Ichishita 8/2/18
Signature Date
NOTARY CERTIFICATION

DEBORAH ICHISHITA NOTARY 04-409 PUBLIC STATE OF HAWAII

Hawaiian Electric Company, Inc.

Auiki Substation Study

Prepared By:

Distribution Planning Division
Transmission and Distribution Planning Department

June 2018

Auiki Substation Study

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APPENDICES

EXECUTIVE SUMMARY

The Harbors Modernization Plan (HMP) was developed to upgrade the aging infrastructure and expand the current capacity of Hawaii's commercial harbor system. This plan identified critical capital improvement projects needed to ensure that the state's hub-and-spoke system is prepared to meet the expanding needs of the industry and the state economy. At the heart of the HMP is the Kapalama Container Terminal (KCT) project, which is a vital component in addressing the severe congestion in the system's hub. The KCT project will be constructed over the space of three piers in Honolulu Harbor and will be occupied by various commercial and industrial customers. As a result, customer demand at Kapalama Terminal Yard is projected to increase by 9.31 MVA in the year 2021.

A load analysis was performed to determine if Hawaiian Electric's existing electrical infrastructure has adequate distribution and subtransmission capacity to serve the projected load growth of the Kapalama area. Based on the latest load development schedules provided by customers with Hawaiian Electric service requests, the analysis indicates that there is insufficient distribution capacity to serve the projected loads. Emergency and normal overload conditions are forecasted to occur in 2021.

Three possible alternatives were evaluated to alleviate the overload conditions and provide capacity for future loads. These options include the following:

1. Develop a new dedicated Auiki substation onsite at Kapalama Terminal Yard and install two 46-12 kV, 10/12.5 MVA distribution transformers.
2. Develop a new system Auiki substation onsite at Kapalama Terminal Yard with provisions for four 46-12 kV, 10/12.5 MVA distribution transformers. Initially, install two 46-12 kV, 10/12.5 MVA distribution transformers.
3. Install two additional 46-12 kV, 10/12.5 MVA distribution transformers at the existing Waiakamilo Substation.

After an analysis of the alternatives, Option 2: Developing and installing two new system 46-12 kV, 10/12.5 MVA distribution transformers at a new Auiki Substation site proved to be the most practical and economical alternative for the following reasons:

- Resolves all distribution transformer and circuit normal and emergency overload conditions.
- Provides capacity to serve the majority of the ultimate projected load in the area.
- Location near the load center (minimal distribution circuit installation costs).
- Location near 46 kV circuits (minimal subtransmission circuit installation costs).
- Land for the substation has already been identified at the future Kapalama Terminal Yard site.

INTRODUCTION

As part of the state's effort to modernize Honolulu Harbor, the Hawai'i Department of Transportation (HDOT) Harbors Division has proposed to develop a new overseas container terminal at Piers 41, 42, and 43. The Kapalama Container Terminal (KCT) project consists of the development of a new pier with berthing capacity for two container ships, and an approximately 84-acre container yard with necessary support buildings, entry and exit gates, security fencing, parking, gantry cranes and container-handling equipment, on-site utilities, outdoor lighting, and other ancillary features. Honolulu Harbor is the state's primary port for all incoming and outgoing container cargo; the KCT project will greatly increase the harbor's existing capacity to accommodate projected future cargo volumes. As a result, customer demand at this site is expected to increase by 9.31 MVA by 2021.

In addition to the concentrated load growth at the site of the KCT project, the Kalihi-Palama/Kapalama area will have load growth due to the Honolulu Rail Transit project and the resulting Transit-Oriented Development (TOD). Multiple rail passenger stations and a traction power system station will be installed within this area, accounting for approximately 3.1 MVA of added system demand in 2020. Although no customer service requests have been submitted, the City and County of Honolulu TOD Division has provided estimates of anticipated development over the next 40 years, in terms of residential units and commercial square feet[1]. TOD is forecased to occur within a half mile radius from passenger stations. Rail transit projects and other forthcoming developments are listed in Table 1 and shown graphically in Appendix A.

1

	Approximate Existing	Phase 1 1-10 years	Phase 2 11-25 years	Phase 3 26-40+ years
Residential Units	3,030	3,490	3,990	4,870
Commercial SF	6,770,910	521,100	760,790	1,302,550

Note: TOD – Anticipated Development displayed graphically in Appendix A

Table 1: Projected New Loads

Customers	Load (MVA)	Year	Status
Kalihi Passenger Station	0.3	2020	Future
Kapalama Passenger Station	0.3	2020	Future
HART - TPSS 19	2.5	2020	Future
Kapalama Container Terminal (KCT)	9.31	2021	Future
[redacted] Residential Development	5.0	2026	Future

Note: The data listed in the above table is the latest available information provided by developers.

OBJECTIVES

The objectives of this study are to:

1. Determine if additional distribution and sub-transmission infrastructure (i.e., substations, transformers, and circuits) will be required.
2. Determine the best solution to serve the proposed developments at the distribution and sub-transmission level.

ASSUMPTIONS

This study is based on the following assumptions:

1. Utilize existing infrastructure where feasible.
2. There is adequate generation capacity to serve the new loads.
3. 138 kV transmission circuit capacity is available at all transmission substation locations.
4. Subtransmission transformer loading limitations are based on 0% loss-of-life and 1% loss-of-life, normal and emergency limits, respectively.
5. Per HECO Engineering Standard Practice V-E-11.1, normal loading limit on a distribution substation transformer shall be its 0% loss-of-life KVA rating, when available. Otherwise, the highest nameplate (OA/FA) KVA rating shall be used.

6. Per HECO Engineering Standard Practice V-E-11.1, emergency loading limit on a distribution substation transformer shall be its 1% loss-of-life KVA rating, when available. Otherwise, the highest nameplate (OA/FA) or (OA/FA/FOA) KVA rating where applicable shall be used.
7. Distribution and subtransmission circuit loading limitations are based on Hawaiian Electric Overhead and Underground Standards.

METHODOLOGY

Background on How Electricity is Transmitted on Oahu

On Oahu, electricity is generated at power plants. The electricity is then transported by 138 kV (138,000 volts) transmission lines to various transmission substations throughout the island. At these transmission substations, electricity is then stepped down or reduced by transformers to 46 kV (46,000 volts). Subtransmission lines (46 kV lines) emanating from these transmission substations transport the electricity to distribution substations. At these distribution substations, electricity is either stepped down to 12 kV (12,000 volts) or 4 kV (4,000 volts) distribution levels. In select areas, 138 kV transmission substations step down voltage directly to a 25 kV (25,000 volts) distribution level. From these distribution substations, 4 kV, 12 kV, or 25 kV distribution lines transport the electricity to homes and businesses.

In order to provide electricity to homes and businesses, the electrical capacity at each point of the electrical system from the generation, to the transmission, to the subtransmission, and to the distribution of electricity must have sufficient capacity to meet the electrical load demand.

Substation Loading and Capability Analysis ("SLACA")

To forecast electrical loads for distribution transformers and circuits, Hawaiian Electric uses the Substation Loading and Capability Analysis ("SLACA") program. This program projects load annually by increasing each circuit's base year load by a predetermined growth rate or new customer loads (whichever is greater). The growth rate takes into account all the Distributed Energy Resources (DER), Demand Side Management (DSM), and Demand Response (DR) that has been implemented on each of the circuits. In addition, projects that will affect loading such as load transfers, which shift load from one circuit to another circuit, are also reflected in the SLACA forecast calculations. The program uses actual loads for the initial base year and forecasts the electrical load for the distribution transformer and circuits for a specific period of time. The actual loads

on each of the circuits incorporate all the Distributed Energy Resources (DER), Demand Side Management (DSM) , and Demand Response (DR) that has been implemented to date in its total. The basis for the analysis is the forecasted electrical loads for the years 2018 to 2026 based on 2017 actual loads.

The projected loading from SLACA is analyzed to determine if normal or emergency overloads are anticipated. It is necessary to address these overloads since potential overloads may result in outages or equipment damage.

Normal overloads are defined as loads exceeding the normal equipment rating of distribution substation transformers and/or circuits under normal conditions. Normal overloads are identified by comparing the SLACA forecasted load with the equipment normal rating.

Emergency overloads are determined by performing an area review. This is accomplished by simulating single contingency failures of each transformer and/or circuit within the project area. When a transformer or circuit is taken out of service, either for maintenance or due to equipment failure, the remaining distribution system must be able to back up the loads being served by the transformer or circuit that is out of service without becoming overloaded.

The projected loading from SLACA is compared to the equipment emergency rating to determine if an overload condition exists. If potential overloads are identified based on the results of the SLACA load analyses, further analyses will be done to determine whether overloads can be resolved with existing system capacity.

In the event the overload conditions cannot be resolved with load transfers to existing adjacent transformers and circuits, Hawaiian Electric will perform additional analyses to determine the optimal substation location in which additional transformer and/or circuit capacity can be installed. The analysis involves identifying available space within

existing substations and new substations, with consideration for future plans for all the substation sites within the study area.

ANALYSIS

To determine whether existing infrastructure can support the forecasted incremental load increases, total annual forecasted loads were compared to existing equipment operational limitations.

Using the SLACA load forecast program, these new loads were chronologically placed on distribution circuits in the study area based on the circuit's geographic location and projected available capacity. SLACA studies and area reviews were performed for the study area to identify possible normal and emergency overload conditions on respective transformers and circuits in the study area.

RESULTS

Normal and Emergency distribution transformer and circuit overloads are projected to occur in 2021 based on the SLACA load analysis and area review (**see Appendix B and Appendix C**). The normal and emergency overload conditions are listed in Table 2 and Table 3.

Table 2: Normal Overload Conditions in 2021

Equipment	Rating (KVA)	Load (KVA)	% Overload	Overload (KVA)
Kapalama 1 TSF	10984	16582	51	5598
Sand Island CKT	8724	12273	41	3549

Table 3: Emergency Overload Conditions in 2021

Equipment	Failure of	Emergency Rating (KVA)	Load (KVA)	% Overload	Overload (KVA)
Kapalama 3 TSF	Kapalama 1 TSF	15505	21924	41%	6419
Waiakamilo-Kapalama CKT	Kapalama 1 TSF	10378	15725	52%	5347
Kapalama 1 TSF	Kapalama 2 TSF	14101	21226	51%	7125
Sand Island CKT	Kapalama 2 TSF	10378	16916	63%	6538
Kapalama 1 TSF	Kapalama 3 TSF	14101	20035	42%	5934
Sand Island CKT	Kapalama 3 TSF	10378	15725	52%	5347
Kapalama 1 TSF	Waiakamilo 2 TSF	14101	20316	44%	6215
Sand Island CKT	Waiakamilo 2 TSF	10378	12302	19%	1924

DISCUSSION OF RESULTS

The area review results (see Appendix C) indicate that the present distribution system capacity is not adequate to serve the projected loads under normal and emergency conditions. The overload conditions are projected to occur as a result of the Kapalama Container Terminal (KCT) project. The presence of these potential overloads may result in damage to a distribution transformer or distribution circuit. Since overload conditions are projected to occur on distribution substation transformers and distribution circuits, additional substation and circuit capacity is required in the area.

OPTIONS

The following are three options to increase the distribution substation and circuit capacity in the area:

1. Develop a new dedicated Auiki substation onsite at Kapalama Terminal Yard and install two 46-12 kV, 10/12.5 MVA distribution transformers.
2. Develop a new system Auiki substation onsite at Kapalama Terminal Yard with provisions for four 46-12 kV, 10/12.5 MVA distribution transformers. Initially, install two 46-12 kV, 10/12.5 MVA distribution transformers.
3. Install two additional 46-12 kV, 10/12.5 MVA distribution transformers at the existing Waiakamilo Substation.

Option 1 – Dedicated Auiki Substation. HDOT Harbors Division identified space within their development that is adequately sized for a HECO distribution substation. In this option, HECO would install two 46-12 kV, 10/12.5 MVA distribution substation transformers and extend two 46 kV circuits to the site. HDOT Harbors Division would install, own, and maintain the 12 kV distribution circuits and associated equipment. For the substation to be dedicated, only HDOT would be served by the substation. This poses an issue because non-HDOT customers will be occupying space within the terminal yard and HDOT Harbors Division does not intend to install nor maintain any of the 12 kV primary distribution facilities. This option resolves the projected 2021

overloads; however, it does not provide substation or circuit capacity to accommodate the forecasted load increases outside of the terminal yard in the Kalihi-Palama area.

Option 2 – System Auiki Substation. This option is similar to Option 1 in that two 46-12 kV, 10/12.5 MVA distribution substation transformers and two 46 kV circuits would be installed for service in 2021. In contrast to option 1, Hawaiian Electric would install and maintain the 12 kV distribution system and make provisions within the substation site to allow expansion for up to four distribution substation transformers. This option would resolve the projected 2021 overloads and provide adequate capacity to serve multiple customers within, as well as the future projected loads surrounding Kapalama Terminal Yard.

Option 3 – Waiakamilo Substation. This option would install two 46-12 kV, 10/12.5 MVA distribution substation transformers at the existing Waiakamilo Substation, a new 46 kV circuit, and four 12 kV circuits. This option would provide sufficient capacity to serve the KCT project, as well as the numerous forecasted loads in the Kalihi-Palama area.

Discussion of Options 1 to 3:

Construction of a dedicated substation (Option 1) must be eliminated from consideration due to the contraints imposed by HDOT and the limitations of providing substation and circuit capacity for load growth outside of the KCT property. The new system substation (Option 2) requires the construction of a new substation but with minimal 12 kV circuit installation since the proposed substation will be located adjacent to the development that is causing the overload conditions. The use of an existing substation (Option 3) has a comparatively smaller scope for the substation work as compared to the new substation option; however, there is extensive 12 kV circuit installation work required due to the existing substation being remote from the new load. Since Option 1 was eliminated from consideration, cost estimates were only developed for the other two options (see Table 4).

COST ANALYSIS

Table 4: Cost Analysis

Option	Name	Cost
2	System Auiki Substation 2-10/12.5 MVA Tsfs	$15,200,000
3	Existing Waiakamilo Substation 2-10/12.5 MVA Tsfs	$26,100,000

Option 2: Construct a new system Auiki Substation and install two 46-12 kV, 10/12.5 MVA transformers is the most cost effective option. The subtransmission and distribution circuit work is minimized due to the location of the substation. Furthermore, this option includes provisions to expand the substation from two to four transformers, which will allow for future load growth.

Option 3: Install capacity at the existing Waiakamilo Substation is the more costly alternative. Being remote to the new loads, this option has 12 kV circuit installation work that is not only more extensive, but is impacted by the Honolulu Authority for Rapid Transit (HART) project and therefore introduces constructability and schedule risks.

NON-TRANSMISSION ALTERNATIVE CONSIDERATIONS

An alternative non-transmission solution considered was a battery energy storage system (BESS).

Based on existing 2017 circuit loading data and the load profile provided for Kapalama Terminal Yard by the customer, seen in Figure 1, the greatest power (kW) and energy (kWH) requirements were identified.

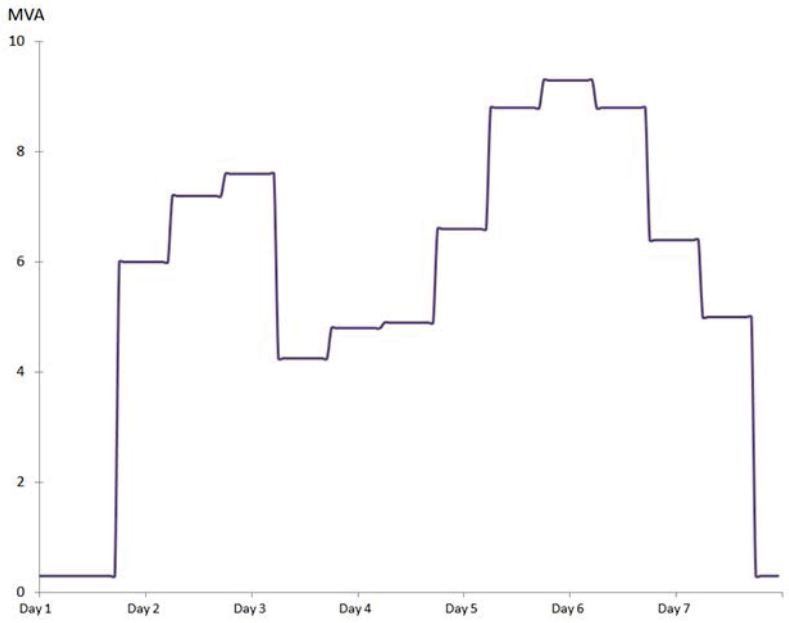


Figure 1: Kapalama Terminal Yard Load Profile

Under normal conditions, the BESS would be interconnected to augment the capacity of the existing Sand Island circuit, fed from the Kapalama 1 substation transformer. In the most extreme emergency overload situation, a portion of Kahai circuit, normally fed from the Kapalama 2 substation transformer, is transferred to Sand Island circuit. A combination of Kapalama 2 transformer load data, circuit spot readings and annual distribution transformer peak load data was used to determine this amount. This load was added to the load profile to account for the worst case scenario for the Kapalama 1 transformer. The maximum demand was found to be 13,891 kW, while the maximum energy requirement was found to be 51,500 kWH, falling on a different day.

For this plan, the battery would be designed to work in conjunction with the existing transformer, handling any load above the normal limit of the transformer. This is illustrated in Figure 2, which shows the battery discharging to provide additional capacity on the circuit. The normal limit of the Kapalama 1 transformer is 10,984 kW. Therefore, the battery capacity would need to be at least 2,907 kW sustained for 18 hours to accommodate the maximum energy requirement.

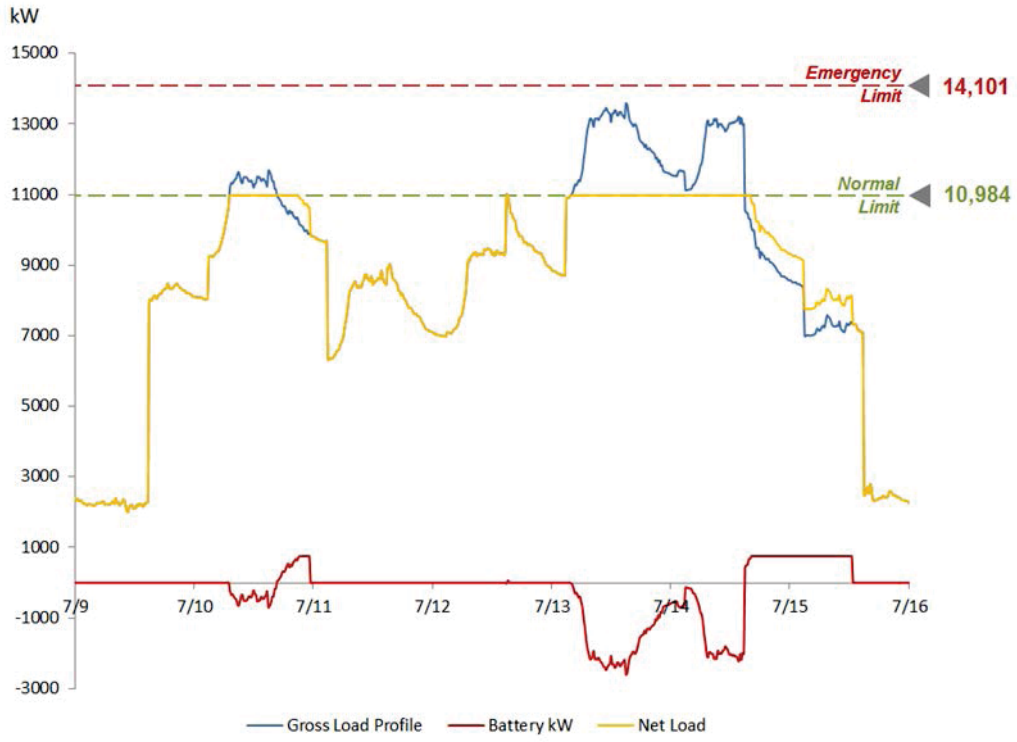


Figure 2: Battery contribution to overall capacity

This solution would utilize three 3000 kW/six-hour batteries. Based on updated December 2016 PSIP[2] utility-scale BESS cost estimates, including high-level interconnection costs, this BESS would cost approximately $17.3 million in the year 2020, and the 15-year replacement BESS in 2035 would cost approximately $14.56 million. This places the final cost of the battery energy storage system at $22.5 million, in present value.

[2] See, PSIP Update Report: December 2016, Appendix J, filed in Docket No. 2014-0183 on December 23, 2016.

The value of substation upfront and operation and maintenance costs avoided because of the battery was summed to find the total benefits of this alternative solution. These results are shown in the cost/benefit analysis shown in Figure 3, where the costs of the BESS outweigh the benefits received.

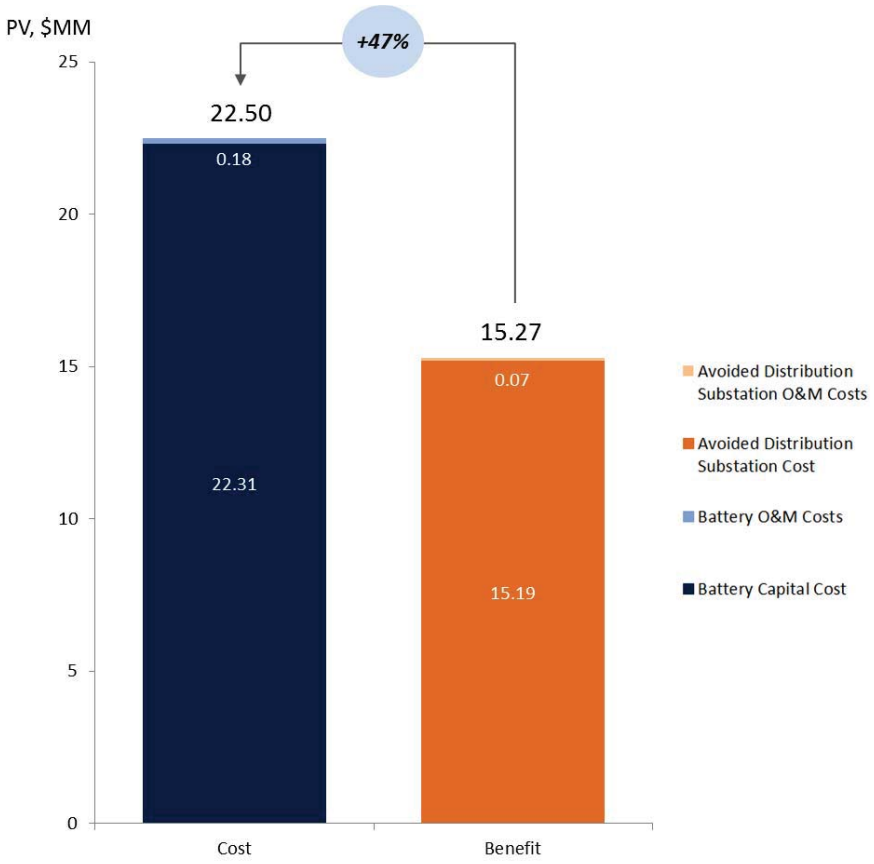


Figure 3: BESS Cost/Benefit Analysis

CONCLUSION

Additional distribution substation and circuit capacity is required by 2021 to alleviate normal overload conditions, to provide backup capability under emergency conditions, and to accommodate the forecasted loads in the Kalihi-Palama region. The installation of two 46-12 kV, 10/12.5 MVA distribution transformers at the proposed system Auiki Substation site is the most desirable option for the following reasons:

- This option alleviates normal overload conditions.
- This option adequately provides back-up capability in the event of an emergency condition.
- The location of the new Auiki Substation near the load growth will minimize distribution circuit installation and costs.
- The new Auiki Substation will have provisions to accommodate a majority of the ultimate projected loads in the vicinity.
- This is the most cost effective option to providing capacity for the Kalihi-Palama study area.

RECOMMENDATIONS

Based on the analysis above, this study recommends selection of Option 2 - installation of the new system Auiki Substation. The proposed project will allow for the timely installation of critical infrastructure to the electrical system which will provide the necessary capacity to serve projected loads and provide essential reliable power under emergency conditions.

The study specifically recommends:

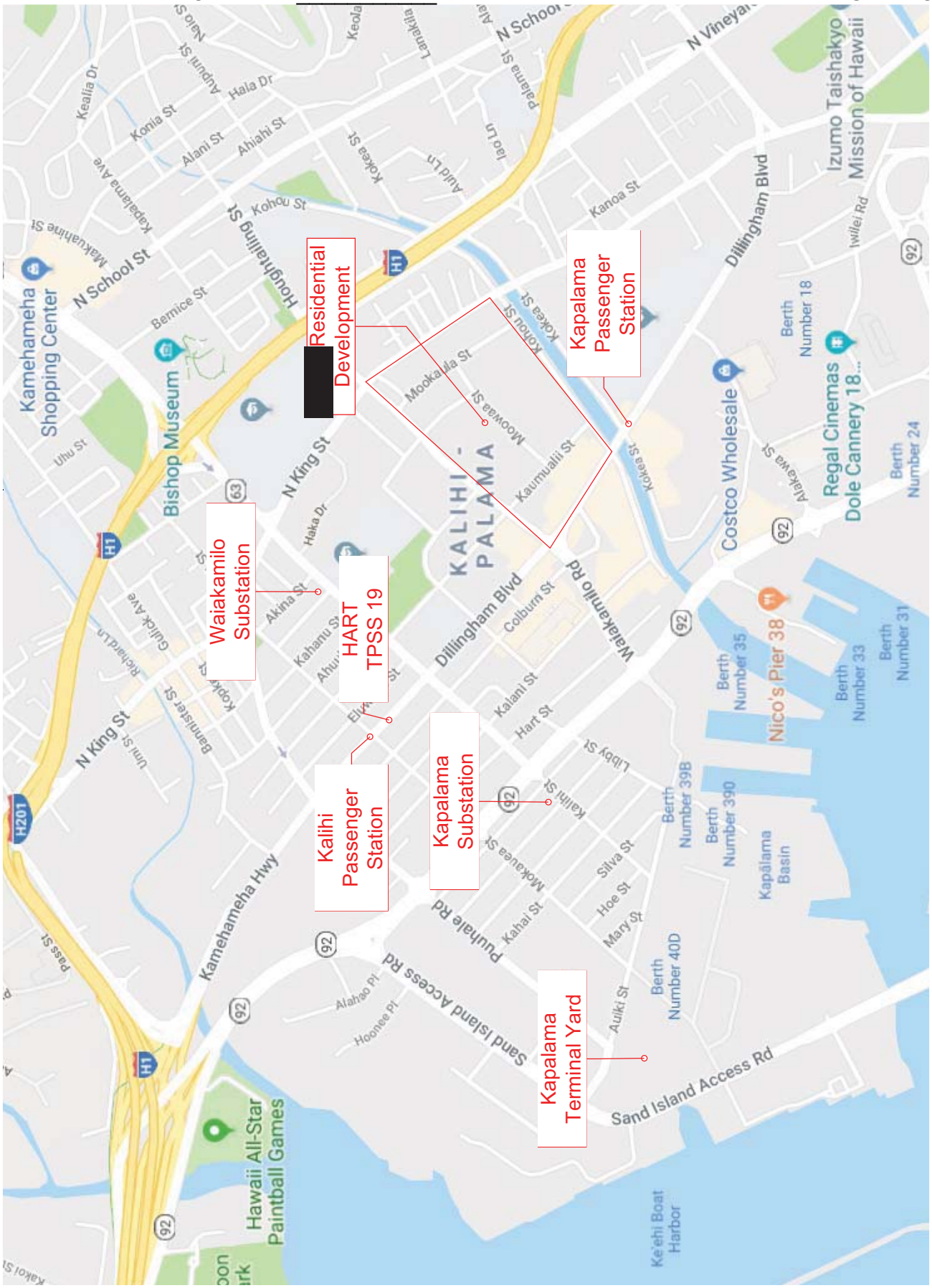
- The design and construction of a new system Auiki distribution substation site, to be sized for ultimately four 10/12.5 MVA distribution transformers.
- The initial installation of two 46-12 kV, 10/12.5 MVA distribution transformers, each with a two circuit radial 12 kV switchgear.
- The installation of four 12 kV circuits at the new Auiki Substation.

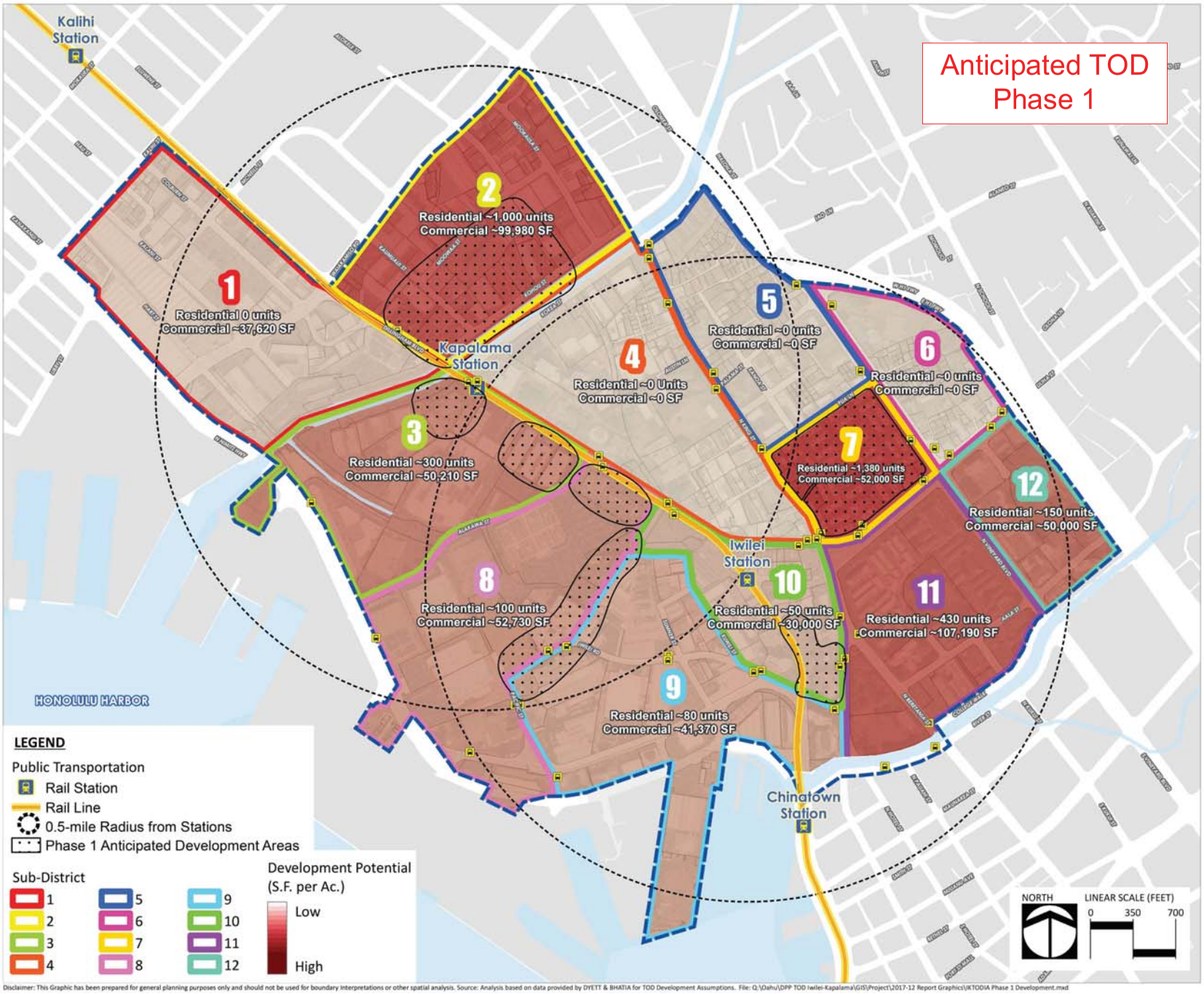
- To serve Auiki Substation by tapping and extending the existing 46 kV Iwilei 1 and Halawa 3 circuits from Puuhale Road and Kalihi Street, respectively.

APPENDIX A

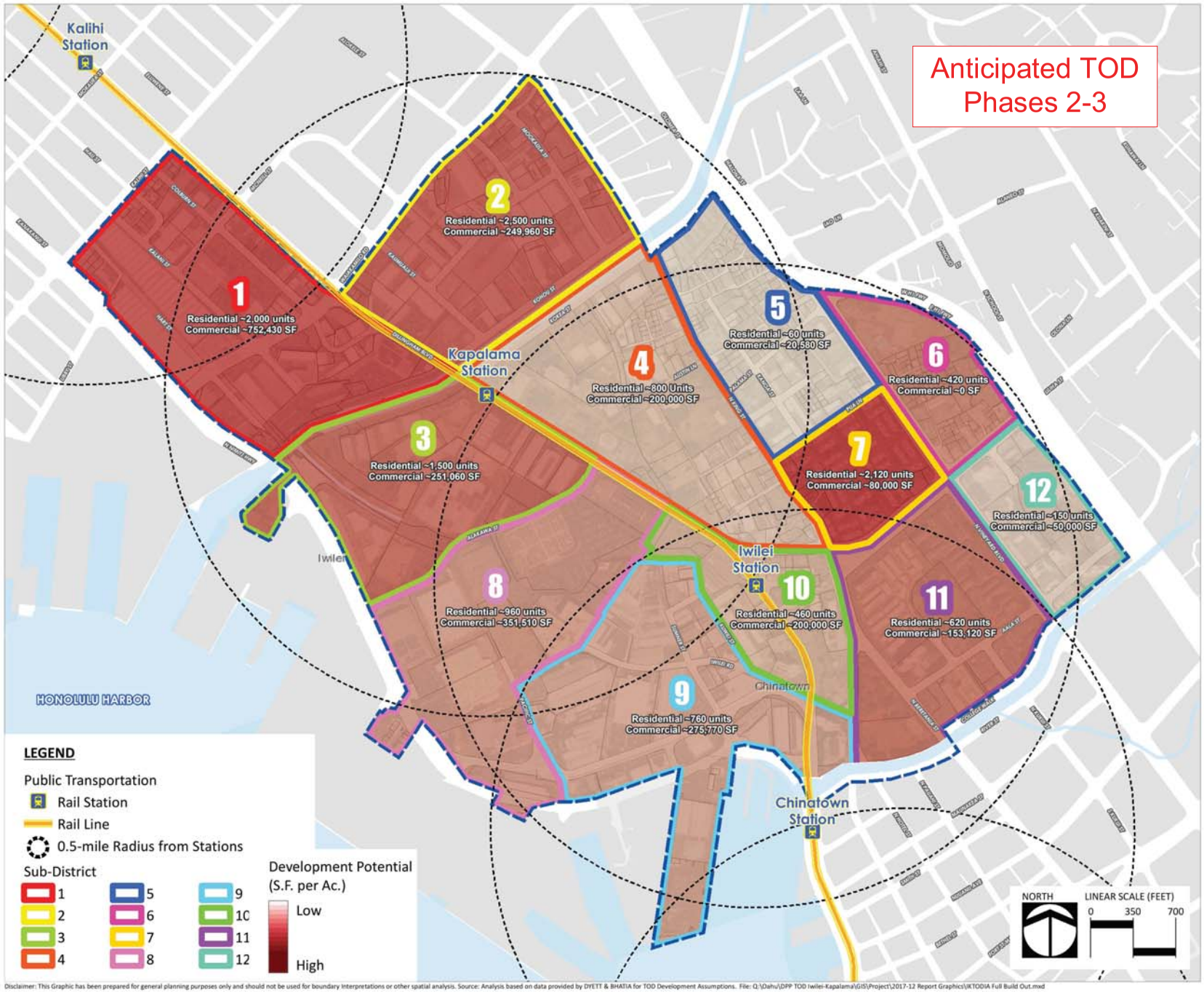
Map of Projected New Loads

and Substation Sites


Residential Development
Kapalama Passenger Station
Waiakamilo Substation
HART TPSS 19
Kalihi Passenger Station
Kapalama Substation
Kapalama Terminal Yard
KALIHI - PALAMA
Kamehameha Shopping Center
Bishop Museum
Costco Wholesale
Regal Cinemas Dole Cannery 18...
Izumo Taishakyo Mission of Hawaii
Nico's Pier 38
Hawaii All-Star Paintball Games
Ke'ehi Boat Harbor
Kapalama Basin
N School St
N King St
Houghtailing St
Dillingham Blvd
Waiakamilo Rd
Kamehameha Hwy
Puuhale Rd
Sand Island Access Rd



Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis. Source: Analysis based on data provided by DYETT & BHATIA for TOD Development Assumptions. File: Q:\Oahu\DPP TOD Iwilei-Kapalama\GIS\Project\2017-12 Report Graphics\IKTODIA Phase 1 Development.mxd



Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis. Source: Analysis based on data provided by DYETT & BHATIA for TOD Development Assumptions. File: Q:\Oahu\DPP TOD Iwilei-Kapalama\GIS\Project\2017-12 Report Graphics\IKTODIA Full Build Out.mxd

APPENDIX B

SLACA Study Forecast

Before Auiki Substation Project

Case Solved: 4/3/2018 W

Kapalama

Kapalama 1 (147) 46.00 - 11.50 kV OA/FA 10000 / 10000 kVA L-L 10984 / 14101 kVA 7/13/2017 Growth 1.0 %

	CT	BKR	UG	OH	LmkVA	A2017	P2018	P2019	P2020	P2021	P2022	P2023	P2024	P2025	P2026
Mokauea(1594)	600	1200	438	515	8725	2559A	2584R	2610R	4267RS	4310R	4353R	4396R	4440R	4485R	4530R
Sand Island(1400)	600	1200	438	515	8725	2874A	2903R	2932R	2962R	12273N$	12395R*	12519R*	12644R*	12771R*	12899R*
				Substation Total		5433	5487	5542	7229	16582#	16748#	16916#	17085#	17256#	17428#

Mokauea	N	0	0	0	0	0	0	0	0	0
	T	0	0	1631	0	0	0	0	0	0
Sand Island	N	0	0	0	9311	0	0	0	0	0
	T	0	0	0	0	0	0	0	0	0

Circuit	*Change Type*	*Date*	*Load kVA*	*Project No.*	*Notes*
Mokauea	Tran Load	2020	1631	Rail	Transfer from Waiakamilo 2-Waiakamilo 4 Transfer load from Waiakamilo 4 to Mokauea; Open SW3468; Close SW3947 Used to compensate the addition of TPSS#19
Sand Island	New Load	2021	9311		Kapalama Container Terminal
	Indef		951	CE063657LY	HSI Electric - on hold might be cancelled

Substation Notes: 46kV Fuse Type: SMD-2B

2011 Peak: 7598 KVA on 4/14/11 13:00 (PQWeb)
2012 Peak: 7305 KVA with 87% PF on 9/19/12 11:30 (PQWeb)
2013 Peak: 6958 KVA with 86% PF on 9/10/13 11:15 (PQWeb)
2014 Peak: 6691 KVA with 87% PF on 10/8/14 10:45 (PQWeb)
2015 Peak: 6599 KVA with 87% PF on 8/20/15 10:15 (PQWeb)
2016 Peak: 6224 KVA with 88% PF on 5/25/16 13:45 (PQWeb)
2017 Peak: 5433 KVA with 89% PF on 7/26/17 9:00 (PQWeb)

APPENDIX C

Area Review:

Emergency Overload Condition Analysis

Before Auiki Substation Project

Kapalama 1 TSF 46-11.5-kV Substation Transforme Area Re w
2 7A (P202)

CONDITION	2 1	Mokau	Sa Is	Kplma1	Hghtlng	K hai	Kplma 2	P hale	Wkmlo-Kplma	Kplm 3	Wkml3	Wkml4	Wkml2	Iwilei 1 11kV	Iwilei 2	Iwilei 1
Normal Ratings (kVA)		8 4	8 4	1 4	6 2	8 4	1 0	8 4	8 4	12788	8 6	8 6	1 73	9 1		1 0
Emergency Ratings (kVA)		1 8	1 8	1 1	8 7	1 8	1 5	1 8	1 8	1 5	1 9	101 9	1	5		1 0
Normal Loads (kVA)		2 9	2 1	5 0	2 5	6 4	9 9	1 9	6 3	8 2	4 8	2 6	7204	4649	0	4 9
Percent Normal Overload		0		0	0	0	0	0	0	0			0	0	0	0
Normal Capacity (kVA)		6 5	5 3	5 4	4 7	2 0	4 1	6 5	1 1	4 6	3 8	5 0	6 9	4912	0	5 1
KAPALAMA 1 TSF FAILS:	Loads:															
Immediately after Outage (Auto Transfer)																
PTM Transfer Circuit- Mokauea Ckt																
OPEN SW1 R; CLOSE SW1608	4 0	- 0		- 0				4 0		4 0						
TRANSFER TO PUUHALE CKT																
PTM Transfer Circuit- Sand Island Ckt																
LR OPEN SW 1 , CLOSE SW 3 9	3 0								-3460	-3460				3 0		3 0
WKM O-KPL A PORTION TO IWILEI 1 11kV																
CLOSE SW 3 TO WKM O-KPL A CKT	12302		- 2	- 2					1 2	1 2						
Emergency Load (kVA)		0	0	0	2 1	6 9	9 0	6 9	1 5	2 4	4 8	3 4	8 2	8 7	0	8 7
Emergency Capacity (kVA)		1 8	1 8	1 1	5 6	3 9	7 5	4 9	- 7	- 9	5 1	6 5	8620	2 8	0	5 3
Percent Emergency Overload		0	0	0	0	0	0	0	52	41	0	0	0	0	0	0
Year of Emergency Overload					2157	2062	2079	2073	2021	2021	2101	2123	2093	2046		2069
Year of 5% Emergency Overload					2162	2067	2084	2078	2021	2021	2106	2128	2098	2051		2074

NDITION	htlng K Kplm	2 ka Kplm	Wk lo ad Kplm Kplm	Wk l Wkml4 Wk l	la 1 la 2 la 1
al R (kVA)					
e e s (kVA)					
al Loads (kVA)					
ercent Nor l Overlo					
al Capac (kVA)					
EN SW ; CLO E SW A 2 KT EN SW , SW 9; CLO E SW S ND IS ND CKT K uiki Villag e SE SW 7, TO PUUHALE CKT					
e e L ad (kVA)					
e e Capac (kVA)					
ercent E ergency Overlo					
ear of Nor l Overlo					
ear of E ergency Overlo					
ear of 5% ergency Overlo					

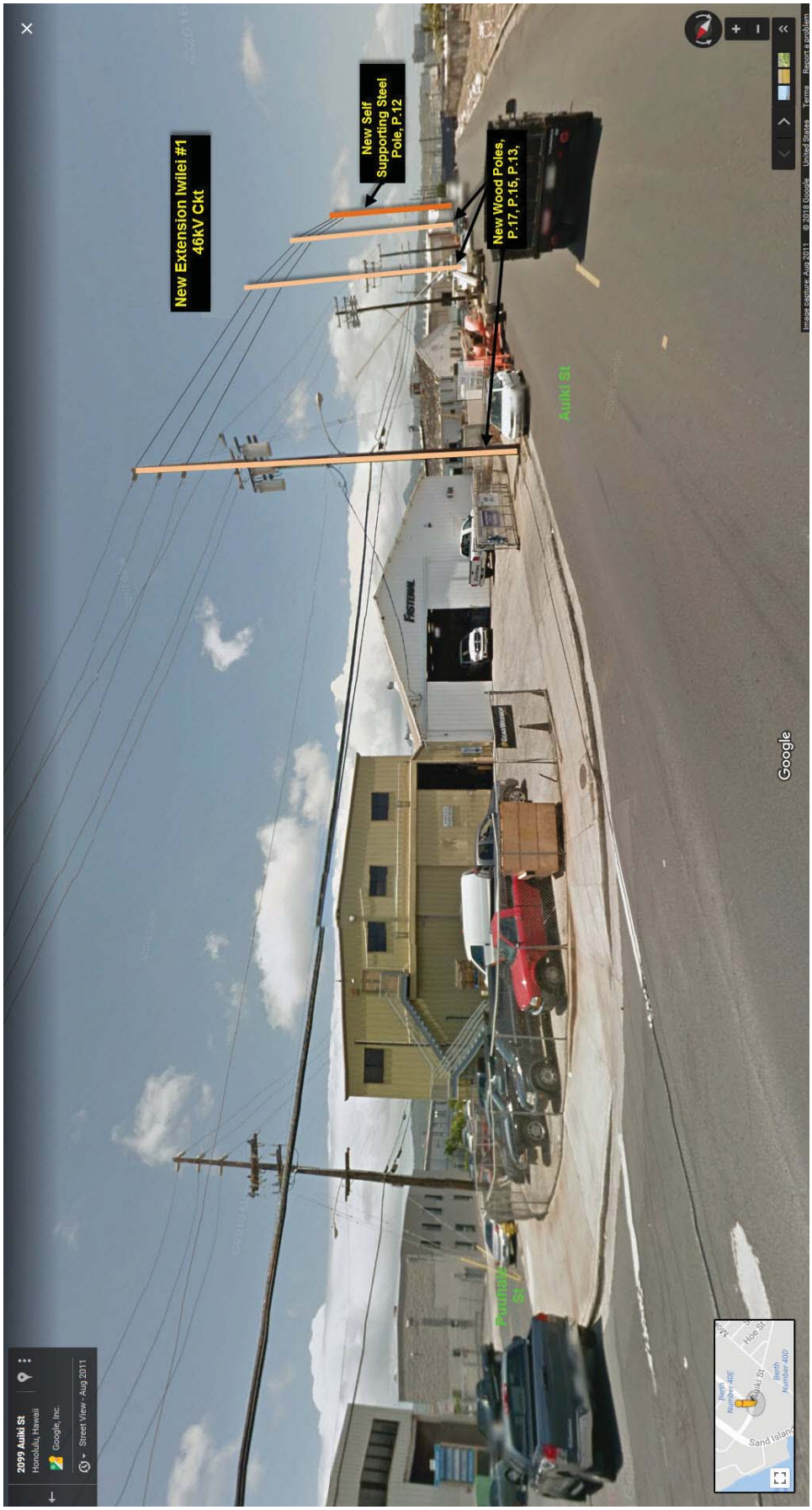
3 T

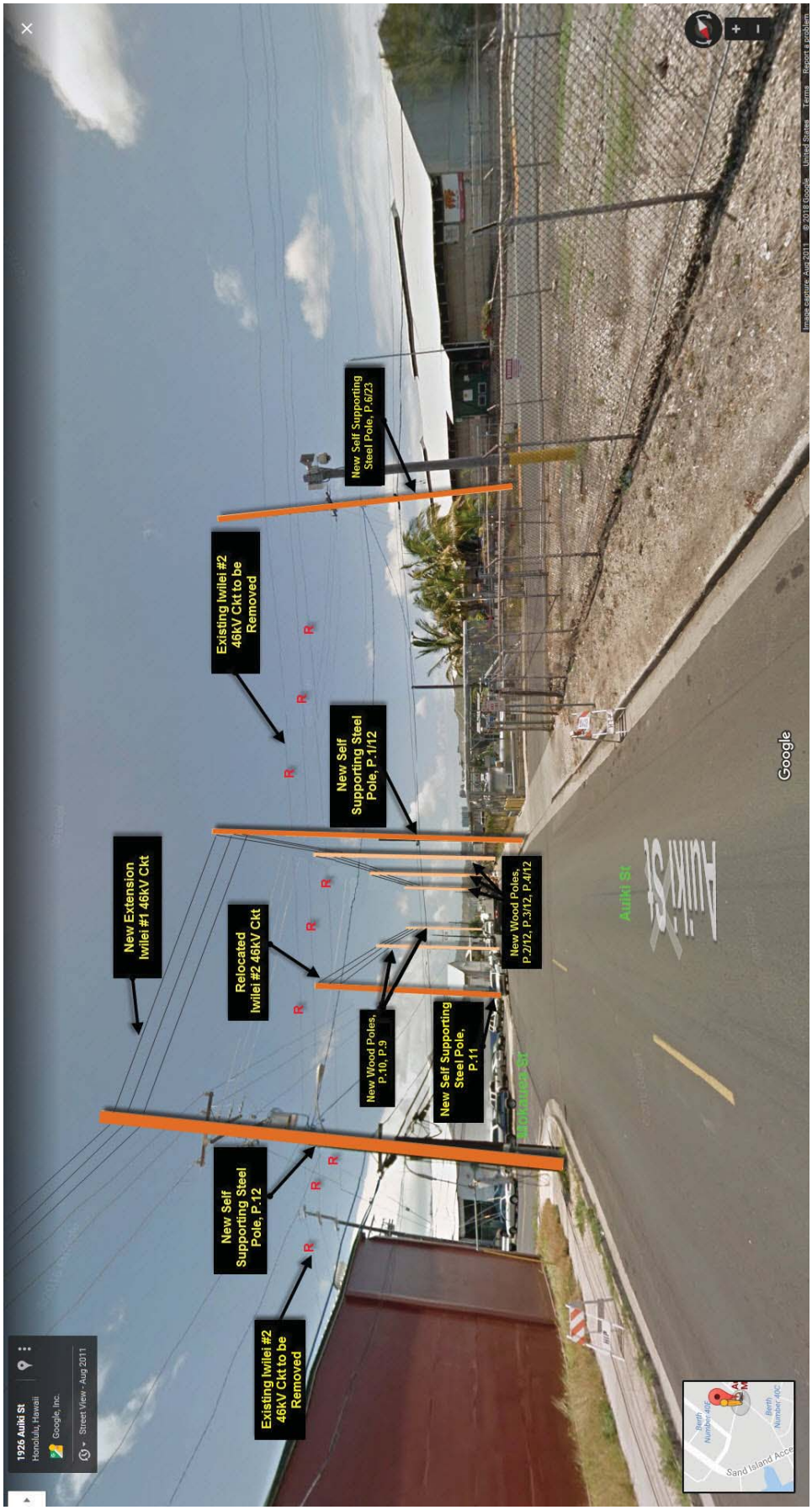
ITIO	Wkmlo le Kplm Kplm	k e d l Kplm	ghtlng Ka Kplma 2	Wkml3 Wkml4 Wkml2	Iwilei 1 Iwilei 2 Iwilei 1
l R (kV					
Emerge y R (kV					
l L kV					
Pe ent No l Overlo					
l C pa ity (kV					
3 T ____ **- Puuhal** E SW 71 , TR TO W I K ILO 3 **t - W** EN SW C E SW 34 , TO S I E SW 39 , P TION TO IWILEI					
Emerge y L d (kV					
Emerge y C pa ity (kV					
Pe ent Emerge y Overlo					
Ye o Emerge y Overlo					
Ye o 5% Emerge y Overlo					

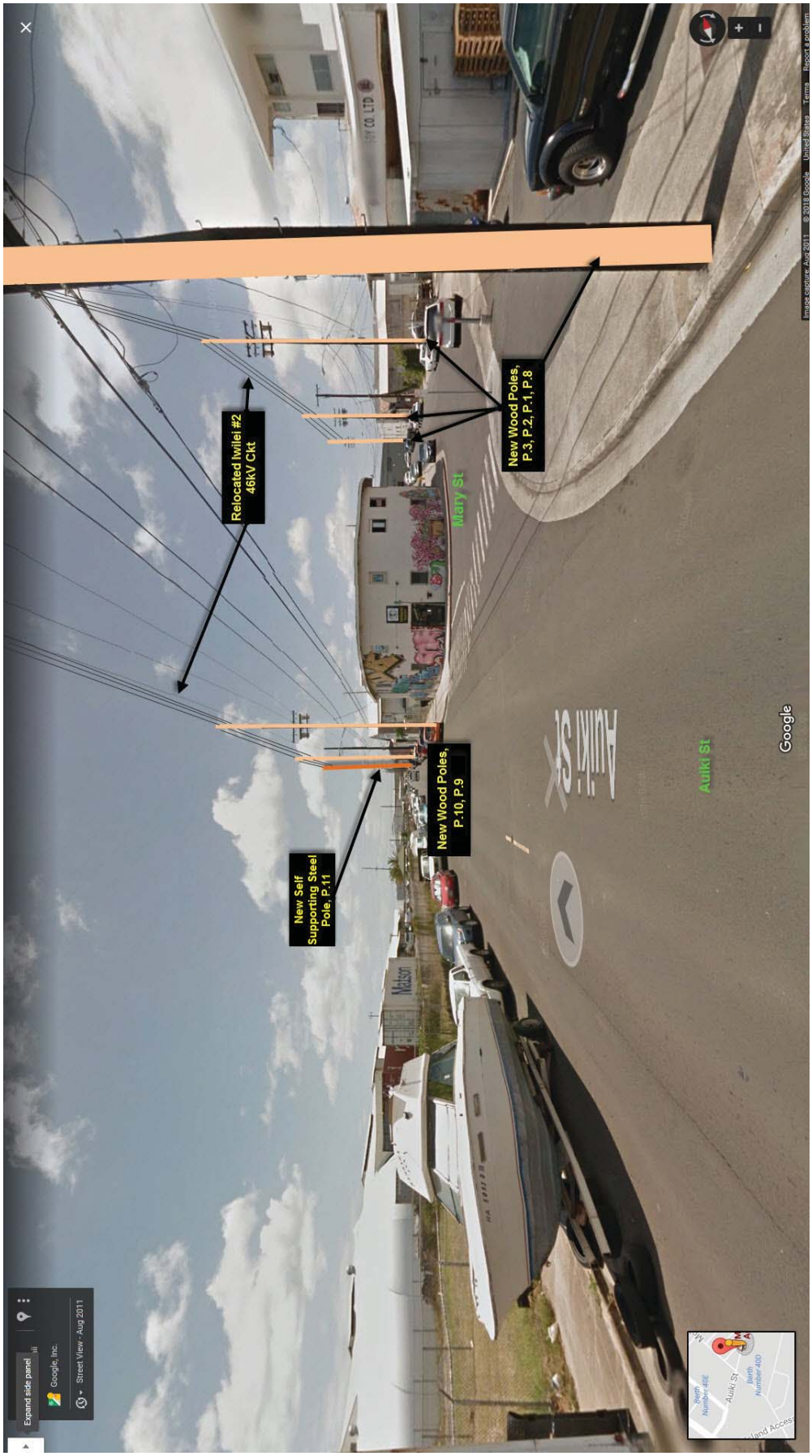
Waiakam

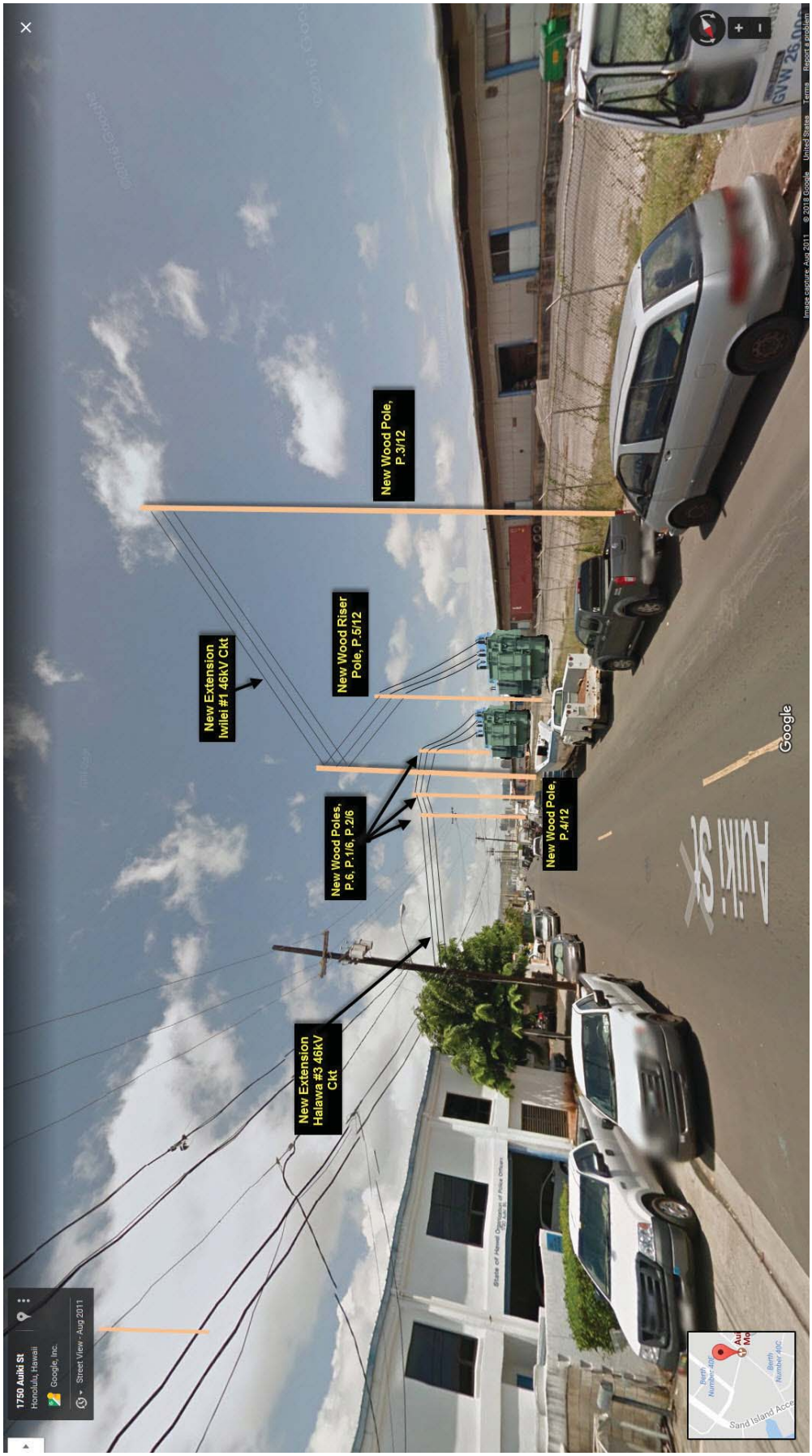
NDITION	Wk l Wkml4 Wk l2	Wk l Wkml2 Wk l	Wk lo kplm Kplm	pu lu fter apu	ka Kplm
al R (kVA):					
e e s (kVA):					
l L (kVA					
ercent Nor l Overlo					
al Capac (kVA)					
W lo #2 _____ AT TPS pe Sw 39 , Cl e Sw 10 t e lo e Sw 7 P 8 to P hale Cl e Sw 39 P3 t M k ue TPS 1					
e e L ad (kVA)					
e e Capac (kVA)					
ear of Nor l Overlo					
ercent E ergency Overlo					
ear of E ergency Overlo					
ear of 5% ergency Overlo					

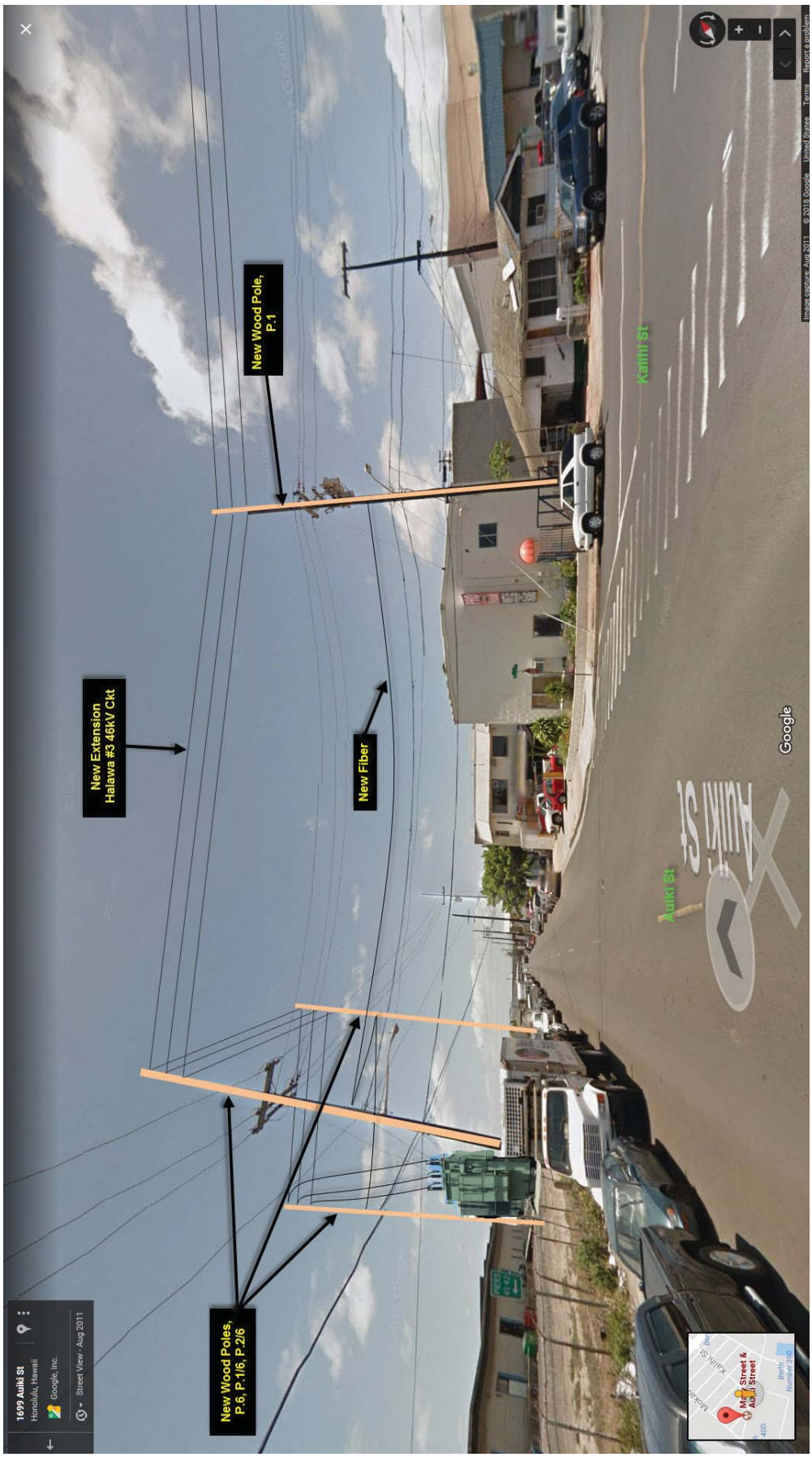

Halawa #3 46kV EXISTING OH CKT
Halawa #3 46kV NEW OH CKT
Iwilei #2 46kV EXISTING OH CKT
Iwilei #2 46kV NEW OH CKT
NEW Kapalama Container Substation
Iwilei #2 46kV NEW UG CKT
Iwilei #1 46kV NEW OH CKT
REMOVE Iwilei #2 46kV EXISTING OH CKT
Iwilei #1 46kV NEW OH CKT
Iwilei #1 46kV EXISTING OH CKT
Steel Pole Riser
Steel Pole Riser

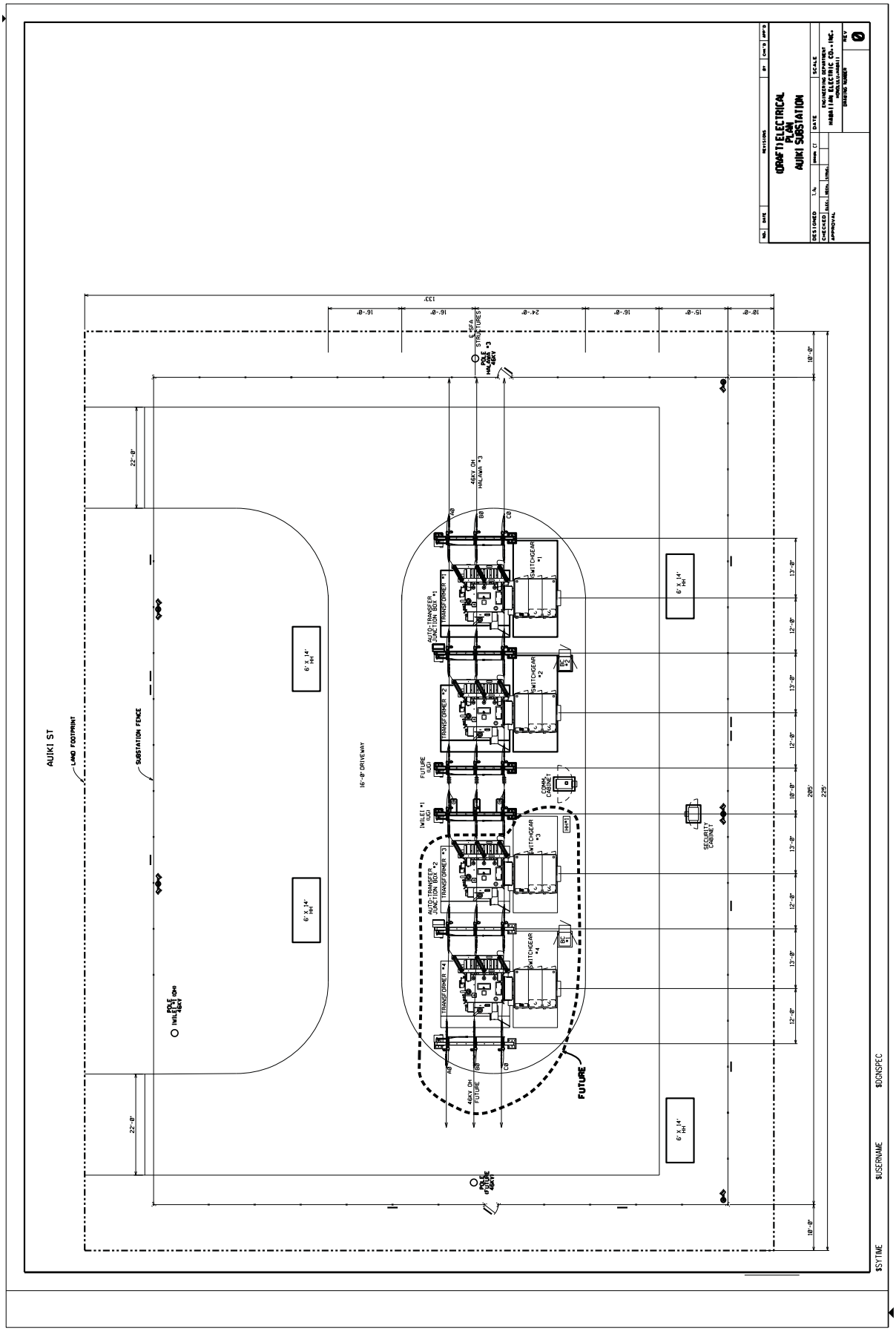

New Extension Iwilei #1
46kV Ckt
New Self
Supporting Steel
Pole, P.12
New Wood Poles,
P.17, P.15, P.13,
Auiki St
Pauhawa
St
Google
2099 Auiki St
Honolulu, Hawaii
Google, Inc.
Street View - Aug 2011
Image capture: Aug 2011 © 2018 Google United States Terms Report a problem
Sand Island

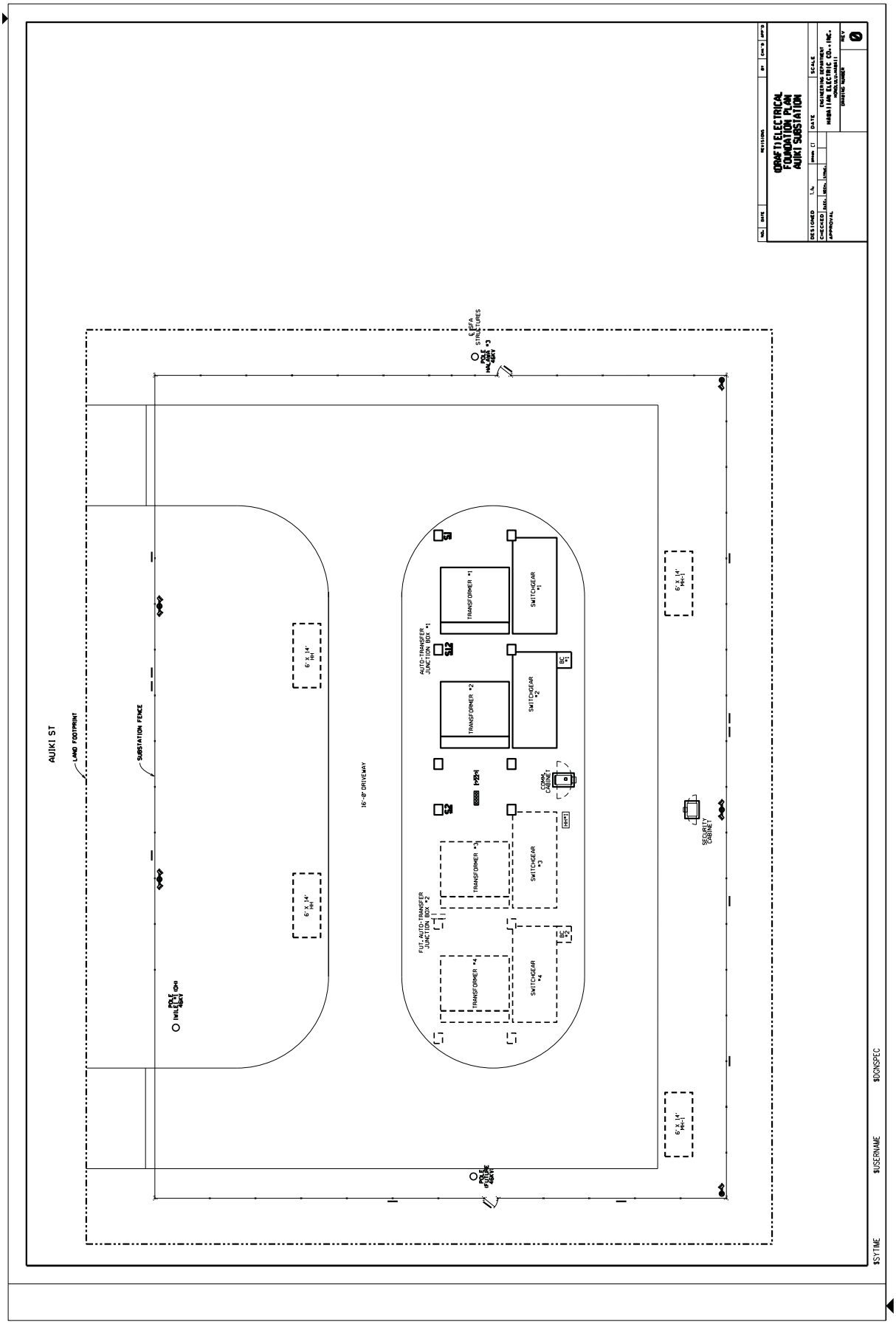

1926 Auiki St
Honolulu, Hawaii
Google, Inc.
Street View - Aug 2011
Existing Iwilei #2 46kV Ckt to be Removed
New Self Supporting Steel Pole, P.12
New Extension Iwilei #1 46kV Ckt
Relocated Iwilei #2 46kV Ckt
New Wood Poles, P.10, P.9
New Self Supporting Steel Pole, P.11
New Wood Poles, P.2/12, P.3/12, P.4/12
New Self Supporting Steel Pole, P.1/12
Existing Iwilei #2 46kV Ckt to be Removed
New Self Supporting Steel Pole, P.6/23
Auiki St
Mokauea St
Google

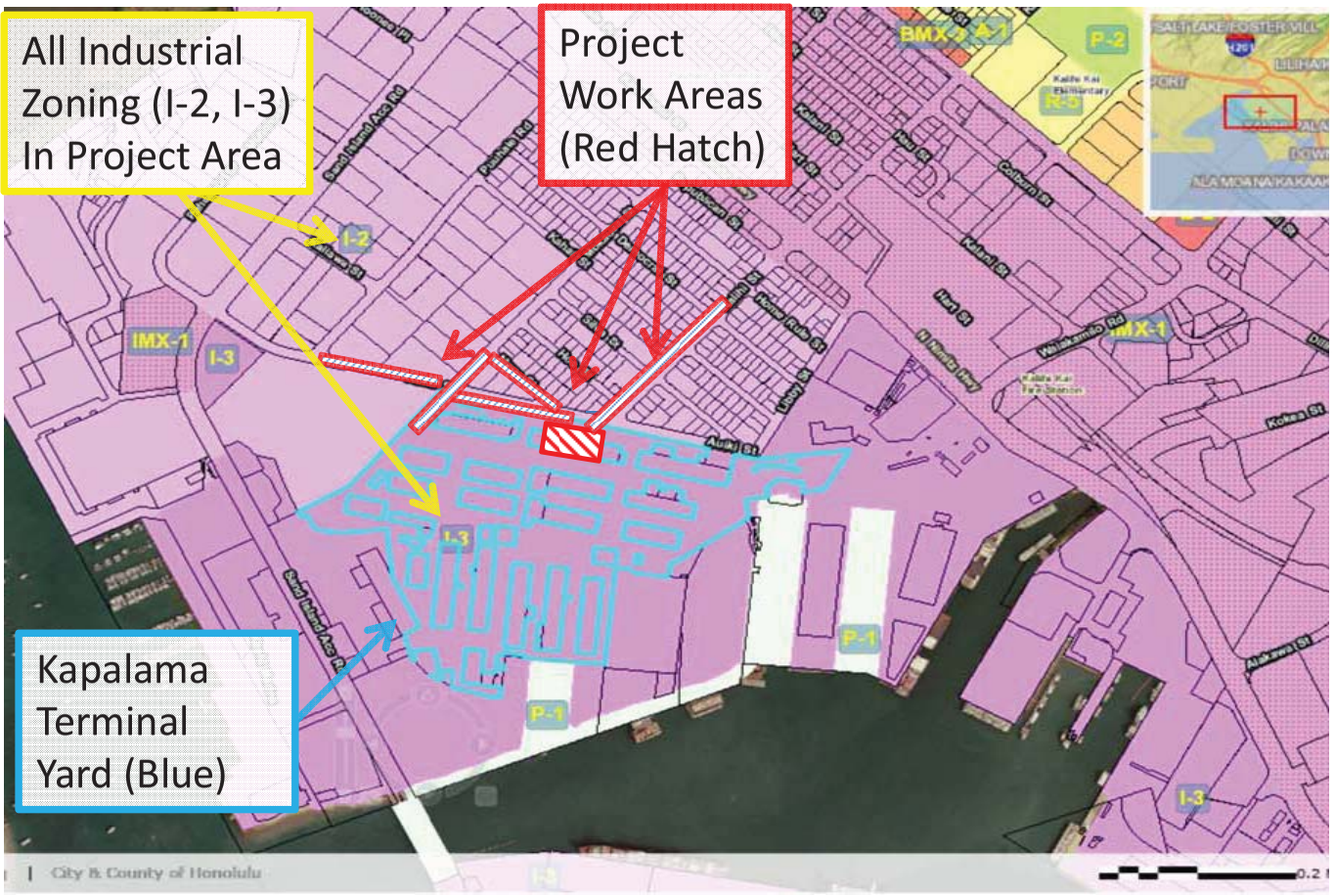

Relocated Iwilei #2
46kV Ckt
New Wood Poles,
P.3, P.2, P.1, P.8
Mary St
New Wood Poles,
P.10, P.9
New Self
Supporting Steel
Pole, P.11
Auiki St
Auiki St
Google
Watson
Expand side panel
Google, Inc.
Street View - Aug 2011


New Extension Halawa #3 46kV Ckt
New Extension Iwilei #1 46kV Ckt
New Wood Poles, P.6, P.1/6, P.2/6
New Wood Riser Pole, P.5/12
New Wood Pole, P.4/12
New Wood Pole, P.3/12
Auiki St
Google
1750 Auiki St
Honolulu, Hawaii
Google, Inc.
Street View - Aug 2011
Image capture: Aug 2011 © 2018 Google United States Terms Report a problem
Sand Island Acce


New Wood Poles, P.6, P.1/6, P.2/6
New Extension Halawa #3 46kV Ckt
New Fiber
New Wood Pole, P.1
1699 Auiki St
Honolulu, Hawaii
Google, Inc.
Street View - Aug 2011
Auiki St
Kalihi St
Google


DRAFT) ELECTRICAL PLAN
AUIKI SUBSTATION
AUIKI ST
LAND FOOTPRINT
SUBSTATION FENCE
16'-0" DRIVEWAY
133'
22'-0"
285'
229'
SWITCHGEAR #1
SWITCHGEAR #2
SWITCHGEAR #3
SWITCHGEAR #4
TRANSFORMER #1
TRANSFORMER #2
TRANSFORMER #3
TRANSFORMER #4
AUTO-TRANSFER JUNCTION BOX #1
AUTO-TRANSFER JUNCTION BOX #2
FUTURE
COMM CABINET
SECURITY CABINET
46KV CH HALAWA #1
46KV CH FUTURE
POLE 46KV
6' X 14' HH


DRAFT ELECTRICAL FOUNDATION PLAN
AUIKI SUBSTATION
HAWAIIAN ELECTRIC CO., INC.
AUIKI ST
LAND FOOTPRINT
SUBSTATION FENCE
16'-0" DRIVEWAY
TRANSFORMER #1
SWITCHGEAR #1
TRANSFORMER #2
SWITCHGEAR #2
TRANSFORMER #3
SWITCHGEAR #3
TRANSFORMER #4
SWITCHGEAR #4
AUTO-TRANSFER JUNCTION BOX #1
FUT. AUTO-TRANSFER JUNCTION BOX #2
COMM. CABINET
SECURITY CABINET
6'X 14' MH-1
CEFA STRUCTURES
$SYTIME
$USERNAME
$DONSPEC

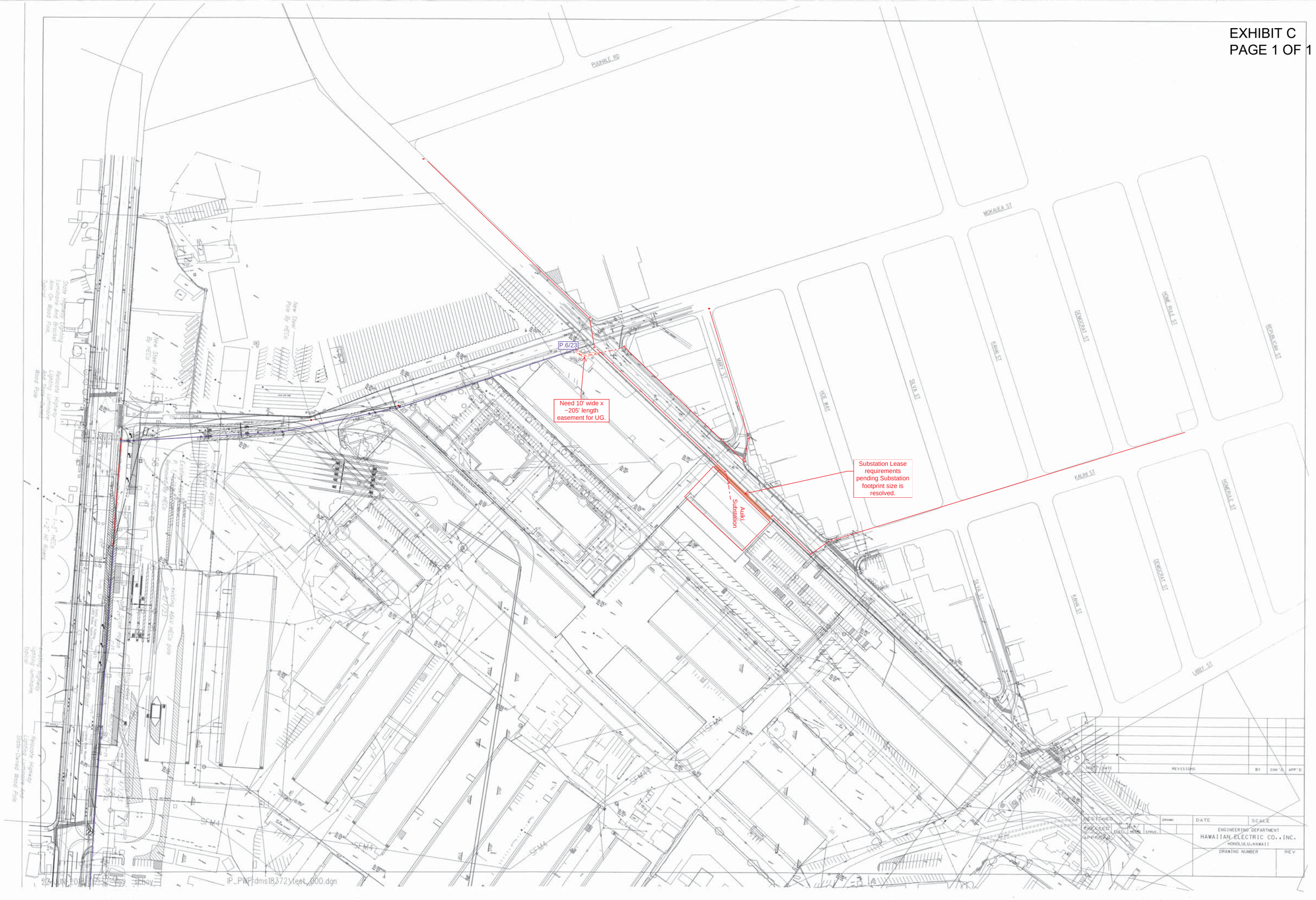


Auiki Substation at Kapalama Terminal Yard

City and County of Honolulu, Dept. of Planning and Permitting Zoning (TMKs): (1) 1-2-025:011 AND 054

Figure – http://gis.hicentral.com/FastMaps/ParcelZoning/

EXHIBIT C
PAGE 1 OF 1



PROJECT COST ESTIMATE

Project Title: Auiki Substation
Budget Item: P0004260, P0004261, P0004262

	P0004260	P0004261	P0004262	TOTAL
LABOR	$ 124,769	$ 1,015,206	$ 707,507	$ 1,847,481
MATERIALS	$ 104,703	$ 2,394,683	$ 417,165	$ 2,916,552
OUTSIDE SERVICES	$ 693,077	$ 3,215,770	$ 1,953,835	$ 5,862,682
OTHER	$ -	$ 157,500	$ -	$ 157,500
OVERHEAD	$ 279,995	$ 1,966,742	$ 1,026,114	$ 3,272,851
AFUDC	$ 124,470	$ 521,797	$ 229,470	$ 875,737
TOTAL COST OF PROJECT	$ 1,327,014	$ 9,271,697	$ 4,334,091	$ 14,932,803
ESTIMATED CONTRIBUTIONS	$ -	$ -	$ -	$ -
NET PROJECT COST	$ 1,327,014	$ 9,271,697	$ 4,334,091	$ 14,932,803

P0004260: Auiki Substation - Telecom

	Group	Hours	Dollars
ENGINEERING			
Proj Mgt Division	(BP)	490	24,956
Structural	(BT)	26	1,047
Substation & Telecom	(BY)	624	30,150
GOVERNMENT RELATIONS			
Government Relations	(NI)	9	501
REG RATE PROCEEDINGS			
Reg Rate Proceedings	(NP)	70	2,921
TEST & SUBSTATION			
Communications	(RC)	160	8,912
Instrument & Control	(RI)	126	7,433
Substation	(RS)	55	3,275
Construction Mgt	(RX)	776	45,574
Total		2,336	124,769

P0004261: Auiki Substation - Substation

	Group	Hours	Dollars
ENGINEERING			
Admin	(BA)	86	3,348
Proj Mgt Division	(BP)	490	24,956
Structural	(BT)	2,306	115,209
Substation & Telecom	(BY)	1,488	69,380
ENTERPRISE OPER SVCS			
Corporate Safety	(FS)	5	207
ENVIRONMENTAL			
Water & Haz Mat	(JW)	149	7,316
LEGAL			
Legal	(NC)	45	2,694
Land & Rights of Way	(NL)	16	662
GOVERNMENT RELATIONS			
Government Relations	(NI)	25	1,417
REG RATE PROCEEDINGS			
Reg Rate Proceedings	(NP)	70	2,921
COMM RELATIONS			
Comm Relations	(QR)	65	2,728
SYSTEM OPERATIONS			
Operating Dispatch	(RD)	20	1,194
TEST & SUBSTATION			
Instrument & Control	(RI)	809	47,445
Relay	(RR)	1,188	72,116
Substation	(RS)	3,691	218,887
Construction Mgt	(RX)	6,945	395,625
Protection	(XR)	80	4,262
PRICING			
Pricing	(SP)	10	414
SUPPORT SERVICES			
Electric & Welding Svcs	(VL)	769	39,304
Purchasing	(VP)	80	3,415
CUST INSTALLATIONS			
Planning & Design	(WP)	35	1,705
Total		18,372	1,015,206

P0004262: Auiki Substation - T&D

	Group	Hours	Dollars
ENGINEERING			
T&D Engineering	(BE)	920	45,416
Proj Mgt Division	(BP)	490	24,956
Structural	(BT)	39	1,570
CONSTR & MAINT			
Field Operation	(DF)	160	10,550
Planning	(DP)	80	3,794
Operations	(DS)	9,329	571,110
GOVERNMENT RELATIONS			
Government Relations	(NI)	9	501
REG RATE PROCEEDINGS			
Reg Rate Proceedings	(NP)	70	2,921
CORPORATE ENTRIES			
Off Duty Police	(ZP)	1,161	46,689
Total		12,258	707,507

Auiki Substation Bill Impact
Summary

				Transformer& Switchgear			TransmissionConductors/Poles			Consolidated		
		Estimated		Revenue	Rate Impact	Bill Impact	Revenue	Rate Impact	Bill Impact	Revenue	Rate Impact	Bill Impact
Year		MWH Sales[1]		Requirement	cents per kWh	500 kWh[2]	Requirement	cents per kWh	500 kWh[2]	Requirement	cents per kWh	500 kWh[2]
		A		*B*	*C=(B*100)/(A*1000)*	*D=C*500/100*	*E*	*F=(E*100)/(A*1000)*	*G=F*500/100*	*H*	*I=(H*100)/(A*1000)*	*J=I*500/100*
2021	1	6,566,500		529,170	0.0081	$ 0.04	216,392	0.0033	$ 0.02	745,562	0.0114	$ 0.06
2022	2	6,530,600		1,211,045	0.0185	$ 0.09	503,901	0.0077	$ 0.04	1,714,946	0.0263	$ 0.13
2023	3	6,407,600		1,179,457	0.0184	$ 0.09	490,352	0.0077	$ 0.04	1,669,809	0.0261	$ 0.13
2024	4	6,355,400		1,149,347	0.0181	$ 0.09	477,407	0.0075	$ 0.04	1,626,754	0.0256	$ 0.13
2025	5	6,249,900		1,120,605	0.0179	$ 0.09	465,021	0.0074	$ 0.04	1,585,626	0.0254	$ 0.13
2026	6	6,195,700		1,093,128	0.0176	$ 0.09	453,153	0.0073	$ 0.04	1,546,280	0.0250	$ 0.12
2027	7	6,097,300		1,066,821	0.0175	$ 0.09	441,763	0.0072	$ 0.04	1,508,584	0.0247	$ 0.12
2028	8	5,995,200		1,041,596	0.0174	$ 0.09	430,816	0.0072	$ 0.04	1,472,412	0.0246	$ 0.12
2029	9	5,829,800		1,016,976	0.0174	$ 0.09	420,116	0.0072	$ 0.04	1,437,092	0.0247	$ 0.12
2030	10	5,735,300		992,442	0.0173	$ 0.09	409,452	0.0071	$ 0.04	1,401,894	0.0244	$ 0.12
2031	11	5,629,600		967,909	0.0172	$ 0.09	398,787	0.0071	$ 0.04	1,366,696	0.0243	$ 0.12
2032	12	5,594,700		988,268	0.0177	$ 0.09	406,480	0.0073	$ 0.04	1,394,748	0.0249	$ 0.12
2033	13	5,554,500		960,462	0.0173	$ 0.09	394,478	0.0071	$ 0.04	1,354,940	0.0244	$ 0.12
2034	14	5,546,900		932,657	0.0168	$ 0.08	382,475	0.0069	$ 0.03	1,315,132	0.0237	$ 0.12
2035	15	5,560,800		904,851	0.0163	$ 0.08	370,473	0.0067	$ 0.03	1,275,324	0.0229	$ 0.11
2036	16	5,579,400		877,045	0.0157	$ 0.08	358,470	0.0064	$ 0.03	1,235,516	0.0221	$ 0.11
2037	17	5,577,000		849,240	0.0152	$ 0.08	346,468	0.0062	$ 0.03	1,195,708	0.0214	$ 0.11
2038	18	5,590,300		821,434	0.0147	$ 0.07	334,465	0.0060	$ 0.03	1,155,899	0.0207	$ 0.10
2039	19	5,615,900		793,629	0.0141	$ 0.07	322,463	0.0057	$ 0.03	1,116,091	0.0199	$ 0.10
2040	20	5,674,100		765,823	0.0135	$ 0.07	310,460	0.0055	$ 0.03	1,076,283	0.0190	$ 0.09
2041	21	5,680,000		741,182	0.0130	$ 0.07	299,752	0.0053	$ 0.03	1,040,934	0.0183	$ 0.09
2042	22	5,723,300		722,869	0.0126	$ 0.06	291,631	0.0051	$ 0.03	1,014,500	0.0177	$ 0.09
2043	23	5,765,700		707,721	0.0123	$ 0.06	284,805	0.0049	$ 0.02	992,526	0.0172	$ 0.09
2044	24	5,829,900		692,573	0.0119	$ 0.06	277,978	0.0048	$ 0.02	970,551	0.0166	$ 0.08
2045	25	5,904,600		677,425	0.0115	$ 0.06	271,152	0.0046	$ 0.02	948,577	0.0161	$ 0.08
2046	26	5,995,800		662,277	0.0110	$ 0.06	264,325	0.0044	$ 0.02	926,603	0.0155	$ 0.08
2047	27	6,082,800		647,129	0.0106	$ 0.05	257,499	0.0042	$ 0.02	904,628	0.0149	$ 0.07
2048	28	6,082,800	3	631,981	0.0104	$ 0.05	250,672	0.0041	$ 0.02	882,654	0.0145	$ 0.07
2049	29	6,082,800	3	616,833	0.0101	$ 0.05	243,846	0.0040	$ 0.02	860,679	0.0141	$ 0.07
2050	30	6,082,800	3	601,685	0.0099	$ 0.05	237,019	0.0039	$ 0.02	838,705	0.0138	$ 0.07
2051	31	6,082,800	3	586,537	0.0096	$ 0.05	230,193	0.0038	$ 0.02	816,730	0.0134	$ 0.07
2052	32	6,082,800	3	571,389	0.0094	$ 0.05	223,366	0.0037	$ 0.02	794,756	0.0131	$ 0.07
2053	33	6,082,800	3	556,241	0.0091	$ 0.05	216,540	0.0036	$ 0.02	772,781	0.0127	$ 0.06
2054	34	6,082,800	3	541,093	0.0089	$ 0.04	209,713	0.0034	$ 0.02	750,807	0.0123	$ 0.06
2055	35	6,082,800	3	525,945	0.0086	$ 0.04	202,887	0.0033	$ 0.02	728,832	0.0120	$ 0.06
2056	36	6,082,800	3	510,797	0.0084	$ 0.04	196,060	0.0032	$ 0.02	706,858	0.0116	$ 0.06
2057	37	6,082,800	3	495,650	0.0081	$ 0.04	189,234	0.0031	$ 0.02	684,883	0.0113	$ 0.06
2058	38	6,082,800	3	480,502	0.0079	$ 0.04	182,407	0.0030	$ 0.01	662,909	0.0109	$ 0.05
2059	39	6,082,800	3	465,354	0.0077	$ 0.04	175,581	0.0029	$ 0.01	640,934	0.0105	$ 0.05
2060	40	6,082,800	3	450,206	0.0074	$ 0.04	168,754	0.0028	$ 0.01	618,960	0.0102	$ 0.05
2061	41	6,082,800	3	435,058	0.0072	$ 0.04	161,928	0.0027	$ 0.01	596,985	0.0098	$ 0.05
2062	42	6,082,800	3	419,910	0.0069	$ 0.03	155,101	0.0025	$ 0.01	575,011	0.0095	$ 0.05
2063	43	6,082,800	3	404,762	0.0067	$ 0.03	148,275	0.0024	$ 0.01	553,036	0.0091	$ 0.05
2064	44	6,082,800	3	389,614	0.0064	$ 0.03	141,448	0.0023	$ 0.01	531,062	0.0087	$ 0.04
2065	45	6,082,800	3	374,466	0.0062	$ 0.03	134,622	0.0022	$ 0.01	509,087	0.0084	$ 0.04
2066	46	6,082,800	3	359,318	0.0059	$ 0.03	127,795	0.0021	$ 0.01	487,113	0.0080	$ 0.04
2067	47	6,082,800	3	344,170	0.0057	$ 0.03	120,969	0.0020	$ 0.01	465,138	0.0076	$ 0.04
2068	48	6,082,800	3	329,022	0.0054	$ 0.03	114,142	0.0019	$ 0.01	443,164	0.0073	$ 0.04
2069	49	6,082,800	3	313,874	0.0052	$ 0.03	107,316	0.0018	$ 0.01	421,189	0.0069	$ 0.03
2070	50	6,082,800	3	298,726	0.0049	$ 0.02	100,489	0.0017	$ 0.01	399,215	0.0066	$ 0.03
2071	51	6,082,800	3	283,578	0.0047	$ 0.02				283,578	0.0047	$ 0.02
2072	52	6,082,800	3	268,430	0.0044	$ 0.02				268,430	0.0044	$ 0.02
2073	53	6,082,800	3	253,282	0.0042	$ 0.02				253,282	0.0042	$ 0.02
2074	54	6,082,800	3	238,134	0.0039	$ 0.02				238,134	0.0039	$ 0.02
2075	55	6,082,800	3	222,986	0.0037	$ 0.02				222,986	0.0037	$ 0.02
Total				36,082,624	Average	$ 0.06	13,918,890	Average	$ 0.02	50,001,514	Average	$ 0.08
NPV @	3.00%			20,760,886			8,309,655			29,070,541		
NPV @	7.03%			12,347,862			5,045,742			17,393,604		
NPV @	12.00%			7,967,820			3,283,073			11,250,893		

Notes:
1. Sales Forecast from the 2017 Long term forecast (HE Jun 17 fct for Fin Analysis.xlsx file) obtained from Forecasting Division.
2. Hawaiian Electric typical residential energy consumption, per month.
3. Using 2047 forecasted sales for years thereafter.

EXHIBIT E
PAGE 1 OF 12

Auiki Substation Bill Impact
Revenue Requirements Model
Assumptions

Manual input
HECO TY2017 Rate Case Dkt 2016-0328 Interim D&O 35100

Cost of Capital Assumptions	Weight	Rate	Weighted Average	After-Tax Weighted Average	Weighted Average Revenue Requirement	Weighted Average Gross-up for Income Taxes
Short Term Debt	1.18%	1.75%	0.02%	0.02%	0.023%	0.02%
Long Term Debt (Taxable Debt)	39.59%	5.03%	1.99%	1.48%	2.186%	1.99%
Hybrids	1.22%	7.19%	0.09%	0.07%	0.096%	0.09%
Preferred Stock	0.90%	5.37%	0.05%	0.05%	0.072%	0.07%
Common Stock	57.10%	9.50%	5.42%	5.42%	8.018%	7.31%
	100.00%		7.57%	7.032%	10.395%	9.471%

Tax Assumptions		Effective
Federal Income Tax Rate	21.00%	19.74%
State Income Tax Rate	6.40%	6.02%
		25.75%

State Investment Tax Credit (ITC)		4.00%
Accelerated State ITC Amortization Period[1]		10
Public Service Company Tax		5.885%
PUC Fee		0.500%
Franchise Tax		2.500%
Composite Revenue Tax Rate		8.885%

Project Assumptions	Transformer & Switchgear	Transmission Conductors/Poles	Total	
Capital Investment	$ 10,598,711	$ 4,334,092	$ 14,932,803	
Depreciation				
Expected Useful Life	55	50		
MACRS Tax Life ("Tax Life")	20	20		half-year convention, table A-1
Tax Class Life ("Class Life")	20	20		half-year convention, table A-8
Placed in Service Date	1-Jan-21	1-Jan-21		
Cost Recovery	RAM	RAM		

O&M			Total
O&M	$ -	$ -	$ -

Escalation Rate	2.0%

Notes:
1. Per HECO 2017 TY Rate Case Parties' Stipulated Settlement Letter in Docket No. 2016-0328, State ITC Amortization accelerated over a ten-year period.

Auiki Substation Bill Impact — Tax Depreciation
Tax Depreciation Factors

Manual input	Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Tax Depreciation Rates (Straight Line)																						
	-																					
	3	16.670%	33.330%	33.330%	16.670%																	
	5	10.000%	20.000%	20.000%	20.000%	20.000%	10.000%															
	7	7.140%	14.290%	14.290%	14.280%	14.290%	14.280%	14.290%	7.140%													
	10	5.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	5.000%										
	15	3.330%	6.670%	6.670%	6.670%	6.670%	6.670%	6.670%	6.660%	6.670%	6.660%	6.670%	6.660%	6.670%	6.660%	6.670%	3.330%					
	20	2.500%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	2.500%
	25	2.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%	4.000%
	28	1.786%	3.571%	3.571%	3.571%	3.571%	3.571%	3.572%	3.571%	3.572%	3.571%	3.572%	3.571%	3.572%	3.571%	3.572%	3.571%	3.572%	3.571%	3.572%	3.571%	3.572%
	30	1.667%	3.333%	3.333%	3.333%	3.333%	3.333%	3.333%	3.333%	3.333%	3.333%	3.333%	3.333%	3.334%	3.333%	3.334%	3.333%	3.334%	3.333%	3.334%	3.333%	3.334%
	35	1.429%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%
	50	1.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%

Source: IRS Publication 946, Table A-8

Tax Depreciation Rates (MACRS)

	-																					
	3	33.330%	44.450%	14.810%	7.410%																	
	5	20.000%	32.000%	19.200%	11.520%	11.520%	5.760%															
	7	14.290%	24.490%	17.490%	12.490%	8.930%	8.920%	8.930%	4.460%													
	10	10.000%	18.000%	14.400%	11.520%	9.220%	7.370%	6.550%	6.550%	6.560%	6.550%	3.280%										
	15	5.000%	9.500%	8.550%	7.700%	6.930%	6.230%	5.900%	5.900%	5.910%	5.900%	5.910%	5.900%	5.910%	5.900%	5.910%	2.950%					
	20	3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%

Source: IRS Publication 946, Table A-1

Auiki Substation Bill Impact											Tax Depreciation													
Tax Depreciation Factors																								
Manual input	Years	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Tax Depreciation Rate																								
	-																							
	3																							
	5																							
	7																							
	10																							
	15																							
	20																							
	25	4.000%	4.000%	4.000%	4.000%	2.000%																		
	28	3.571%	3.572%	3.571%	3.572%	3.571%	3.572%	3.571%	1.786%															
	30	3.333%	3.334%	3.333%	3.334%	3.333%	3.334%	3.333%	3.334%	3.333%	1.667%													
	35	2.857%	2.857%	2.857%	2.857%	2.857%	2.857%	2.858%	2.857%	2.858%	2.857%	2.858%	2.857%	2.858%	2.857%	1.429%								
	50	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%
Source: IRS Publication 946, T																								
Tax Depreciation Rate																								
	-																							
	3																							
	5																							
	7																							
	10																							
	15																							
	20																							
Source: IRS Publication 946, T																								

Tax Depreciation

Auiki Substation Bill Impact									
Tax Depreciation Factors									
Manual input	Years	45	46	47	48	49	50	51	Total
Tax Depreciation Rate									
	-								
	3								100.000%
	5								100.000%
	7								100.000%
	10								100.000%
	15								100.000%
	20								100.000%
	25								100.000%
	28								100.000%
	30								100.000%
	35								100.000%
	50	2.000%	2.000%	2.000%	2.000%	2.000%	2.000%	1.000%	100.000%
Source: IRS Publication 946, T									
Tax Depreciation Rate									
	-								
	3								100.000%
	5								100.000%
	7								100.000%
	10								100.000%
	15								100.000%
	20								100.000%
Source: IRS Publication 946, T									

Auiki Substation Bill Impact
Revenue Requirements Model - Calculations

		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Manual input		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
O&M																												
Escalation Rate		1.00	1.02	1.04	1.06	1.08	1.10	1.13	1.15	1.17	1.20	1.22	1.24	1.27	1.29	1.32	1.35	1.37	1.40	1.43	1.46	1.49	1.52	1.55	1.58	1.61	1.64	1.67
O&M		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plant Asset Depreciation																												
Book Depreciation																												
Book Depreciation Rates		0.000%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%
Depreciation Expense		-	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272
Accumulated Depreciation		-	196,272	392,545	588,817	785,090	981,362	1,177,635	1,373,907	1,570,179	1,766,452	1,962,724	2,158,997	2,355,269	2,551,542	2,747,814	2,944,086	3,140,359	3,336,631	3,532,904	3,729,176	3,925,449	4,121,721	4,317,993	4,514,266	4,710,538	4,906,811	5,103,083
Tax Depreciation																												
Tax Depreciation Rates (Straight Line)	**20**	2.500%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	2.500%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Revenue Bond Financed Tax Basis (S/L	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax Depreciation Rates (MACRS)	**20**	3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
NonRB Financed Tax Basis (MACRS)	100.0%	397,452	765,121	707,676	654,682	605,504	560,142	518,065	479,274	472,914	472,808	472,914	472,808	472,914	472,808	472,914	472,808	472,914	472,808	472,914	472,808	236,457	-	-	-	-	-	-
Tax Depreciation		397,452	765,121	707,676	654,682	605,504	560,142	518,065	479,274	472,914	472,808	472,914	472,808	472,914	472,808	472,914	472,808	472,914	472,808	472,914	472,808	236,457	-	-	-	-	-	-
Accumulated Tax Depreciation		397,452	1,162,573	1,870,249	2,524,931	3,130,435	3,690,577	4,208,642	4,687,916	5,160,830	5,633,639	6,106,553	6,579,362	7,052,276	7,525,085	7,997,999	8,470,808	8,943,722	9,416,531	9,889,445	10,362,254	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711
State Investment Tax Credit (ITC)																												
Book																												
State ITC Amortization Rate		0.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Amortization of State ITC	4.00%	-	42,395	42,395	42,395	42,395	42,395	42,395	42,395	42,395	42,395	42,395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accumulated Amortization		-	42,395	84,790	127,185	169,579	211,974	254,369	296,764	339,159	381,554	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948
Deferred ITC		423,948	381,554	339,159	296,764	254,369	211,974	169,579	127,185	84,790	42,395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax		423,948																										
Deferred Tax Calculation																												
Book Accumulated Depreciation		-	196,272	392,545	588,817	785,090	981,362	1,177,635	1,373,907	1,570,179	1,766,452	1,962,724	2,158,997	2,355,269	2,551,542	2,747,814	2,944,086	3,140,359	3,336,631	3,532,904	3,729,176	3,925,449	4,121,721	4,317,993	4,514,266	4,710,538	4,906,811	5,103,083
Tax Accumulated Depreciation		397,452	1,162,573	1,870,249	2,524,931	3,130,435	3,690,577	4,208,642	4,687,916	5,160,830	5,633,639	6,106,553	6,579,362	7,052,276	7,525,085	7,997,999	8,470,808	8,943,722	9,416,531	9,889,445	10,362,254	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711
Book/Tax Acc Depr Difference		(397,452)	(966,300)	(1,477,704)	(1,936,114)	(2,345,346)	(2,709,215)	(3,031,008)	(3,314,009)	(3,590,651)	(3,867,187)	(4,143,829)	(4,420,365)	(4,697,007)	(4,973,543)	(5,250,185)	(5,526,721)	(5,803,363)	(6,079,900)	(6,356,542)	(6,633,078)	(6,673,262)	(6,476,990)	(6,280,718)	(6,084,445)	(5,888,173)	(5,691,900)	(5,495,628)
Deferred ITC		423,948	381,554	339,159	296,764	254,369	211,974	169,579	127,185	84,790	42,395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Deferred Tax Asset (Liability)		6,823	(150,583)	(293,197)	(422,163)	(538,466)	(643,086)	(736,872)	(820,667)	(902,825)	(984,956)	(1,067,114)	(1,138,327)	(1,209,568)	(1,280,781)	(1,352,021)	(1,423,235)	(1,494,475)	(1,565,688)	(1,636,929)	(1,708,142)	(1,718,491)	(1,667,947)	(1,617,403)	(1,566,859)	(1,516,315)	(1,465,771)	(1,415,227)
Deferred Tax Base		(26,497)	611,243	553,798	500,805	451,627	406,264	364,187	325,396	319,037	318,931	319,037	276,536	276,642	276,536	276,642	276,536	276,642	276,536	276,642	276,536	40,185	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)
Deferred Taxes - Federal		(5,230)	120,640	109,302	98,843	89,137	80,184	71,879	64,223	62,968	62,947	62,968	54,579	54,600	54,579	54,600	54,579	54,600	54,579	54,600	54,579	7,931	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)
Deferred Taxes - State excluding credit		(1,594)	36,767	33,311	30,124	27,166	24,437	21,906	19,573	19,190	19,184	19,190	16,634	16,640	16,634	16,640	16,634	16,640	16,634	16,640	16,634	2,417	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)
Change in Deferred Taxes		(6,823)	157,407	142,613	128,967	116,302	104,621	93,785	83,796	82,158	82,131	82,158	71,213	71,241	71,213	71,241	71,213	71,241	71,213	71,241	71,213	10,348	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)
Accumulated Deferred Taxes		(6,823)	150,583	293,197	422,163	538,466	643,086	736,872	820,667	902,825	984,956	1,067,114	1,138,327	1,209,568	1,280,781	1,352,021	1,423,235	1,494,475	1,565,688	1,636,929	1,708,142	1,718,491	1,667,947	1,617,403	1,566,859	1,516,315	1,465,771	1,415,227
check		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Change in Deferred ITC		423,948	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		423,948	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rate Base and Financing																												
Investment: (Rate Base)																												
Gross Plant		10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711
Accumulated Depreciation		-	196,272	392,545	588,817	785,090	981,362	1,177,635	1,373,907	1,570,179	1,766,452	1,962,724	2,158,997	2,355,269	2,551,542	2,747,814	2,944,086	3,140,359	3,336,631	3,532,904	3,729,176	3,925,449	4,121,721	4,317,993	4,514,266	4,710,538	4,906,811	5,103,083
Accumulated Deferred Taxes		(6,823)	150,583	293,197	422,163	538,466	643,086	736,872	820,667	902,825	984,956	1,067,114	1,138,327	1,209,568	1,280,781	1,352,021	1,423,235	1,494,475	1,565,688	1,636,929	1,708,142	1,718,491	1,667,947	1,617,403	1,566,859	1,516,315	1,465,771	1,415,227
Accumulated Deferred ITC		423,948	381,554	339,159	296,764	254,369	211,974	169,579	127,185	84,790	42,395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ending Net Investment	-	10,181,586	9,870,302	9,573,811	9,290,966	9,020,786	8,762,288	8,514,626	8,276,952	8,040,917	7,804,908	7,568,873	7,301,387	7,033,874	6,766,389	6,498,876	6,231,390	5,963,877	5,696,391	5,428,878	5,161,393	4,954,772	4,809,043	4,663,315	4,517,586	4,371,858	4,226,129	4,080,400
Average Net Investment		5,090,793	10,025,944	9,722,056	9,432,389	9,155,876	8,891,537	8,638,457	8,395,789	8,158,935	7,922,913	7,686,891	7,435,130	7,167,631	6,900,131	6,632,632	6,365,133	6,097,633	5,830,134	5,562,635	5,295,136	5,058,082	4,881,908	4,736,179	4,590,450	4,444,722	4,298,993	4,153,265
Average Financing:																												
Short Term Debt	1.18%	60,270	118,697	115,099	111,670	108,396	105,267	102,271	99,398	96,593	93,799	91,005	88,024	84,857	81,691	78,524	75,357	72,190	69,023	65,856	62,689	59,883	57,797	56,072	54,346	52,621	50,896	49,170
Long Term Debt (Revenue Bonds)	39.59%	2,015,681	3,969,736	3,849,413	3,734,720	3,625,236	3,520,572	3,420,365	3,324,282	3,230,500	3,137,048	3,043,596	2,943,913	2,837,997	2,732,082	2,626,166	2,520,251	2,414,336	2,308,420	2,202,505	2,096,590	2,002,729	1,932,974	1,875,273	1,817,572	1,759,871	1,702,171	1,644,470
Taxable Debt	1.22%	62,182	122,463	118,751	115,213	111,835	108,606	105,515	102,551	99,658	96,775	93,892	90,817	87,550	84,282	81,015	77,747	74,480	71,213	67,945	64,678	61,782	59,630	57,850	56,070	54,290	52,510	50,730
Preferred Stock	0.90%	45,874	90,346	87,607	84,997	82,505	80,123	77,843	75,656	73,522	71,395	69,268	66,999	64,589	62,178	59,768	57,357	54,947	52,536	50,126	47,715	45,579	43,992	42,679	41,365	40,052	38,739	37,426
Common Equity	57.10%	2,906,786	5,724,703	5,551,186	5,385,789	5,227,904	5,076,969	4,932,463	4,793,902	4,658,661	4,523,895	4,389,129	4,245,377	4,092,638	3,939,899	3,787,159	3,634,420	3,481,681	3,328,942	3,176,203	3,023,464	2,888,109	2,787,515	2,704,306	2,621,096	2,537,887	2,454,678	2,371,468
Total Financing		5,090,793	10,025,944	9,722,056	9,432,389	9,155,876	8,891,537	8,638,457	8,395,789	8,158,935	7,922,913	7,686,891	7,435,130	7,167,631	6,900,131	6,632,632	6,365,133	6,097,633	5,830,134	5,562,635	5,295,136	5,058,082	4,881,908	4,736,179	4,590,450	4,444,722	4,298,993	4,153,265
Return on Investment																												
Short Term Debt	1.75%	1,055	2,077	2,014	1,954	1,897	1,842	1,790	1,739	1,690	1,641	1,593	1,540	1,485	1,430	1,374	1,319	1,263	1,208	1,152	1,097	1,048	1,011	981	951	921	891	860
Long Term Debt (Taxable Debt)	5.03%	101,389	199,678	193,625	187,856	182,349	177,085	172,044	167,211	162,494	157,794	153,093	148,079	142,751	137,424	132,096	126,769	121,441	116,114	110,786	105,458	100,737	97,229	94,326	91,424	88,522	85,619	82,717
Hybrids	7.19%	4,471	8,805	8,538	8,284	8,041	7,809	7,587	7,373	7,165	6,958	6,751	6,530	6,295	6,060	5,825	5,590	5,355	5,120	4,885	4,650	4,442	4,287	4,159	4,031	3,903	3,775	3,648
Total Interest Expense		106,914	210,560	204,178	198,094	192,287	186,736	181,421	176,324	171,350	166,393	161,436	156,149	150,531	144,913	139,295	133,677	128,060	122,442	116,824	111,206	106,227	102,527	99,467	96,406	93,346	90,285	87,225
Preferred Dividends	5.37%	2,463	4,852	4,705	4,564	4,431	4,303	4,180	4,063	3,948	3,834	3,720	3,598	3,468	3,339	3,210	3,080	2,951	2,821	2,692	2,562	2,448	2,362	2,292	2,221	2,151	2,080	2,010
Net Income on Common	9.50%	276,145	543,847	527,363	511,650	496,651	482,312	468,584	455,421	442,573	429,770	416,967	403,311	388,801	374,290	359,780	345,270	330,760	316,249	301,739	287,229	274,370	264,814	256,909	249,004	241,099	233,194	225,289
Income Taxes																												
Income Before Pref Dividends		278,608	548,698	532,067	516,214	501,081	486,615	472,764	459,483	446,521	433,604	420,687	406,909	392,269	377,629	362,990	348,350	333,710	319,071	304,431	289,791	276,818	267,176	259,201	251,225	243,250	235,275	227,299
Income Before Taxes (including ITC)		375,239	739,006	716,607	695,256	674,874	655,390	636,736	618,849	601,390	583,993	566,596	548,039	528,322	508,605	488,887	469,170	449,453	429,736	410,019	390,301	372,828	359,843	349,101	338,359	327,618	316,876	306,135
Investment Tax Credit		-	42,395	42,395	42,395	42,395	42,395	42,395	42,395	42,395	42,395	42,395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Income Before Taxes (excluding ITC)		375,239	696,612	674,212	652,861	632,479	612,995	594,341	576,454	558,995	541,598	524,201	548,039	528,322	508,605	488,887	469,170	449,453	429,736	410,019	390,301	372,828	359,843	349,101	338,359	327,618	316,876	306,135
Federal Income Tax		74,060	145,857	141,436	137,222	133,199	129,353	125,671	122,141	118,695	115,262	111,828	108,166	104,274	100,382	96,491	92,599	88,708	84,816	80,925	77,033	73,585	71,022	68,902	66,781	64,661	62,541	60,421
State Income Tax		22,571	44,452	43,104	41,820	40,594	39,422	38,300	37,224	36,174	35,127	34,081	32,965	31,779	30,593	29,407	28,221	27,035	25,849	24,663	23,477	22,426	21,645	20,999	20,352	19,706	19,060	18,414
State Investment Tax Credit		-	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
~~Total State Tax~~		22,571	2,057	709	(575)	(1,801)	(2,973)	(4,095)	(5,171)	(6,221)	(7,267)	(8,314)	32,965	31,779	30,593	29,407	28,221	27,035	25,849	24,663	23,477	22,426	21,645	20,999	20,352	19,706	19,060	18,414
Total Taxes		96,631	147,913	142,145	136,647	131,398	126,380	121,577	116,970	112,474	107,994	103,514	141,130	136,053	130,975	125,898	120,820	115,743	110,665	105,587	100,510	96,010	92,666	89,900	87,134	84,368	81,602	78,835
Revenue Requirement Calculation																												
Revenue Requirement Factors		**0.0499**	**0.1143**	**0.1113**	**0.1084**	**0.1057**	**0.1031**	**0.1007**	**0.0983**	**0.0960**	**0.0936**	**0.0913**	**0.0932**	**0.0906**	**0.0880**	**0.0854**	**0.0828**	**0.0801**	**0.0775**	**0.0749**	**0.0723**	**0.0699**	**0.0682**	**0.0668**	**0.0653**	**0.0639**	**0.0625**	**0.0611**
Revenue Requirement		**529,170**	**1,211,045**	**1,179,457**	**1,149,347**	**1,120,605**	**1,093,128**	**1,066,821**	**1,041,596**	**1,016,976**	**992,442**	**967,909**	**988,268**	**960,462**	**932,657**	**904,851**	**877,045**	**849,240**	**821,434**	**793,629**	**765,823**	**741,182**	**722,869**	**707,721**	**692,573**	**677,425**	**662,277**	**647,129**
Revenue Taxes		47,017	107,601	104,795	102,120	99,566	97,124	94,787	92,546	90,358	88,179	85,999	87,808	85,337	82,867	80,396	77,925	75,455	72,984	70,514	68,043	65,854	64,227	62,881	61,535	60,189	58,843	57,497
Income Before Depr, Int, Inc Tax		482,154	1,103,444	1,074,662	1,047,228	1,021,039	996,003	972,034	949,050	926,618	904,264	881,910	900,460	875,125	849,790	824,455	799,120	773,785	748,450	723,115	697,780	675,328	658,642	644,840	631,038	617,236	603,434	589,632
Depreciation Expense		-	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272
O&M		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest Expense		106,914	210,560	204,178	198,094	192,287	186,736	181,421	176,324	171,350	166,393	161,436	156,149	150,531	144,913	139,295	133,677	128,060	122,442	116,824	111,206	106,227	102,527	99,467	96,406	93,346	90,285	87,225
Income Before Income Taxes		375,239	696,612	674,212	652,861	632,479	612,995	594,341	576,454	558,995	541,598	524,201	548,039	528,322	508,605	488,887	469,170	449,453	429,736	410,019	390,301	372,828	359,843	349,101	338,359	327,618	316,876	306,135
Income Taxes - Federal		74,060	145,857	141,436	137,222	133,199	129,353	125,671	122,141	118,695	115,262	111,828	108,166	104,274	100,382	96,491	92,599	88,708	84,816	80,925	77,033	73,585	71,022	68,902	66,781	64,661	62,541	60,421
Income Taxes - State		22,571	44,452	43,104	41,820	40,594	39,422	38,300	37,224	36,174	35,127	34,081	32,965	31,779	30,593	29,407	28,221	27,035	25,849	24,663	23,477	22,426	21,645	20,999	20,352	19,706	19,060	18,414
State ITC		-	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	(42,395)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
~~Total Income Taxes~~		96,631	147,913	142,145	136,647	131,398	126,380	121,577	116,970	112,474	107,994	103,514	141,130	136,053	130,975	125,898	120,820	115,743	110,665	105,587	100,510	96,010	92,666	89,900	87,134	84,368	81,602	78,835
Preferred Dividends		2,463	4,852	4,705	4,564	4,431	4,303	4,180	4,063	3,948	3,834	3,720	3,598	3,468	3,339	3,210	3,080	2,951	2,821	2,692	2,562	2,448	2,362	2,292	2,221	2,151	2,080	2,010
Net Income for Common		276,145	543,847	527,363	511,650	496,651	482,312	468,584	455,421	442,573	429,770	416,967	403,311	388,801	374,290	359,780	345,270	330,760	316,249	301,739	287,229	274,370	264,814	256,909	249,004	241,099	233,194	225,289
check		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ROE		*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*

Auiki Substation Bill Impact
Revenue Requirements Model - Calculat

	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074
Manual input	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
O&M																											
Escalation Rate	1.71	1.74	1.78	1.81	1.85	1.88	1.92	1.96	2.00	2.04	2.08	2.12	2.16	2.21	2.25	2.30	2.34	2.39	2.44	2.49	2.54	2.59	2.64	2.69	2.75	2.80	2.86
O&M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plant Asset Depreciation																											
Book Depreciation																											
Book Depreciation Rates	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%	1.852%
Depreciation Expense	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272
Accumulated Depreciation	5,299,356	5,495,628	5,691,900	5,888,173	6,084,445	6,280,718	6,476,990	6,673,262	6,869,535	7,065,807	7,262,080	7,458,352	7,654,625	7,850,897	8,047,169	8,243,442	8,439,714	8,635,987	8,832,259	9,028,532	9,224,804	9,421,076	9,617,349	9,813,621	10,009,894	10,206,166	10,402,439
Tax Depreciation																											
Tax Depreciation Rates (Straight Line)	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Revenue Bond Financed Tax Basis (S/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax Depreciation Rates (MACRS)	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
NonRB Financed Tax Basis (MACRS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax Depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accumulated Tax Depreciation	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711
State Investment Tax Credit (ITC)																											
Book																											
State ITC Amortization Rate	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Amortization of State ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accumulated Amortization	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948	423,948
Deferred ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax																											
Deferred Tax Calculation																											
Book Accumulated Depreciation	5,299,356	5,495,628	5,691,900	5,888,173	6,084,445	6,280,718	6,476,990	6,673,262	6,869,535	7,065,807	7,262,080	7,458,352	7,654,625	7,850,897	8,047,169	8,243,442	8,439,714	8,635,987	8,832,259	9,028,532	9,224,804	9,421,076	9,617,349	9,813,621	10,009,894	10,206,166	10,402,439
Tax Accumulated Depreciation	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711
Book/Tax Acc Depr Difference	(5,299,356)	(5,103,083)	(4,906,811)	(4,710,538)	(4,514,266)	(4,317,993)	(4,121,721)	(3,925,449)	(3,729,176)	(3,532,904)	(3,336,631)	(3,140,359)	(2,944,086)	(2,747,814)	(2,551,542)	(2,355,269)	(2,158,997)	(1,962,724)	(1,766,452)	(1,570,179)	(1,373,907)	(1,177,635)	(981,362)	(785,090)	(588,817)	(392,545)	(196,272)
Deferred ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Deferred Tax Asset (Liability)	(1,364,684)	(1,314,140)	(1,263,596)	(1,213,052)	(1,162,508)	(1,111,964)	(1,061,421)	(1,010,877)	(960,333)	(909,789)	(859,245)	(808,701)	(758,158)	(707,614)	(657,070)	(606,526)	(555,982)	(505,438)	(454,895)	(404,351)	(353,807)	(303,263)	(252,719)	(202,175)	(151,632)	(101,088)	(50,544)
Deferred Tax Base	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)	(196,272)
Deferred Taxes - Federal	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)	(38,738)
Deferred Taxes - State excluding credit	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)	(11,806)
Change in Deferred Taxes	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)	(50,544)
Accumulated Deferred Taxes	1,364,684	1,314,140	1,263,596	1,213,052	1,162,508	1,111,964	1,061,421	1,010,877	960,333	909,789	859,245	808,701	758,158	707,614	657,070	606,526	555,982	505,438	454,895	404,351	353,807	303,263	252,719	202,175	151,632	101,088	50,544
check	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	-	0	0	-	-	-	-	-	(0)	(0)	(0)
Change in Deferred ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rate Base and Financing																											
Investment: (Rate Base)																											
Gross Plant	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711
Accumulated Depreciation	5,299,356	5,495,628	5,691,900	5,888,173	6,084,445	6,280,718	6,476,990	6,673,262	6,869,535	7,065,807	7,262,080	7,458,352	7,654,625	7,850,897	8,047,169	8,243,442	8,439,714	8,635,987	8,832,259	9,028,532	9,224,804	9,421,076	9,617,349	9,813,621	10,009,894	10,206,166	10,402,439
Accumulated Deferred Taxes	1,364,684	1,314,140	1,263,596	1,213,052	1,162,508	1,111,964	1,061,421	1,010,877	960,333	909,789	859,245	808,701	758,158	707,614	657,070	606,526	555,982	505,438	454,895	404,351	353,807	303,263	252,719	202,175	151,632	101,088	50,544
Accumulated Deferred ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ending Net Investment	3,934,672	3,788,943	3,643,215	3,497,486	3,351,757	3,206,029	3,060,300	2,914,572	2,768,843	2,623,115	2,477,386	2,331,657	2,185,929	2,040,200	1,894,472	1,748,743	1,603,014	1,457,286	1,311,557	1,165,829	1,020,100	874,372	728,643	582,914	437,186	291,457	145,729
Average Net Investment	4,007,536	3,861,808	3,716,079	3,570,350	3,424,622	3,278,893	3,133,165	2,987,436	2,841,707	2,695,979	2,550,250	2,404,522	2,258,793	2,113,065	1,967,336	1,821,607	1,675,879	1,530,150	1,384,422	1,238,693	1,092,964	947,236	801,507	655,779	510,050	364,321	218,593
Average Financing:																											
Short Term Debt	47,445	45,720	43,995	42,269	40,544	38,819	37,093	35,368	33,643	31,918	30,192	28,467	26,742	25,017	23,291	21,566	19,841	18,115	16,390	14,665	12,940	11,214	9,489	7,764	6,038	4,313	2,588
Long Term Debt (Revenue Bonds)	1,586,769	1,529,069	1,471,368	1,413,667	1,355,967	1,298,266	1,240,565	1,182,864	1,125,164	1,067,463	1,009,762	952,062	894,361	836,660	778,959	721,259	663,558	605,857	548,157	490,456	432,755	375,055	317,354	259,653	201,952	144,252	86,551
Taxable Debt	48,950	47,170	45,390	43,610	41,830	40,050	38,270	36,490	34,710	32,930	31,150	29,370	27,590	25,810	24,030	22,250	20,470	18,690	16,910	15,130	13,350	11,570	9,790	8,010	6,230	4,450	2,670
Preferred Stock	36,113	34,799	33,486	32,173	30,860	29,547	28,234	26,920	25,607	24,294	22,981	21,668	20,354	19,041	17,728	16,415	15,102	13,788	12,475	11,162	9,849	8,536	7,223	5,909	4,596	3,283	1,970
Common Equity	2,288,259	2,205,049	2,121,840	2,038,630	1,955,421	1,872,212	1,789,002	1,705,793	1,622,583	1,539,374	1,456,165	1,372,955	1,289,746	1,206,536	1,123,327	1,040,118	956,908	873,699	790,489	707,280	624,071	540,861	457,652	374,442	291,233	208,024	124,814
Total Financing	4,007,536	3,861,808	3,716,079	3,570,350	3,424,622	3,278,893	3,133,165	2,987,436	2,841,707	2,695,979	2,550,250	2,404,522	2,258,793	2,113,065	1,967,336	1,821,607	1,675,879	1,530,150	1,384,422	1,238,693	1,092,964	947,236	801,507	655,779	510,050	364,321	218,593
Return on Investment																											
Short Term Debt	830	800	770	740	710	679	649	619	589	559	528	498	468	438	408	377	347	317	287	257	226	196	166	136	106	75	45
Long Term Debt (Taxable Debt)	79,814	76,912	74,010	71,107	68,205	65,303	62,400	59,498	56,596	53,693	50,791	47,889	44,986	42,084	39,182	36,279	33,377	30,475	27,572	24,670	21,768	18,865	15,963	13,061	10,158	7,256	4,354
Hybrids	3,520	3,392	3,264	3,136	3,008	2,880	2,752	2,624	2,496	2,368	2,240	2,112	1,984	1,856	1,728	1,600	1,472	1,344	1,216	1,088	960	832	704	576	448	320	192
Total Interest Expense	84,164	81,104	78,043	74,983	71,922	68,862	65,801	62,741	59,680	56,620	53,559	50,499	47,438	44,378	41,317	38,257	35,196	32,135	29,075	26,014	22,954	19,893	16,833	13,772	10,712	7,651	4,591
Preferred Dividends	1,939	1,869	1,798	1,728	1,657	1,587	1,516	1,446	1,375	1,305	1,234	1,164	1,093	1,023	952	881	811	740	670	599	529	458	388	317	247	176	106
Net Income on Common	217,385	209,480	201,575	193,670	185,765	177,860	169,955	162,050	154,145	146,241	138,336	130,431	122,526	114,621	106,716	98,811	90,906	83,001	75,096	67,192	59,287	51,382	43,477	35,572	27,667	19,762	11,857
Income Taxes																											
Income Before Pref Dividends	219,324	211,348	203,373	195,398	187,422	179,447	171,471	163,496	155,521	147,545	139,570	131,594	123,619	115,643	107,668	99,693	91,717	83,742	75,766	67,791	59,816	51,840	43,865	35,889	27,914	19,939	11,963
Income Before Taxes (including ITC)	295,393	284,652	273,910	263,168	252,427	241,685	230,944	220,202	209,461	198,719	187,977	177,236	166,494	155,753	145,011	134,270	123,528	112,786	102,045	91,303	80,562	69,820	59,079	48,337	37,595	26,854	16,112
Investment Tax Credit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Income Before Taxes (excluding ITC)	295,393	284,652	273,910	263,168	252,427	241,685	230,944	220,202	209,461	198,719	187,977	177,236	166,494	155,753	145,011	134,270	123,528	112,786	102,045	91,303	80,562	69,820	59,079	48,337	37,595	26,854	16,112
Federal Income Tax	58,301	56,181	54,061	51,941	49,821	47,701	45,581	43,461	41,341	39,221	37,101	34,981	32,861	30,741	28,621	26,501	24,381	22,260	20,140	18,020	15,900	13,780	11,660	9,540	7,420	5,300	3,180
State Income Tax	17,768	17,122	16,476	15,830	15,184	14,537	13,891	13,245	12,599	11,953	11,307	10,661	10,015	9,369	8,722	8,076	7,430	6,784	6,138	5,492	4,846	4,200	3,554	2,907	2,261	1,615	969
State Investment Tax Credit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total State Tax	17,768	17,122	16,476	15,830	15,184	14,537	13,891	13,245	12,599	11,953	11,307	10,661	10,015	9,369	8,722	8,076	7,430	6,784	6,138	5,492	4,846	4,200	3,554	2,907	2,261	1,615	969
Total Taxes	76,069	73,303	70,537	67,771	65,005	62,238	59,472	56,706	53,940	51,174	48,408	45,642	42,875	40,109	37,343	34,577	31,811	29,045	26,278	23,512	20,746	17,980	15,214	12,448	9,682	6,915	4,149
Revenue Requirement Calculation																											
Revenue Requirement Factors	**0.0596**	**0.0582**	**0.0568**	**0.0553**	**0.0539**	**0.0525**	**0.0511**	**0.0496**	**0.0482**	**0.0468**	**0.0453**	**0.0439**	**0.0425**	**0.0410**	**0.0396**	**0.0382**	**0.0368**	**0.0353**	**0.0339**	**0.0325**	**0.0310**	**0.0296**	**0.0282**	**0.0268**	**0.0253**	**0.0239**	**0.0225**
Revenue Requirement	**631,981**	**616,833**	**601,685**	**586,537**	**571,389**	**556,241**	**541,093**	**525,945**	**510,797**	**495,650**	**480,502**	**465,354**	**450,206**	**435,058**	**419,910**	**404,762**	**389,614**	**374,466**	**359,318**	**344,170**	**329,022**	**313,874**	**298,726**	**283,578**	**268,430**	**253,282**	**238,134**
Revenue Taxes	56,152	54,806	53,460	52,114	50,768	49,422	48,076	46,730	45,384	44,038	42,693	41,347	40,001	38,655	37,309	35,963	34,617	33,271	31,925	30,579	29,234	27,888	26,542	25,196	23,850	22,504	21,158
Income Before Depr, Int, Inc Tax	575,830	562,028	548,226	534,424	520,621	506,819	493,017	479,215	465,413	451,611	437,809	424,007	410,205	396,403	382,601	368,799	354,996	341,194	327,392	313,590	299,788	285,986	272,184	258,382	244,580	230,778	216,976
Depreciation Expense	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272	196,272
O&M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest Expense	84,164	81,104	78,043	74,983	71,922	68,862	65,801	62,741	59,680	56,620	53,559	50,499	47,438	44,378	41,317	38,257	35,196	32,135	29,075	26,014	22,954	19,893	16,833	13,772	10,712	7,651	4,591
Income Before Income Taxes	295,393	284,652	273,910	263,168	252,427	241,685	230,944	220,202	209,461	198,719	187,977	177,236	166,494	155,753	145,011	134,270	123,528	112,786	102,045	91,303	80,562	69,820	59,079	48,337	37,595	26,854	16,112
Income Taxes - Federal	58,301	56,181	54,061	51,941	49,821	47,701	45,581	43,461	41,341	39,221	37,101	34,981	32,861	30,741	28,621	26,501	24,381	22,260	20,140	18,020	15,900	13,780	11,660	9,540	7,420	5,300	3,180
Income Taxes - State	17,768	17,122	16,476	15,830	15,184	14,537	13,891	13,245	12,599	11,953	11,307	10,661	10,015	9,369	8,722	8,076	7,430	6,784	6,138	5,492	4,846	4,200	3,554	2,907	2,261	1,615	969
State ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Income Taxes	76,069	73,303	70,537	67,771	65,005	62,238	59,472	56,706	53,940	51,174	48,408	45,642	42,875	40,109	37,343	34,577	31,811	29,045	26,278	23,512	20,746	17,980	15,214	12,448	9,682	6,915	4,149
Preferred Dividends	1,939	1,869	1,798	1,728	1,657	1,587	1,516	1,446	1,375	1,305	1,234	1,164	1,093	1,023	952	881	811	740	670	599	529	458	388	317	247	176	106
Net Income for Common	217,385	209,480	201,575	193,670	185,765	177,860	169,955	162,050	154,145	146,241	138,336	130,431	122,526	114,621	106,716	98,811	90,906	83,001	75,096	67,192	59,287	51,382	43,477	35,572	27,667	19,762	11,857
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(0)	(0)	-	-	(0)	(0)	0
	9.50%	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*

Auiki Substation Bill Impact							
Revenue Requirements Model - Calculat							
	2075	2076	2077	2078	2079	2080	
Manual input	55	56	57	58	59	60	Total
O&M							
Escalation Rate	2.91	2.97	3.03	3.09	3.15	3.22	
O&M	-	-	-	-	-	-	-
Plant Asset Depreciation							
Book Depreciation							
Book Depreciation Rates	1.852%	0.000%	0.000%	0.000%	0.000%	0.000%	100.00%
Depreciation Expense	196,272	-	-	-	-	-	10,598,711
Accumulated Depreciation	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	
Tax Depreciation							
Tax Depreciation Rates (Straight Line)	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	100.00%
Revenue Bond Financed Tax Basis (S/L	-	-	-	-	-	-	-
Tax Depreciation Rates (MACRS)	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	100.00%
NonRB Financed Tax Basis (MACRS)	-	-	-	-	-	-	10,598,711
Tax Depreciation	-	-	-	-	-	-	10,598,711
Accumulated Tax Depreciation	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	
State Investment Tax Credit (ITC)							
Book							
State ITC Amortization Rate	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	100.00%
Amortization of State ITC	-	-	-	-	-	-	423,948
Accumulated Amortization	423,948	423,948	423,948	423,948	423,948	423,948	
Deferred ITC	-	-	-	-	-	-	
Tax							
Deferred Tax Calculation							
Book Accumulated Depreciation	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	
Tax Accumulated Depreciation	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	
Book/Tax Acc Depr Difference	-	-	-	-	-	-	
Deferred ITC	-	-	-	-	-	-	
Net Deferred Tax Asset (Liability)	-	-	-	-	-	-	
Deferred Tax Base	(196,272)	-	-	-	-	-	
Deferred Taxes - Federal	(38,738)	-	-	-	-	-	
Deferred Taxes - State excluding credit	(11,806)	-	-	-	-	-	
Change in Deferred Taxes	(50,544)	-	-	-	-	-	
Accumulated Deferred Taxes	(0)	(0)	(0)	(0)	(0)	(0)	
check	(0)	(0)	(0)	(0)	(0)	(0)	
Change in Deferred ITC	-	-	-	-	-	-	
	-	-	-	-	-	-	
Rate Base and Financing							
Investment: (Rate Base)							
Gross Plant	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	
Accumulated Depreciation	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	10,598,711	
Accumulated Deferred Taxes	(0)	(0)	(0)	(0)	(0)	(0)	
Accumulated Deferred ITC	-	-	-	-	-	-	
Ending Net Investment	0	0	0	0	0	0	
Average Net Investment	72,864	0	0	0	0	0	
Average Financing:							
Short Term Debt	863	0	0	0	0	0	
Long Term Debt (Revenue Bonds)	28,850	0	0	0	0	0	
Taxable Debt	890	0	0	0	0	0	
Preferred Stock	657	0	0	0	0	0	
Common Equity	41,605	0	0	0	0	0	
Total Financing	72,864	0	0	0	0	0	
Return on Investment							
Short Term Debt	15	0	0	0	0	0	
Long Term Debt (Taxable Debt)	1,451	0	0	0	0	0	
Hybrids	64	0	0	0	0	0	
Total Interest Expense	1,530	0	0	0	0	0	
Preferred Dividends	35	0	0	0	0	0	
Net Income on Common	3,952	0	0	0	0	0	
Income Taxes							
Income Before Pref Dividends	3,988	0	0	0	0	0	
Income Before Taxes (including ITC)	5,371	0	0	0	0	0	
Investment Tax Credit	-	-	-	-	-	-	
Income Before Taxes (excluding ITC)	5,371	0	0	0	0	0	
Federal Income Tax	1,060	0	0	0	0	0	
State Income Tax	323	0	0	0	0	0	
State Investment Tax Credit	-	-	-	-	-	-	
Total State Tax	323	0	0	0	0	0	
Total Taxes	1,383	0	0	0	0	0	
Revenue Requirement Calculation							
Revenue Requirement Factors	**0.0210**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	
Revenue Requirement	**222,986**	**0**	**0**	**0**	**0**	**0**	
Revenue Taxes	19,812	0	0	0	0	0	
Income Before Depr, Int, Inc Tax	203,173	0	0	0	0	0	
Depreciation Expense	196,272	-	-	-	-	-	
O&M	-	-	-	-	-	-	
Interest Expense	1,530	0	0	0	0	0	
Income Before Income Taxes	5,371	0	0	0	0	0	
Income Taxes - Federal	1,060	0	0	0	0	0	
Income Taxes - State	323	0	0	0	0	0	
State ITC	-	-	-	-	-	-	
Total Income Taxes	1,383	0	0	0	0	0	
Preferred Dividends	35	0	0	0	0	0	
Net Income for Common	3,952	0	0	0	0	0	
	(0)	-	-	-	-	-	
	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	

Auiki Substation Bill Impact
Revenue Requirements Model - Calculations

		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Manual input		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
O&M																												
Escalation Rate		1.00	1.02	1.04	1.06	1.08	1.10	1.13	1.15	1.17	1.20	1.22	1.24	1.27	1.29	1.32	1.35	1.37	1.40	1.43	1.46	1.49	1.52	1.55	1.58	1.61	1.64	1.67
O&M		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plant Asset Depreciation																												
Book Depreciation																												
Book Depreciation Rates		0.000%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%
Depreciation Expense		-	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451
Accumulated Depreciation		-	88,451	176,902	265,353	353,803	442,254	530,705	619,156	707,607	796,058	884,509	972,959	1,061,410	1,149,861	1,238,312	1,326,763	1,415,214	1,503,665	1,592,115	1,680,566	1,769,017	1,857,468	1,945,919	2,034,370	2,122,821	2,211,271	2,299,722
Tax Depreciation																												
Tax Depreciation Rates (Straight Line)	20	2.500%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	2.500%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Revenue Bond Financed Tax Basis (S/L	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax Depreciation Rates (MACRS)	20	3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	4.462%	4.461%	2.231%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
NonRB Financed Tax Basis (MACRS)	100.0%	162,528	312,878	289,387	267,717	247,607	229,057	211,850	195,988	193,387	193,344	193,387	193,344	193,387	193,344	193,387	193,344	193,387	193,344	193,387	193,344	96,694	-	-	-	-	-	-
Tax Depreciation		162,528	312,878	289,387	267,717	247,607	229,057	211,850	195,988	193,387	193,344	193,387	193,344	193,387	193,344	193,387	193,344	193,387	193,344	193,387	193,344	96,694	-	-	-	-	-	-
Accumulated Tax Depreciation		162,528	475,407	764,794	1,032,511	1,280,117	1,509,174	1,721,025	1,917,012	2,110,399	2,303,743	2,497,130	2,690,474	2,883,861	3,077,205	3,270,593	3,463,936	3,657,324	3,850,667	4,044,055	4,237,398	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092
State Investment Tax Credit (ITC)																												
Book																												
State ITC Amortization Rate		0.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	10.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Amortization of State ITC	4.00%	-	17,336	17,336	17,336	17,336	17,336	17,336	17,336	17,336	17,336	17,336	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accumulated Amortization		-	17,336	34,673	52,009	69,345	86,682	104,018	121,355	138,691	156,027	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364
Deferred ITC		173,364	156,027	138,691	121,355	104,018	86,682	69,345	52,009	34,673	17,336	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax		173,364																										
Deferred Tax Calculation																												
Book Accumulated Depreciation		-	88,451	176,902	265,353	353,803	442,254	530,705	619,156	707,607	796,058	884,509	972,959	1,061,410	1,149,861	1,238,312	1,326,763	1,415,214	1,503,665	1,592,115	1,680,566	1,769,017	1,857,468	1,945,919	2,034,370	2,122,821	2,211,271	2,299,722
Tax Accumulated Depreciation		162,528	475,407	764,794	1,032,511	1,280,117	1,509,174	1,721,025	1,917,012	2,110,399	2,303,743	2,497,130	2,690,474	2,883,861	3,077,205	3,270,593	3,463,936	3,657,324	3,850,667	4,044,055	4,237,398	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092
Book/Tax Acc Depr Difference		(162,528)	(386,956)	(587,892)	(767,158)	(926,314)	(1,066,920)	(1,190,319)	(1,297,856)	(1,402,793)	(1,507,686)	(1,612,622)	(1,717,515)	(1,822,451)	(1,927,344)	(2,032,281)	(2,137,173)	(2,242,110)	(2,347,003)	(2,451,939)	(2,556,832)	(2,565,075)	(2,476,624)	(2,388,173)	(2,299,722)	(2,211,271)	(2,122,821)	(2,034,370)
Deferred ITC		173,364	156,027	138,691	121,355	104,018	86,682	69,345	52,009	34,673	17,336	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Deferred Tax Asset (Liability)		2,790	(59,468)	(115,678)	(166,307)	(211,757)	(252,430)	(288,672)	(320,829)	(352,317)	(383,793)	(415,280)	(442,292)	(469,315)	(496,327)	(523,350)	(550,362)	(577,385)	(604,397)	(631,420)	(658,432)	(660,555)	(637,777)	(614,999)	(592,222)	(569,444)	(546,666)	(523,888)
Deferred Tax Base		(10,835)	241,764	218,273	196,602	176,492	157,942	140,736	124,873	122,273	122,229	122,273	104,893	104,936	104,893	104,936	104,893	104,936	104,893	104,936	104,893	8,243	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)
Deferred Taxes - Federal		(2,139)	47,717	43,080	38,803	34,834	31,173	27,777	24,646	24,133	24,124	24,133	20,703	20,711	20,703	20,711	20,703	20,711	20,703	20,711	20,703	1,627	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)
Deferred Taxes - State excluding credit		(652)	14,542	13,129	11,826	10,616	9,500	8,465	7,511	7,355	7,352	7,355	6,309	6,312	6,309	6,312	6,309	6,312	6,309	6,312	6,309	496	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)
Change in Deferred Taxes		(2,790)	62,259	56,209	50,629	45,450	40,673	36,242	32,157	31,488	31,476	31,488	27,012	27,023	27,012	27,023	27,012	27,023	27,012	27,023	27,012	2,123	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)
Accumulated Deferred Taxes		(2,790)	59,468	115,678	166,307	211,757	252,430	288,672	320,829	352,317	383,793	415,280	442,292	469,315	496,327	523,350	550,362	577,385	604,397	631,420	658,432	660,555	637,777	614,999	592,222	569,444	546,666	523,888
check		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Change in Deferred ITC		173,364	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		173,364	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rate Base and Financing																												
Investment: (Rate Base)																												
Gross Plant		4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092
Accumulated Depreciation		-	88,451	176,902	265,353	353,803	442,254	530,705	619,156	707,607	796,058	884,509	972,959	1,061,410	1,149,861	1,238,312	1,326,763	1,415,214	1,503,665	1,592,115	1,680,566	1,769,017	1,857,468	1,945,919	2,034,370	2,122,821	2,211,271	2,299,722
Accumulated Deferred Taxes		(2,790)	59,468	115,678	166,307	211,757	252,430	288,672	320,829	352,317	383,793	415,280	442,292	469,315	496,327	523,350	550,362	577,385	604,397	631,420	658,432	660,555	637,777	614,999	592,222	569,444	546,666	523,888
Accumulated Deferred ITC		173,364	156,027	138,691	121,355	104,018	86,682	69,345	52,009	34,673	17,336	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ending Net Investment	-	4,163,519	4,030,145	3,902,822	3,781,078	3,664,514	3,552,726	3,445,370	3,342,098	3,239,496	3,136,905	3,034,303	2,918,840	2,803,366	2,687,904	2,572,430	2,456,967	2,341,493	2,226,030	2,110,556	1,995,093	1,904,520	1,838,847	1,773,174	1,707,501	1,641,827	1,576,154	1,510,481
Average Net Investment		2,081,759	4,096,832	3,966,484	3,841,950	3,722,796	3,608,620	3,499,048	3,393,734	3,290,797	3,188,200	3,085,604	2,976,572	2,861,103	2,745,635	2,630,167	2,514,698	2,399,230	2,283,761	2,168,293	2,052,825	1,949,807	1,871,683	1,806,010	1,740,337	1,674,664	1,608,991	1,543,318
Average Financing:																												
Short Term Debt	1.18%	24,646	48,502	46,959	45,485	44,074	42,722	41,425	40,178	38,960	37,745	36,530	35,240	33,873	32,506	31,138	29,771	28,404	27,037	25,670	24,303	23,084	22,159	21,381	20,604	19,826	19,049	18,271
Long Term Debt (Revenue Bonds)	39.59%	824,265	1,622,126	1,570,515	1,521,206	1,474,028	1,428,820	1,385,435	1,343,736	1,302,979	1,262,356	1,221,734	1,178,563	1,132,843	1,087,124	1,041,405	995,686	949,966	904,247	858,528	812,808	772,019	741,086	715,083	689,080	663,077	637,074	611,071
Taxable Debt	1.22%	25,428	50,041	48,449	46,928	45,472	44,078	42,739	41,453	40,196	38,943	37,689	36,358	34,947	33,537	32,126	30,716	29,306	27,895	26,485	25,074	23,816	22,862	22,060	21,257	20,455	19,653	18,851
Preferred Stock	0.90%	18,759	36,917	35,743	34,621	33,547	32,518	31,531	30,582	29,654	28,729	27,805	26,822	25,782	24,741	23,701	22,660	21,620	20,579	19,539	18,498	17,570	16,866	16,274	15,682	15,091	14,499	13,907
Common Equity	57.10%	1,188,661	2,339,246	2,264,818	2,193,711	2,125,675	2,060,482	1,997,918	1,937,784	1,879,009	1,820,427	1,761,846	1,699,589	1,633,658	1,567,727	1,501,796	1,435,865	1,369,934	1,304,002	1,238,071	1,172,140	1,113,318	1,068,710	1,031,212	993,713	956,215	918,716	881,217
Total Financing		2,081,759	4,096,832	3,966,484	3,841,950	3,722,796	3,608,620	3,499,048	3,393,734	3,290,797	3,188,200	3,085,604	2,976,572	2,861,103	2,745,635	2,630,167	2,514,698	2,399,230	2,283,761	2,168,293	2,052,825	1,949,807	1,871,683	1,806,010	1,740,337	1,674,664	1,608,991	1,543,318
Return on Investment																												
Short Term Debt	1.75%	431	849	822	796	771	748	725	703	682	661	639	617	593	569	545	521	497	473	449	425	404	388	374	361	347	333	320
Long Term Debt (Taxable Debt)	5.03%	41,461	81,593	78,997	76,517	74,144	71,870	69,687	67,590	65,540	63,497	61,453	59,282	56,982	54,682	52,383	50,083	47,783	45,484	43,184	40,884	38,833	37,277	35,969	34,661	33,353	32,045	30,737
Hybrids	7.19%	1,828	3,598	3,483	3,374	3,269	3,169	3,073	2,980	2,890	2,800	2,710	2,614	2,513	2,411	2,310	2,208	2,107	2,006	1,904	1,803	1,712	1,644	1,586	1,528	1,471	1,413	1,355
Total Interest Expense		43,720	86,040	83,302	80,687	78,184	75,786	73,485	71,274	69,112	66,957	64,802	62,513	60,087	57,662	55,237	52,812	50,387	47,962	45,537	43,112	40,949	39,308	37,929	36,550	35,170	33,791	32,412
Preferred Dividends	5.37%	1,007	1,982	1,919	1,859	1,801	1,746	1,693	1,642	1,592	1,543	1,493	1,440	1,384	1,329	1,273	1,217	1,161	1,105	1,049	993	944	906	874	842	810	779	747
Net Income on Common	9.50%	112,923	222,228	215,158	208,403	201,939	195,746	189,802	184,090	178,506	172,941	167,375	161,461	155,198	148,934	142,671	136,407	130,144	123,880	117,617	111,353	105,765	101,527	97,965	94,403	90,840	87,278	83,716
Income Taxes																												
Income Before Pref Dividends		113,930	224,211	217,077	210,262	203,741	197,492	191,495	185,732	180,098	174,483	168,868	162,901	156,582	150,263	143,943	137,624	131,305	124,985	118,666	112,347	106,709	102,433	98,839	95,245	91,651	88,057	84,462
Income Before Taxes (including ITC)		153,445	301,975	292,367	283,188	274,405	265,989	257,913	250,150	242,563	235,000	227,438	219,401	210,890	202,379	193,868	185,357	176,846	168,335	159,824	151,312	143,719	137,961	133,120	128,279	123,438	118,598	113,757
Investment Tax Credit		-	17,336	17,336	17,336	17,336	17,336	17,336	17,336	17,336	17,336	17,336	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Income Before Taxes (excluding ITC)		153,445	284,639	275,031	265,851	257,069	248,653	240,576	232,814	225,226	217,664	210,102	219,401	210,890	202,379	193,868	185,357	176,846	168,335	159,824	151,312	143,719	137,961	133,120	128,279	123,438	118,598	113,757
Federal Income Tax		30,285	59,600	57,704	55,892	54,159	52,498	50,904	49,372	47,874	46,382	44,889	43,303	41,623	39,943	38,263	36,584	34,904	33,224	31,544	29,864	28,366	27,229	26,274	25,318	24,363	23,407	22,452
State Income Tax		9,230	18,164	17,586	17,034	16,506	15,999	15,514	15,047	14,590	14,135	13,680	13,197	12,685	12,173	11,661	11,149	10,637	10,125	9,613	9,102	8,645	8,298	8,007	7,716	7,425	7,134	6,843
State Investment Tax Credit		-	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total State Tax		9,230	828	250	(303)	(831)	(1,337)	(1,823)	(2,290)	(2,746)	(3,201)	(3,656)	13,197	12,685	12,173	11,661	11,149	10,637	10,125	9,613	9,102	8,645	8,298	8,007	7,716	7,425	7,134	6,843
Total Taxes		39,515	60,428	57,954	55,590	53,328	51,161	49,081	47,082	45,128	43,181	41,233	56,500	54,308	52,116	49,925	47,733	45,541	43,349	41,158	38,966	37,010	35,527	34,281	33,034	31,788	30,541	29,295
Revenue Requirement Calculation																												
Revenue Requirement Factors		**0.0499**	**0.1163**	**0.1131**	**0.1102**	**0.1073**	**0.1046**	**0.1019**	**0.0994**	**0.0969**	**0.0945**	**0.0920**	**0.0938**	**0.0910**	**0.0882**	**0.0855**	**0.0827**	**0.0799**	**0.0772**	**0.0744**	**0.0716**	**0.0692**	**0.0673**	**0.0657**	**0.0641**	**0.0626**	**0.0610**	**0.0594**
Revenue Requirement		**216,392**	**503,901**	**490,352**	**477,407**	**465,021**	**453,153**	**441,763**	**430,816**	**420,116**	**409,452**	**398,787**	**406,480**	**394,478**	**382,475**	**370,473**	**358,470**	**346,468**	**334,465**	**322,463**	**310,460**	**299,752**	**291,631**	**284,805**	**277,978**	**271,152**	**264,325**	**257,499**
Revenue Taxes		19,226	44,772	43,568	42,418	41,317	40,263	39,251	38,278	37,327	36,380	35,432	36,116	35,049	33,983	32,917	31,850	30,784	29,717	28,651	27,584	26,633	25,911	25,305	24,698	24,092	23,485	22,879
Income Before Depr, Int, Inc Tax		197,165	459,129	446,784	434,989	423,704	412,890	402,513	392,538	382,789	373,072	363,355	370,365	359,429	348,492	337,556	326,620	315,684	304,748	293,812	282,876	273,119	265,720	259,500	253,280	247,060	240,840	234,620
Depreciation Expense		-	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451
O&M		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest Expense		43,720	86,040	83,302	80,687	78,184	75,786	73,485	71,274	69,112	66,957	64,802	62,513	60,087	57,662	55,237	52,812	50,387	47,962	45,537	43,112	40,949	39,308	37,929	36,550	35,170	33,791	32,412
Income Before Income Taxes		153,445	284,639	275,031	265,851	257,069	248,653	240,576	232,814	225,226	217,664	210,102	219,401	210,890	202,379	193,868	185,357	176,846	168,335	159,824	151,312	143,719	137,961	133,120	128,279	123,438	118,598	113,757
Income Taxes - Federal		30,285	59,600	57,704	55,892	54,159	52,498	50,904	49,372	47,874	46,382	44,889	43,303	41,623	39,943	38,263	36,584	34,904	33,224	31,544	29,864	28,366	27,229	26,274	25,318	24,363	23,407	22,452
Income Taxes - State		9,230	18,164	17,586	17,034	16,506	15,999	15,514	15,047	14,590	14,135	13,680	13,197	12,685	12,173	11,661	11,149	10,637	10,125	9,613	9,102	8,645	8,298	8,007	7,716	7,425	7,134	6,843
State ITC		-	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	(17,336)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Income Taxes		39,515	60,428	57,954	55,590	53,328	51,161	49,081	47,082	45,128	43,181	41,233	56,500	54,308	52,116	49,925	47,733	45,541	43,349	41,158	38,966	37,010	35,527	34,281	33,034	31,788	30,541	29,295
Preferred Dividends		1,007	1,982	1,919	1,859	1,801	1,746	1,693	1,642	1,592	1,543	1,493	1,440	1,384	1,329	1,273	1,217	1,161	1,105	1,049	993	944	906	874	842	810	779	747
Net Income for Common		112,923	222,228	215,158	208,403	201,939	195,746	189,802	184,090	178,506	172,941	167,375	161,461	155,198	148,934	142,671	136,407	130,144	123,880	117,617	111,353	105,765	101,527	97,965	94,403	90,840	87,278	83,716
check		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ROE		*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*

Auiki Substation Bill Impact
Revenue Requirements Model - Calculat

	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074
Manual input	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
O&M																											
Escalation Rate	1.71	1.74	1.78	1.81	1.85	1.88	1.92	1.96	2.00	2.04	2.08	2.12	2.16	2.21	2.25	2.30	2.34	2.39	2.44	2.49	2.54	2.59	2.64	2.69	2.75	2.80	2.86
O&M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plant Asset Depreciation																											
Book Depreciation																											
Book Depreciation Rates	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	2.041%	0.000%	0.000%	0.000%	0.000%
Depreciation Expense	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	-	-	-	-
Accumulated Depreciation	2,388,173	2,476,624	2,565,075	2,653,526	2,741,977	2,830,427	2,918,878	3,007,329	3,095,780	3,184,231	3,272,682	3,361,133	3,449,583	3,538,034	3,626,485	3,714,936	3,803,387	3,891,838	3,980,289	4,068,739	4,157,190	4,245,641	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092
Tax Depreciation																											
Tax Depreciation Rates (Straight Line)	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Revenue Bond Financed Tax Basis (S/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax Depreciation Rates (MACRS)	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
NonRB Financed Tax Basis (MACRS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax Depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accumulated Tax Depreciation	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092
State Investment Tax Credit (ITC)																											
Book																											
State ITC Amortization Rate	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Amortization of State ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accumulated Amortization	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364
Deferred ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax																											
Deferred Tax Calculation																											
Book Accumulated Depreciation	2,388,173	2,476,624	2,565,075	2,653,526	2,741,977	2,830,427	2,918,878	3,007,329	3,095,780	3,184,231	3,272,682	3,361,133	3,449,583	3,538,034	3,626,485	3,714,936	3,803,387	3,891,838	3,980,289	4,068,739	4,157,190	4,245,641	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092
Tax Accumulated Depreciation	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092
Book/Tax Acc Depr Difference	(1,945,919)	(1,857,468)	(1,769,017)	(1,680,566)	(1,592,115)	(1,503,665)	(1,415,214)	(1,326,763)	(1,238,312)	(1,149,861)	(1,061,410)	(972,959)	(884,509)	(796,058)	(707,607)	(619,156)	(530,705)	(442,254)	(353,803)	(265,353)	(176,902)	(88,451)	-	-	-	-	-
Deferred ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Deferred Tax Asset (Liability)	(501,111)	(478,333)	(455,555)	(432,777)	(410,000)	(387,222)	(364,444)	(341,666)	(318,889)	(296,111)	(273,333)	(250,555)	(227,778)	(205,000)	(182,222)	(159,444)	(136,667)	(113,889)	(91,111)	(68,333)	(45,556)	(22,778)	-	-	-	-	-
Deferred Tax Base	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	(88,451)	-	-	-	-
Deferred Taxes - Federal	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	(17,457)	-	-	-	-
Deferred Taxes - State excluding credit	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	(5,320)	-	-	-	-
Change in Deferred Taxes	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	(22,778)	-	-	-	-
Accumulated Deferred Taxes	501,111	478,333	455,555	432,777	410,000	387,222	364,444	341,666	318,889	296,111	273,333	250,555	227,778	205,000	182,222	159,444	136,667	113,889	91,111	68,333	45,556	22,778	0	0	0	0	0
check	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Change in Deferred ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rate Base and Financing																											
Investment: (Rate Base)																											
Gross Plant	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092
Accumulated Depreciation	2,388,173	2,476,624	2,565,075	2,653,526	2,741,977	2,830,427	2,918,878	3,007,329	3,095,780	3,184,231	3,272,682	3,361,133	3,449,583	3,538,034	3,626,485	3,714,936	3,803,387	3,891,838	3,980,289	4,068,739	4,157,190	4,245,641	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092
Accumulated Deferred Taxes	501,111	478,333	455,555	432,777	410,000	387,222	364,444	341,666	318,889	296,111	273,333	250,555	227,778	205,000	182,222	159,444	136,667	113,889	91,111	68,333	45,556	22,778	0	0	0	0	0
Accumulated Deferred ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ending Net Investment	1,444,808	1,379,135	1,313,462	1,247,789	1,182,116	1,116,443	1,050,770	985,096	919,423	853,750	788,077	722,404	656,731	591,058	525,385	459,712	394,039	328,365	262,692	197,019	131,346	65,673	(0)	(0)	(0)	(0)	(0)
Average Net Investment	1,477,645	1,411,972	1,346,299	1,280,625	1,214,952	1,149,279	1,083,606	1,017,933	952,260	886,587	820,914	755,241	689,568	623,894	558,221	492,548	426,875	361,202	295,529	229,856	164,183	98,510	32,837	(0)	(0)	(0)	(0)
Average Financing:																											
Short Term Debt	17,494	16,716	15,939	15,161	14,384	13,606	12,829	12,051	11,274	10,496	9,719	8,941	8,164	7,386	6,609	5,831	5,054	4,276	3,499	2,721	1,944	1,166	389	(0)	(0)	(0)	(0)
Long Term Debt (Revenue Bonds)	585,068	559,065	533,062	507,059	481,056	455,053	429,050	403,047	377,044	351,041	325,038	299,035	273,032	247,029	221,026	195,023	169,020	143,017	117,014	91,011	65,008	39,005	13,002	(0)	(0)	(0)	(0)
Taxable Debt	18,049	17,247	16,444	15,642	14,840	14,038	13,236	12,434	11,631	10,829	10,027	9,225	8,423	7,621	6,818	6,016	5,214	4,412	3,610	2,808	2,005	1,203	401	(0)	(0)	(0)	(0)
Preferred Stock	13,315	12,724	12,132	11,540	10,948	10,356	9,765	9,173	8,581	7,989	7,397	6,806	6,214	5,622	5,030	4,438	3,847	3,255	2,663	2,071	1,479	888	296	(0)	(0)	(0)	(0)
Common Equity	843,719	806,220	768,722	731,223	693,724	656,226	618,727	581,228	543,730	506,231	468,733	431,234	393,735	356,237	318,738	281,240	243,741	206,242	168,744	131,245	93,747	56,248	18,749	(0)	(0)	(0)	(0)
Total Financing	1,477,645	1,411,972	1,346,299	1,280,625	1,214,952	1,149,279	1,083,606	1,017,933	952,260	886,587	820,914	755,241	689,568	623,894	558,221	492,548	426,875	361,202	295,529	229,856	164,183	98,510	32,837	(0)	(0)	(0)	(0)
Return on Investment																											
Short Term Debt	306	293	279	265	252	238	225	211	197	184	170	156	143	129	116	102	88	75	61	48	34	20	7	(0)	(0)	(0)	(0)
Long Term Debt (Taxable Debt)	29,429	28,121	26,813	25,505	24,197	22,889	21,581	20,273	18,965	17,657	16,349	15,041	13,733	12,426	11,118	9,810	8,502	7,194	5,886	4,578	3,270	1,962	654	(0)	(0)	(0)	(0)
Hybrids	1,298	1,240	1,182	1,125	1,067	1,009	952	894	836	779	721	663	606	548	490	433	375	317	260	202	144	87	29	(0)	(0)	(0)	(0)
Total Interest Expense	31,033	29,654	28,274	26,895	25,516	24,137	22,757	21,378	19,999	18,620	17,240	15,861	14,482	13,103	11,723	10,344	8,965	7,586	6,207	4,827	3,448	2,069	690	(0)	(0)	(0)	(0)
Preferred Dividends	715	683	651	620	588	556	524	493	461	429	397	365	334	302	270	238	207	175	143	111	79	48	16	(0)	(0)	(0)	(0)
Net Income on Common	80,153	76,591	73,029	69,466	65,904	62,341	58,779	55,217	51,654	48,092	44,530	40,967	37,405	33,842	30,280	26,718	23,155	19,593	16,031	12,468	8,906	5,344	1,781	(0)	(0)	(0)	(0)
Income Taxes																											
Income Before Pref Dividends	80,868	77,274	73,680	70,086	66,492	62,898	59,303	55,709	52,115	48,521	44,927	41,333	37,739	34,144	30,550	26,956	23,362	19,768	16,174	12,580	8,985	5,391	1,797	(0)	(0)	(0)	(0)
Income Before Taxes (including ITC)	108,916	104,076	99,235	94,394	89,553	84,713	79,872	75,031	70,191	65,350	60,509	55,668	50,828	45,987	41,146	36,305	31,465	26,624	21,783	16,943	12,102	7,261	2,420	(0)	(0)	(0)	(0)
Investment Tax Credit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Income Before Taxes (excluding ITC)	108,916	104,076	99,235	94,394	89,553	84,713	79,872	75,031	70,191	65,350	60,509	55,668	50,828	45,987	41,146	36,305	31,465	26,624	21,783	16,943	12,102	7,261	2,420	(0)	(0)	(0)	(0)
Federal Income Tax	21,497	20,541	19,586	18,630	17,675	16,720	15,764	14,809	13,853	12,898	11,943	10,987	10,032	9,076	8,121	7,166	6,210	5,255	4,299	3,344	2,389	1,433	478	(0)	(0)	(0)	(0)
State Income Tax	6,551	6,260	5,969	5,678	5,387	5,095	4,804	4,513	4,222	3,931	3,640	3,348	3,057	2,766	2,475	2,184	1,893	1,601	1,310	1,019	728	437	146	(0)	(0)	(0)	(0)
State Investment Tax Credit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total State Tax	6,551	6,260	5,969	5,678	5,387	5,095	4,804	4,513	4,222	3,931	3,640	3,348	3,057	2,766	2,475	2,184	1,893	1,601	1,310	1,019	728	437	146	(0)	(0)	(0)	(0)
Total Taxes	28,048	26,801	25,555	24,308	23,062	21,815	20,569	19,322	18,075	16,829	15,582	14,336	13,089	11,842	10,596	9,349	8,103	6,856	5,610	4,363	3,116	1,870	623	(0)	(0)	(0)	(0)
Revenue Requirement Calculation																											
Revenue Requirement Factors	**0.0578**	**0.0563**	**0.0547**	**0.0531**	**0.0515**	**0.0500**	**0.0484**	**0.0468**	**0.0452**	**0.0437**	**0.0421**	**0.0405**	**0.0389**	**0.0374**	**0.0358**	**0.0342**	**0.0326**	**0.0311**	**0.0295**	**0.0279**	**0.0263**	**0.0248**	**0.0232**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**
Revenue Requirement	**250,672**	**243,846**	**237,019**	**230,193**	**223,366**	**216,540**	**209,713**	**202,887**	**196,060**	**189,234**	**182,407**	**175,581**	**168,754**	**161,928**	**155,101**	**148,275**	**141,448**	**134,622**	**127,795**	**120,969**	**114,142**	**107,316**	**100,489**	**(0)**	**(0)**	**(0)**	**(0)**
Revenue Taxes	22,272	21,666	21,059	20,453	19,846	19,240	18,633	18,026	17,420	16,813	16,207	15,600	14,994	14,387	13,781	13,174	12,568	11,961	11,355	10,748	10,142	9,535	8,928	(0)	(0)	(0)	(0)
Income Before Depr, Int, Inc Tax	228,400	222,180	215,960	209,740	203,520	197,300	191,080	184,860	178,640	172,420	166,200	159,980	153,760	147,540	141,321	135,101	128,881	122,661	116,441	110,221	104,001	97,781	91,561	(0)	(0)	(0)	(0)
Depreciation Expense	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	88,451	-	-	-	-
O&M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest Expense	31,033	29,654	28,274	26,895	25,516	24,137	22,757	21,378	19,999	18,620	17,240	15,861	14,482	13,103	11,723	10,344	8,965	7,586	6,207	4,827	3,448	2,069	690	(0)	(0)	(0)	(0)
Income Before Income Taxes	108,916	104,076	99,235	94,394	89,553	84,713	79,872	75,031	70,191	65,350	60,509	55,668	50,828	45,987	41,146	36,305	31,465	26,624	21,783	16,943	12,102	7,261	2,420	(0)	(0)	(0)	(0)
Income Taxes - Federal	21,497	20,541	19,586	18,630	17,675	16,720	15,764	14,809	13,853	12,898	11,943	10,987	10,032	9,076	8,121	7,166	6,210	5,255	4,299	3,344	2,389	1,433	478	(0)	(0)	(0)	(0)
Income Taxes - State	6,551	6,260	5,969	5,678	5,387	5,095	4,804	4,513	4,222	3,931	3,640	3,348	3,057	2,766	2,475	2,184	1,893	1,601	1,310	1,019	728	437	146	(0)	(0)	(0)	(0)
State ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Income Taxes	28,048	26,801	25,555	24,308	23,062	21,815	20,569	19,322	18,075	16,829	15,582	14,336	13,089	11,842	10,596	9,349	8,103	6,856	5,610	4,363	3,116	1,870	623	(0)	(0)	(0)	(0)
Preferred Dividends	715	683	651	620	588	556	524	493	461	429	397	365	334	302	270	238	207	175	143	111	79	48	16	(0)	(0)	(0)	(0)
Net Income for Common	80,153	76,591	73,029	69,466	65,904	62,341	58,779	55,217	51,654	48,092	44,530	40,967	37,405	33,842	30,280	26,718	23,155	19,593	16,031	12,468	8,906	5,344	1,781	(0)	(0)	(0)	(0)
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*(0)*	*(0)*	*0*	-	-	-	-
	9.50%	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*

Auiki Substation Bill Impact							
Revenue Requirements Model - Calculat							
	2075	2076	2077	2078	2079	2080	
Manual input	55	56	57	58	59	60	Total
O&M							
Escalation Rate	2.91	2.97	3.03	3.09	3.15	3.22	
O&M	-	-	-	-	-	-	-
Plant Asset Depreciation							
Book Depreciation							
Book Depreciation Rates	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	100.00%
Depreciation Expense	-	-	-	-	-	-	4,334,092
Accumulated Depreciation	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	
Tax Depreciation							
Tax Depreciation Rates (Straight Line)	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	100.00%
Revenue Bond Financed Tax Basis (S/L	-	-	-	-	-	-	-
Tax Depreciation Rates (MACRS)	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	100.00%
NonRB Financed Tax Basis (MACRS)	-	-	-	-	-	-	4,334,092
Tax Depreciation	-	-	-	-	-	-	4,334,092
Accumulated Tax Depreciation	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	
State Investment Tax Credit (ITC)							
Book							
State ITC Amortization Rate	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	100.00%
Amortization of State ITC	-	-	-	-	-	-	173,364
Accumulated Amortization	173,364	173,364	173,364	173,364	173,364	173,364	
Deferred ITC	-	-	-	-	-	-	
Tax							
Deferred Tax Calculation							
Book Accumulated Depreciation	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	
Tax Accumulated Depreciation	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	
Book/Tax Acc Depr Difference	-	-	-	-	-	-	
Deferred ITC	-	-	-	-	-	-	
Net Deferred Tax Asset (Liability)	-	-	-	-	-	-	
Deferred Tax Base	-	-	-	-	-	-	
Deferred Taxes - Federal	-	-	-	-	-	-	
Deferred Taxes - State excluding credit	-	-	-	-	-	-	
Change in Deferred Taxes	-	-	-	-	-	-	
Accumulated Deferred Taxes	0	0	0	0	0	0	
check	0	0	0	0	0	0	
Change in Deferred ITC	-	-	-	-	-	-	
	-	-	-	-	-	-	
Rate Base and Financing							
Investment: (Rate Base)							
Gross Plant	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	
Accumulated Depreciation	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	4,334,092	
Accumulated Deferred Taxes	0	0	0	0	0	0	
Accumulated Deferred ITC	-	-	-	-	-	-	
Ending Net Investment	(0)	(0)	(0)	(0)	(0)	(0)	
Average Net Investment	(0)	(0)	(0)	(0)	(0)	(0)	
Average Financing:							
Short Term Debt	(0)	(0)	(0)	(0)	(0)	(0)	
Long Term Debt (Revenue Bonds)	(0)	(0)	(0)	(0)	(0)	(0)	
Taxable Debt	(0)	(0)	(0)	(0)	(0)	(0)	
Preferred Stock	(0)	(0)	(0)	(0)	(0)	(0)	
Common Equity	(0)	(0)	(0)	(0)	(0)	(0)	
Total Financing	(0)	(0)	(0)	(0)	(0)	(0)	
Return on Investment							
Short Term Debt	(0)	(0)	(0)	(0)	(0)	(0)	
Long Term Debt (Taxable Debt)	(0)	(0)	(0)	(0)	(0)	(0)	
Hybrids	(0)	(0)	(0)	(0)	(0)	(0)	
Total Interest Expense	(0)	(0)	(0)	(0)	(0)	(0)	
Preferred Dividends	(0)	(0)	(0)	(0)	(0)	(0)	
Net Income on Common	(0)	(0)	(0)	(0)	(0)	(0)	
Income Taxes							
Income Before Pref Dividends	(0)	(0)	(0)	(0)	(0)	(0)	
Income Before Taxes (including ITC)	(0)	(0)	(0)	(0)	(0)	(0)	
Investment Tax Credit	-	-	-	-	-	-	
Income Before Taxes (excluding ITC)	(0)	(0)	(0)	(0)	(0)	(0)	
Federal Income Tax	(0)	(0)	(0)	(0)	(0)	(0)	
State Income Tax	(0)	(0)	(0)	(0)	(0)	(0)	
State Investment Tax Credit	-	-	-	-	-	-	
Total State Tax	(0)	(0)	(0)	(0)	(0)	(0)	
Total Taxes	(0)	(0)	(0)	(0)	(0)	(0)	
Revenue Requirement Calculation							
Revenue Requirement Factors	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	
Revenue Requirement	**(0)**	**(0)**	**(0)**	**(0)**	**(0)**	**(0)**	
Revenue Taxes	(0)	(0)	(0)	(0)	(0)	(0)	
Income Before Depr, Int, Inc Tax	(0)	(0)	(0)	(0)	(0)	(0)	
Depreciation Expense	-	-	-	-	-	-	
O&M	-	-	-	-	-	-	
Interest Expense	(0)	(0)	(0)	(0)	(0)	(0)	
Income Before Income Taxes	(0)	(0)	(0)	(0)	(0)	(0)	
Income Taxes - Federal	(0)	(0)	(0)	(0)	(0)	(0)	
Income Taxes - State	(0)	(0)	(0)	(0)	(0)	(0)	
State ITC	-	-	-	-	-	-	
Total Income Taxes	(0)	(0)	(0)	(0)	(0)	(0)	
Preferred Dividends	(0)	(0)	(0)	(0)	(0)	(0)	
Net Income for Common	(0)	(0)	(0)	(0)	(0)	(0)	
	-	-	-	-	-	-	
	9.50%	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	

Hawaiian Electric Co., Inc.
TOTAL GWH SALES FORECAST (INCLUDING FUTURE LAYERS)
June 2017 Forecast

Year	Sch R GWh Sales	% Change	Sch G GWh Sales	% Change	Sch J GWh Sales	% Change	Sch P GWh Sales	% Change	Sch F GWh Sales	% Change	Total GWh Sales	% Change	Total GWh Sales
Recd 2016	1,580.4		292.6		1,842.1		2,911.1		34.0		6,660.2		6,660,200
2017	1,540.8	-2.5%	293.1	0.2%	1,858.8	0.9%	2,903.9	-0.2%	32.5	-4.4%	6,629.1	-0.5%	6,629,100
2018	1,499.2	-2.7%	286.9	-2.1%	1,855.4	-0.2%	2,895.3	-0.3%	31.1	-4.3%	6,567.9	-0.9%	6,567,900
2019	1,456.0	-2.9%	280.3	-2.3%	1,850.8	-0.2%	2,927.1	1.1%	30.9	-0.6%	6,545.1	-0.3%	6,545,100
2020	1,434.4	-1.5%	275.8	-1.6%	1,838.1	-0.7%	2,978.0	1.7%	30.7	-0.6%	6,557.0	0.2%	6,557,000
2021	1,404.0	-2.1%	272.1	-1.3%	1,823.8	-0.8%	3,036.3	2.0%	30.3	-1.3%	6,566.5	0.1%	6,566,500
2022	1,378.8	-1.8%	268.5	-1.3%	1,807.7	-0.9%	3,045.4	0.3%	30.2	-0.3%	6,530.6	-0.5%	6,530,600
2023	1,343.1	-2.6%	262.5	-2.2%	1,773.5	-1.9%	2,998.6	-1.5%	29.9	-1.0%	6,407.6	-1.9%	6,407,600
2024	1,323.9	-1.4%	257.5	-1.9%	1,739.2	-1.9%	3,005.2	0.2%	29.6	-1.0%	6,355.4	-0.8%	6,355,400
2025	1,294.2	-2.2%	252.8	-1.8%	1,716.4	-1.3%	2,957.2	-1.6%	29.3	-1.0%	6,249.9	-1.7%	6,249,900
2026	1,263.4	-2.4%	247.6	-2.1%	1,699.4	-1.0%	2,956.3	0.0%	29.0	-1.0%	6,195.7	-0.9%	6,195,700
2027	1,229.4	-2.7%	242.2	-2.2%	1,679.5	-1.2%	2,917.6	-1.3%	28.6	-1.4%	6,097.3	-1.6%	6,097,300
2028	1,190.2	-3.2%	236.4	-2.4%	1,660.6	-1.1%	2,879.5	-1.3%	28.5	-0.3%	5,995.2	-1.7%	5,995,200
2029	1,136.6	-4.5%	228.1	-3.5%	1,622.0	-2.3%	2,815.1	-2.2%	28.0	-1.8%	5,829.8	-2.8%	5,829,800
2030	1,107.5	-2.6%	222.3	-2.5%	1,601.1	-1.3%	2,776.7	-1.4%	27.7	-1.1%	5,735.3	-1.6%	5,735,300
2031	1,076.4	-2.8%	215.9	-2.9%	1,579.7	-1.3%	2,730.2	-1.7%	27.4	-1.1%	5,629.6	-1.8%	5,629,600
2032	1,074.6	-0.2%	212.7	-1.5%	1,573.5	-0.4%	2,706.6	-0.9%	27.3	-0.4%	5,594.7	-0.6%	5,594,700
2033	1,076.0	0.1%	208.4	-2.0%	1,555.3	-1.2%	2,687.8	-0.7%	27.0	-1.1%	5,554.5	-0.7%	5,554,500
2034	1,085.5	0.9%	206.1	-1.1%	1,553.3	-0.1%	2,675.2	-0.5%	26.8	-0.7%	5,546.9	-0.1%	5,546,900
2035	1,096.3	1.0%	205.1	-0.5%	1,551.5	-0.1%	2,681.4	0.2%	26.5	-1.1%	5,560.8	0.3%	5,560,800
2036	1,115.1	1.7%	205.5	0.2%	1,555.6	0.3%	2,676.7	-0.2%	26.5	0.0%	5,579.4	0.3%	5,579,400
2037	1,133.6	1.7%	205.0	-0.2%	1,550.3	-0.3%	2,661.9	-0.6%	26.2	-1.1%	5,577.0	0.0%	5,577,000
2038	1,155.4	1.9%	205.4	0.2%	1,552.0	0.1%	2,651.4	-0.4%	26.1	-0.4%	5,590.3	0.2%	5,590,300
2039	1,183.3	2.4%	205.5	0.0%	1,553.4	0.1%	2,647.8	-0.1%	25.9	-0.8%	5,615.9	0.5%	5,615,900
2040	1,217.9	2.9%	206.6	0.5%	1,568.8	1.0%	2,654.9	0.3%	25.9	0.0%	5,674.1	1.0%	5,674,100
2041	1,244.0	2.1%	207.6	0.5%	1,574.7	0.4%	2,628.1	-1.0%	25.6	-1.2%	5,680.0	0.1%	5,680,000
2042	1,278.9	2.8%	207.8	0.1%	1,577.8	0.2%	2,633.4	0.2%	25.4	-0.8%	5,723.3	0.8%	5,723,300
2043	1,317.6	3.0%	208.9	0.5%	1,590.1	0.8%	2,623.9	-0.4%	25.2	-0.8%	5,765.7	0.7%	5,765,700
2044	1,361.6	3.3%	210.2	0.6%	1,605.6	1.0%	2,627.3	0.1%	25.2	0.0%	5,829.9	1.1%	5,829,900
2045	1,412.7	3.8%	211.3	0.5%	1,624.8	1.2%	2,630.9	0.1%	24.9	-1.2%	5,904.6	1.3%	5,904,600
2046	1,466.2	3.8%	215.4	1.9%	1,671.8	2.9%	2,617.6	-0.5%	24.8	-0.4%	5,995.8	1.5%	5,995,800
2047	1,520.7	3.7%	219.3	1.8%	1,715.8	2.6%	2,602.4	-0.6%	24.6	-0.8%	6,082.8	1.5%	6,082,800

HAWAII STEVEDORES, INC.
1601 Sand Island Parkway • Honolulu, Hawaii 96819 • (808) 527-3450

February 27, 2018

Hawaiian Electric
P. O. Box 2760
Honolulu, Hawaii 96840
Attn: [redacted]

Subject: Projected Electrical Loads for the New Kapalama Terminal

Dear [redacted]

As a follow up to projected electrical load information provided in August 2017, for the proposed Kapalama Terminal, our preliminary assumptions regarding future operations at the Terminal are as follows:

- There will be a peak of [redacted]
- It is likely that [redacted] could be berthed simultaneously.
- [redacted]
- A minimum of [redacted] is projected to be in port, 6 out of 7 days per week.
- The Terminal will be equipped with a total of [redacted] electric wharf gantry cranes. [redacted]
- While a ship is in port, all facilities at the Terminal will be continuously occupied and operational. These facilities include the proposed Administration, Maintenance and Marine Operations Buildings.
- The Terminal will be equipped with a minimum of [redacted] It is anticipated that every vessel will carry [redacted] and all of the [redacted] will be fully utilized whenever a vessel is in port.

Based on the anticipated Terminal operational scheme described above, the demand load for the Terminal will peak at the estimated [redacted], and could be [redacted]. This scenario is expected to occur on a weekly basis. While the gantry [redacted] and [redacted] will likely be [redacted] in nature, continuous Terminal operations will require [redacted]

When a single vessel is in port, the Terminal demand loads are expected to peak at approximately [redacted] if [redacted] are utilized. Based on the premise that three to four vessels will be [redacted] the [redacted] demand may need to be supported over a period of [redacted] hours per

a week. Again this load could be [redacted] but [redacted] Terminal operations will require support of the [redacted]

The above information represents our best projection of anticipated Terminal operations at this time. We may be able to provide additional input in the future as our equipment and facility requirements are further refined.

Respectfully,

[redacted]
Hawaii Stevedores, Inc.

PLANNING DEMAND LOAD PROFILE FOR THE NEW KAPALAMA CONTAINER TERMINAL
02/23/2018

AUIKI SUBSTATION AT KAPALAMA TERMINAL YARD TRANSMISSION AND NON-TRANSMISSION ALTERNATIVES ANALYSIS

1) ALTERNATIVE/OPTION 1: INSTALLATION OF A DEDICATED DISTRIBUTION SUBSTATION AT KAPALAMA TERMINAL YARD.

The first option, a dedicated substation was not evaluated further, as initial customer requests did not request primary service, but requested secondary service to individual tenant meters. This is consistent with Hawaiian Electric Rule 13 regulating line extensions and substations. This also aligns with Hawaiian Electric Rule 14 on Service Conncections and Facilities on Customer's Premises, which allows Hawaiian Electric discretion to provide secondary conductor to meet customer demand.

2) ALTERNATIVE 2: INSTALLATION OF A SYSTEM DISTRIBUTION SUBSTATION AT KAPALAMA TERMINAL YARD.

The option was selected through the alternative analysis, and is detailed in this G.O.7 Application.

3) ALTERNATIVE 3: TRANSFORMER/SWITCHGEAR INSTALLATION AT EXISTING HAWAIIAN ELECTRIC WAIAKAMILO SYSTEM SUBSTATION.

The first alternative compared against the selected Auiki System Substation build on State of Hawai'i provided land at the former Kapalama Military Reservation, was installation of two similar transformer and switchgear electrical equipment at Hawaiian Electric's Waiakamilo System Substation located on Kalihi Street. This installation uses similar electrical equipment to resolve constrained capacity issues caused by new tenant and customers to be sited at the Port of Honolulu Kapalama Terminal Yard expansion and redevelopment area. This option exhibits increased risk due to significant conductor

undergrounding required due to existing overhead conflicts and interaction with the guideway being installed due to the HART rail project.

4) ALTERNATIVE 4: INSTALLATION OF A THREE (3) 3,000kW 6 HOUR BATTERY ENERGY STORAGE SYSTEM

An alternative solution considered was a battery energy storage system ("BESS"). Under normal conditions, the BESS would be interconnected to augment the capacity of the existing Sand Island circuit, fed from the Kapalama 1 substation transformer. For this plan, the battery would be designed to work in conjunction with the existing transformer, handling any load above the normal limit of the transformer. The battery capacity would need to be at least 2,907 kW sustained for 18 hours to accommodate the maximum energy requirement. This solution would utilize three 3000 kW/six-hour batteries. Based on updated December 2016 PSIP[1] utility-scale BESS cost estimates, including high-level interconnection costs, this places the final cost of the battery energy storage system at $22.27 million, in present value.

Based on existing 2017 circuit loading data and the load profile provided for Kapalama Terminal Yard by the customer, seen in Figure 1, the greatest power (kW) and energy (kWH) requirements were identified.

[1] See, PSIP Update Report: December 2016, Appendix J, filed in Docket No. 2014-0183 on December 23, 2016.

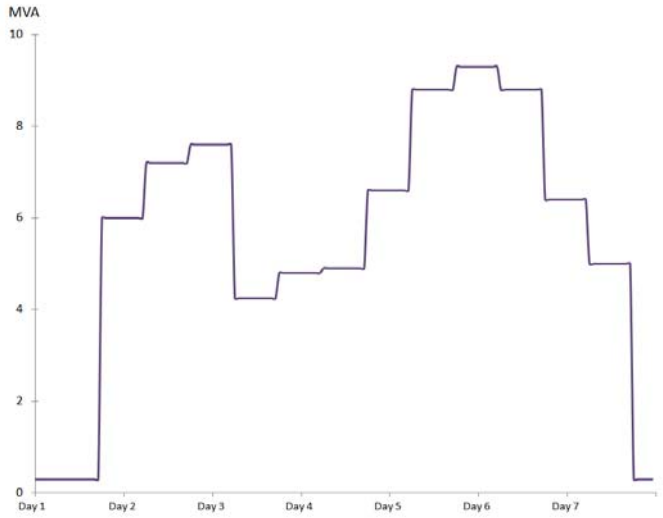


Figure 1: Provided Kapalama Terminal Yard load profile

Under normal conditions, the BESS would be interconnected to augment the capacity of the existing Sand Island circuit, fed from the Kapalama 1 substation transformer. In the most extreme emergency overload situation, a portion of Kahai circuit, normally fed from the Kapalama 2 substation transformer, is transferred to Sand Island circuit. A combination of Kapalama 2 transformer load data, circuit spot readings and annual distribution transformer peak load data was used to determine this amount. This load was added to the load profile to account for the worst case scenario for the Kapalama 1 transformer. The maximum demand was found to be 13,891 kW, while the maximum energy requirement was found to be 51,500 kWH, falling on a different day.

For this plan, the battery would be designed to work in conjunction with the existing transformer, handling any load above the normal limit of the transformer. This is illustrated in Figure 2, which shows the battery discharging to provide additional capacity on the circuit. The normal limit of the Kapalama 1 transformer is 10,984 kW. Therefore, the battery capacity would

need to be at least 2,907 kW sustained for 18 hours to accommodate the maximum energy requirement.

Figure 2: Battery contribution to overall capacity

This solution would utilize three 3000 kW/six-hour batteries. Based on updated December 2016 PSIP[2] utility-scale BESS cost estimates, including high-level interconnection costs, this BESS would cost approximately $17.3 million in the year 2020, and the 15-year replacement BESS in 2035 would cost approximately $14.56 million. This places the final cost of the battery energy storage system at $22.27 million, in present value.

The value of substation upfront and operation and maintenance costs avoided because of the battery was summed to find the total benefits of this alternative solution. These results are shown in the cost/benefit analysis shown in Figure 3, where it can be seen that the costs of the BESS outweigh the benefits received.

[2] See, PSIP Update Report: December 2016, Appendix J, filed in Docket No. 2014-0183 on December 23, 2016.

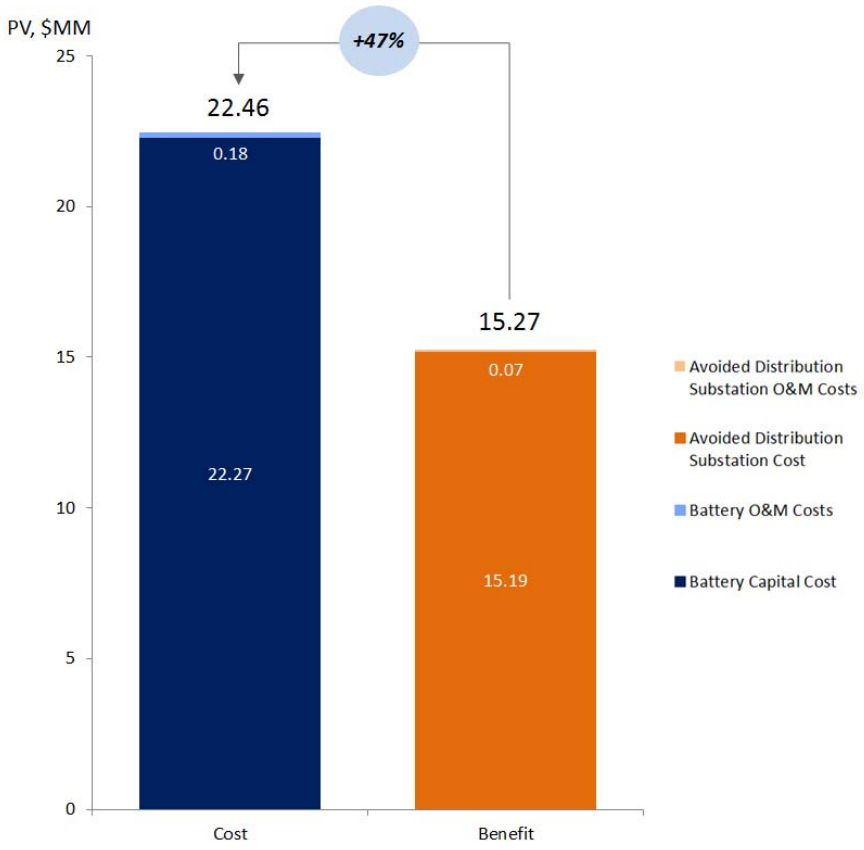


Figure 3: BESS Cost/Benefit Analysis

OVERHEAD vs. UNDERGROUND COMPARISON
AUIKI SUBSTATION PROJECT

	OVERHEAD	UNDERGROUND
LABOR	$870,232	$681,068
OVERHEAD COSTS	$1,081,638	$2,187,835
Sub-Total	$1,951,871	$2,868,903
MATERIALS	$564,011	$335,425
OUTSIDE SERVICES	$714,865	$11,007,453
OTHER		
ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION (AFDUC)	$34,772	$111,956
TOTAL COST OF PROJECT	**$3,265,519**	**$14,323,738**

OVERHEAD ITEMS
The breakdown of materials and their estimated costs for each item costing $1,000 or more are shown below:

Quantity	Item	Total Cost
21	46kV Framing	$16,678
19	12kV Framing	$2,432
8	Preassembled 3 phase Transformer Bank Framing	$7,622
2	Dead End Riser 12kV Framing with Cutouts	$1,058
1	Dead End Riser 46kV Framing with Vertical Switch	$13,151
2	Dead End Riser 46kV Overhead Framing	$10,287
8	Preassembled 3 Phase Transformer Banks	$3,554
1	Pole Mount Transformer 25kVA	$1,319
11	Pole Mount Transformer 50kVA	$25,125
6	Pole Mount Transformer 75kVA	$17,353
22	Termite Mesh Barrier	$9,878
22	Wood Poles, 65-ft Class 1	$44,093
3,624 #	Conductor, 336 AAC KCM, AL, 46kV	$7,755
1,000’	Conductor, Triplex, Service Drop	$2,020
1,230’	Fiber ADSS, 24 Strand	$1,476
2	Fiber ADSS Splice Enclosure	$4,363
3	Dead End Preassembled 46kV Riser Underground Framing	$25,022
2	Dead End Preassembled 12kV Riser Underground Framing	$1,911
3	Terminations at Substation	$6,723
1,300’	Conductor, 1500 KCM, AL, 46kV	$16,731
4	Racking and Grounding Bus inside Manholes	$1,124

OUTSIDE OVERHEAD CONSTRUCTION COSTS:

Quantity	Item	Total Cost
22	Dig Holes for Class 1 Wood Poles	$19,635
4	Custom Steel Poles	$200,000
4	Foundations for Custom Steel Poles	$125,000
1	Underground 4-5” Ducts for 46kV Ckts	$287,500
1	Underground 4-4” Ducts for 12kV Ckt inside Substation	$137,500
1	Underground 4-5” Ducts for 46kV Ckt inside Substation	$72,500

UNDERGROUND ITEMS

The breakdown of materials and their estimated costs for each item costing $1,000 or more are shown below:

Quantity	Item	Total Cost
2	Dead End 46kV Riser Overhead Framing with Switches	$26,303
2	Wood Poles, 60’ Class 1	$4,008
6	Splices for 3-1/C 1500 KCM without Shield Break	$14,107
6	Splices 3-1/C 1500 KCM with Shield Break	$14,336
2	Dead End Preassembled 46kV Riser Underground Framing	$16,681
6	Terminations at Substation	$13,447
8	Racking & Ground Bus for Manholes	$2,248
10,200’	Conductor, 1500 KCM, AL, 46kV	$131,274
1,230’	Fiber ADSS, 24 Strand	$1,476

OUTSIDE OVERHEAD CONSTRUCTION COSTS:

Quantity	Item	Total Cost
2	Dig Holes for Class 1 Wood Poles	$1,785
2	Excavate for Anchors	$5,000
1	Underground 4-5” Ducts for Iwilei #1 46kV Circuit	$1,297,500
1	Underground 4-5” Ducts for Halawa #3 46kV Circuit	$1,223,750
1	Underground 4-5” Ducts for 46kV Circuits inside Substation	$58,000
1	Underground 4-5” Ducts for 12kV Circuits inside Substation	$90,000
1	Underground 4-4” Ducts for Fiber	$194,000
1	Underground Jet Grout for Iwilei #1 46kV Circuit	$2,800,000
1	Underground Jet Grout for Halawa #3 46kV Circuit	$2,640,000
1	Underground Jet Grout for Fiber	$570,000

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

Deputy Directors
ROY CATALANI
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
HAR-ESP 0417.19

July 30, 2018

The Honorable Chair and Members
of the Hawaii Public Utilities Commission
465 South King Street
Kekuanaoa Building, #103
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Proposed Substation on Auiki Street
H.C. 10502 Kapalama Container Terminal Yard

The Department of Transportation, Harbors Division, (DOT Harbors) is developing the Kapalama Container Terminal (KCT) which will be a new container yard on approximately 84 acres of land formerly occupied by the Kapalama Military Reservation. KCT will be constructed in two phases, under the H.C. 10502 Kapalama Container Terminal Yard project and the H.C. 10498 Kapalama Container Terminal Wharf and Dredging project (both referred to collectively as the KCT Project), and completion is anticipated at the end of 2021.

To support this development, the Hawaiian Electric Company, Inc. (HECO) will be developing a new substation on Auiki Street near KCT (Auiki Street Substation) to meet the new demands that will result from the full development of KCT, and to meet the needs of other HECO customers in the area.

Honolulu Harbor is the primary entry point for approximately 80% of cargo for the State of Hawaii and the existing container yard(s) there are already at, or will imminently exceed, their collective capacity to safely handle cargo. Therefore, the development of KCT was identified in the Honolulu Waterfront Master Plan (1989) as DOT Harbors' highest priority project to meet the projected increase of cargo handling volume due to, and to support, forecasted population growth, by providing additional cargo handling capacity.

Once the KCT Project is completed, the container yard lighting system will be operated and maintained by DOT Harbors. However, the container yard area will be leased to one or more container terminal operators/tenants:

a. Pasha Hawaii will be the primary tenant of, and operator at, KCT who will operate, maintain, and require considerable power for, refrigerator units and six ship-to-shore gantry cranes starting in 2022. Furthermore, Pasha Hawaii will also be leasing space for, and constructing, buildings for maintenance of its container yard vehicles as well as to house administration and operational personnel, along with guard shacks and gates with electronic security features, all of which will require power.

b. Young Brothers is also a likely tenant at KCT and they would have separate power requirements whose specifics are unknown at this time. Furthermore, the Hawaii Fueling Facilities Corporation is also planning to occupy a small area within KCT and they will require a small amount of power to support their facilities as well. Other tenants at KCT are possible later as DOT functions and needs, that cannot be foreseen at this time, arise in the future.

The DOT Harbors fully supports HECO in the development of the Auiki Street Substation as it is critical to occupancy and success of KCT and therefore respectfully requests that the Public Utilities Commission favorably review, and approve, the HECO application associated with the development of the Auiki Street Substation.

Should you have any questions, please contact Mr. Carter Luke, Engineering Program Manager, with our Harbors Division, Engineering Branch, at (808) 587-1862.

Sincerely,

JADE T. BUTAY
Director of Transportation

c: Carter Luke, DOT Harbors Division, Engineering Branch
DOT Harbors Division, Project Management

July 17, 2018

Mr. Jade T. Butay
Director
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

Re: Incremental Cost to Underground Power Lines
Auiki System Substation at Kapalama Terminal Yard and 46kV line Extensions

Dear Mr. Butay,

In accordance with Hawaii Revised Statute 269-27.6(3), Hawaiian Electric Company is required to check with government agencies or other parties prior to initiating proposed projects, to inquire whether those agencies or owners are willing to pay for additional costs of under-grounding the electric lines associated with the project.

Hawaiian Electric Company's proposed Auiki System Substation build project involves construction of two (2) Unit 10/12.5MVA, 46/12kV system substation at the former Kapalama Military Reservation and also include telecommunications installation, the extension and realignment of roughly 3,400 circuit feet of overhead 46kV and 12kV conductors, along with 500 feet of underground cabling to avoid crossing overhead conflicts. (see Figure 1).

This build will provide the necessary capacity to service projected loads, including HART and Transit Oriented Development in the Kalihi/Palama area, along with resolving an overcapacity condition resulting from defined aggregated loads received as a customer request from five (5) new tenants of the Kapalama Terminal Yard. An alternative and constructability analysis has determined that the proposed project is the most cost effective and most constructible option.

The estimated cost for the overhead portion of this project is $3.25 million. The minimum estimated cost to underground the lines would exceed $14.3 million utilizing various trenching methodology.

If the State of Hawai'i Department of Transportation Highways Division or the Harbors Division is willing to pay for the costs of undergrounding the subject lines, please notify Hawaiian Electric in writing by August 10, 2018. Please contact [redacted] or [redacted] with any questions regarding the project.

Thank you for your attention in this matter.

Sincerely,

[redacted]

cc: [redacted]

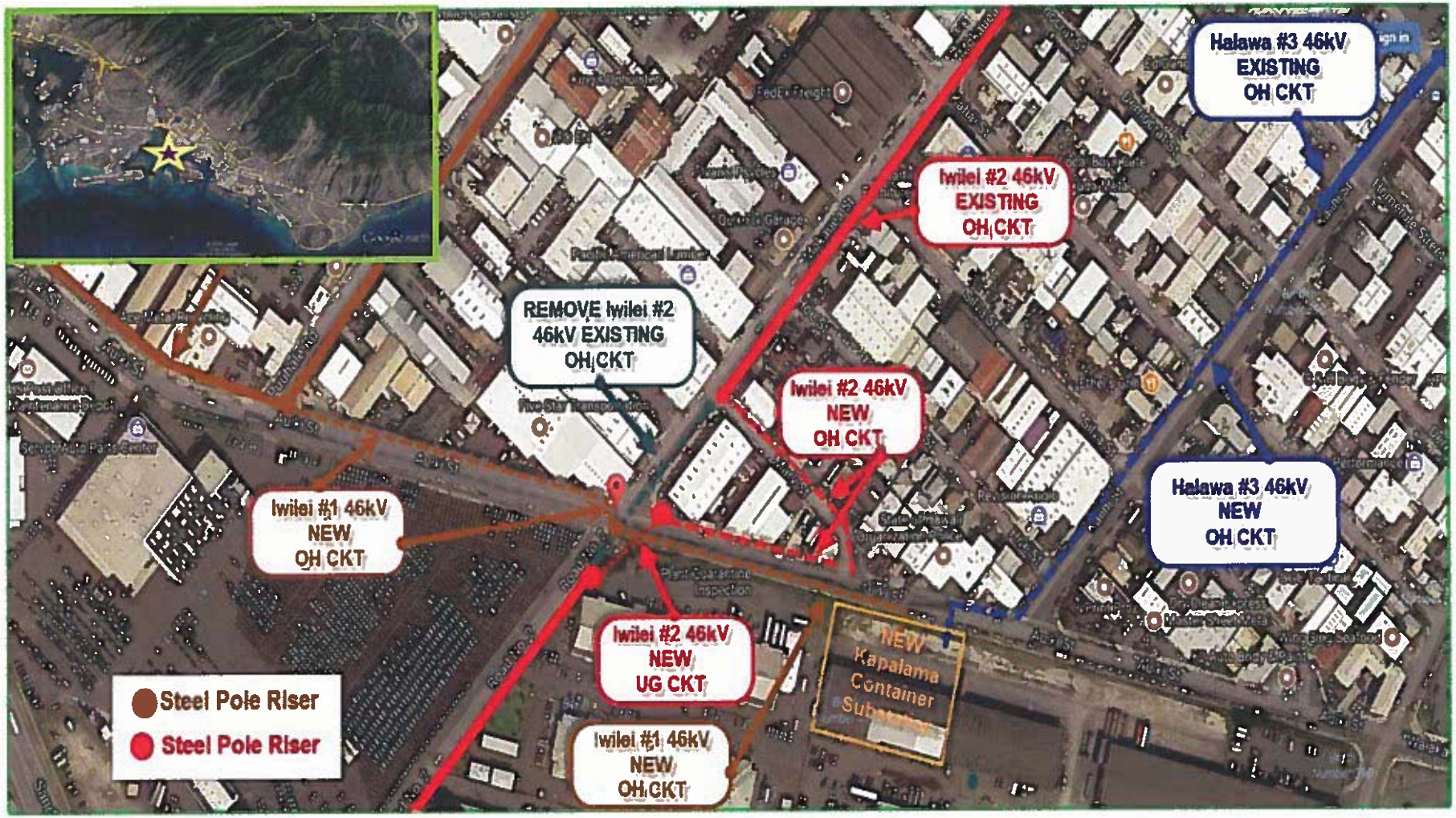


Figure 1 Project Location Figure: Auiki Substation at Kapalama Terminal Yard

Hawaiian Electric

July 17, 2018

Suzanne D. Case, Chairperson
Board of Land and Natural Resources
State of Hawai'i
P.O. Box 621
Honolulu, HI 96809

Re: Incremental Cost to Underground Power Lines
Auiki System Substation at Kapalama Terminal Yard and 46kV line Extensions

Dear Ms. Case,

In accordance with Hawaii Revised Statute 269-27.6(3), Hawaiian Electric Company is required to check with government agencies or other parties prior to initiating proposed projects, to inquire whether those agencies or owners are willing to pay for additional costs of under-grounding the electric lines associated with the project.

Hawaiian Electric Company's proposed Auiki System Substation build project involves construction of two (2) Unit 10/12.5MVA, 46/12kV system substation at the former Kapalama Military Reservation and also include telecommunications installation, the extension and realignment of roughly 3,400 circuit feet of overhead 46kV and 12kV conductors, along with 500 feet of underground cabling to avoid crossing overhead conflicts. (see Figure 1).

This build will provide the necessary capacity to service projected loads, including HART and Transit Oriented Development in the Kalihi/Palama area, along with resolving an overcapacity condition resulting from defined aggregated loads received as a customer request from five (5) new tenants of the Kapalama Terminal Yard. An alternative and constructability analysis has determined that the proposed project is the most cost effective and most constructible option.

The estimated cost for the overhead portion of this project is $3.25 million. The minimum estimated cost to underground the lines would exceed $14.3 million utilizing various trenching methodology.

If the Board of Land and Natural Resources is willing to pay for the costs of undergrounding the subject lines, please notify Hawaiian Electric in writing by August 10, 2018. Please contact [redacted] or [redacted] with any questions regarding the project.

Thank you for your attention in this matter.

Sincerely,

[redacted]

cc: [redacted]

Figure 1 Project Location Figure: Auiki Substation at Kapalama Terminal Yard

Hawaiian Electric

July 17, 2018

Mr. Robert J. Kroning, Director
Dept. of Design & Construction
City & County of Honolulu
650 S. King Street, 11th Floor
Honolulu, HI 96813

Re: Incremental Cost to Underground Power Lines
Auiki System Substation at Kapalama Terminal Yard and 46kV line Extensions

Dear Mr. Kroning,

In accordance with Hawaii Revised Statute 269-27.6(3), Hawaiian Electric Company is required to check with government agencies or other parties prior to initiating proposed projects, to inquire whether those agencies or owners are willing to pay for additional costs of under-grounding the electric lines associated with the project.

Hawaiian Electric Company's proposed Auiki System Substation build project involves construction of two (2) Unit 10/12.5MVA, 46/12kV system substation on the former Kapalama Military Reservation and also include telecommunications installation, the extension and realignment of roughly 3,400 circuit feet of overhead 46kV and 12kV conductors, along with 500 feet of underground cabling to avoid crossing overhead conflicts. (see Figure 1).

This build will provide the necessary capacity to service projected loads, including HART and Transit Oriented Development in the Kalihi/Palama area, along with resolving an overcapacity condition resulting from defined aggregated loads received as a customer request from five (5) new tenants of the Kapalama Terminal Yard. An alternative and constructability analysis has determined that the proposed project is the most cost effective and most constructible option.

The estimated cost for the overhead portion of this project is $3.25 million. The minimum estimated cost to underground the lines would exceed $14.3 million utilizing various trenching methodology.

If the City and County of Honolulu is willing to pay for the costs of undergrounding the subject lines, please notify Hawaiian Electric in writing by August 10, 2018. Please contact [redacted] or [redacted] with any questions regarding the project.

Thank you for your attention in this matter.

Sincerely,

[redacted]

cc: [redacted]

Figure 1 Project Location Figure: Auiki Substation at Kapalama Terminal Yard

Hawaiian Electric

Hawaiian Electric Company, Inc. hereby identifies redacted confidential and/or proprietary financial information that is being submitted confidentially until the issuance of a Protective Order in this docket ("Protective Order"). The following identifies, in reasonable detail, the confidential information's source, character, and location; (2) states clearly the basis for the claim of confidentiality; and (3) describes, with particularity, the cognizable harm to the producing party or participant from any misuse or unpermitted disclosure of the information.

Reference	**Identification of Item**	**Basis of Confidentiality**	**Harm**
Exhibit A, page 6, and Appendix A Map 1	Substation Distribution Planning Study which contains confidential information on development actions and strategy	Third-party confidential information on development actions and strategy which falls under the frustration of legitimate government function exception of the Uniform Information Practices Act ("UIPA").	Disclosure of confidential third-party development loads and details could place the third-party at a competitive disadvantage with respect to industry competitors and give providers of competitive services information useful in making their own marketing decisions without expending the time and money necessary to gather and develop the data. In addition, disclosure of the information could result in the Company infringing upon certain proprietary rights and exposing the Company to certain liabilities, harm the Company's relationship with existing and/or prospective vendors and discourage vendors from doing business with the Company, which could lead to paying increased amounts for the same products or services in the future and increase costs for the Company and its customers.

Reference	Identification of Item	Basis of Confidentiality	Harm
Exhibit F, pages 1-3.	Letter from Hawaii Stevedores, Inc. to Hawaiian Electric which contains Honolulu Harbor Transportation, and Critical Energy Infrastructure information, and Company employee identifying information	To the extent that the confidential information consists of critical infrastructure information that should not be disclosed under the Homeland Security Act of 2002, such information is exempt from disclosure under section 92F-13(4) of the UIPA. Also, confidential personal identification information of Company employees falls under the unwarranted invasion of personal privacy and frustration of legitimate government function exceptions of the UIPA.	Public disclosure of confidential information on wharf and container ship cargo, loading, handling and arrival schedules, circuit and system energy requirements load profiles and information on cycling Critical Energy Infrastructure serving Federal, State and Law Enforcement Loads could increase risk to the State and Company's facilities, jeopardize emergency and disaster preparedness plans, and/or adversely impact the ability to respond to potential terrorist threats. Disclosure of the confidential personal identification information to the general public could expose the employee(s) to, among other things, potential victimization. Disclosure of this type of information would also harm the Company in recruiting and retaining qualified employees, employee morale, as well as the cost of addressing any potential untoward uses of the confidential information. In addition, disclosure of identifying information of the Company's contractor's employees could harm the Company's relationships with existing and/or prospective vendors and contractors.

Reference	Identification of Item	Basis of Confidentiality	Harm
Exhibit J, pages 1, 3, and 5.	Overhead and underground contribution letters with employee identifying information	Confidential personal identification information of the Company's and its contractor's employees which falls under the unwarranted invasion of personal privacy exception[1] and the frustration of legitimate government function exception[2] of the Uniform Information Practices Act ("UIPA").	Disclosure of the confidential information to the general public could expose the employee(s) to, among other things, potential victimization. Disclosure of this type of information could also harm the Company in recruiting and retaining qualified employees, employee morale, as well as the cost of addressing any potential untoward uses of the confidential information. In addition, disclosure of identifying information of the Company's contractor's employees could harm the Company's relationships with existing and/or prospective vendors and contractors.

[1] Haw. Rev. Stat. § 92F-13(1).

[2] Haw. Rev. Stat. § 92F-13(3).

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAI'I

In the Matter of the Application of	)	
	)	
HAWAIIAN ELECTRIC COMPANY, INC.	)	Docket No.
	)	
for approval to commit funds in excess of $2,500,000 (excluding customer contributions) for Project Item Y00291, Auiki Substation, and related approvals.	)	

CERTIFICATE OF SERVICE

I hereby certify that I have this date served two copies of the foregoing Application, Verification and Exhibits A-K, together with this Certificate of Service, by making personal service and/or mailing a copy by United States mail, postage paid, to the following and at the following address:

Dean Nishina (two copies via hand delivery)
Executive Director
Division of Consumer Advocacy
Department of Commerce and Consumer Affairs
335 Merchant Street, Room 326
Honolulu, Hawai'i 96813

DATED: Honolulu, Hawai'i, August 2, 2018.

HAWAIIAN ELECTRIC COMPANY, INC.

Lani Wong