
Preliminary Engineering Study Report

City of Berkeley

100 Seawall Dr, Berkeley, CA



***Pacific Gas and
Electric Company***

WE DELIVER ENERGY.

June 2025

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1. Introduction

City of Berkeley has submitted an application to Pacific Gas & Electric Company (PG&E) for an Electric Ferry and EV charging at 100 Seawall Dr, Berkeley, CA with an estimated demand of 4.4 MW by Q1 of 2026 under PM 35604246.

PG&E has determined that a Preliminary Engineering Study (PES) will be needed to determine the options to serve the Project and identify any impacts caused by this interconnection. This PES identifies:

- Distribution system options to serve the Project on PG&E's existing distribution facilities
- Transmission and distribution system impacts caused solely by the Project
- Transmission and distribution system reinforcements necessary to mitigate any adverse impacts caused by the Project under peak-load conditions

This study assumes no additional generation, renewable or otherwise, will be installed at the site. Should City of Berkeley wish to install generation, renewable or otherwise, at the site later, an application is required.

This study will determine which, if any, primary facilities, conductor, and equipment will need to be installed, upgraded, and/or modified on the existing distribution network to provide adequate capacity. This study will be limited to what primary line, substation work, and transmission line work is required to serve the project regardless of whether the project is served at primary voltage with a single meter (12,000 volts) or secondary voltage (480 volts) with multiple transformers and meter locations.

This Agreement does not constitute an agreement to extend power to the Customer's Project. The extension of power from PG&E's Distribution System and other services that the Project may require will be addressed in separate agreements in accordance with PG&E tariff rules then in effect. Should the Customer pursue electric distribution or service extensions, that work would be performed under PG&E's standard form, Distribution Service and Extension Agreement Declarations (Form 65-0980). The Customer will be responsible for separately making all necessary arrangements for extension of power.

If no customer comments have been received after ten business days of receiving the draft PES report, this PES report will be deemed final. This PES report is valid for three months from the date the final report is issued to the customer. After that, a new study will be required.

2. Project and Interconnection Information

City of Berkeley submitted a Large Load Study request for 4.4 MW load at 100 Seawall Dr, Berkeley, CA, 94710. The request consists of two separate service requests. The first service consists of 4 electric ferry charging stations with 1 MW/charger for a total of 4 MW of load. The ferry service will be served at a primary voltage of 12 kV. The second service request consist of 400 kW of load which will be used for EV level 2 charging. The secondary service will be served at 120/208V. The second service will be at a different service location than the primary service shown on Figure 2-2.



Figure 2-1: Vicinity Sketch – 100 Seawall Dr, Berkeley, CA 94710

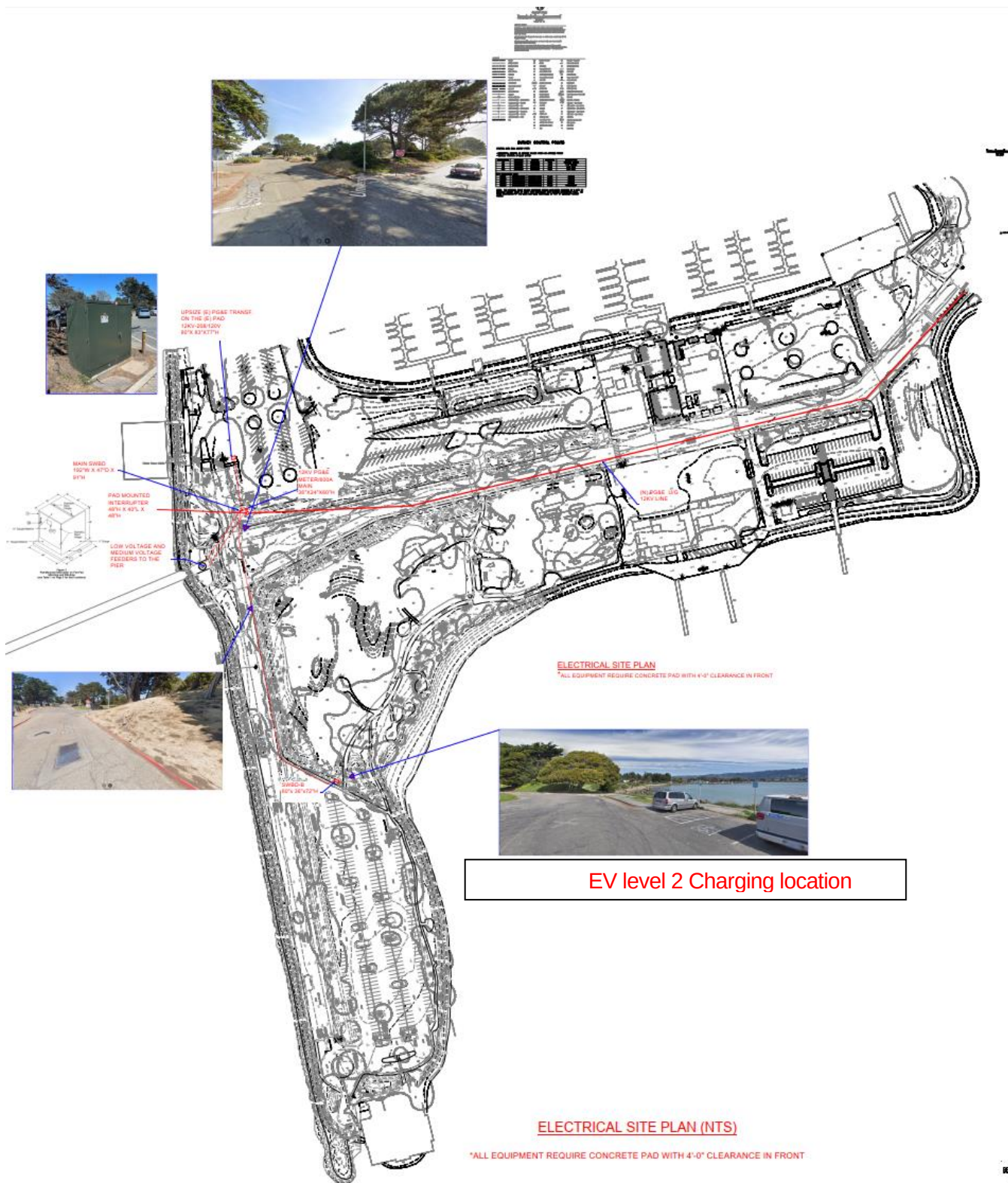


Figure 2-2: City of Berkeley Master Plan – 100 Seawall Dr, Berkeley, CA 94710

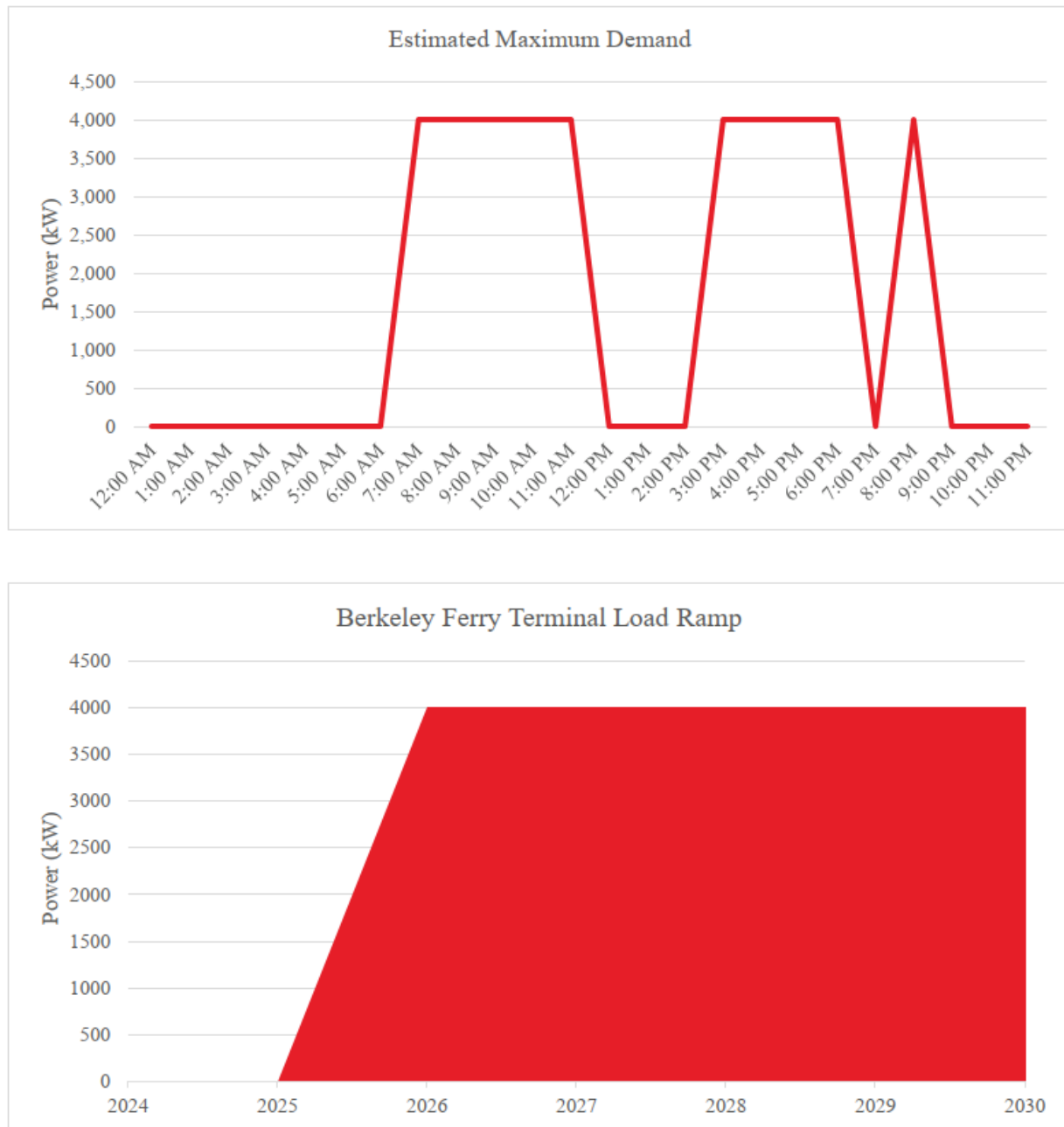


Figure 2-3: City of Berkeley Load ramp up for Electric Ferry

Attachment 5: Electric Float Charging One-Line

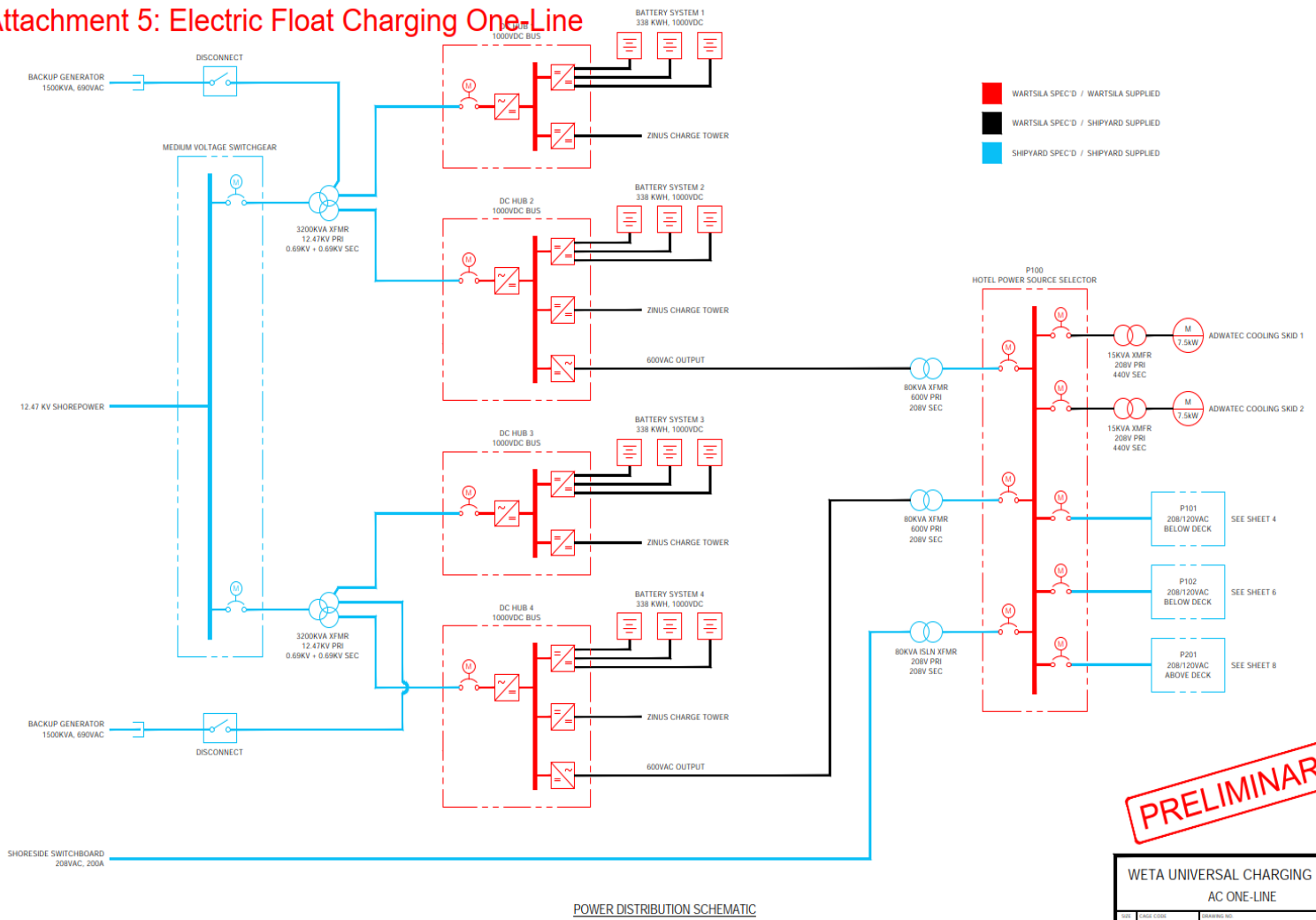
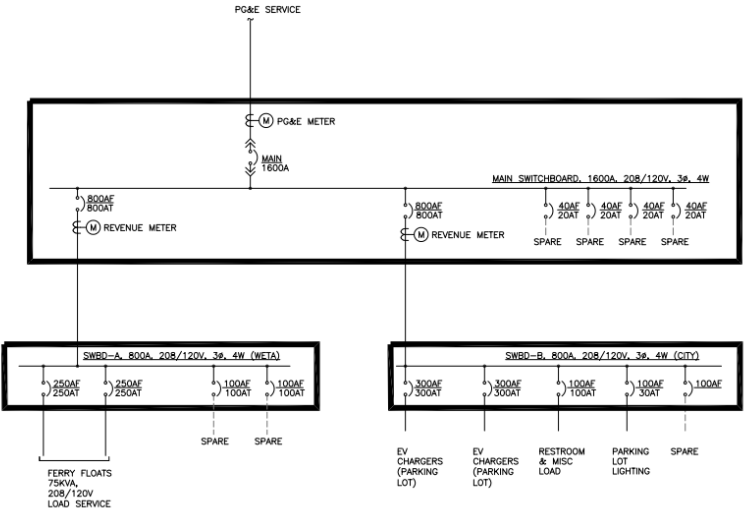


Figure 2-4: City of Berkeley Single Line Diagram for Electric Ferry Service



SINGLE LINE DIAGRAM

								DESIGNED BY S. AG			BERKELEY FERRY TERMINAL FACILITY BERKELEY CALIFORNIA ELECTRICAL SINGLE LINE DIAGRAM		CADD DATE 08/15/2024	
								DRAWN BY A. SATURN					SCALE AS SHOWN	
								CHECKED BY G. CHEUNG					CONTRACT NUMBER XXX-XXX	
								IN CHARGE					DWG NO E101	REV/PAGE NO A / 00 OF XXXX
REV	DATE	BY	SUB	APP	DESCRIPTION	REV	DATE	BY	SUB	APP	DESCRIPTION			

Figure 2-5: City of Berkeley Single line Diagram for EV charging

3. Study Assumptions

The infrastructure evaluation will identify any new PG&E substation facilities or existing facility upgrades necessary to serve City of Berkeley using the following assumptions:

- The peak electrical demand and schedule provided by the customer in Figure 2-3 with a maximum net electrical demand of 4 MW of EV ferry service request.
- The secondary service with a maximum net electrical demand of 400 kW of EV charging request.
- Two separate services will be provided to serve the Electric ferry charging and EV charging in accordance with the service voltage request.
- The service voltage for the Electric ferry charging service will be at primary voltage of 12 kV.
- The service voltage for the EV charging service will be at secondary voltage of 120/208 V.
- Customer must abide by the Interconnection Requirements and Primary Services from the Greenbook found in Section 11 pertaining to Alternative Source installed at customer expense.
- Charging schedules for each ferry was requested, but the City of Berkeley requested PG&E to serve 4MW for the electric ferry charging site.

4. Present Available Capacity

100 Seawall Dr, Berkeley is presently served by El Cerrito G 1103. Per PG&E Electric Rule 2¹, 12 kV circuits are typically rated at 12 MW total. Given this total capacity, current load projections as well as existing applications for customer growth, PG&E's projections for available capacity are insufficient to accommodate the additional demand of 4 MW of primary service and 400 kW of secondary service.

Present available capacity for this load application is 1 MW which is subject to change. These capacity estimates are forecasts only and apply at peak loading conditions. Additionally, these forecasts can be impacted by new customer loads as well as increased loads for existing customers.

These capacity estimates are forecasts only and apply at peak loading conditions. Additionally, these forecasts can be impacted by new customer loads as well as increased loads for existing customers.

It is essential that load estimates provided by City of Berkeley be as accurate as possible so that PG&E can propose the most appropriate and relevant options for serving this load. It is in

¹ https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_RULES_2.pdf

interest of both PG&E and City of Berkeley to ensure that unnecessary infrastructure is neither designed nor constructed.

5. Project Cost and Timeline Estimates

Any costs provided in the final report are non-binding good faith cost estimates only. All costs shown in the final study will be considered AACE Class 5² estimates.

Any timelines provided in the PES will be non-binding good faith estimates only. Detailed timeline estimates can be provided upon completion of the Engineering and Design process if City of Berkeley decides to proceed with the project. Timelines may be subject to change based on funding considerations or other extenuating circumstances.

² AACE is an acronym for the Association for the Advancement of Cost Engineering. AACE Class 5 is based on historical information with less than 2% of project definition required. The probable accuracy of the AACE Class 5 cost is +100%, -50%.

6. Evaluation of Distribution Alternatives

Any extension of 12 kV line sections would be subject to approval and permitting by various agencies. Right-of-way acquisition of these lines would be the responsibility of PG&E. Per Electric Rule 2, the maximum load that can be served from a single 12 kV feeder is 12 MVA or 11.9 MW at 99% power factor.

Proposed:

The proposed plan is to reconductor and install cable along Virginia St thru Second St and Frontage Rd thru University Ave to serve the 4.4 MW load to the City of Berkeley.

Initial scope of the work required to serve City of Berkeley is detailed below:

- Trench and install approximately 5,000 feet of 3-1100Al cable in 2-6" conduits
- Install approximately 5,000 feet of 3-1100Al cable in 6" conduit
- Install approximately 1,200 feet of 3-750Cu and 3-1100Al in existing 4" and 5" conduits
- Trench and install approximately 500 feet of 3-600Al cable in 6" conduit
- Trench and install approximately 900 feet of 3-1/0Al cable in 4" conduit
- Reconductor approximately 2,000 ft of existing overhead conductor with 3-397 Al Overhead Conductor
- Install one Subsurface Switch-Interrupter-Switch in #7 enclosure
- Install two 900A U.S. Switches
- Install one Part 44 Cutout with 40T Fuse
- Install one SCADA multi-way pad-mounted interrupter on applicant provided space

Overall, these mitigations have an expected completion date of approximately **18-24** months from when the PG&E work is initiated.

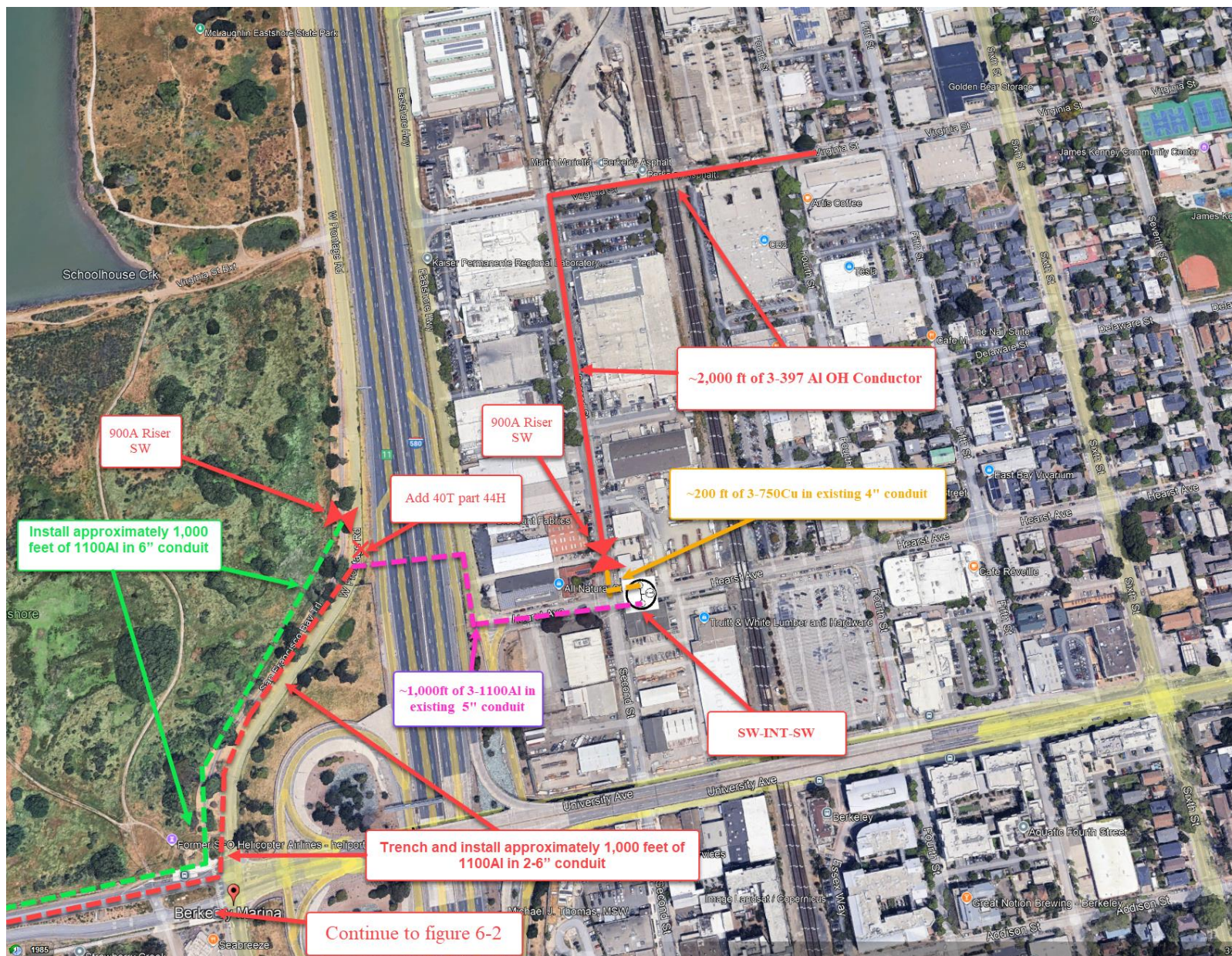


Figure 6-1 Reconnector to 3-397Al along Virginia St thru 2nd St and Install 3-750Cu and 3-1100Al along Hearst Ave and I-80 crossing.



Figure 6-2 Trench and install 3-1100AI, 3-600AI and 3-1/0AI along Frontage Rd and University Ave

Table 6-1 Description of work

Work Description	\$ Cost
Trench and install approximately 5,000 feet of 3-1100Al in 2-6" conduit	5,275,000
Install approximately 5,000 feet of 3-1100Al in 6" conduit	2,400,000
Install approximately 1,200 feet of 3-750Cu and 3-1100Al in existing 4" and 5" conduits	576,000
Trench and install approximately 500 feet of 3-600Al cable in 6" conduit	527,500
Trench and install approximately 900 feet of 3-1/0Al cable in 4" conduit	949,500
Reconductor approximately 2,000 ft of existing overhead conductor with 3-397 Al Overhead Conductor	1,100,000
Install one Subsurface Switch-Interrupter-Switch in #7 enclosure	155,000
Install two 900A U.S. Switches	102,000
Install one Part 44 Cutout with 40T Fuses	17,000
Install one SCADA multi-way pad-mounted interrupter on applicant provided space	180,000
Estimated Cost	11,282,000
Contingency (AACE Class 5: -50%/+100%)	-5,641,000 / 11,282,000
Total Cost with Contingency	5,641,000 / 22,564,000

7. Preferred Option

Based on net estimate outlined in section 6, PG&E has determined that the preferred service option is to create distribution capacity for City of Berkeley facility at 100 Seawall Dr, Berkeley, CA is to extend/reinforce 12kV along Virginia St thru 2nd St and Hearst Ave to 100 Seawall Dr for the 12kV primary service and secondary service (120/208V) requests.

Lower Loads:

- If actual loads fall below the level where infrastructure improvements would not have been justified, PG&E will be required to bill for the portion of the project unsupported by revenue (deficiency billing).

Higher Loads:

- If actual loads approach the level where the distribution facilities are forecasted to be above capacity, then PG&E will design an alternative capacity project to bring necessary capacity to the area.

8. Study Updates

The PES is performed in accordance with the assumptions listed in the Section titled “[Study Assumptions](#)”. In the event that these assumptions become invalid, an updated study may be required to re-evaluate City of Berkeley interconnection impact on PG&E’s electric transmission and distribution system. Changes that might prompt an updated study are:

- Change in the interconnection date or the timing of subsequent load additions.
- Change in the projected amount of initial load or subsequent loads.
- Change in the nature of the load.
- Change in the interconnection plan.

City of Berkeley would be responsible for paying for any such updated study.

9. Study Schedule

PG&E’s study schedule for City of Berkeley at 100 Seawall Dr, Berkeley

Task	Milestone Description	Target Date
1	Engineering Advance received	Dec 5th, 2024
2	Customer received initial PES plan for 4.4 MW load	March 11, 2025
3	City of Berkeley signed PES Study Plan	April 22, 2025
4	PG&E submits Draft PES report	June 11, 2025
5	City of Berkeley, Inc. submits comments on Draft PES report	+10 BD
6	PG&E submits finalized PES report	+20 BD



Preliminary Engineering Study Agreement

City of Berkeley has reviewed the Preliminary Engineering Study for capacity for their proposed project at 100 Seawall Dr, Berkeley and agrees with the proposed Preliminary Engineering Study.

City of Berkeley has paid a total of \$30,000 in study fees as of Dec 5th, 2024.

If no customer comments have been received after ten business days of receiving the draft PES report, this PES report will be deemed final. This PES report is valid for three months from the date the final report is issued to the customer. After that, a new study will be required.

☐ City of Berkeley agrees to the study and assumptions outlined in this Study Report.

City of Berkeley has opted to choose:

☐ Description of option based on City of Berkeley's request to serve their full load.

City of Berkeley:

BY: _____
(Signature)

(Type or Print Name)

MAILING ADDRESS:

