DOCKETED	
Docket Number:	23-OPT-02
Project Title:	Darden Clean Energy Project
TN #:	255082
Document Title:	CEC Data Request Response Set 2
Description:	Provides the Applicant's second response set to data requests received from the CEC. Responses address data requests related to Hazards and Hazardous Materials, Project Description, Socioeconomics, Traffic and Transportation, Transmission System and Design, and Waste. The document includes the following appendices to support responses: - Appendix A DR HAZ-7 Industrial Lithium-Ion Battery Emergency Response Guide - Appendix B DR TRANS-5 Preliminary Helicopter Use Plan - Appendix C DR TRANS-7 Transportation Analysis Supplement - Appendix D DR TSD-2 Substation and Switchyard Diagram - Appendix E DR TSD-4 Grounding Detail
Filer:	Evelyn Langsdale
Organization:	Rincon Consultants
Submitter Role:	Applicant Consultant
Submission Date:	3/14/2024 5:09:29 PM
Docketed Date:	3/15/2024

Darden Clean Energy Project (23-OPT-02)

CEC Data Request Response Set #2

prepared by

IP Darden I, LLC and Affiliates
c/o Intersect Power, LLC
9450 SW Gemini Drive, PMB #68743
Beaverton, Oregon 97008

prepared with the assistance of

Rincon Consultants, Inc.
7080 North Whitney Avenue, Suite 101
Fresno, California 93720

March 2024

RINCON CONSULTANTS, INC. SINCE 1994

Table of Contents

Tables

Figures

Appendices

This page intentionally left blank.

1 Introduction

On December 11, 2023, IP Darden I, LLC and Affiliates (Applicant) received a Determination of Incomplete Application and Request for Information from the California Energy Commission (CEC) for the Darden Clean Energy Project (23-OPT-02) in response to the Applicant's application filed on November 9, 2023. The following document provides the Applicant's second set of responses to the Data Requests received from the CEC. Table 1 lists all Data Requests for which a response is provided in Response Set #2.

Table 1 Data Responses Included in Response Set #2

Data Request Resources Area	Data Request Number
Air Quality	–
Biological Resources	–
Cultural and Tribal Cultural Resources	–
Efficiency, Energy and Energy Resources	–
Geologic Hazards	–
Greenhouse Gas Emission (Climate Change)	–
Hazardous Materials Handling	HAZ-2 through HAZ-7
Land Use	–
Noise	–
Project Description	PD-1 through PD-16
Public Health	–
Socioeconomics	SOCIO-1 through SOCIO-8
Soils	–
Traffic and Transportation	TRANS-1 through TRANS-9
Transmission System Design	TSD-1, TSD-2, TSD-4, TSD-5, TSD-7, TSD-8
Visual Resources	–
Waste Management	WASTE-1
Water Resources	–
Worker Safety	–

The responses are grouped by individual discipline or topic area and are presented in the same order and with the same numbering provided by the CEC. New or revised graphics, tables, or attachments are provided throughout and as appendices to this document. The responses included in this document are considered complete responses to the corresponding Data Requests.

Table 2 provides a list of all remaining Data Requests received from the CEC that have not been addressed in Response Set #1 or Response Set #2.

Table 2 Outstanding Data Responses

Data Request Resources Area	Data Request Number
Air Quality	AQ-1 through AQ-12
Biological Resources	BIO-1 through BIO-47
Cultural and Tribal Cultural Resources	–
Efficiency, Energy and Energy Resources	EEF-1 through EEF-3
Geologic Hazards	–
Greenhouse Gas Emission (Climate Change)	GHG-1 through GHG-9
Hazardous Materials Handling	HAZ-1
Land Use	–
Noise	–
Project Description	–
Public Health	PH-1 through PH-5
Socioeconomics	–
Soils	–
Traffic and Transportation	–
Transmission System Design	TSD-3 and TSD-6
Visual Resources	–
Waste Management	–
Water Resources	WATER-1 through WATER-23
Worker Safety	–

Supplemental Data Request Response Sets will be provided to the CEC in response to the Data Requests not addressed in this document.

2 Hazardous Materials Handling

2.1 Data Requests DR HAZ-2 through DR HAZ-7

2.1.1 Data Request DR HAZ-2

DR HAZ-2: For Table 5.9-1, please provide the quantity of lithium that would be present onsite for the BESS based on the project description (Chapter 2, p.2-7), which includes several different lithium-ion battery chemistries.

Response: Based on a typical battery design, the weight of the metal oxide in the lithium batteries could vary between a total of 7,379 tons to 14,757 tons, depending on the final size of the BESS. Table 5.9-1 has been updated to show these quantities, as well as to remove mention of lead-acid batteries (see response to DR HAZ-4) and is provided below. Table 5.9-1 has also been updated to reflect a change in the amount of hydrogen to be stored on-site, as discussed in the response to DR HAZ-5.

2.1.2 Data Request DR HAZ-3

DR HAZ-3: Please update Table 5.9-3 to include the toxicity, reactivity and flammability for the lithium-ion BESS.

Response: Table 5.9-3 has been updated to include the toxicity, reactivity and flammability for the lithium-ion BESS and is provided below. “Lithium-ion BESS” has been added as the last line item of the table under “Hydrogen.”

Table 5.9-1 Use and Location of Hazardous Materials

Chemical Name	Use/Purpose	Quantity	Storage Location	State	Type of Storage Container	Project Phase
Cleaning chemicals/ detergents	Cleaning	NA	O&M Building	Liquid	Cans, buckets	Construction and/or O&M
Paint	Construction and O&M	NA	O&M Building	Liquid	Cans, buckets	Construction and/or O&M
Diesel	O&M	400 gallons	ASTs for backup generator(s)	Liquid	AST	O&M
Diesel (dyed and clear)	Fueling Equipment	14,000 gallons	Office Trailers and/or Tooling Connex Boxes	Liquid	AST	Construction
Propane	Construction	1,600 gallons	O&M Building	Gas	Pressurized tank	Construction
Adhesives	Construction and O&M	NA	O&M Building	Liquid, Solid	Bottles	Construction and/or O&M
Sealants	Construction and O&M	NA	O&M Building	Liquid	Bottles	Construction and/or O&M
Hydraulic fluids	O&M	215,800 gallons	Transformers	Liquid	Cans, ASTs	O&M
Sulfur hexafluoride	O&M	620 gallons	HV breakers	Gas	Cylinders	Construction and/or O&M
Mineral oil	O&M	355,000 gallons	GSU transformers	Liquid	Drums, ASTs	Construction and/or O&M
Sulfuric acid	O&M	690 gallons	Battery cells	Liquid	In cells	Construction and/or O&M
Ethylene glycol solution	BESS	NA	BESS	Liquid	NA	Construction and/or O&M
1,1,1,2-tetrafluororethane	BESS	NA	BESS	Gas	Cylinders	Construction and/or O&M
Gasoline	O&M	50 gallons	Flammables storage locker outside O&M Building	Liquid	Cans	O&M
Gasoline	Fueling Equipment	1,800 gallons	Flammables storage locker outside O&M Building	Liquid	Cans	Construction
Coolant	Construction and O&M	50 gallons	NA	Liquid	Cans	Construction and/or O&M
Lubricants	Construction and O&M	NA	NA	Liquid	Cans, ASTs	Construction and/or O&M
Hydrogen	O&M	130,000 lbs	Hydrogen facility	Gas	Cylinders	O&M
Aqueous Ammonia (20-30%)	O&M	NA	NA	Liquid	Cans, bottles	Construction and/or O&M
Lithium-ion batteries	Construction and O&M	7,379 to 14,757 tons	Energy storage	Solid	NA	Construction and/or O&M

NA = not available

Table 5.9-3 Toxicity, Reactivity, and Flammability of Hazardous Substances Stored On-site

Hazardous Material	Physical Description	Health Hazard/Toxicity	Reactivity and Incompatibilities	Flammability [a]
Cleaning chemicals/ detergents	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Paint	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Diesel No. 2	Oily, light liquid	May be carcinogenic	Strong oxidizers, acids	Flammable
Propane	Colorless, odorless gas	Liquid can cause burns similar to frostbite	Strong oxidizers	Flammable
Adhesives	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Sealants	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Hydraulic fluid (FR3 natural ester fluid)	Light green liquid	Minimal irritation or no effect	Strong oxidizers, Strong Alkali	Combustible
Sulfur hexafluoride (SF6)	Colorless, odorless gas	Can displace oxygen and cause rapid suffocation	None	Nonflammable
Parrafin oil	Oily, colorless liquid	May be fatal if swallowed or enters airways	Strong oxidizers	Combustible
Sulfuric acid	Colorless liquid	Causes burns by all exposure routes	Strong oxidizers, combustible material, bases, organic materials, reducing agents, finely powdered metals, peroxides	Nonflammable
Ethylene glycol solution	Viscous, colorless liquid	May cause skin, eye, and respiratory tract irritation	Strong oxidizers, strong acids, strong bases, aldehydes	Combustible
1,1,1,2-tetraflurorethane	Colorless gas, faint ethereal odor	Liquid can cause burns similar to frostbite	None	Nonflammable
Gasoline	Transparent to light yellow liquid	Carcinogenic, may cause irritation to skin, nose, throat, and lungs	Strong oxidizers	Flammable
Coolant	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Lubricants	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels

Hazardous Material	Physical Description	Health Hazard/Toxicity	Reactivity and Incompatibilities	Flammability [a]
Hydrogen	Odorless, colorless gas	Contact with rapidly expanding gas may cause burns or frostbite	Strong oxidizers	Flammable
Lithium-ion BESS	Battery product	Aquatic chronic toxicity; may be carcinogenic	Not considered reactive under normal conditions at ambient temperature; incompatible with combustible materials, organic chemicals, strong acids, reducing substances, strong oxidizers, and chemically active metals.	Flammable

Notes:

[a] In accordance with Caltrans regulations, under 49 CFR Section 173: flammable liquids have a flash point less than or equal to 141°F; combustible liquids have a flash point greater than 141°F

Source: Data were obtained from Material Safety Data Sheets.

2.1.3 Data Request DR HAZ-4

DR HAZ-4: Table 5.9-1 lists lead acid batteries as one of the possible energy storage options for the BESS. Please clarify if lead acid batteries would be used for the BESS and update Chapter 2 Project Description accordingly along with Tables 5.9-1, 5.9-2, and 5.9-3.

Response: The BESS will use lithium-ion batteries as the energy storage option. Lead acid batteries will not be used for the BESS. Table 5.9-1 has been updated above, under the response to DR HAZ-2. Table 5.9-2 has been updated, as shown below. Table 5.9-3 does not require an update as it only mentions lithium-ion batteries. Table 5.9-2 has also been updated to reflect a change in the amount of hydrogen to be stored on-site, as discussed in the response to DR HAZ-5.

2.1.4 Data Request DR HAZ-5

DR HAZ-5: Please demonstrate that the 400 gallons of hydrogen shown in Tables 5.9-1 and 5.9-2 matches the quantity of stored hydrogen shown in Chapter 4, Figure 4-1. If not, please update Tables 5.9-1 and 5.9-2 accordingly and provide the individual amount of hydrogen within each hydrogen storage container identified on Figure 4-1.

Response: Figure 4-1 is conceptual and does not represent the hydrogen storage necessary for the Project, which will be further refined during final design and is dependent on the future offtake strategy. At the current stage of design, the Applicant estimates the Project will require approximately 130,000 pounds (roughly 60 metric tons) of stored hydrogen. Hydrogen will be stored in gaseous form at a pressure of approximately 200 bar in storage containers designed and manufactured in accordance with current industry standards and regulations. The storage cylinder size will be finalized as design and engineering progresses, but the current design indicates each individual cylinder will have a volume of 550 liters and contain approximately 8 kilograms of hydrogen at the maximum pressure of 200 bar.

2.1.5 Data Request DR HAZ-6

DR HAZ-6: Please update Tables 5.9-1 to 5.9-3, to include the required information for the captured oxygen option. Please provide a site plan location for the captured oxygen and describe how the oxygen would be stored and sent off site.

Response: Following further analysis conducted by the Applicant, it has been determined that oxygen will not be captured, stored, or sent offsite to an off taker. Oxygen will be vented to a safe location that does not create a hazard to the natural or human environment.

Table 5.9-2 Chemical Inventory, Description of Hazardous Materials On-site, and Reportable Quantities

Trade Name	Chemical Name	CAS Number	Maximum Quantity On-site	CERCLA SARA RQ [a]	RQ of Material as Used On-site [b]	EHS TPQ [c]	Regulated Substance TQ [d]	Prop 65
Cleaning chemicals/ detergents	Various	Various	NA	–	–	–	–	No
Paint	Various	Various	NA	–	–	–	–	No
Diesel No. 2	Diesel No. 2	68476-34-6	2,000 gallons	–	–	–	–	No
Propane	Propane	74-98-6	1,600 gallons	–	–	–	–	No
Adhesives	Various	Various	NA	–	–	–	–	No
Sealants	Various	Various	NA	–	–	–	–	No
Hydraulic fluid (FR3 natural ester fluid)	FR3	None	427,380 gallons	42 gallons [e]	42 gallons [e]	–	–	No
Sulfur hexafluoride (SF6)	Sulfur hexafluoride	2551-62-4	620 gallons	–	–	–	–	No
Parrafin oil	Mineral oil	8042-47-5	210,215 gallons	42 gallons [e]	42 gallons [e]	–	–	No
Electrolyte	Sulfuric Acid	7664-93-9	690 gallons	1,000 lbs	3,333 lbs	1,000 lbs	1,000 lbs	Yes
Ethylene glycol solution	Ethylene glycol solution	107-21-1	NA	–	–	–	–	Ye
1,1,1,2-tetrafluororethane	1,1,1,2-tetraflurorethane	811-97-2	NA	–	–	–	–	No
Gasoline	Gasoline	8006-61-9; 86290-85-1	50 gallons	–	–	–	–	No
Coolant	Various	Various	50 gallons	–	–	–	–	No
Lubricants	Oil	None	NA	42 gallons [e]	42 gallons [e]	–	–	No
Hydrogen	Hydrogen	1333-74-0	130,000 lbs	–	–	–	130,000 lbs	No
Lithium-ion batteries	Lithium-ion Batteries	Various	14,757 tons	–	–	–	–	No

[a] RQs are for a pure chemical, per CERCLA SARA (ref. 40 CFR Section 302, Table 302.4). Releases equal to or greater than the RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment and human health or safety must be reported.

[b] RQ for materials as used on-site. Since some of the hazardous materials are mixtures that only contain a percentage of an RQ, the RQ of the mixture can be different than for a pure chemical. For example, if a substance only contains 10 percent of a reportable chemical and the RQ is 100 pounds, the RQ for that material will be (100 pounds)/(10%) = 1,000 pounds.

[c] EHS TPQ (ref. 40 CFR Part 355, Appendix A). If quantities of EHS materials equal to or greater than the TPQ are handled or stored on-site, they must be registered with the local Administering Agency (i.e., Fresno County Environmental Health – CUPA/Hazardous Materials Handling Program).

[d] TQ is from Title 19 CCR Section 2770.5 (state) or Title 40 CFR Section 68.130 (federal).

Trade Name	Chemical Name	CAS Number	Maximum Quantity On-site	CERCLA SARA RQ [a]	RQ of Material as Used On-site [b]	EHS TPQ [c]	Regulated Substance TQ [d]	Prop 65

[e] State RQ for oil spills that will reach California state waters [CA Water Code Section 13272(f)]

Notes:

--: No reporting requirements. The chemical has no listed threshold under this requirement.

NA: not available

CAS: Chemical Abstract Service

CCR: California Code of Regulations

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act

CFR: Code of Federal Regulations

EHS: Extremely Hazardous Substances

Lbs: pounds

Prop 65: Proposition 65

RQ: Reportable Quantity

SARA: Superfund Amendments and Reauthorization Act

TPQ: Threshold Planning Quantity

TQ: Threshold Quantity

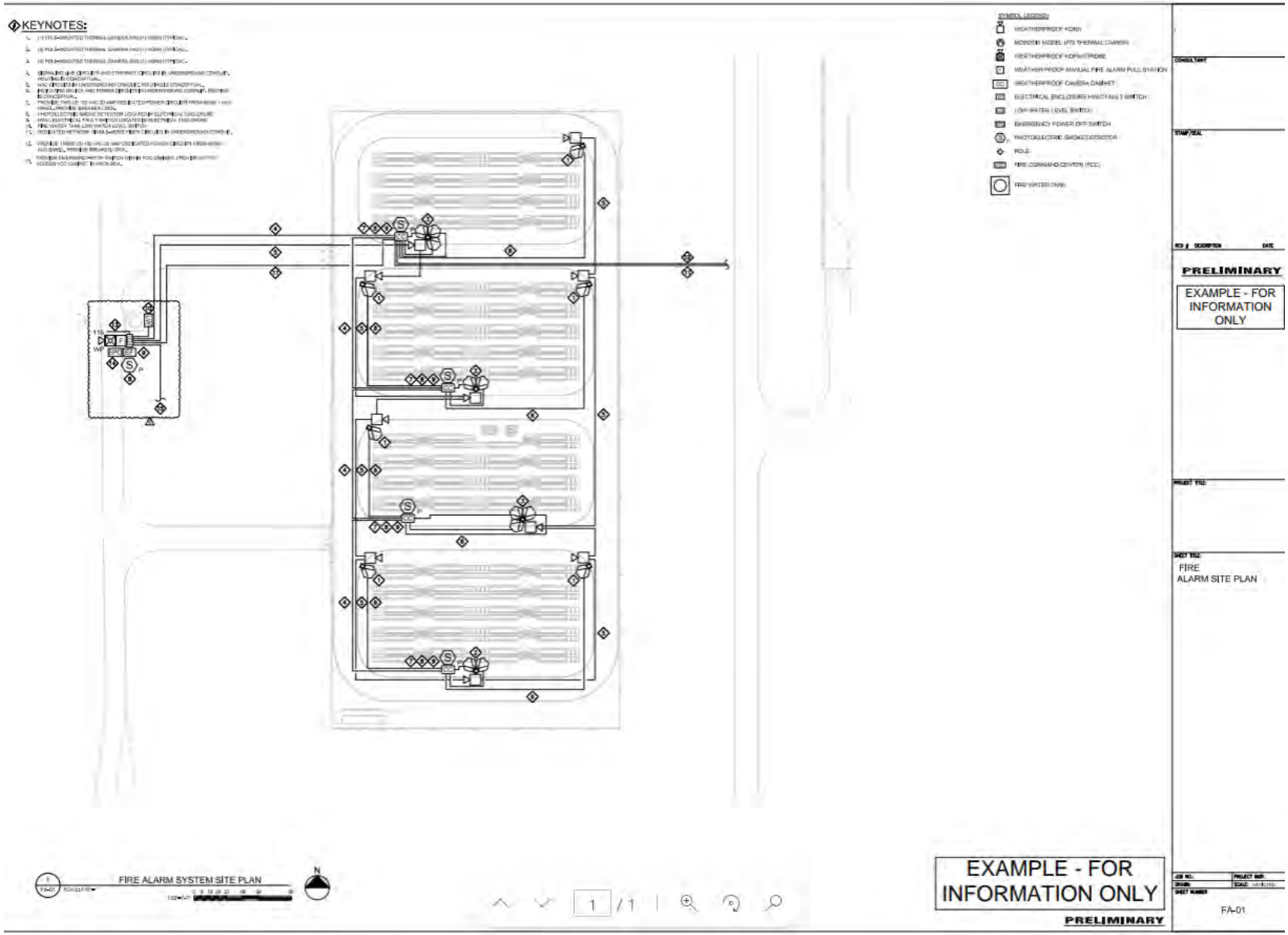
2.1.6 Data Request DR HAZ-7

DR HAZ-7: Please provide a schematic site plan for the BESS that includes the locations for the emergency water storage. Please provide fire protection basis of design for BESS (similar to Appendix P for the hydrogen facility).

Response: The BESS facility will be designed using a UL9540A tested, modular, fully integrated, AC-coupled industrial BESS. The BESS will be connected to pad mounted transformers that step up the voltage to medium voltage levels, in-turn connecting to the Project substation through a feeder breaker. There will be up to four emergency 15,000-gallon water tanks for the Project. A typical BESS fire protection layout is provided in Figure 1 below. The final number and location of water tanks for emergency use will be determined in accordance with vendor requirements and the California Fire Code (CFC)l.

The BESS will comply with the current CFC, which governs the code requirements to minimize the risk of fire and life safety hazards specific to BESS used for load shedding, load sharing and other grid services (Chapter 12 Section 1206 of the 2019 CFC). In accordance with the CFC, the battery enclosure and the site installation design are all required to be approved by the local or State Fire Marshal. Potential hazards and procedures to follow in case of emergencies associated with the BESS are outlined in the Industrial Lithium-Ion Battery Emergency Response Guide, which is provided as Appendix A to this document.

Figure 1 DR HAZ-7 Typical BESS Fire Protection Layout



3 Project Description

3.1 Data Requests DR PD-1 through DR PD-16

3.1.1 Data Request DR PD-1

DR PD-1: Please provide a description of how the solar facility, battery facility, and hydrogen facility would interact with each other. For example, would the solar facility primarily provide power to the electrical grid, or would the solar facility primarily service the hydrogen facility, and when would the BESS be charged?

Response: Because offtake contracts have not yet been executed, the ultimate configuration and ratio of solar, hydrogen, and battery storage components of the Project has not been finalized. Therefore, a range of operational scenarios is described herein. Since submitting the Opt-In Application, the Applicant has done additional engineering and analysis and optimized the size of the green hydrogen facility, which would max out at 800 MW relative to the 1,150 MW of solar production.

Hydrogen would only be produced using renewable energy. When there is no renewable energy supply, no hydrogen would be produced and the facility would remain in standby using grid supplied energy for auxiliary systems such as monitoring equipment, safety systems, pumps, compressors, water treatment and required utilities. When a sufficient supply of renewable energy becomes available, the facility would be able to resume the production of hydrogen. The renewable energy source for the hydrogen electrolyzer would be the Project's solar production, solar-charged BESS, or both at the same time. The precise schedule and balance of the energy supply for the electrolyzer is being analyzed and will be finalized in a later stage of design.

The 800 MW hydrogen facility would generate hydrogen on average 11 hours per day (4,230 hours per year) but hydrogen facility and electrolyzer supporting equipment would operate 24 hours per day (8,760 hours per year) at approximately 10 percent of power input in stand-by mode, requiring up to 800 MW of energy during hydrogen production and 80 MW when in stand-by mode. Annually, the hydrogen facility would require 3,746,800 MWh (11-hour operating schedule at 800MW and 13-hour operating schedule at 80 MW per day). The facility would produce up to approximately 140 metric tons (approximately 154 tons) of gaseous hydrogen per day.

The final size of the BESS would be optimized to support the electrolyzer facility and/or solar facility. Energy produced by the solar facility in excess of what is consumed by the electrolyzer may be dispatched onto the electric grid, stored in the BESS, or both. The BESS may also be charged by the grid, however if the energy from the BESS is not sourced from renewables it would not be used to power the electrolyzer. A metering system would be employed to measure how much energy stored in the BESS is derived from the grid versus the solar facility in order to ensure that only the quantity of renewable electricity stored in the BESS would be used to power the electrolyzer.

A co-benefit of this flexible manner of operating the electrolyzer to follow the availability of renewable energy is that the Project will have the ability to elect not to generate hydrogen and instead push those renewable electrons onto the grid during reliability events.

The alternative configuration proposed for the Project is a scenario with no electrolyzer, with the Project consisting of a solar PV facility paired with BESS. In this scenario, the BESS would generally

be charged with solar generation, but it is also expected that the BESS would draw some energy from the grid. It is also possible that a portion of the BESS would not be tied to the solar and would only be tied to the grid.

Adding storage capacity to the California Independent System Operator (CAISO) system enables the storing of energy when it is produced and subsequently discharging that energy when it is most needed, benefiting CAISO, ratepayers, utilities, and independent power producers. With the aggressive California state renewable energy and zero-carbon electric supply targets accelerating the renewable generator buildout, the energy on the grid is becoming increasingly green. Moreover, the lowest priced energy often occurs in the middle of the day, when solar facilities across the state are simultaneously operating at full capacity, which results in the optimal time to charge batteries with an increasingly higher percentage of green energy. Furthermore, enabling grid charging also allows the batteries to provide critical reliability enhancing ancillary services to the grid, such as frequency regulation and spinning reserves.

3.1.2 Data Request DR PD-2

DR PD-2: Please describe where on the project site the green hydrogen stub pipeline would be proposed and confirm the approximate length and width of the corridor. Please show the location on a figure and GIS shape file.

Response: The stub pipeline locations have not been finalized and will be dependent on final design. A KMZ was provided via Kiteworks on March 14, 2024 and includes representative locations of the stubs at each proposed hydrogen location. These locations are also illustrated in Figure 2 below. The stub pipelines will lead from the hydrogen facility and end at the edge of the Project boundary where they will connect with the independent offtake pipeline. The permanent corridor within the Project site may be up to approximately 90 feet wide. The length of the corridor may range from several hundred feet to up to 2 miles.

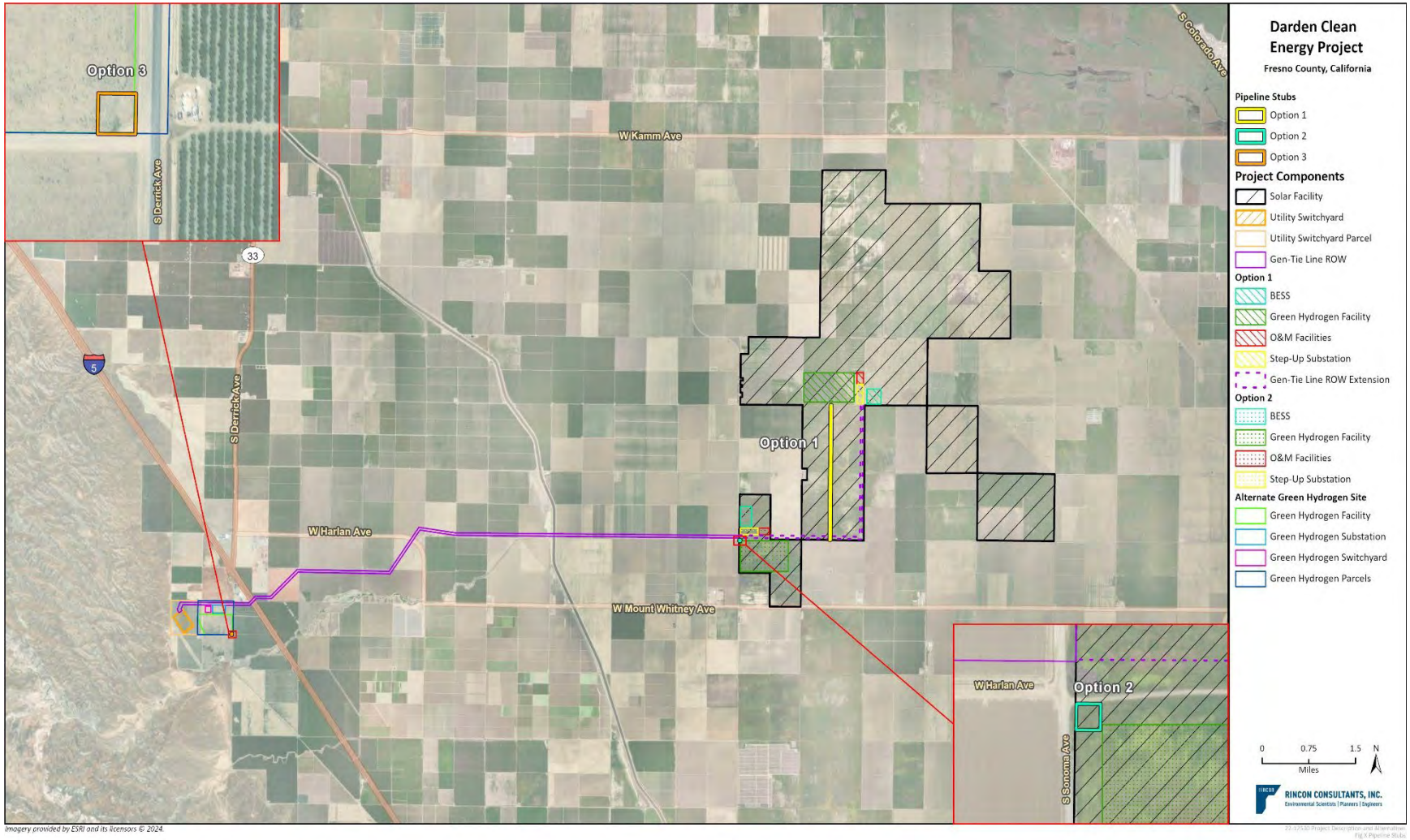
3.1.3 Data Request DR PD-3

DR PD-3: Please include the technical details for the hydrogen stub pipeline including but not limited to pipeline pressure, material, diameter, and applicable safety codes.

Response: The specifications of the stub pipeline including material, pressure limits, and temperature will be dictated by the offtake pipeline specifications to ensure material compatibility.

The pipeline will be developed in accordance with governing pipeline codes and standards for hydrogen technologies and natural gas pipelines including but not limited to: 49 CFR Part 192, American Society of Mechanical Engineers (ASME) B31.12, ASME B31.8 and others process design codes and standards that may include but would not be limited to: ASME Pressure Vessel Code Section VIII; ASME B31.3 and B16.34; National Fire Protection Association (NFPA) 2; American Petroleum Institute 610, 661, 617, 618, 619, 541, 520 and 521.

Figure 2 DR PD-2 Green Hydrogen Stub Pipeline Potential Locations



3.1.4 Data Request DR PD-4

DR PD-4: Please describe the construction methods that would be used, including dimensions of sub-surface work, for each of the alternative on-site hydrogen stub pipeline routes.

Response: The stub pipelines are anticipated to be installed via open-cut trenching. Open-cut trench pipeline installation typically consists of trench excavation, pipe bedding stabilization, pipe installation, and backfill. The construction crew would typically operate a backhoe, compaction equipment (roller and hand-operated equipment), dump trucks for stockpiling of soils and delivery of backfill material, utility trucks (with truck-mounted or towed generator and hand tools), and water trucks/water buffalos. The dimensions of subsurface work will be determined during final design, but it is assumed the approximate dimensions of the trench will be 4 feet deep by 2-3 feet wide. The permanent corridor for the pipeline, within the Project site, may be approximately 30 to 90 feet wide. The length of the pipeline corridor may range from several hundred feet to up to 2 miles.

Ground restoration typically is performed at the completion of each segment of pipeline and then at the end of a project once all excavation and backfill operations have been completed.

3.1.5 Data Request DR PD-5 [Reserved]

3.1.6 Data Request DR PD-6

DR PD-6: Please add the Southern California Gas Company Angeles Link project to the Cumulative Projects List (Table 5-1), along with supporting information about the project's details.

Response: The Southern California Gas Company (SoCalGas) Angeles Link project has been added to Table 5-1 below. While Table 5-1 has been updated to include Angeles Link, a project to develop the nation's largest clean renewable hydrogen energy pipeline system to deliver clean, reliable, renewable energy to the Los Angeles region, the location and ultimate size of this potential cumulative project is not currently known as SoCalGas is in the preliminary design and feasibility analysis phase.[1] It is speculative to complete analysis of this potential cumulative project because of the multiple unknown variables and data involved.

[1] Southern California Gas Company. 2024. Angeles Link. Available at https://www.socalgas.com/sustainability/hydrogen/angeles-link.

Table 5-1 Cumulative Projects List

Project Name	Description	Location	Distance to Project Site	Status
FC-1: Akhavi LLC Project	GPA 560: Rezone	20866 Lassen Avenue, Five Points	3.6 miles southeast of the solar facility	Under Fresno County Planning Commission Review.[2]
FC-2: Arroyo Pasajero Bridge Replacement Geotechnical	Bridge replacement	Intersection of Fresno Coalinga Road and S. El Dorado Avenue	6.3 miles south of the solar facility	Under Fresno County Planning Commission Review.[2]
FC-3: Sentry Ag Services Project	CUP 3768: CUP for increase cow-heard size + building of 3 additional barns	13695 West Elkhorn Avenue, Riverdale	7.2 miles east of the solar facility	Under Fresno County Planning Commission Review.[2]
FC-4: Kamm Avenue Pistachio	CUP 3685: Pistachio processing facility with a variance request for building height more than 35 feet	On the south side of Kamm Avenue, approximately 1 mile west of State Route 33, and approximately 4 miles east of I-5 in unincorporated Fresno County (Fresno County 2021a)	7.1 miles north of the utility switchyard	Under Fresno County Planning Commission Review.[2]
FC-5: WTC Riverdale, LLC Project	CUP 3679 EXT 1: Dairy Digester/Connection to Existing Pipeline for renewable natural gas	12840 West Kamm Avenue, Riverdale	8.7 miles east of the solar facility	Under Fresno County Planning Commission Review.[2]
FC-6: Seneca Resources Corporation Project	CUP 3548: Oil and Gas Exploration/ Production	West of Coalinga Mendota Road	9.4 miles southwest of the solar facility	Under Fresno County Planning Commission Review.[2]
FC-7: Landfill Gas Conditioning System & Pipeline	CUP 3762: Landfill Gas Conditioning System & Pipeline	18950 West American Avenue, Kerman	10.6 miles northeast of the solar facility	Under Fresno County Planning Commission Review.[2]
FC-8: Gas Station and Convenience Store	CUP 3758: Gas Station and Convenience Store	25014 W Dorris Ave, Coalinga	12.2 miles south of the solar facility	Under Fresno County Planning Commission Review.[2]
FC-9: Heartland Hydrogen Project	CUP 3630/3631; Development of an electrolytic hydrogen fuel generation facility using treated wastewater and on-site generation of solar PV energy; project would be capable of producing approximately 30,000 kg/day of renewable hydrogen for zero-emission transportation fuel	State Route 33 and West American Avenue, second location at Bass Avenue in the city of Mendota	12.3 miles northwest of the solar facility	Environmental Review in Progress.[1]
FC-10: Agricultural Commercial Center	CUP 3697: Agricultural Commercial Center	32899 Lassen Avenue, Huron	13.8 miles southeast	Under Fresno County Planning Commission Review.[2]
FC-11: Multi use/Freeway commercial development	Multi use/Freeway commercial development	25203 West Dorris Avenue, Coalinga	12.2 miles southwest	Under Fresno County Planning Commission Review.[2]

Project Name	Description	Location	Distance to Project Site	Status
FC-12: Scarlet Solar	400 MW PV solar facility with 400 MW energy storage system on 4,089 acres	3.5 miles west-southwest of the community of Tranquility and approximately 6.5 miles east of I-5 along State Route 33 at W South Avenue in unincorporated Fresno County	10.4 miles northwest	Project is currently under construction.[1, 5]
FC-13: Sonrisa Solar Project	CUP 3677: 200 MW PV solar facility with battery storage capacity of 100 megawatts on approximately 2,000 acres	Approximately 1.9 miles east of State Route 33 at West Adams Avenue	10.4 miles northwest of the solar facility	Under Fresno County Planning Commission Review.[1]
FC-14: Tranquility Solar Project	CUP 3451-58: 200 MW solar facility on 3,732 acres	Intersection of West Floral Avenue and State Route 33	10.1 miles north of the utility switchyard	Under construction, not completed.[2]
FC-15: Luna Valley Solar	CUP 3671: 200 MW solar facility and energy storage on 1,252 acres	0.90-mile northwest of the intersection of Manning Avenue and South Derrick Avenue	12.7 miles north of the utility switchyard	Approved; Construction permits not yet obtained.[2, 3]
FC-16: H2B2 USA, LLC, Project	CUP 3738: Solar and battery storage facility on 60 acres	24387 West Whitesbridge Avenue, Kerman	14.4 miles north of the solar facility	Under Fresno County Planning Commission Review.[1]
FC-18: Five Points Pipeline, LLC, Project	CUP 3735: Construction of a dairy gas digester facility and pipeline	0.95-mile southeast of South Madera Avenue and West Elkhorn Avenue	6.5 miles east of the solar facility	Under Fresno County Planning Commission Review.[2]
FC-20: Agricultural Operations Facility Project	CUP 3756: Construction of three agricultural operations buildings totaling approximately 7.3 acres	2725 South Sycamore Avenue, Kerman	14.3 miles northeast of the solar facility	Under Fresno County Planning Commission Review.[2]
FC-21: Plug Project Holdings Co. Project	VA 4122: Variance Application	0.40-mile northwest of the intersection of State Route 33 and West Adams Avenue	12.4 miles northwest of the solar facility	Under Fresno County Planning Commission Review.[2]
FC-23: Microwave Tower Project	DRA 4739: Microwave Tower	Adjacent to Janetski Field along West Morton Avenue	8.5 miles north of the solar facility	Under Fresno County Planning Commission Review.[2]
FC-24: Tranquility Wastewater Treatment Plant Improvement Project	This planning project will assess the condition of the sewer collection system pipelines, correct existing deficiencies, and prioritize the replacement of sewer lines based on their estimated remaining useful life.	0.30-mile south of the intersection of South Levee Road and South Sonoma Avenue	9 miles north of the solar facility	Under Fresno County Planning Commission Review.[2]

Project Name	Description	Location	Distance to Project Site	Status
WWD-1: Westlands Solar Park (WSP)[7]	A series of utility-scale solar photovoltaic (PV) energy generating facilities on about 21,000 acres which would produce 2,000 MW through the implementation of individual solar projects in 12 subareas which are all adjacent to each other.	West-central Kings County, generally located south of SR-198, west of SR-41 and the Kings River, and east of the Fresno County Line	22.8 miles southeast of the solar facility	Environmental review completed. Individual solar operations as part of this project are in various stages. Some are operational with others expected to come online in 2023-2024.[6]
WWD-2: Valley Clean Infrastructure Plan (VCIP)[8]	A plan that would allow for the construction of solar facilities and electric transmission infrastructure with the potential to provide 20,000 MWs of solar energy and energy storage	Throughout Westlands Water District; specific location undetermined	Specific location undetermined	Project is currently soliciting input from landowners in Westlands Water District.[4]
SoCalGas Angeles Link[8]	A project that could be the nation's largest clean renewable hydrogen energy pipeline system that could deliver clean, reliable, renewable energy to the Los Angeles region. As envisioned, the project could support the integration of more renewable electricity like solar and wind into California's statewide energy infrastructure system and would significantly reduce greenhouse gas emissions from electric generation, industrial processes, heavy-duty trucks, and other hard-to-electrify sectors of the Southern California economy.	Throughout Southern California	Specific location undetermined	Project is currently in Phase 1 of three phases, which includes the preliminary front-end engineering and design scope and feasibility analysis.[9]

Sources: [1] County of Fresno 2023a; [2] County of Fresno 2023b; [3] County of Fresno 2023c; [4] Golden State Clean Energy 2023;[5] WWD 2023; [6] WWD 2017; [9] SoCalGas 2024

[7] Although greater than 15 miles from the Project site, the Westlands Solar Park is included within the cumulative projects list due to the size and regional significance.

[8] The location and ultimate size of this potential cumulative project is not currently known; therefore, while it is included in this Cumulative Projects List, it would be speculative to complete analysis of this potential cumulative project because of the multiple unknown variables and data involved.

CUP – conditional use permit; DRA – Director Review and Approval; FC – Fresno County; GPA – General Plan Amendment; MW – megawatts; VA – Variance Application; WWD – Westlands Water District

3.1.7 Data Request DR PD-7

DR PD-7: Please update the project description to resolve the discrepancy between subsections 2.1.5.4 and 4.1.4.3. If hydrogen would be stored on the project site, please update and provide additional information about the impacts of hydrogen storage in the appropriate technical sections.

Response: At the current stage of design, the Applicant is accounting for hydrogen storage of 60 metric tons, or roughly 130,000 lbs. The final amount of on-site storage will be determined based on the facility design and the offtake pipeline system, when identified. Hydrogen will be stored in gaseous form at a pressure of approximately 200 bar in storage containers designed and manufactured in accordance with current industry standards and regulations. The storage cylinder size will be finalized as design and engineering progresses, but current design indicates each individual cylinder would have a volume of 550 liters and contain approximately 8 kilograms of hydrogen at the maximum pressure of 200 bar. The storage vessels will be procured from a proven vendor and installed in accordance with the vendor's specifications. The storage vessels will most likely be installed in groups (called banks) so that they can be isolated in case of emergency or maintenance. Isolation valves and pressure relief valves will be installed between banks so each section of the storage could be isolated and depressurized in case of emergency. An updated Project Description will be provided separately that incorporates all updated information provided by the Applicant in response to the Data Requests. Hydrogen storage is addressed in the responses provided to DRs HAZ-2, HAZ-4, and HAZ-5 above. Regulations related to on-site storage of hydrogen are captured in the updated Table 5.10-5 provided in response to DR WS-1 and discussed in the response to DR WS-2, both of which were provided in Data Response Set #1. Hydrogen storage is also included in Section 5.5, *Visual Resources*, Table 5.5-1 of the Opt-In Application.

3.1.8 Data Request DR PD-8

DR PD-8: Please update the project description section to include the required information for the captured oxygen option. Please provide a site plan location for the captured oxygen and describe how the oxygen would be stored and sent off site.

Response: Following further analysis conducted by the Applicant, it has been determined that oxygen will not be captured, stored, or sent offsite to an off taker. Oxygen will be vented to a safe location that does not create a hazard to the natural environment.

3.1.9 Data Request DR PD-9

DR PD-9: Please provide further information as to which battery technology would in fact be used for this project.

Response: Only lithium-ion technology will be used for the Project, as discussed in responses to DR HAZ-2, DR HAZ-4, and DR PD-11.

3.1.10 Data Request DR PD-10

DR PD-10: Describe the depths of excavation for the transformer pads, inverter piles, step-up substation, operations and maintenance buildings and facilities, BESS foundations, green hydrogen facility, and switchyard structures (COHP 1990, p. 7).

Response: Depths for the Project equipment and foundations will be specific to the final design of each component. Typical approximate depths anticipated are listed below.

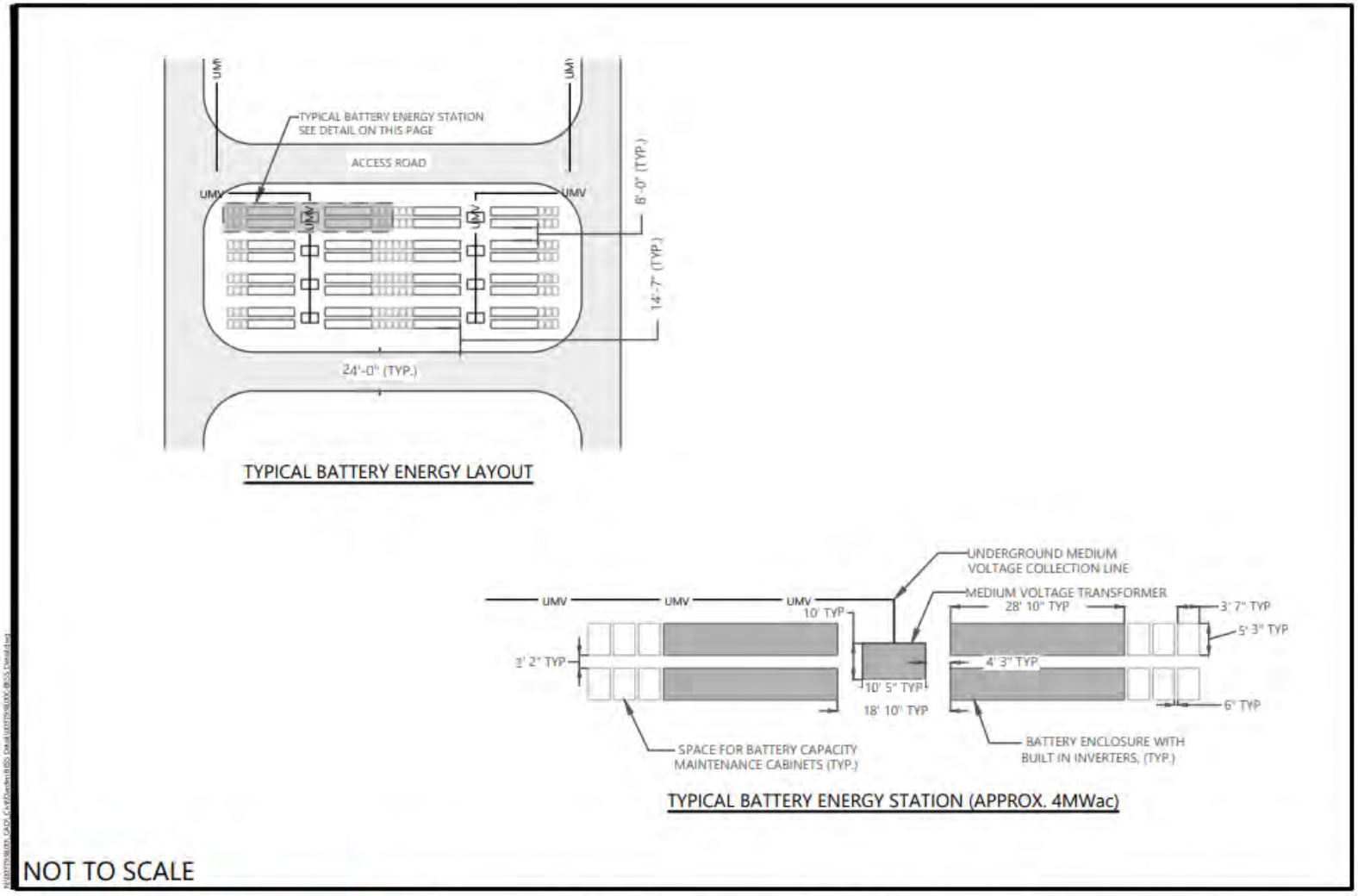
- Transformer Pads: 4 feet
- Inverter Piles: 12 feet
- Step Up Substation: 10 to 22 feet
- O&M Building: 3 feet
- BESS Foundations: 12 feet
- Green Hydrogen Facility: 25 to 30 feet
- Utility Switchyard: 10 to 22 feet

3.1.11 Data Request DR PD-11

DR PD-11: Please provide a site plan with layout for the BESS, including but not limited to number of battery systems, BESS arrangement, access roads and pathways.

Response: A conceptual site plan with a typical BESS layout is provided as Figure 3 below. The energy storage system will consist of lithium-ion battery banks housed in electrical enclosures and buried electrical conduit. As detailed Project design and engineering continues and the size of the storage system is finalized, a battery vendor will be selected and details of the lithium-ion technology and battery dimensions will be determined. Between 610 and 1,220 electrical enclosures will be installed on level foundations for the Project. The enclosures will be connected to pad mount transformers that step up the battery voltage to medium voltage levels, and will connect to the Project substation through feeder breakers. The layout of the BESS will entail blocks of 4 to 6 battery energy stations surrounded by access roads, with each energy station consisting of 2 to 4 battery enclosures and 1 medium voltage transformer.

Figure 3 DR PD-11 Conceptual BESS Layout and Detail



3.1.12 Data Request DR PD-12

DR PD-12: Will the applicant mow or grade the entire gen-tie right-of-way? If so, to what depth?

Response: Minimal to no grading is anticipated due to the flat topography of the Project area. The entire gen-tie corridor will not be cleared or mowed for construction or operations. The portion of the gen-tie corridor within the solar PV area will be managed during operations to prevent establishment of weeds and reduce fire loads and may be mowed on a regular basis. The portion of the gen-tie corridor that consists of easements will not be cleared except for the area immediately surrounding the pole structures. Each support pole along the gen-tie line easements will include an operations and maintenance area of roughly 50 feet by 50 feet, where vegetation will be cleared. Additionally, an access corridor of approximately 20 feet may be cleared for operations and maintenance within parcels containing orchards and will be determined based on final design and layout. Areas temporarily impacted during construction will be either restored to agriculture or revegetated in accordance with the Vegetation Management Plan, which includes weed prevention measures. For further information regarding the Vegetation Management Plan, please refer to the response to DR BIO-42.

3.1.13 Data Request DR PD-13

DR PD-13: Please provide the Letter Agreement with PG&E from May 18, 2023.

Response: The Letter Agreement between the Applicant and PG&E was incorrectly characterized in the original Darden application materials submitted to the CEC in November 2023. The formal Agreement is not provided with this data response but is described further below.

The Agreement does not detail the construction, operation, and ownership of the Project, and instead describes certain work that will occur prior to the execution of the Large Generator Interconnection Agreement (LGIA) under the terms of PG&E's Transmission Owner Tariff. The Letter Agreement is intended to commence and accelerate design and engineering scope related to known interconnection upgrade workstreams. Under the Agreement, PG&E will establish a project team, develop a project schedule, conduct scoping and design activities, and review the design package prepared by IP Darden. The Agreement indicates that the Applicant intends to self-build the switchyard, and that procurement and construction activities will be performed pursuant to a subsequent interconnection agreement. Details of the transfer of ownership will be defined in a future agreement between the Applicant and PG&E, but the utility will ultimately own and operate the loop-in, switchyard, and one span of the gen-tie line up to the point of change in ownership (POCO). The remainder of the gen-tie line will be owned and operated by the Applicant.

3.1.14 Data Request DR PD-14

DR PD-14: Please provide the direct mailing addresses for occupants of properties contiguous to the proposed power plant, related facilities, transmission lines, or other linear facilities as shown on the latest equalized assessment roll or if no there are no occupants for properties contiguous to the power plant, related facilities, transmission lines or other linear facilities, please make a statement to that.

Response: Table 3 below provides residential addresses for properties within one mile of the Project.

Table 3 DR PD-14 Residential Addresses within 1-Mile of the Project

Assessor's Parcel Number	Site Address	Building Latitude	Building Longitude
045-070-47S	28947 W Mt Whitney Ave Cantua Creek, CA 93608	36.42982949	-120.3197722
045-080-28S	20009 S Derrick Ave Cantua Creek, CA 93608	36.42990256	-120.3913907
045-080-37S	31485 W Harlan Ave Cantua Creek, CA 93608	36.44277598	-120.36619
050-070-63S	19056 S Napa Ave Cantua Creek, CA 93608	36.45698202	-120.229554
050-070-63S	19056 S Napa Ave Cantua Creek, CA 93608	36.45730821	-120.2295583
050-060-20S	25457 W Cerini Ave Cantua Creek, CA 93608	36.45737888	-120.2385486
050-060-20S	25457 W Cerini Ave Cantua Creek, CA 93608	36.45743547	-120.238331
050-060-20S	25457 W Cerini Ave Cantua Creek, CA 93608	36.457532	-120.2382395
050-070-63S	23936 W Cerini Ave Cantua Creek, CA 93608	36.4578035	-120.229315
050-060-20S	25457 W Cerini Ave Cantua Creek, CA 93608	36.45781501	-120.2386185
050-070-63S	23936 W Cerini Ave Cantua Creek, CA 93608	36.45802403	-120.228788
050-030-50S	23936 W Cerini Ave Cantua Creek, CA 93608	36.45846222	-120.2294757
050-020-37S	18019 S Sonoma Ave Cantua Creek, CA 93608	36.46533047	-120.2524233
050-020-37S	18019 S Sonoma Ave Cantua Creek, CA 93608	36.4653357	-120.2535559
050-020-37S	18019 S Sonoma Ave Cantua Creek, CA 93608	36.46534093	-120.2531812
050-020-37S	18019 S Sonoma Ave Cantua Creek, CA 93608	36.465344	-120.2527593
050-020-37S	18019 S Sonoma Ave Cantua Creek, CA 93608	36.46563051	-120.253062
050-020-37S	18019 S Sonoma Ave Cantua Creek, CA 93608	36.47223801	-120.2503572
050-020-37S	18019 S Sonoma Ave Cantua Creek, CA 93608	36.47227199	-120.249154
050-020-37S	18019 S Sonoma Ave Cantua Creek, CA 93608	36.47228093	-120.2489964
050-020-37S	18019 S Sonoma Ave Cantua Creek, CA 93608	36.47228155	-120.2498917
050-020-23S	17635 S Sonoma Ave Cantua Creek, CA 93608	36.47301148	-120.248744

Assessor's Parcel Number	Site Address	Building Latitude	Building Longitude
050-020-23S	17635 S Sonoma Ave Cantua Creek, CA 93608	36.47361757	-120.2491532
050-020-47ST	17910 S Sonoma Ave Cantua Creek, CA 93608	36.47438552	-120.2476215
050-020-46S	17830 S Sonoma Ave Cantua Creek, CA 93608	36.47467548	-120.2476195
050-020-46S	17830 S Sonoma Ave Cantua Creek, CA 93608	36.47498626	-120.2476535
050-020-23S	17635 S Sonoma Ave Cantua Creek, CA 93608	36.47669399	-120.2484325
050-020-23S	17635 S Sonoma Ave Cantua Creek, CA 93608	36.47708001	-120.248446
050-020-23S	17635 S Sonoma Ave Cantua Creek, CA 93608	36.47807886	-120.2484278
050-020-44S	17812 S Sonoma Ave Cantua Creek, CA 93608	36.47808	-120.247393
050-020-23S	17635 S Sonoma Ave Cantua Creek, CA 93608	36.47850754	-120.2484267
050-020-39S	17056 S Sonoma Ave Cantua Creek, CA 93608	36.48413057	-120.2461996
040-100-29S	24841 W Clarkson Ave Cantua Creek, CA 93608	36.501424	-120.243147

3.1.15 Data Request DR PD-15

DR PD-15: Please clarify which source has the correct list of APNs and correct any errors.

Response: The letters at the end of the parcel numbers identify specific tax statuses; however, the numbers of the APNs refer to the parcels themselves. Therefore, APN 04007031 in Table 1-1 and APN 04007031ST in Appendix F refer to the same parcel. However, Table 1-1 has been updated below to include the letters associated with the APNs for consistency with Appendix A and Appendix F.

In addition, parcels 050-070-63 and 045-070-032 have been removed from Table 1-1 because they do not fall within the Project footprint.

Table 1-1 Project Site Assessor's Parcel Numbers

Assessor's Parcel Numbers	Section(s)-Township-Range	County
Solar Facility, and Options 1 and 2 Step-up Substation and BESS		
040-070-31ST	S22 – 16S – 16E	Fresno County
040-070-32ST	S22 – 16S – 16E	Fresno County
040-110-15ST	S35 – 16S – 16E	Fresno County
040-110-16ST	S34 – 16S – 16E	Fresno County
040-110-20ST	S36 – 16S – 16E	Fresno County
040-110-21ST	S26 – 16S – 16E	Fresno County
040-110-23ST	S26 – 16S – 16E	Fresno County
040-110-25ST	S26 – 16S – 16E	Fresno County
040-110-27ST	S27 – 16S – 16E	Fresno County
040-110-28ST	S27 – 16S – 16E	Fresno County
040-110-29ST	S27 – 16S – 16E	Fresno County
040-110-30ST	S27 – 16S – 16E	Fresno County
040-110-31ST	S26 – 16S – 16E	Fresno County
040-110-32ST	S26 – 16S – 16E	Fresno County
040-110-34ST	S25 – 16S – 16E	Fresno County
050-020-47ST	S4 – 17S – 16E	Fresno County
050-030-04ST	S2 – 17S – 16E	Fresno County
050-030-05ST	S2 – 17S – 16E	Fresno County
050-030-07ST	S2 – 17S – 16E	Fresno County
050-030-08ST	S2 – 17S – 16E	Fresno County
050-030-10ST	S2 – 17S – 16E	Fresno County
050-030-21ST	S3 – 17S – 16E	Fresno County
050-030-24ST	S12 – 17S – 16E	Fresno County
050-030-25ST	S12 – 17S – 16E	Fresno County
050-030-26ST	S10 – 17S – 16E	Fresno County
050-030-27ST	S10 – 17S – 16E	Fresno County
050-030-29ST	S10 – 17S – 16E	Fresno County
050-030-30ST	S3 – 17S – 16E	Fresno County
050-030-31ST	S3 – 17S – 16E	Fresno County
050-030-32ST	S02, 03 – 17S – 16E	Fresno County
050-030-33ST	S3 – 17S – 16E	Fresno County
050-030-49ST	S10 – 17S – 16E	Fresno County
050-060-45ST	S21 – 17S – 16E	Fresno County
050-060-46ST	S16 – 17S – 16E	Fresno County
050-060-47ST	S16 – 17S – 16E	Fresno County
050-060-48ST	S16 – 17S – 16E	Fresno County
050-070-02T	S15 – 17S – 16E	Fresno County
050-070-41ST	S15 – 17S – 16E	Fresno County
050-070-42ST	S15 – 17S – 16E	Fresno County
050-070-43ST	S15 – 17S – 16E	Fresno County

Assessor's Parcel Numbers	Section(s)-Township-Range	County
050-070-64ST	S15 – 17S – 16E	Fresno County
050-080-01ST	S18 – 17S – 17E	Fresno County
Gen-tie Line Easement and Extension		
045-160-24S	S25 – 17S – 14E	Fresno County
045-160-23S	S25 – 17S – 14E	Fresno County
045-160-22S	S25 – 17S – 14E	Fresno County
045-171-01	S30 – 17S – 15E	Fresno County
045-080-47S	S19 – 17S – 15E	Fresno County
045-080-38S	S19 – 17S – 15E	Fresno County
045-080-17S	S20 – 17S – 15E	Fresno County
045-080-49S	S21 – 17S – 15E	Fresno County
045-080-09S	S16 – 17S – 15E	Fresno County
045-070-51S	S15 – 17S – 15E	Fresno County
045-070-49S	S15 – 17S – 15E	Fresno County
045-070-04	S14 – 17S – 15E	Fresno County
045-070-44S	S14 – 17S – 15E	Fresno County
045-070-45S	S14 – 17S – 15E	Fresno County
045-070-26ST	S13 – 17S – 15E	Fresno County
045-070-37S	S13 – 17S – 15E	Fresno County
045-070-35S	S13 – 17S – 15E	Fresno County
050-060-27S	S18 – 17S – 16E	Fresno County
050-060-38S	S17 – 17S – 16E	Fresno County
050-060-24S	S17 – 17S – 16E	Fresno County
050-060-48ST	S16 – 17S – 16E	Fresno County
050-060-20S	S16, 21 -17S – 16E	Fresno County
050-070-43ST	S15 – 17S – 16E	Fresno County
050-070-02T	S15 – 17S – 16E	Fresno County
050-070-42ST	S15 – 17S – 16E	Fresno County
050-030-27ST	S10 – 17S – 16E	Fresno County
050-030-26ST	S10 – 17S – 16E	Fresno County
050-030-21ST	S3 – 17S – 16E	Fresno County
Green Hydrogen Facility (Option 1 and Option 2)		
050-030-21ST	S3 – 17S – 16E	Fresno County
050-060-45ST	S21 – 17S – 16E	Fresno County
Green Hydrogen Facility (Alternate)		
045-160-18S	S25 – 17S – 14E	Fresno County
045-160-21S	S25 – 17S – 14E	Fresno County
045-160-22S	S25 – 17S – 14E	Fresno County
045-160-23S	S25 – 17S – 14E	Fresno County
Utility Switchyard		
045-160-24S	S25 – 17S – 14E	Fresno County

3.1.16 Data Request DR PD-16

DR PD-16: Please provide recent aerial photo(s) showing the entire project site prior to construction, and then using the same photo(s) provide a simulation or artist's rendering showing all project components at the site after construction.

Response: A recent aerial photo that shows the entire Project site, as well as a photo simulation that shows Project components after construction, are provided below as Figure 4 and Figure 5.

Figure 4 DR PD-16 Aerial Photo of the Existing Project Area

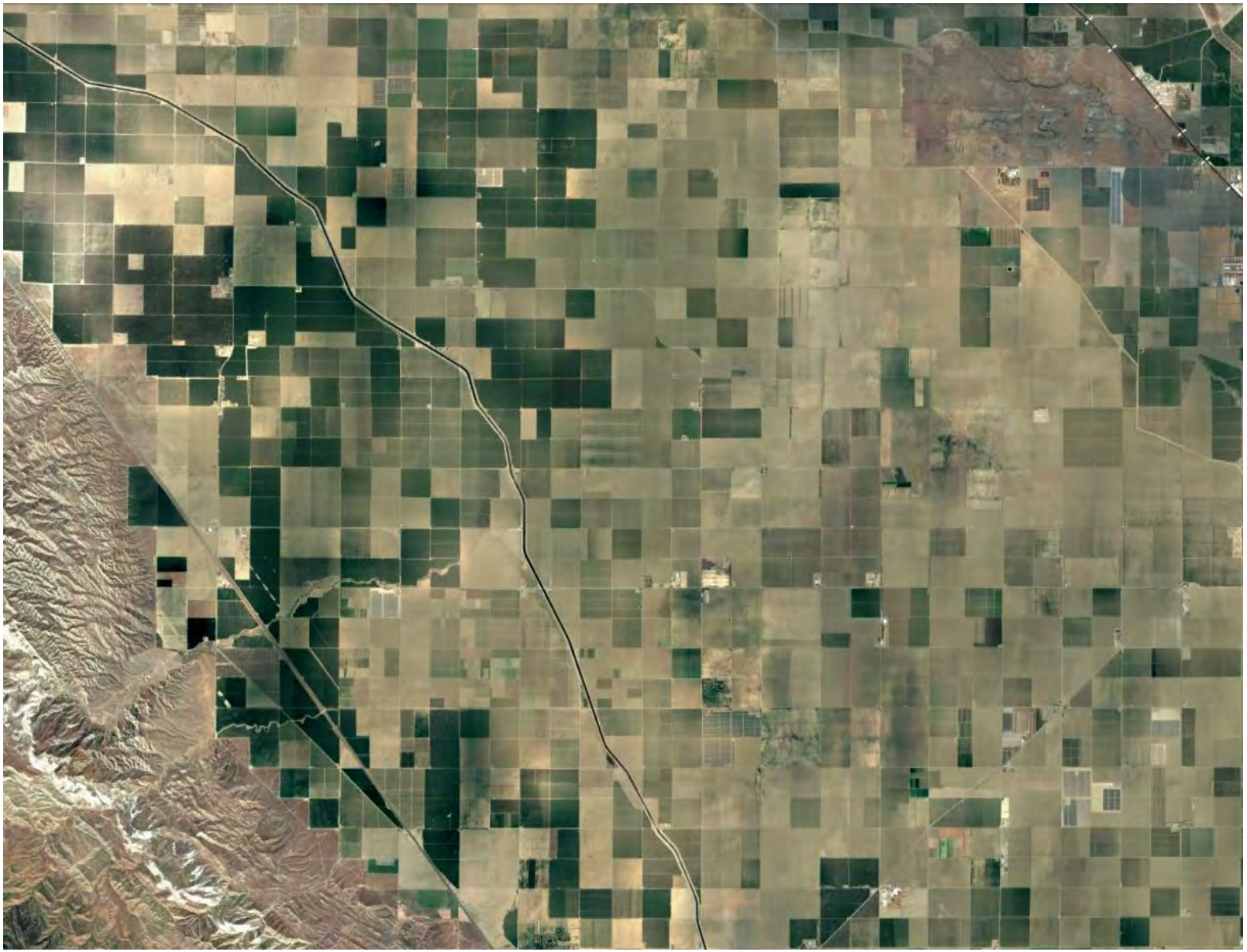
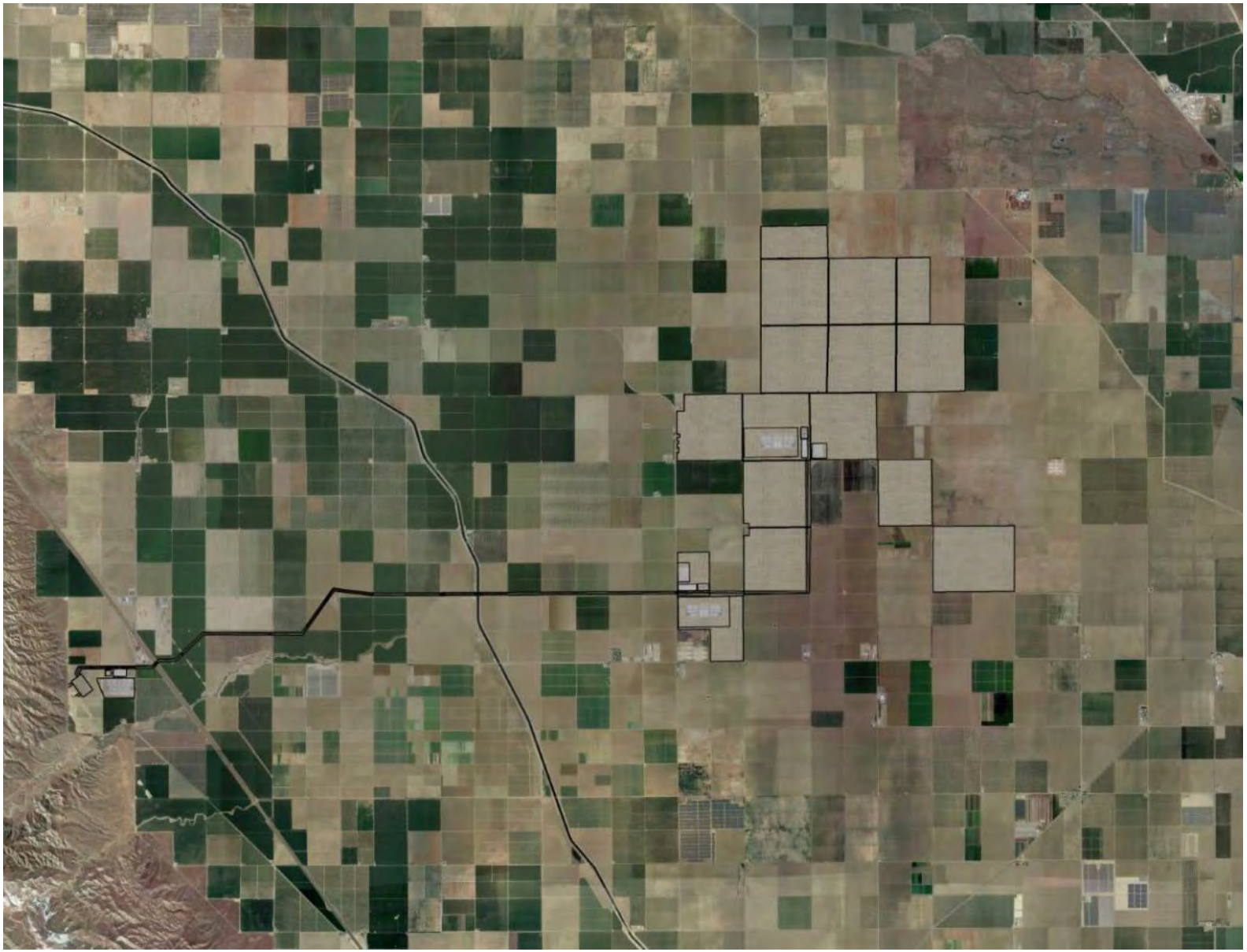


Figure 5 DR PD-16 Aerial Simulation of Post-Construction Project Components



4 Socioeconomics

4.1 Data Requests DR SOCIO-1 through DR SOCIO-8

4.1.1 Data Request DR SOCIO-1

DR SOCIO-1: Per Appendix B (g) (7) (A) (iv), provide the availability of skilled workers by occupation for operation the project.

Response: The Project will require an estimated 40 permanent full-time employees plus one full-time equivalent contract employee for grounds maintenance. It is estimated that the solar and hydrogen facilities will require two operations managers each and 36 additional technician-level staff.

To determine availability, these employment positions were assigned to occupations, which allows comparison with data on labor availability by occupation from the Bureau of Labor Statistics. The Bureau of Labor Statistics does not define a green hydrogen technician occupation; therefore, the Solar PV Installers occupation was utilized as a substitute. Solar PV Installers (SOC code 47-2231) occupation description covers installation and maintenance of solar PV systems. Table 4 details operational employment by component and occupation.

Table 4 DR SOCIO-1 Operational Employees in Full-time Equivalent

SOC Code	Occupation Title	PV Solar	BESS	Hydrogen	Contract Employment
11-3000	Operations Specialties Managers	2	0	2	0
47-2231	Solar PV Installers	10	4	22	0
37-0000	Building and Grounds Maintenance	0	0	0	1

Across the study area (Fresno-Madera Metropolitan Statistical Area [MSA], comprised of Fresno, Madera, and Kings counties), the Project would require approximately one percent of all Operations and Specialties Managers, 14 percent of Solar PV Installers, and less than one percent of Building and Grounds Maintenance employment. Table 5 shows Project labor as a share of available regional labor, divided into components and shows a combined total. The shading in the table highlights where the percentage of Project operations labor demand exceeds certain thresholds. The dark blue shows Project demand exceeding 10 percent of available labor. Light blue shows Project demand between 6.4 percent—the current unemployment rate for Fresno County where more than half of the regional workforce is centered—and 10 percent of available labor. Green indicates Project demand that is less than the unemployment rate of 6.4 percent.

Table 5 DR SOCIO-1 Operational Labor Demand as Share of Regional Employment

SOC Code	Occupation Title	PV Solar	BESS	Hydrogen	Contract Employment	Total
11-3000	Operations Specialties Managers	0.6%	0.0%	0.6%	0.0%	1.2%
47-2231	Solar PV Installers	4.0%	1.6%	**8.8%**	0.0%	**14.4%**
37-0000	Building and Grounds Maintenance	0.0%	0.0%	0.0%	0.0%	0.001%

Source: IP Darden, 2023; BLS, OEWS, 2022.

= Project demand between 6.4 and 10 percent of available labor

= Project demand exceeding 10 percent of available labor

- For all occupations where Project demand as a share of regional employment is below the unemployment rate (cells in green in Table 5), it is assumed the Project would be able to hire sufficient workers locally to fill all (100 percent of) positions.
- For occupations where Project demand as a share of regional employment is above the unemployment rate (6.4 percent) but below 10 percent of the average regional total (cells in light orange in Table 5), it is assumed the Project could have sufficient influence to hire upwards of 100 percent if managers provide sufficient incentives, given the lower numbers needed in these occupation categories, but it is assumed 75 percent would be hired locally to provide a conservative estimate.
- For occupations where Project demand as a share of regional employment is above 10 percent of the average regional total (cells in orange in Table 5), it is assumed the Project could hire a substantial number from the local region with sufficient incentives, but not 100 percent given the high numbers of workers needed and the tight labor market in construction in this region. In this case, it is assumed 50 percent would come from the local area.

Table 6 shows the result of applying these assumptions to the Project operational workforce. All Operations Specialties Managers and contract employees are anticipated to live and work in the study area (i.e., "local"). However, half of the employed Solar PV Installers, who will service and maintain the solar, BESS, and hydrogen components of the Project, are anticipated to live outside of the study area or relocate to the study area.

Table 6 DR SOCIO-1 Estimate of Local and Non-Local Operational Workforce

Occupation Title	Share Local	Local Operational Workforce	Non-Local Operational Workforce
Operations Specialties Managers	100%	4	0
Solar PV Installers	50%	18	18
Building and Grounds Maintenance	100%	1	0
Total		**23**	**18**

Source: ECONorthwest analysis, 2023

4.1.2 Data Request DR SOCIO-2

DR SOCIO-2: Per Appendix B (g) (7) (B), provide the year of the estimate used in the discussion of the socioeconomic impacts caused by construction and operation of the project.

Response: All construction and operations workforce and cost estimates were finalized in 2023. Dollar amounts for these inputs were provided in 2022 dollars. Economic impacts created by the construction and operations employment and spending were developed based on the 2021 IMPLAN model[2] and results were presented in 2022 dollars.

4.1.3 Data Request DR SOCIO-3

DR SOCIO-3: Per Appendix B (g) (7) (B) (i), provide the estimated number of workers employed by occupation for each month during construction.

Response: Table 7 below presents the construction workforce by occupation and month for the 36-month construction timeline (from December 2025 to December 2028). Table 8 below presents the construction workforce by occupation and month for the 18-month construction timeline (from December 2025 to June 2027).

[2] The 2021 model year was the most recently available at the time of application preparation. For more information on the 2021 IMPLAN model, see https://support.implan.com/hc/en-us/articles/10964288399771-2021-Data-Release.

Table 7 DR SOCIO-3 36-Month Construction Workforce Timeline (All Components)

SOC Code	Occupation Title	12-25	1-26	2-26	3-26	4-26	5-26	6-26	7-26	8-26	9-26	10-26	11-26	12-26	1-27	2-27	3-27	4-27	5-27
47-2111	Electricians	0	0	0	0	0	227	227	227	227	227	227	227	227	227	227	227	207	278
47-2073	Construction Equipment Operators	19	19	19	19	19	110	110	110	90	90	90	90	90	90	90	90	82	98
47-2071	Paving Operators	19	19	19	19	19	22	22	22	2	2	2	2	2	2	2	2	2	2
47-2221	Iron Workers	19	19	19	19	19	161	161	161	142	142	142	142	142	142	142	142	132	147
47-2061	Construction Laborers	19	19	19	19	19	136	136	136	117	117	117	117	117	117	117	117	107	138
17-1022	Surveyors	19	19	19	19	19	30	30	30	10	10	10	10	10	10	10	10	8	16
47-1011	Craft Supervision	19	19	19	19	19	42	42	42	22	22	22	22	22	22	22	22	16	32
11-9021	Construction Management	19	19	19	19	19	36	36	36	16	16	16	16	16	16	16	16	16	24
43-1000	Administrative Assistant	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	4
49-9051	Power Line Installers	0	0	0	0	0	10	10	10	10	10	10	10	10	10	10	10	0	32
17-2051	Civil Engineers	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	3
47-2051	Concrete Finishers	19	19	19	19	19	34	34	34	14	14	14	14	14	14	14	14	4	36
47-4011	Construction Inspector/Engineers	19	19	19	19	19	30	30	30	10	10	10	10	10	10	10	10	8	16
29-9011	Health and Safety Specialists	0	0	0	0	0	14	14	14	14	14	14	14	14	14	14	14	12	22
Total		**175**	**175**	**175**	**175**	**175**	**855**	**855**	**855**	**680**	**680**	**680**	**680**	**680**	**680**	**680**	**680**	**600**	**850**

SOC Code	Occupation Title	6-27	7-27	8-27	9-27	10-27	11-27	12-27	1-28	2-28	3-28	4-28	5-28	6-28	7-28	8-28	9-28	10-28	11-28	12-28
47-2111	Electricians	278	278	278	278	278	294	294	347	373	373	373	373	286	79	79	79	26	26	26
47-2073	Construction Equipment Operators	98	98	98	98	98	107	107	112	129	129	129	129	104	22	22	22	17	17	17
47-2071	Paving Operators	2	2	2	2	2	2	2	2	4	4	4	4	4	2	2	2	2	2	2
47-2221	Iron Workers	147	147	147	147	147	157	157	165	177	177	177	177	152	20	20	20	11	11	11
47-2061	Construction Laborers	138	138	138	138	138	148	148	157	183	183	183	183	142	35	35	35	26	26	26
17-1022	Surveyors	16	16	16	16	16	21	21	23	27	27	27	27	14	6	6	6	4	4	4
47-1011	Craft Supervision	32	32	32	32	32	42	42	46	59	59	59	59	34	17	17	17	13	13	13
11-9021	Construction Management	24	24	24	24	24	29	29	38	51	51	51	51	38	22	22	22	13	13	13
43-1000	Administrative Assistant	4	4	4	4	4	5	5	6	8	8	8	8	5	3	3	3	2	2	2
49-9051	Power Line Installers	32	32	32	32	32	55	55	55	59	59	59	59	4	4	4	4	4	4	4
17-2051	Civil Engineers	3	3	3	3	3	4	4	5	7	7	7	7	4	3	3	3	2	2	2
47-2051	Concrete Finishers	36	36	36	36	36	40	40	40	53	53	53	53	17	13	13	13	13	13	13
47-4011	Construction Inspector/Engineers	16	16	16	16	16	21	21	25	34	34	34	34	21	13	13	13	9	9	9
29-9011	Health and Safety Specialists	22	22	22	22	22	26	26	29	37	37	37	37	24	11	11	11	8	8	8
Total		**850**	**850**	**850**	**850**	**850**	**950**	**950**	**1,050**	**1,200**	**1,200**	**1,200**	**1,200**	**850**	**250**	**250**	**250**	**150**	**150**	**150**

Table 8 DR SOCIO-3 18-Month Construction Workforce Timeline (All Components)

SOC Code	Occupation Title	12-25	1-26	2-26	3-26	4-26	5-26	6-26	7-26	8-26	9-26	10-26	11-26	12-26	1-27	2-27	3-27	4-27	5-27	6-27
47-2111	Electricians	0	20	337	337	337	410	410	390	390	431	484	484	464	464	464	464	390	297	297
47-2073	Construction Equipment Operators	22	35	158	158	158	155	155	142	142	178	192	192	185	185	185	185	167	117	117
47-2071	Paving Operators	22	22	26	26	26	4	4	4	4	7	8	8	8	8	8	8	8	4	4
47-2221	Iron Workers	22	31	197	197	197	193	193	184	184	221	256	256	246	246	246	246	228	156	156
47-2061	Construction Laborers	22	31	197	197	197	211	211	203	203	239	257	257	247	247	247	247	210	156	156
17-1022	Surveyors	22	26	36	36	36	23	23	19	19	24	25	25	23	23	23	23	14	8	8
47-1011	Craft Supervision	22	31	53	53	53	49	49	41	41	50	59	59	52	52	52	52	34	16	16
11-9021	Construction Management	22	26	49	49	49	36	36	32	32	41	47	47	44	44	44	44	35	20	20
43-1000	Administrative Assistant	0	1	4	4	4	6	6	5	5	7	8	8	7	7	7	7	5	2	2
49-9051	Power Line Installers	0	21	28	28	28	65	65	44	44	44	44	44	37	37	37	37	0	0	0
17-2051	Civil Engineers	0	1	3	3	3	5	5	4	4	5	6	6	5	5	5	5	3	2	2
47-2051	Concrete Finishers	22	26	37	37	37	46	46	42	42	51	53	53	46	46	46	46	15	4	4
47-4011	Construction Inspector/Engineers	22	26	38	38	38	24	24	20	20	25	29	29	26	26	26	26	17	8	8
29-9011	Health and Safety Specialists	0	3	18	18	18	29	29	25	25	34	39	39	36	36	36	36	25	12	12
Total		**200**	**300**	**1,180**	**1,180**	**1,180**	**1,255**	**1,255**	**1,155**	**1,155**	**1,355**	**1,505**	**1,505**	**1,425**	**1,425**	**1,425**	**1,425**	**1,150**	**800**	**800**

4.1.4 Data Request DR SOCIO-4

DR SOCIO-4: Per Appendix B (g) (7) (B) (v), provide the response times to hospitals and for police protection, fire protection, and emergency services.

Response: Response times by service area are provided below.

Fire Protection

Response times were generated by Fresno County Fire through a simulation of a single-engine response to a point at the center of the Project site near the Elkhart and Butte intersection. Actual times may differ from these estimations, contingent on access points, road types, and weather conditions. For the Elkhorn and Butte intersection, the first-alarm commercial fire response times range from 30 minutes to 45 minutes.

Variables such as gate access locations and road conditions within the Project significantly impact response times; paved roads are fastest, followed by gravel, while dirt roads, especially after rain, may require Four-Wheel Drive (4WD). However, the district's standard engines lack 4WD capability, which specialized small 4WD vehicles possess but lack the necessary pump and tank capacity for structural fire apparatus per NFPA and ISO standards (information obtained from personal communications with Ryan Michaels, Assistant Chief at Fresno County Fire).

Emergency Medical Services

The ambulance stationed nearest to the Project site in the City of San Joaquin would typically take between 10 to 12 minutes to respond (information obtained from personal communications with Daniel Lynch, EMS Director for the Central California EMS Agency).

Law Enforcement

Estimated law enforcement response times are based on approximate travel times from the Fresno County Sheriff's Office Area One Substation to the Project site. Drive times from the City of San Joaquin to the northern, southern, western, and eastern borders of the Project and the western satellite area range from 8 minutes to 25 minutes. If units were on a call in the eastern part of the Office's area of responsibility, response times could range from 45 minutes to an hour.

All response times are subject to change depending on various factors, including but not limited to poor weather conditions, emergency calls for service, active unrelated law enforcement operations, and active/ongoing priority law enforcement investigations.

Hospitals

Drive times between major hospitals in the region and the Project site range from 30 minutes to an hour and 10 minutes, with an average travel duration from the Project site to the medical facility of approximately 60 minutes. Travel times are influenced by traffic patterns and other factors.

4.1.5 Data Request DR SOCIO-5

DR SOCIO-5: Per Appendix B (g) (7) (B) (vii), provide the total annual operation payroll for permanent and short-term (contract) operation employees.

Response: With 40 permanent full-time equivalent (FTE) operations employees, the total direct payroll is estimated to be approximately $4.8 million based on IMPLAN, 2021 estimates. For contract employment, the Applicant estimates that the site will require one FTE annually to maintain the grounds and perform solar washing. Although this work may be performed by multiple employees, the labor hours will total 2,080 hours per year, or one FTE. The weighted average salary for a full-time employee in Building and Grounds Maintenance occupations (SOC code 37-000) across Fresno, Madera, and Kings counties is approximately $39,350. The total permanent and contract operations annual payroll is estimated to an aggregated total of approximately $4.82 million, as shown in Table 9.

Table 9 DR SOCIO-5 Total Estimated Annual Operation Payroll

Impact	Total Direct Income[1]
Permanent Operations	$4,780,000
Contract Operations	$39,000
Total	**$4,819,000**

Source: IMPLAN 2021, Bureau of Labor Statistics OES 2022, ECONorthwest Analysis

[1] The total direct income of $4.8 million is comprised of the approximate direct labor income from the solar facility ($2.3 million), green hydrogen facility ($1.7 million), and BESS ($800,000), as described in Appendix M of the Opt-In Application.

4.1.6 Data Request DR SOCIO-6

DR SOCIO-6: Per Appendix B (g) (7) (B) (viii), provide an estimate of the total annual expenditures for locally purchased materials for the operational phase of the project.

Response: The Applicant anticipates that expenditures on locally purchased materials will total roughly $100,000 annually.

4.1.7 Data Request DR SOCIO-7

DR SOCIO-7: Per Appendix B (g) (7) (B) (xi), provide an estimated dollar amount of the property taxes generated during an operational year of the project.

Response: A response for this data request will be provided separately and submitted to the docket with an Application for Confidential Designation.

4.1.8 Data Request DR SOCIO-8

DR SOCIO-8: Per Appendix B (i) (2), provide the name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and provide the name of the official who will serve as a contact person for Commission staff.

Response: Table 10 below includes the name, title, phone number, address, and email address of the official(s) contacted within each agency. In instances where a representative responded in place of the contacted official, only the name of the responding representative is included. Officials marked with an asterisk were contacted but did not provide a response.

Table 10 DR SOCIO-8 Socioeconomics Interviewee Contact Information

Name	Title	Phone Number	Address	Email
Daniel Lynch	EMS Director at Central California EMS Agency	599-600-3387	1221 Fulton St. 5th Floor P.O. Box 11867 Fresno, CA 93775	dlynch@fresnocountyca.gov
Dale Dodson	EMS Operations Coordinator at Central California EMS Agency	599-600-3387	1221 Fulton St., 5th Floor P.O. Box 11867 Fresno, CA 93775	ddotson@fresnocountyca.gov
Ryan Michaels	Assistant Chief at Fresno County Fire Protection District	559-493-4300	210 S. Academy Ave. Sanger, CA 93657	ryan.michaels@fire.ca.gov
Brandon Pursell	Regional Mutual Aid Coordinator and Area 1 Patrol Commander at Fresno County Sheriff's Office	559-600-8288	2200 Fresno St. Fresno, CA 93721	brandon.pursell@fresnosheriff.org
Julian Ramos	Client Services Manager at Fresno County EDC	559-476-2511	1060 Fulton St. 4th Floor Fresno, CA 93721	ramos@fresnoedc.com
Steven Gutierrez*	Labor Market Researcher at California Employment Development Department	916-907-4593	NA	steven.gutierrez@edd.ca.gov
Representative*	Fresno County Recycling and Solid Waste Disposal	559-600-4259	NA	recycling@fresnocountyca.gov

* Agency or individual was contacted but did not respond

5 Traffic and Transportation

5.1 Data Requests DR TRANS-1 through DR TRANS-9

5.1.1 Data Request DR TRANS-1

DR TRANS-1: The Agro-West Airport was identified in Section 5.4 Traffic and Transportation as being located approximately 1.3 miles from the project site; however, CEC staff identified the airport as being located along S. Sanoma Avenue between W. Oakland Avenue and W. Packard Avenue, approximately 6 miles south of the nearest project components. Staff requests clarification of the location of the airport, a map at the requisite scale, and revised description of the location of the nearby airports and their distances from the project as required per Appendix B (g) (5) (B) (i). If the airport is located within four miles of the project, staff requests the applicant consult with the owners of the airport to determine and provide the extent of the operations conducted (e.g., hours of operation, purposes of flights, number of flights, aircraft types, and flight paths) at the airport as it is a private airport and there is not information available online.

Response: The location of the Agro-West Airport was incorrectly described and is in fact located approximately 6 miles south of the Project site and not located within four miles of the Project. Due to the distance from the Project site, the Agro-West Airport does not fit within the boundaries of the scaled maps of transportation facilities. A revised description of nearby airport locations, and their distances from the Project, is provided in the following paragraph:

In the central San Joaquin Valley, where the Project site is located, the Fresno Yosemite International Airport serves as the principal passenger airfreight airport. Fresno Yosemite International Airport is located approximately 35 miles northeast of the Project site. Other airports in the Project site's regional vicinity include the San Joaquin Airport (approximately 5.4 miles from the Project site) and the Agro-West Airport (approximately 6 miles from the Project site). Section 5.5, Visual Resources, provides a light and glare analysis for the Project, including Federal Aviation Administration lighting requirements and approval, if determined necessary. Neither the San Joaquin Airport nor the Agro-West Airport have runways greater than 3,200 feet (AirNav 2023a), and thus the Project would not trigger a notice for compliance with Federal Aviation Regulation Part 77 - Objects Affecting Navigable Airspace. The nearest airport with a runway longer than 3,200 feet is the William Robert Johnston Airport, located approximately 18.3 miles from the Project site (AirNav 2023b). The nearest heliport is the PG&E Fresno Service Center Heliport, located approximately 26.8 miles from the Project site.

5.1.2 Data Request DR TRANS-2

DR TRANS-2: Please provide the following information in order for CEC staff to confirm the oxygen and heat rejection data:

a) Stack height (meters) for oxygen and heat release points for the hydrogen electrolyzer and cooling systems.
b) Exhaust temperature (Kelvin) for the hydrogen electrolyzer oxygen and cooling system heat.
c) Exit velocity (meter per second) for the hydrogen electrolyzer and cooling system.
e) Stack diameter (meters) for the hydrogen electrolyzer and cooling systems.

f) Number of oxygen and heat rejection points.

g) Arrangement and distance between similar heat rejection/exhaust/equipment (e.g., hydrogen electrolyzer and cooling system) (meters).

Response: Oxygen venting will occur by routing the produced oxygen to a common vent or vents within the electrolyzer facility. Details will be finalized during continued engineering and design phases. Preliminary information is provided below.

a) The oxygen stack height and diameter will be identified in the engineered venting philosophy, which is dependent on the overall facility layout and design and could entail one vent for the entire 800 MW facility, one vent per 100 MW block, or something in between. These details will be developed as engineering and design progresses. Current 25 MW electrolyzer facilities have an oxygen vent stack that is 25 feet high and 6 inches in diameter.

b) It is assumed that vented oxygen will not be cooled down. Oxygen produced from electrolysis is typically fully saturated with water at the operating temperature of the electrolysis (approximately 70 to 85 degrees Celsius or 343 to 358 degrees Kelvin). Most electrolyzer vendors do not require vented oxygen to be cooled down and typically route oxygen to the oxygen vent stack from the water/oxygen separator directly.

c) Since detailed calculations for the vent stack have not been performed, exit velocity cannot be determined at this time; this calculation will be performed in the subsequent engineering phases.

e) The hydrogen stack height and diameter will be identified in the engineered venting philosophy that will be developed as engineering and design progresses. There will be no vent stacks for the cooling system.

f) The number of oxygen and heat rejections points will be identified in the engineered venting philosophy that will be developed as engineering and design progresses.

g) The exact arrangement and distance between heat rejection/exhaust/equipment is not known at this time. The vents stack will be located away from any other exhaust sources. Refer to Figure 4-1 Hydrogen Facility Preliminary Site Plan in Section 4, *Engineering* of the Opt-In Application for additional detail.

5.1.3 Data Request DR TRANS-3

DR TRANS-3: Provide a thermal plume analysis supporting the conclusion that the oxygen cloud and heat rejection would not create a hazard to the existing environment.

Response: Oxygen produced at the hydrogen facility will be vented in a manner to avoid creating a hazard to the existing environment. Analysis of the venting will occur during continued engineering and design phases, when locations and amounts of venting have been finalized. Oxygen venting will comply with applicable laws, regulations, standards, and best engineering and operating practices. Various reviews are planned to minimize risks to the health and safety of workers and the public. These reviews include but are not limited to:

- Multidisciplinary design review
- Third party industry review
- 3D Model review focusing on operations and maintenance
- Hazards and operability review

Appendix B (g) (5) (B) states, "If the proposed project including any linear facility is to be located within four miles of an airport, a planned or proposed airport runway, or an airport runway under construction, discuss the project's compliance with the applicable section of the current Federal Aviation regulation Part 77 – Safe, Efficient Use, and Preservation of the Navigable Airspace, specifically any potential to obstruct or impede air navigation generated by the project during construction or operation; such as, a thermal plume, a visible water vapor plume, glare, electrical interference, or surface structure height." As discussed in the response to TRANS-1 above, the Project is not located within four miles of an airport, planned or proposed airport runway, or an airport runway under construction; therefore, it is the Applicant's understanding that a thermal plume analysis that describes the plume's velocity is not required.

In addition, aerial applicators for agricultural crop production and maintenance in the land surrounding the Project site are subject to Federal Aviation Administration regulations, including 14 Code of Federal Regulations (C.F.R.) § 91.119 – Minimum safe altitudes: General, which establish minimum safe altitudes for aerial applicators.[3] This section states that "except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(b) **Over congested areas.** Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,00 feet of the aircraft.

(c) **Over other than congested areas.** An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those areas, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

5.1.4 Data Request DR TRANS-4

DR TRANS-4: Provide a description of the oxygen capturing process and include additional ADT required for this process in Table 3-1b in Appendix K.

Response: Following further analysis conducted by the Applicant, it has been determined that oxygen will not be captured, stored, or sent offsite to an off taker. Oxygen will be vented to a safe location that does not create a hazard to the natural environment. Therefore, no additional average daily trips (ADT) are associated with the oxygen capturing process.

5.1.5 Data Request DR TRANS-5

DR TRANS-5: Please provide a Helicopter Use Plan. In addition to the documents listed on page 5.10-10, provide a map depicting the location of the approved landing areas, refuel station, hanger location and all equipment laydown and construction worker parking areas. If the transmission line corridor requires the construction of access roads or reinforcement of the existing access road, provide a discussion of activities required to complete road improvements.

Response: A preliminary Helicopter Use Plan is included as Appendix B to this document. The Helicopter Use Plan will be updated prior to construction to incorporate final design details and plan specifics. The final Helicopter Use Plan will be submitted to CEC for review and approval.

Road improvements to existing access roads are anticipated for access to the gen-tie corridor and could include compaction of native soil or installation of aggregate base. Access road locations and

[3] 14 Code of Federal Regulations (C.F.R.) § 91.119. 2010. Available online at https://www.law.cornell.edu/cfr/text/14/91.119.

improvements will be based on current geotechnical studies and continued stages of gen-tie design and engineering.

5.1.6 Data Request DR TRANS-6

DR TRANS-6: Please provide an updated VMT analysis in Section 5.4 Traffic and Transportation and Appendix K that utilizes FCOG's VMT analysis methodology to support the VMT impact conclusion.

Response: For construction impacts involving VMT, FCOG's *Fresno County SB 743 Implementation Regional Guidelines* states, on page 1, "If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate."[4] The construction VMT discussion included in Section 5.4 Traffic and Transportation is a qualitative approach that evaluates proximity to other destinations and average commuter distances to the Project site, as FCOG does not include a methodology for analyzing construction-related VMT impacts.

For operational VMT impacts, FCOG's *Fresno County SB 743 Implementation Regional Guidelines* contains screening thresholds on page 9, including, "The project generates fewer than 500 average daily trips (ADT)."[3] During Project operation, the Project would generate 80 average daily trips, and is under the 500 average daily trips screening threshold. Consequently, Project operation is screened out of a VMT analysis, in accordance with FCOG VMT guidance. FCOG's *Fresno County SB 743 Implementation Regional Guidelines* states, on page 9, that "land use development projects that have one or more of the [screening thresholds] may be presumed to create a less than significant impact"[3]. As the Project is screened out of a VMT analysis, it may thus be presumed to have a less-than-significant operational impact, which is consistent with the VMT analysis in Section 5.4.

5.1.7 Data Request DR TRANS-7

DR TRANS-7: For Table 3-1b, please provide the ITE land use code, the PCE trip adjustment for expected truck trips for operation and clarify the correct estimated number of ADT for operation of the project.

Response: The Institute of Transportation Engineers land use code for Table 3-1b in Appendix K is 140. Estimated ADT for Project operation is 80 employee vehicle trips. Since the Opt-in Application was submitted, in addition to the 80 ADT, two average daily truck trips (i.e., one outbound and one inbound trip) for operations have been added for disposal of water treatment sludge generated by the hydrogen facility (see response to DR WASTE-1). The roadway capacity calculations from Appendix K were reviewed and it was determined that the results of the traffic analysis do not change due to this addition, as described in Appendix C to this document. The two additional daily trips for sludge hauling would be the equivalent of 6 daily passenger car trips using a standard passenger car equivalent of 3.0 which is typical for large trucks.

The addition of the daily truck trips is being considered in the updated air quality modeling being conducted in response to the DRs AQ-1 through AQ-12. The noise analysis conducted for the Project, as described in Appendix J of the Opt-in Application, conservatively assumed up to 8 daily

[4] Fresno Council of Governments. 2021. Fresno County SB 743 Implementation Regional Guidelines. https://fresnocog.wpenginepowered.com/wp-content/uploads/2021/01/Fresno-COG-VMT-Report_01-08-2021.pdf

truck trips for operations; therefore, addition of two daily truck trips does not alter the noise impact analyses.

5.1.8 Data Request DR TRANS-8

DR TRANS-8: Please provide a description of access points for each project component (e.g., solar facility, battery energy storge system, green hydrogen facility, step-up substation, transmission line corridor, and the PG&E utility switchyard) and clearly marked maps illustrating the location of the new roads.

Response: Access roads and access points to each Project component will be finalized as detailed Project design continues; precise locations of the access roads and access points are not available at this time. The siting of access roads and access points will include consideration of the following:

- Existing paved roads within dedicated and maintained public rights-of-way
- Existing unmaintained gravel or dirt roads within a recorded public road easement
- Existing unmaintained gravel or dirt roads within Project parcels
- Existing unmaintained gravel or dirt roads within non-Project parcels, for which a third-party easement may be required.

The comprehensive site access plan will also consider circulation, safety requirements, and emergency access to reduce construction traffic hazards and to maintain site access.

Project access road types will be determined based on the needed improvements and weight and size of the equipment being delivered along a given access route. The heaviest deliveries will require paved roads or improved and maintained gravel roads, such as those to the PG&E utility switchyard, Project substation, BESS facility, hydrogen facility, and gen-tie corridor.

Access to the balance of the solar facility will require less robust road improvements, and could be accessed via unpaved roads (e.g., compacted native soil or aggregate base).

5.1.9 Data Request DR TRANS-9

DR TRANS-9: Per Appendix B (i) (2), provide the name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and provide the name of the official who will serve as a contact person for Commission staff.

Response: Table 5.4-7, from Section 5.4, *Traffic and Transportation*, of the Opt-In Application, has been updated below with name, title, and phone number for previously missing contacts. These contacts have not been contacted previously regarding the Project but have been identified as the appropriate contacts for Commission staff. For the last row—"Safety Permits"—these kinds of permits are submitted online and are not reviewed in-office; therefore, a specific contact has not been provided.

Table 5.4-7 Agency Contacts for Traffic and Transportation

Issue	Agency	Contact
Transportation Permit for Oversized Loads	Caltrans	Ai Tran, Lead for Annual Permits Transportation Permits Issuance Branch 1823 14th Street Sacramento, CA 95814 916-639-5739
Hazardous Material Transportation License	CHP	Angela Gonzales Hazardous Material Licensing P.O. Box 942898 Sacramento, CA 942898 916-843-3400
Transportation Permit	Fresno County	Katherine Pippig Department of Public Works and Planning Maintenance & Operations Division 2220 Tulare Street, 6th Floor Fresno, CA 93721 559-600-4227
Safety Permits	Federal Motor Carrier Safety Administration	California Division Office 1325 J Street, Suite 1540 Sacramento, CA 95814 916-930-2760

6 Transmissions System Design

6.1 Data Requests DR TSD-1 through DR TSD-8

6.1.1 Data Request DR TSD-1

DR TSD-1: Please provide the comprehensive (all appendices) California ISO Phase I Interconnection Study and, when available, the Phase II Interconnection Study.

Response: The California ISO Phase I Interconnection Study was submitted to the docket in response to DR TSD-1 with an Application for Confidential Designation on February 9, 2024.

6.1.2 Data Request DR TSD-2

DR TSD-2: Provide legible one-line diagrams of the Darden project's substation and the switching station used to connect the project to PG&E's 500 kV system. Show all the equipment ratings, including the bay arrangement of the breakers, disconnect switches, buses, and other equipment that would be necessary for the interconnection of the project.

Response: Diagrams of the Project's substation (Option 1 and Option 2) and utility switchyard, which will be used to connect the Project to PG&E's 500 kV system are provided in Appendix D to this document.

6.1.3 Data Request DR TSD-4

DR TSD-4: Please provide grounding details of the proposed project's substations, switching stations, and generator-tie line. If it is available, please provide the expected Electro Magnetic Field and Electric Field values, below the gen-tie line.

Response: The grounding detail for the Project's substations, utility switchyard and generation intertie line is provided as Appendix E to this document. The estimated Electro Magnetic Field values at the edge of the gen-tie line right-of-way are anticipated to be approximately 78.52 milligauss. The Electric Field values are anticipated to be approximately 2.052 kilovolts per meter (kV/m) at the edge of the gen-tie line right-of-way and approximately 11.585 kV/m throughout the gen-tie line right-of-way.

6.1.4 Data Request DR TSD-5

DR TSD-5: Please provide the number of 500 kV structures that would be necessary to construct the gen-tie line and its chosen conductor type, size, and current carrying capacity.

Response: Approximately 80 to 90 500 kV structures will be necessary to construct the gen-tie line. The planned conductor type is a bundled 2x1590 Lapwing with an approximate ampacity of 2,700 amperes.

6.1.5 Data Request DR TSD-7

DR TSD-7: Please provide a table that identifies laws, regulations, ordinances, and standards (LORS) which are applicable to transmission facility construction.

Response: LORS applicable to Project construction, including transmission facility construction, are identified throughout the Opt-In Application. LORS applicable to transmission facilities construction specifically are included in Table 11 below.

Table 11 DR TSD-7 Laws, Regulations, Ordinances, and Standards (LORS) Applicable to Transmission Facility Design and Construction

LORS	Applicability	Opt-In Application Reference	Conformity
Federal			
North American Electric Reliability Corporation Standards	To improve the reliability of regional electric transmission systems, the North American Electric Reliability Corporation (NERC) developed a transmission vegetation management program for all transmission lines operated at 200 kilovolts (kV) and above, and to lower voltage lines designated by the Regional Reliability Organization as critical to the reliability of the regional electrical system.	Section 5.12	This program would apply to the Project as the Project would involve installation of a 500 kV gen-tie line. The Project would comply with the transmission vegetation management program.
29 CFR 1910.95, 29 CFR 1926.52, and CFR 1926.101 (OSHA regulations)	Regulates on-site noise levels.	Impact NOI-1	The Project would not result in on-site noise levels in exceedance of OSHA regulations.
Clean Water Act, 1972, including amendments	Regulates stormwater and non-stormwater discharges from construction and industrial activities	Impact SOI-1	The Project would comply with the requirements of the Clean Water Act, including amendments, through NPDES compliance.
Migratory Bird Treaty Act (MBTA) (16 U.S.C. §703 et seq.)	The MBTA makes it unlawful to intentionally pursue, hunt, take, capture, or kill migratory birds anywhere in the United States.	Section 5.12	The Project transmission facilities would be designed consistent with the Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (Avian Power Line Interaction Committee [APLIC] 2006) where feasible to reduce collision hazards for avian species.
State			
California Department of Fish and Wildlife (CDFW) California Fully Protected Species (Fish and Game Code Sections 3511, 4700, 5050 and 5515) and Species of Special Concern	The California fish and Game Code sections (fish at Section 5515, amphibians and reptiles at Section 5050, birds at Section 3511, and mammals at Section 4700) dealing with "fully protected" species states that these species "…may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected species".	Section 5.12	The Project is unlikely to impact any Fully Protected species. The Project will include mitigation measures, plans, and/or permitting under Senate Bill 147 to reduce impacts to fully protected species to a less than significant level, as discussed in the updated LORS table to be submitted in response to DR BIO-47.

LORS	Applicability	Opt-In Application Reference	Conformity
National Pollutant Discharge Elimination System Construction General Permit	The Construction General Permit regulates discharges of pollutants in stormwater associated with construction activity to waters of the United States from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. The permit regulates stormwater discharges from construction or demolition activities, such as linear underground projects, including installation of utility lines.	Section 5.13	The Project would be subject to the Construction General Permit and would comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities.
Title 8, California Code of Regulations (CCR), General Industrial Safety Orders, Article 105, Control of Noise Exposure	Regulates on-site noise levels.	Impact NOI-1	The Project would not result in on-site noise levels in exceedance of Cal/OSHA regulations.
California Public Utilities Commission (CPUC), General Order 131-D	The CPUC regulates the planning and construction of electric generation, transmission lines, and substations by public utilities pursuant to General Order 131-D.	N/A	Since the Applicant is not a public utility, CPUC General Orders are not applicable to the Project. The Project would involve installation of a gen-tie line, which would connect to a new utility switchyard along PG&E's Los Banos-Midway #2 500kV transmission line. The connection to the existing transmission line, and all Project components that are the responsibility of PG&E, would be built according to General Order 131-D, as applicable.
CPUC General Order 165	General Order 165 establishes requirements for inspection of electric distribution and transmission facilities owned and operated by public utilities not contained in a substation. Utilities must perform "Patrol" inspections, defined as a simple visual inspection of utility equipment and structures that is designed to identify obvious structural problems and hazards, including wildfire hazards, at least once per year for each piece of equipment and structure.	N/A	Since the Applicant is not a public utility, CPUC General Orders are not applicable to the Project. The connection to the existing transmission line, and all Project components that are the responsibility of PG&E, would be constructed and operated in conformance with these orders, including CPUC vegetation management and clearance requirements (GO 95, GO 165, and GO 166) as well as the portions of the Public Resources Code that identify clearance requirements and requirements for work in State Responsibility Areas.

LORS	Applicability	Opt-In Application Reference	Conformity
2022 California Building Code: ▪ Chapter 1 ▪ Chapters 16/16a ▪ Chapters 17/17a ▪ Chapters 18/18a ▪ Appendix J	Defines acceptable design criteria for structures with respect to seismic design and load bearing capacity.	▪ Impact GEO-1 ▪ Impact GEO-3 ▪ Impact GEO-4 ▪ Impact GEO-5 ▪ Impact GEO-6 ▪ Impact GEO-7	Project grading and construction would comply with seismic recommendations provided by a professional engineer in accordance with CBC requirements.
2022 California Building Code (CCR Title 24, Part 2, Chapters 18 and 18A)	Sets the requirements for general building design and construction	▪ Impact SOI-2	Project construction would comply with building and design recommendations in accordance with CBC requirements.
Alquist Priolo Earthquake Fault Zoning Act	Identifies areas subject to surface rupture from surface faults.	▪ Impact GEO-1 ▪ Impact GEO-3 ▪ Impact GEO-5 ▪ Impact GEO-6 ▪ Impact GEO-7	The Project would not include components located within a mapped Alquist-Priolo Earthquake Fault Zone.
Porter-Cologne Water Quality Control Act	Regulates discharges of waste to state waters and land	▪ Impact SOI-1	The Project would comply with the requirements set forth in the Porter-Cologne Water Quality Control Act through NPDES compliance.
Seismic Hazards Mapping Act	Identifies secondary seismic hazards including liquefaction and seismically induced landslides.	▪ Impact GEO-1 ▪ Impact GEO-3 ▪ Impact GEO-5 ▪ Impact GEO-6 ▪ Impact GEO-7	The Project is not located in a seismic hazard area and thus would conform with requirements set forth in the Seismic Hazards Mapping Act.
Department of Water Quality, Construction General Permit, SWPPP	Requirements for Application for General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order 2009-0009-DWQ as amended by Order 2010-0014-DWQ	▪ Impact SOI-1	The Project would comply with Order 2009-0009-DWQ as amended by Order 2010-0014-DWQ, and the Applicant would prepare a SWPPP.
Table 18-1-B of the Uniform Building Code (ICC 1994)	Regulations for soils and foundations, including standards for defining expansive soils	▪ Impact SOI-2	Project construction would comply with soil and foundation recommendations in accordance with Uniform Building Code requirements.

LORS	Applicability	Opt-In Application Reference	Conformity
Local			
Fresno County Code of Ordinances: ▪ Title 15 and Title 17	Identify building and construction requirements to reduce hazard potential that are applicable to all new construction, including the Project.	▪ Impact GEO-1 ▪ Impact GEO-3 ▪ Impact GEO-4 ▪ Impact GEO-5 ▪ Impact GEO-6 ▪ Impact GEO-7	The Project would adhere to the standards within Title 15 and Title 17 and obtain all necessary permits prior to construction.
Fresno County Code of Ordinances Chapter 8.40, *Noise Control*	Contains the noise measurement criteria, exterior noise thresholds, and noise source exemptions for Fresno County.	▪ Impact NOI-2	The Project would be consistent with the noise thresholds stated within the Fresno County Code of Ordinances Chapter 8.40, *Noise Control*.
Fresno County General Plan: ▪ Policy HS-A ▪ Policy HS.D-1 ▪ Policy HS.D-3 ▪ Policy HS.D-4 ▪ Policy HS.D-8 ▪ Policy HS.D-9 ▪ Policy HS.D-12	These policies aim to minimize the loss of life, injury, and property damage due to seismic and geologic hazards. Requirements for Site Plan Reviews, Environmental Assessments, and for building on native soils.	▪ Impact GEO-1 ▪ Impact GEO-3 ▪ Impact GEO-4 ▪ Impact GEO-5 ▪ Impact GEO-6 ▪ Impact GEO-7 ▪ Section 5.14.5	The Project would minimize the loss of life, injury, and property damage by complying with seismic and geologic hazard recommendations provided by a professional engineer in accordance with CBC requirements.
Fresno County General Plan: ▪ Policy HS-G.1 ▪ Policy HS-G.4 ▪ Policy HS-G.5 ▪ Policy HS-G.6 ▪ Policy HS-G.8	Ensure that residential and other noise-sensitive uses are protected from exposure to harmful or annoying noise levels.	▪ Impact NOI-2	The Project would be designed and constructed consistent with Fresno County General Plan policies.

LORS	Applicability	Opt-In Application Reference	Conformity
Fresno County Multi-Jurisdictional Hazard Mitigation Plan: ▪ Policy HS.D-1 ▪ Policy HS.D-3 ▪ Policy HS.D-4 ▪ Policy HS.D-7 ▪ Policy HS.D-8 ▪ Policy HS-D.10 ▪ Policy HS-D.11	These policies ensure that utility facilities are sited to minimize susceptibility to seismic and geologic hazards and aim to minimize the susceptibility to the effects of soil erosion, expansive soils, and land subsidence, as well as the loss of life, injury, and property damage due to seismic and geologic hazards.	▪ Impact GEO-1 ▪ Impact GEO-3 ▪ Impact GEO-4 ▪ Impact GEO-5 ▪ Impact GEO-6 ▪ Impact GEO-7 ▪ Impact SOI-1 ▪ Impact SOI-2	The Project would minimize the loss of life, injury, and property damage by complying with seismic and geologic hazard recommendations provided by a professional engineer in accordance with CBC requirements.

6.1.6 Data Request DR TSD-8

DR TSD-8: Please provide a table that identifies each agency with jurisdiction to issue transmission system design applicable permits, leases and approvals or enforce state and federal LORS.

Response: Agencies with jurisdiction to issue transmission system design applicable permits, leases, and approvals, or enforce state and federal LORS are listed in Table 12 below.

Table 12 DR TSD-8 Agencies with Jurisdiction to Issue Transmission System Design Permits, Leases and Approvals, or Enforce State and Federal LORS

LORS	Agency	Enforcement or Permit/Approval Required
Federal		
North American Electric Reliability Corporation Standards	Federal Energy Regulatory Commission (FERC)	FERC reviews, approves, and enforces the NERC Standards, which the transmission design will comply with.
Migratory Bird Treaty Act (MBTA) (16 U.S.C. §703 et seq.)	United States Fish and Wildlife Service (USFWS)	USFWS enforces the MBTA, which the transmission design will comply with. Transmission design will also be consistent with the Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (Avian Power Line Interaction Committee [APLIC] 2006).
OSHA Excavation standards, Title 29 CFR Part 1926, Subpart P	Occupational Safety and Health Agency (OSHA)	OSHA enforces the OSHA Excavation Standards, which contain requirements for excavation and trenching operations. The Project transmission design will comply with these standards.
State		
California Department of Fish and Wildlife (CDFW) California Fully Protected Species (Fish and Game Code Sections 3511, 4700, 5050 and 5515) and Species of Special Concern	California Department of Fish and Wildlife (CDFW)	CDFW enforces the California Fish and Game Code, which contains regulations for Fully Protected Species (Fish and Game Code Sections 3511, 4700, 5050 and 5515) and Species of Special Concern. Transmission design will comply with the California Fish and Game Code.
State Water Resources Control Board	National Pollutant Discharge Elimination System Construction General Permit	The Construction General Permit regulates stormwater discharges from construction or demolition activities, such as linear underground projects, including installation of utility lines. Transmission design and construction will comply with and obtain coverage under the Construction General Permit.
California Public Utilities Commission (CPUC), General Order 131-D	California Public Utilities Commission	The Utility Switchyard would be owned and operated by PG&E and would be required to comply with this General Order.
CPUC General Order 165	California Public Utilities Commission	The Utility Switchyard would be owned and operated by PG&E and would be required to comply with this General Order.

7 Waste Management

7.1 Data Request DR WASTE-1

7.1.1 Data Request DR WASTE-1

DR WASTE-1: Please revise Table 5.11-1 and Table 5.11-2 to include an estimated quantity for each identified waste stream. In addition, please provide the estimated total waste generated during construction and the estimated annual waste generated during operation, so that impacts to local landfill facilities can be evaluated.

Response: Table 5.11-1 and Table 5.11-2 have been updated to include an estimated quantity for each identified waste stream and are provided below. Typical waste streams that are not anticipated for the Project include excavated soil (due to a balanced site), controlled substances, concrete, potable water, fuels (generators, other equipment), and welding materials. These waste streams have been removed from Table 5.11-1 and Table 5.11-2. In addition, the estimated annual waste generated during operation has been added to Table 5.11-2.

Considering there are multiple locations that would accept the anticipated waste streams generated by the Project, and the solid waste landfills that would accept Project-related construction and operational waste have a collective remaining capacity of over 70 million cubic yards, waste generated from construction and operation of the solar facility, Options 1 and 2 step-up substation, gen-tie line components, Options 1 and 2 BESS component, Options 1 and 2 green hydrogen component, and utility switchyard would not exceed the capacity of surrounding accepting facilities.

Table 5.11-1 Potential Waste Streams Generated During Construction

Waste Stream	Origin	Classification	Composition	Disposal	Estimated Total Quantity
Excess concrete	Construction of concrete pads, foundations, and supports	Nonhazardous	Concrete	Recycle or Class II/III landfill	20 tons
Excavated soil for offsite disposal	Excavation or trenching activities	Nonhazardous	Soils	Class II/III landfill	0
Scrap metal	Construction of supports, racks, and other structural components	Nonhazardous	Metal	Recycle or Class II/III landfill	20 tons
Incidental office waste	General administrative activities	Nonhazardous	Paper, plastic, solid waste	Recycle or Class II/III landfill	15 tons
Solar panels	Construction of solar subarrays	Nonhazardous	Glass, plastic, and metal	Contracted recycling	70,000 units
Sanitary waste	Sanitary waste generated during construction activities	Nonhazardous	Liquid	Contracted sanitary service/septic	820,000 gallons
Potable water	General construction activities and dust suppression	Nonhazardous	Water	Evaporation	1,200 acre-feet
Equipment washing water	General construction activities	Nonhazardous waste	Water	Recycle or treat and discharge	4 acre-feet
Waste oil (lubricating, insulating)	Heavy machinery or other heavy equipment maintenance	Hazardous	Hydrocarbons	Recycling or dispose by certified oil handler/recycler	2,750 gallons
Solvents, detergents, glycols, refrigerants, paint, adhesives	Equipment maintenance	Hazardous	Solvents	Recycle or Class II/III landfill	50 gallons
Empty hazardous material containers	Transport of hazardous materials to the Project site	Hazardous	Drums, totes, containers	Recycle	20 units
Fuels	Generators or other heavy equipment	Hazardous	Hydrocarbons	Recycle	550 gallons
Welding materials	Construction of supports, racks, and other structural components	Hazardous	Solids, metals	Recycle or dispose at Class I landfill	More than 100 pounds
Oil filters	Vehicles, generators, heavy equipment	Hazardous	Hydrocarbon or solvent impacted solids	Recycling or dispose by certified oil handler/recycler	200 units
Oily rags/sorbents	Cleanup of spills	Hazardous	Hydrocarbon or solvent impacted solids	Recycling or dispose by certified oil handler/recycler	500 units
Spent lead acid batteries	Battery operated equipment	Hazardous	Heavy metals	Returned to manufacturer for recycling	50 units
Spent alkaline batteries	Battery operated equipment	Hazardous	Metals	Recycle, dispose off-site at Universal Waste Destination Facility	200 units

TBD = To be determined

Table 5.11-2 Potential Waste Streams Generated During Operation (35 years)

Waste Stream	Origin	Classification	Composition	Disposal	Estimated Quantity	Annual Estimated Quantity
Paper, wood, glass, insulation, plastics	General operational activities	Nonhazardous	Solids (paper, wood, glass, insulation, plastics)	Recycle or Class II/III Landfill	5,460 cubic yards	156 cubic yards
Scrap metal	Maintenance of structural elements	Nonhazardous	Metal	Recycle or Class II/III Landfill	5 tons	0.14 tons
Spent solar panels and components	Operations and Maintenance of the solar subarray	Nonhazardous	Glass, plastic, and metal	Recycle or Class II/III Landfill	54,250 panels	1,550 panels
Spent transformer components	Operations and Maintenance of the step-up substation	Nonhazardous	Metals, mineral oils, solids	Recycle or Class II/III Landfill	5 tons	0.14 tons
Spent switchyard equipment	Operations and Maintenance of the switchyard	Nonhazardous	Metals, solids	Recycle or Class II/III Landfill	5 tons	0.14 tons
Hydrogen generation components – electrolyzer	Operation of the green hydrogen facility	Nonhazardous	Transformers (metals, mineral oil), rectifiers, stacks, separators, rotating equipment solids	Recycle or Class II/III Landfill	100 tons	2.9 tons
Reverse osmosis membrane, other filtration membranes	Water treatment system associated with electrolysis	Nonhazardous	Sediment and solids, membranes	Recycle or Class II/III Landfill	Less than 1 ton	Less than 0.03 tons
Spent activated carbon filters, air filters	Water treatment system associated with electrolysis	Nonhazardous	Carbon, metals, hydrocarbons	Recycle or Class II/III Landfill	5 tons	0.14 tons
Water treatment sludge	Zero liquid discharge system	Nonhazardous	Sediment and sludge (assuming 60 percent solids, 40 percent water)	Dispose at Class I/II landfill	259,000 tons	7,400 tons
Incidental office waste	General administrative activities	Nonhazardous	Paper, plastic, solid waste	Recycle or Class II/III Landfill	765 tons	21.9 tons
Sanitary waste	On-site personnel use	Nonhazardous	Liquid	Septic system or contracted sanitary service	9.1 tons	0.26 tons
Wastewater	Washing solar panels, equipment cleaning	Nonhazardous	Water	Evaporation or treat and discharge	110,000,000 gallons	3,142,857 gallons

Waste Stream	Origin	Classification	Composition	Disposal	Estimated Quantity	Annual Estimated Quantity
Waste oil (lubricating, insulating)	Equipment, transformers	Hazardous	Hydrocarbons	Cleaned w/ rags/sorbents/disposed by certified oil recycler	527,500 gallons	15,071 gallons
Solvents, detergents, glycols, refrigerants, paint, adhesives	Maintenance of heavy equipment	Hazardous	Solvents	Class I landfill	2 tons	0.06 tons
Empty hazardous material containers	Transport of hazardous materials to the Project site	Hazardous	Drums, totes, containers	Recycle or Class I Landfill	5 tons	0.14 tons
Welding materials	Maintenance of structural elements	Hazardous	Metals	Recycle or Class I Landfill	5 tons	0.14 tons
Oil filters	Equipment, vehicles, generators	Hazardous	Hydrocarbon or solvent impacted solids	Recycle or dispose by certified oil handler/recycler	1.75 tons	0.05 tons
Oily rags/sorbents	Cleanup of spills	Hazardous	Hydrocarbon or solvent impacted solids	Recycle or dispose by certified oil handler/recycler	1.75 tons	0.05 tons
Spent Lead acid batteries	Battery operated equipment	Hazardous	Heavy metals	Returned to manufacturer for recycling	120 cells	3.4 cells
Spent alkaline batteries	Battery operated equipment	Hazardous	Metals	Recycle, dispose off-site at Universal Waste Destination Facility	0.09 tons	0.003 tons
Controlled substances	Inerts/explosives packaging, smoke detectors, fire extinguishers	Hazardous	Controlled substance	Dispose by certified hauler	0.5 tons	0.01 tons

TBD = To be determined

This page intentionally left blank.

Appendix A

DR HAZ-7 Industrial Lithium-Ion Battery Emergency Response Guide

MEGAPACK

POWERPACK

Industrial Lithium-Ion Battery Emergency Response Guide

For Tesla Industrial Energy Products including Megapack and Powerpack

PRODUCT SPECIFICATIONS

All specifications and descriptions contained in this document are verified to be accurate at the time of printing. However, because continuous improvement is a goal at Tesla, we reserve the right to make product or documentation modifications at any time, with or without notice.

The images provided in this document are for demonstration purposes only. Depending on product version and market region, details may appear slightly different.

This document does not create contractual obligations for Tesla or its affiliates and is provided without warranty of any kind, except to the extent expressly agreed in a contract.

LATEST REVISIONS

Documents are periodically updated. To ensure you have the latest revision of this document, visit the Tesla Partner Portal at *https://partners.tesla.com/*.

ERRORS OR OMISSIONS

To communicate inaccuracies or omissions in this document, reach out to your Tesla representative.

COPYRIGHT

1 Introduction and Scope

This emergency response guide (ERG) serves as a resource for emergency responders and Authorities Having Jurisdiction (AHJs) with regard to safety surrounding Tesla Industrial Energy products. This guide should also be reviewed by customers, site managers, and operators to ensure a clear understanding of potential hazards and the procedures to follow in case of emergencies.

Tesla Industrial Energy products are defined as rechargeable lithium-ion battery energy storage products designed, manufactured, and sold by Tesla, and include all versions of Megapack and Powerpack, collectively referred to in this guide as "Tesla Industrial Energy products," "Tesla Energy products," or "the product" unless otherwise noted. The information and recommendations set forth in this ERG are made in good faith and believed to be accurate as of the date of preparation.

This guide is available in various languages as indicated below. Information in this guide is periodically updated and translations are periodically added. Check the Tesla First Responders Information page at *https://www.tesla.com/firstresponders* for the latest revision of this guide, for ERGs for other Tesla products, and for the latest additional translated versions.

English	Deutsch	Español	Français
עברית	Italiano	日本語	한국어
Nederlands	简体中文	繁體中文	Português
Slovenščina			

2 Company, Contact, & Product Info

2.1 Identification of Company and Contact Information

Table 1. Company and Contact Information

Products	Tesla Industrial Energy products, designed for industrial, utility, or commercial energy applications, and modules and sub-assemblies that can be installed in such products. Descriptions and specific part numbers are listed in *Product Descriptions on page 6*.	
Locations	Headquarters (USA)	1 Tesla Road Austin, TX 78725 USA Tel. No. +1 512-516-8177 (do not use for emergencies; see below)
	Europe and Africa	Burgemeester Stramanweg 122 1101EN Amsterdam, The Netherlands Tel. No. +31 20 258 3916 (do not use for emergencies; see below)
	Australia and Asia	Level-14, 15 Blue Street North Sydney NSW, 2060, Australia Tel. No. 1800 686 705 (do not use for emergencies; see below)
	Manufacturer (USA)	1 Tesla Road Austin, TX 78725 USA Tel. No. +1 512-516-8177 (do not use for emergencies; see below)
Emergency Contacts	CHEMTREC (Transportation)	For hazardous materials (or dangerous goods) incidents during transportation such as spill, leak, fire, exposure, or accident, call CHEMTREC, day or night. Contract Number: CCN204273 Within USA and Canada: 1-800-424-9300 Outside USA and Canada: (+international prefix) +1 703-741-5970 (collect calls accepted)
	Tesla Energy Technical Support Contacts	Hotline telephone numbers: • North America (24x7): +1 650-681-6060 • Asia/Australia/New Zealand (24x7): +61 2 432 802 81 • Europe/Middle East/Africa (24x7): +31 2 08 88 53 32 • Japan: +0120 312-441

	• France: +33 173218702 • The Netherlands: +31 208885332 • Slovenia: +38 617778699 • South Africa: +27 213004878 • Switzerland: +41 445155607 • United Kingdom: +44 1628450645

2.2 SDS Information

Safety Data Sheets (SDS) are available for materials in Tesla Energy products. Contact Tesla for a copy of these documents.

Table 2. Thermal Contents

Materials with SDS	Approximate Quantity
Ethylene glycol 50/50 mixture with water	• Powerpack 1: 22 L of 50/50 mixture • Powerpack 2: 26 L of 50/50 mixture • Powerpack Inverter: 11 L of 50/50 mixture • Powerpack Pod module: None • Megapack: 540 L of 50/50 mixture • Megapack battery module: 20 L of 50/50 mixture • Megapack 2: 360 L of 50/50 mixture • Megapack 2 battery module: 20 L of 50/50 mixture • Megapack 2 XL: Up to 400 L of 50/50 mixture • Megapack 2 XL battery module: 20 L of 50/50 mixture
R-134a: 1,1,1,2-Tetrafluoroethane refrigerant	• Powerpack 1, 2: 400 g • Powerpack Pod module: None • Megapack: 7.6 kg • Megapack battery module: None • Megapack 2: 7.6 kg • Megapack 2 battery module: None • Megapack 2 XL: Up to 3.0 kg • Megapack 2 XL battery module: None

2.3 Lithium-Ion Cells

The products contain sealed lithium-ion battery cells (cells). Cells each contain lithium-ion electrodes, which can be composed of:

- Lithium Nickel Cobalt Aluminum Oxide (NCA material), LiNixCoyAlzO2
- Lithium Nickel, Manganese, Cobalt Oxide (NMC material) LiNixMnyCozO2
- Lithium Iron Phosphate (LFP material) LiFePO4

- Lithium Nickel, Manganese Oxide (NMO material), LiNixMnyO2
- Lithium Cobalt Oxide, LiCoO2
- or a mixture of these compounds

The cells and batteries do not contain metallic lithium. Individual cells have nominal voltages of up to approximately 3.6 V.

2.4 Product Descriptions

Individual lithium-ion cells are connected to form modules. Modules are battery sub-assemblies. These modules are installed into the products. Approximate product specifications are listed below.

2.4.1 Powerpack

Powerpack is Tesla's energy storage system for commercial and industrial use.

NOTE: Images below are indicative representations designed to assist with product identification. Existing product models may vary.

Figure 1. Powerpack: Units and Inverter

1. Powerpack Units (include lithium-ion cells)
2. Powerpack Inverter

Figure 2. Example of a Powerpack Site

Table 3. Approximate Powerpack Specifications

Part Number (Reman Number if available)	Description	Module Voltage – as shipped (V)	Max System DC Voltage	Max System AC Voltage	Weight	Height	Width	Depth
Powerpack 1 Versions								
1047404-x*y*-z*	POWERPACK (2hr continuous net discharge)	<30 (DC)	450 (DC)	480 (AC)	1680 kg (3700 lb)	219 cm (86 in)	97 cm (38 in)	132 cm (52 in)
1060119-x*y*-z*	POWERPACK (4hr continuous net discharge)	<30 (DC)	450 (DC)	480 (AC)	1665 kg (3670 lb)	219 cm (86 in)	97 cm (38 in)	132 cm (52 in)
1121229-x*y*-z*	POWERPACK (4hr continuous net discharge)	<30 (DC)	450 (DC)	480 (AC)	2160 kg (4765 lb)	219 cm (86 in)	97 cm (38 in)	132 cm (52 in)
** The 8th or 9th digit could be any number or letter and the 10th digit could be any letter.*								
Powerpack 1.5 Version								
1089288-x*y*-z*	POWERPACK 1.5 C/2 SYSTEM	<30 (DC)	960 (DC)	480 (AC)	1622 kg (3575 lb)	219 cm (86 in)	131 cm (51.5 in)	82 cm (32.5 in)
** The 8th or 9th digit could be any number or letter and the 10th digit could be any letter.*								
Powerpack 2 / 2.5 Versions								
1083931-x*y*-z* (1130518-x*y*-z*)	POWERPACK 2,C/4 SYSTEM	<30 (DC)	960 (DC)	480 (AC)	2160 kg (4765 lb)	219 cm (86 in)	131 cm (51.5 in)	82 cm (32.5 in)

Part Number (Reman Number if available)	Description	Module Voltage – as shipped (V)	Max System DC Voltage	Max System AC Voltage	Weight	Height	Width	Depth
1083932-x*y*-z*	POWERPACK 2,C/2 SYSTEM	<30 (DC)	960 (DC)	480 (AC)	2160 kg (4765 lb)	219 cm (86 in)	131 cm (51.5 in)	82 cm (32.5 in)
1490025-x*y*-z*	POWERPACK 2.5,C/4 SYSTEM	<30 (DC)	960 (DC)	480 (AC)	2160 kg (4765 lb)	219 cm (86 in)	131 cm (51.5 in)	82 cm (32.5 in)
1490026-x*y*-z*	POWERPACK 2.5,C/2 SYSTEM	<30 (DC)	960 (DC)	480 (AC)	2160 kg (4765 lb)	219 cm (86 in)	131 cm (51.5 in)	82 cm (32.5 in)
1490027-x*y*-z*	POWERPACK 2.5,C/2 SYSTEM	<30 (DC)	960 (DC)	480 (AC)	2160 kg (4765 lb)	219 cm (86 in)	131 cm (51.5 in)	82 cm (32.5 in)
** The 8th or 9th digit could be any number or letter and the 10th digit could be any letter.*								
Spare Parts								
N/A	POWERPACK POD MODULE	<30 (DC)	960 (DC)	N/A	98 kg (215 lb)	12 cm (5 in)	100 cm (39 ½ in)	75 cm (29 ½ in)

2.4.2 Megapack

Megapack is Tesla's all-in-one utility-scale energy storage system.

NOTE: Images below are indicative representations designed to assist with product identification. Existing product models may vary.

Figure 3. Megapack

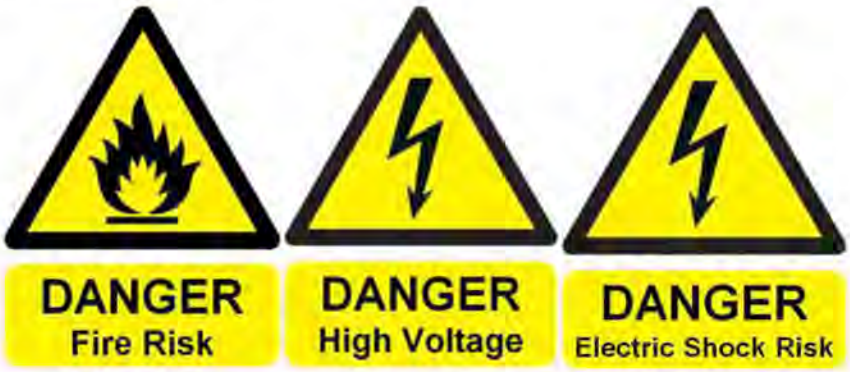
Figure 4. Example of a Megapack Site

Table 4. Approximate Megapack Specifications

Part Number (Reman Number if available)	Description	Module Voltage – as shipped (V)	Max System DC Voltage	Max System AC Voltage	Weight	Height	Width	Depth
Megapack (all versions - dimensions as measured for enclosure envelope for 1462965-x*y*-z*)								
1462965-x*y*-z*	MEGAPACK	<450 (DC)	960 (DC)	518 (AC)	25,400 kg (56,000 lb) (max)	252.2 cm (99 ¼ in)	716.8 cm (282 ¼ in) (length)	165.9 cm (65 ¼ in)
1748844-x*y*-z*	MEGAPACK 2	480 (AC)	<1230 (DC)	480 (AC)	30,500 kg (67,250 lb) (max)	250.6 cm (98 ¾ in)	725.0 cm (285 ½ in) (length)	163.7 cm (64 ½ in)
1848844-x*y*-z*	MEGAPACK 2 XL	480 (AC)	<1230 (DC)	480 (AC)	38,100 kg (84,000 lb) (max)	278.5 cm (110 in)	880 cm (346 ½ in) (length)	165 cm (65 in)
** The 8th or 9th digit could be any number or letter and the 10th digit could be any letter.*								
Spare Parts								
N/A	MEGAPACK BATTERY MODULE	<450 (DC)	960 (DC)	N/A	1,085 kg (2,400 lb)	66 cm (26 in)	81 cm (32 in)	149 cm (59 ½ in)
N/A	MEGAPACK 2 BATTERY MODULE	480 (AC)	<1230 (DC)	480 (AC)	1,250 kg (2,760 lb)	67 cm (26 ½ in)	81 cm (32 in)	149 cm (59 ½ in)
N/A	MEGAPACK 2 XL BATTERY MODULE	480 (AC)	<1230 (DC)	480 (AC)	1,250 kg (2,760 lb)	67 cm (26 ½ in)	81 cm (32 in)	149 cm (59 ½ in)

3 Handling, Use, & Hazard Precautions

3.1 General Precautions



The products described by this document are dangerous if mishandled. Injury to property or person, including loss of life is possible if mishandled.

The products contain lithium-ion batteries. A battery is a source of energy. Do not short circuit, puncture, incinerate, crush, immerse, force discharge or expose to temperatures above the operating temperature range of the product as discussed in *Hazards Associated with Elevated Temperature Exposure on page 13*. An internal or external short circuit can cause significant overheating and provide an ignition source resulting in fire, including surrounding materials or materials within the cell or battery. Under normal conditions of use, the electrode materials and electrolyte they contain are not exposed, provided the battery integrity is maintained and seals remain intact. The risk of exposure may occur only in cases of abuse (mechanical, thermal, electrical).

3.2 High-Voltage Hazards

Under normal conditions of use, provided that the product enclosure remains closed, handling the product does not pose an electrical hazard. Numerous safeguards have been designed into the product to help ensure that the high voltage battery is kept safe and secure under a number of expected abuse conditions. All of the component battery cells are sealed within the product as sub-groups within enclosures (Pods for Powerpack or battery modules for Megapack), cannot be accessed from the exterior, and are not accessible to non-Tesla personnel.

A high voltage and electrocution risk may present if the product's outer enclosure and/or safety circuits have been compromised or have been significantly damaged. A battery pack, even in a normally discharged condition, is likely to contain substantial electrical charge and can cause injury or death if mishandled. If the product has been significantly visibly damaged or its enclosure compromised, practice appropriate high-voltage preventative measures until the danger has been assessed (and dissipated if necessary).

WARNING: Never cut into a sealed product enclosure due to high voltage and electrocution risks.

For proper installation / removal instructions, contact Tesla (*Identification of Company and Contact Information on page 4*).

3.3 Hazards Associated with Elevated Temperature Exposure

This product is designed to withstand operating ambient temperatures up to 50°C (122°F), or as indicated in the product specification, with up to 100% operating humidity (condensing). This product is designed to withstand storage temperatures up to 60°C (140°F), or as indicated in the product specification, and <95% relative humidity (non-condensing) for up to 24 hours without affecting the health of the unit.

Prolonged exposure of the product to conditions beyond these limits may increase the potential of thermal runaway and result in a fire. Exposure of battery packs to localized heat sources such as flames may result in cell thermal runaway reactions and should be avoided.

3.4 Hazards Associated with Mechanical Damage

Mechanical damage to the product can result in a number of hazardous conditions (discussed below) including:

- Leaked battery pack coolant (see *Hazards Associated with Leaked Coolant on page 13*)
- Leaked refrigerant (see *Hazards Associated with Leaked Refrigerant on page 13*)
- Leaked cell electrolyte (see *Hazards Associated with Leaked Electrolyte on page 14*)
- Rapid heating of individual cells due to exothermic reaction of materials (cell thermal runaway), venting of cells, and propagation of self-heating and thermal runaway reactions to neighboring cells.
- Fire

To prevent mechanical damage to the product, these items should be properly stored when not in use or prior to being installed (see *Storage Precautions on page 21*).

3.5 Hazards Associated with Leaked Coolant

Thermal management of the product is achieved via liquid cooling using a 50/50 mixture of ethylene glycol and water. A typical Powerpack battery unit includes about 26 L of coolant (Powerpack 2/2.5) or about 22 L of coolant (Powerpack 1). The Powerpack Inverter (fully populated) includes about 11 L of coolant. A typical Megapack includes about 540 L of coolant. A typical Megapack 2 includes about 360 L of coolant. Mechanical damage to a product that has been installed could result in leakage of the coolant. The fluid may be blue, green, or orange in color and does not emit a strong odor.

For information regarding the toxicological hazards associated with ethylene glycol, as well as ecological effects and disposal considerations, refer to the specific Safety Data Sheet (SDS) for battery coolant (see *SDS Information on page 5*).

Extended exposure of the product to leaked coolant could cause additional damage to the product such as corrosion and compromise of protection electronics.

3.6 Hazards Associated with Leaked Refrigerant

The product's thermal management system includes up to 7.6 kg of R-134a: 1,1,1,2-Tetrafluoroethane refrigerant in a sealed system. Mechanical damage to the product could result in a release of the refrigerant. Such a release would appear similar to the emission of smoke.

For information regarding the toxicological hazards associated with R-134a, as well as ecological effects and disposal considerations, refer to the specific Safety Data Sheet (SDS) for R-134a (see *SDS Information on page 5*).

3.7 Hazards Associated with Leaked Electrolyte

The possibility of an electrolyte spill from the product's cells is very remote for the following reasons:

- Liquid electrolyte is largely absorbed within the cell materials during the manufacturing process. The electrolyte also gets consumed during the normal operation of the batteries.
- The cells are hermetically sealed. Even if a single cell were damaged in a manner that could cause a leak, the volume would be of negligible concern.
- Cells are assembled into enclosed module compartments and inaccessible to personnel. The product architecture prevents any direct contact with the battery cells.

As such, the absence of free liquid electrolyte makes it impractical to report the volume of electrolyte within the product, and the cell and product design prevent the possibility for spills at the project site.

3.8 Hazards Associated with Vented Electrolyte

Lithium-ion cells are sealed units, and thus under normal usage conditions, venting of electrolyte should not occur. If subjected to abnormal heating or other abuse conditions, electrolyte and electrolyte decomposition products can vaporize and be vented from cells. Vented gases are a common early indicator of a thermal runaway reaction – an abnormal and hazardous condition.

Regulatory testing has shown that the products of combustion of lithium-ion batteries can include flammable and nonflammable gases. Based on this testing, the flammable gases are found to be below their lower flammable limit (LFL) and do not pose a deflagration or explosion risk to first responders or the general public. The nonflammable gases were found to be comparable to smoke encountered in a Class A structure fire and do not produce any unique, or atypical, gases beyond what you would find in the combustion of modern combustible materials.

In close proximity, vented gases may irritate the eyes, skin, and throat. Cell vent gases are typically hot; upon exit from a cell, vent gas temperatures can exceed 600°C (1,110°F). Vented electrolyte is flammable and may ignite on contact with a competent ignition source such as an open flame, spark, or a sufficiently heated surface. Vented electrolyte may also ignite on contact with cells undergoing a thermal runaway reaction.

4 In Case of Emergency

WARNING: In case of emergency, severe physical impact, or transportation accident, do not approach the product or open any of its doors.

WARNING: In case of severe physical impact or transportation accident, it may take time before any visible indication of an abnormal and hazardous condition (e.g., smoke or fire) can be observed. Contact Tesla for guidance (*Identification of Company and Contact Information on page 4*).

CAUTION: Response should only be performed by trained professionals.

4.1 During Storage or Operation

During storage or operation, emergencies include but are not limited to:

- Suspicious odor observed near the product
- Smoke or fire emanating from the product
- Severe physical impact on the product

In case of emergency, isolate, deny entry, and perform the following:

1. If possible, and if trained and properly equipped, shut off the unit/system (see *Shutting Down in an Emergency on page 19*).
2. Evacuate the area.
3. If not already present, notify appropriately trained first responders, the local fire department, and any appointed subject matter expert (SME) if available.
4. Contact Tesla for guidance (*Identification of Company and Contact Information on page 4*).

4.2 During Transportation

During transportation, emergencies include but are not limited to:

- Suspicious odor observed near the product
- Smoke or fire emanating from the product
- Transportation accident causing a severe physical impact on the product
- Transportation accident leading to tipping over of the product

In case of emergency, perform the following:

1. If possible, move the unit/system to an open area and away from exposures (such as buildings, flammable material, or people).
2. Evacuate the area.
3. Notify appropriately trained first responders, the local fire department, and any appointed subject matter expert (SME) if available.
4. Contact Tesla for guidance (*Identification of Company and Contact Information on page 4*).

5 Firefighting Measures

WARNING: Response should only be performed by professionals trained in high voltage and arc flash emergencies. In the event of a response to a Tesla product fire or hazardous event, contact Tesla for guidance (*Identification of Company and Contact Information on page 4*).

5.1 Firefighter PPE

Firefighters should wear self-contained breathing apparatus (SCBA) and structural firefighting gear. Industry testing has shown that standard structural firefighting gear provides adequate protection.

5.2 Responding to a Venting Product

Smoke or suspicious odor emanating from a Tesla Energy product can be an indication of an abnormal and hazardous condition. Battery thermal runaway fires are preceded by a period of smoke. If fire, smoke, or suspicious odor is observed emanating from the product at any time, perform the following:

1. If possible, shut off the unit/system (see *Shutting Down in an Emergency on page 19*).
2. Evacuate the area of all non-emergency personnel.

   WARNING: When responding to a fire event, do not approach the unit and attempt to open any doors. The doors are designed to remain shut.
3. If not already done, contact Tesla Energy Technical Support for assistance (*Identification of Company and Contact Information on page 4*).
4. Maintain a safe distance from the unit and monitor for evidence of continued smoke venting or fire.

   WARNING: There may be periods of up to three hours at a time during which the thermal runaway propagates from battery modules to battery modules. During such time, the battery may not generate visible signs of thermal event although the event can still be active and the battery can flare up.

   a. Complete area size-up and establish water supply.
   b. If a fire has not developed: Position attack lines to protect neighboring exposures and neighboring battery enclosures.
   c. If a fire develops:
      - Allow the affected unit to consume itself as it is designed to do. Applying water to the burning unit will only slow its eventual combustion.
      - If advised by Tesla, use wide-fog stream, at lowest volume possible, to achieve desired cooling of neighboring battery enclosures while maintaining contact with Tesla. If communication cannot be established with Tesla, apply water at the discretion of first responders.

        NOTE: Water has been deemed appropriate for use on Tesla Energy products, thus will not create a hazard while protecting exposures.

      - At the discretion of first responders, apply water to other neighboring exposures.
5. Allow the battery pack to cool down while maintaining contact with Tesla for guidance (this process may take 12-48 hours or longer).

6. Monitor the temperature of the battery pack using a thermal imaging camera to determine if it is safe to interact with the unit.
7. Contact Tesla Energy Technical Support for next steps (*Identification of Company and Contact Information on page 4*).

6 Shutting Down in an Emergency

WARNING: Shutting off power to the product does not de-energize the battery, and a shock hazard may still be present.

WARNING: If smoke or fire is visible, do not approach the product or open any of its doors.

WARNING: In case of flooding, stay out of the water if any part of the product or its wiring is submerged.

To shut the product down in an emergency, perform the appropriate steps below and then contact Tesla (*Identification of Company and Contact Information on page 4*):

6.1 Powerpack System

1. If an external emergency stop (E-Stop) button or remote shutdown contact to the Powerpack is present, engage it.
2. If the Powerpack is serviced upstream by an external AC breaker or disconnect, open the breaker or disconnect.

6.2 Megapack

1. If an external E-Stop button or remote shutdown contact to the Megapack is present, engage it.
2. If the Megapack is serviced upstream by an external AC breaker or disconnect, open the breaker or disconnect.

7 First Aid Measures

7.1 Electric Shock / Electrocution

Seek immediate medical assistance if an electrical shock or electrocution has occurred (or is suspected).

7.2 Contact with Leaked Electrolyte

Battery cells are sealed. Contents of an open (broken) battery cell can cause skin irritation and/or chemical burns. If materials from a ruptured or otherwise damaged cell or battery contact skin, flush immediately with water, remove all clothing around affected area, and wash affected area with soap and water. If a chemical burn occurs or if irritation persists, seek medical assistance.

For eye contact, flush with significant amounts of water for 15 minutes without rubbing and see a physician at once.

7.3 Inhalation of Electrolyte Vapors

If inhalation of electrolyte vapors occurs, move person into fresh air. If throat irritation is present, seek immediate medical assistance.

7.4 Vent Gas Inhalation

Battery cells are sealed and venting of cells should not occur during normal use. If inhalation of vent gases occurs, move person into fresh air. If signs of respiratory distress are present, seek immediate medical assistance.

8 Storage Precautions

Powerpack systems and sub-assemblies should be stored in approved packaging prior to installation. Megapack does not include packaging and can be stored as-shipped with a tarp.

Elevated temperatures can result in reduced battery service life. The product can withstand ambient temperatures of -40°C to 60°C (-40ºF to 140ºF) for up to 24 hours. Do not store the product near heating equipment.

Ideally, the product should be stored at 50% state of charge (SOC) or less. The product should not be stored for extended periods either at a full SOC or completely discharged since both conditions adversely impact battery life.

The storage area should be protected from flooding.

Long-term storage areas should be compliant with the appropriate local fire code requirements.

Acceptable storage density of battery packs and storage height of battery packs will be defined by the local authority having jurisdiction (AHJ). Requirements and limits will be based upon a number of factors including the structural and fire protection characteristics of the storage area and recommendations for fire protection promulgated by the National Fire Protection Association (NFPA) and similar organizations. At the time of this writing, no standard Commodity Classification has been defined for lithium-ion cells or battery packs (see 2016 NFPA 13: Standard for the Installation of Sprinkler Systems). The product only has a 30-40% state of charge (SOC) while in storage which reduces the energy impact on fire occurrences. As an example of the reduced energy, the 30% level has been determined to be acceptable for air flight shipping based upon extensive testing and analysis in conjunction with the FAA. Tesla recommends treating lithium-ion cells and batteries in packaging as equivalent to a typical Group A plastic commodity.

9 Damaged Product Handling

This section describes the handling, storage, and transportation of damaged products.

If the event of damage to a product, contact Tesla immediately (*Identification of Company and Contact Information on page 4*).

If a product has been damaged (for example, its battery enclosure has been dented or compromised), it is possible that heating is occurring that may eventually lead to a fire. Damaged or opened cells/batteries can result in rapid heating (due to exothermic reaction of constituent materials), the release of flammable vapors, and propagation of self-heating and thermal runaway reactions to neighboring cells.

Before handling or transporting a damaged product, wait at least 24 hours. Smoke may be an indication that a thermal reaction is in progress. If no smoke, flame, sign of coolant leakage, or signs of heat has been observed for 24 hours, the product may be disconnected and moved to a safe location. Contact Tesla (*Identification of Company and Contact Information on page 4*) to obtain specific instructions for evaluating, disconnecting, and preparing a damaged product for transport.

A damaged product should be monitored during storage for evidence of smoke, flame, sign of coolant leakage, or signs of heat. If full-time monitoring of the product is not possible (for example during extended storage), the product should be moved to a safe storage location.

A safe storage location for a damaged battery will be free of flammable materials, accessible only by trained professionals, and 50 feet (15 m) downwind of occupied structures. For example, a fenced, open yard may be an appropriate safe location. Do not store damaged products adjacent to undamaged products. It is possible that a damaged product may sustain further damage during transportation and may lead to a fire. To further reduce this risk, handle the damaged product with extreme caution.

10 Disposal Procedures

For disposal after a fire or thermal event, contact Tesla for guidance (*Identification of Company and Contact Information on page 4*).

In most cases, the product can be recycled. Contact Tesla to return the product to a Tesla facility for disassembly and further processing. If disposing of the product without returning it to Tesla, consult with local, state and/or federal authorities on the appropriate methods for disposal and recycling of lithium-ion batteries. Note that the products do not contain heavy metals such as lead, cadmium, or mercury.

11 Maintenance or Repair

Tesla requests all maintenance, service, and repairs of the product be performed by Tesla-approved service personnel or Tesla-authorized repair facilities. This includes all proactive and corrective maintenance over the lifetime of the product. Improper service or repair by personnel not approved nor authorized by Tesla could void the product's Limited Warranty, lead to failure of the product, and potentially result in development of an unsafe condition and unexpected electrical events.

12 Transportation

Lithium-ion batteries are regulated as Class 9 Miscellaneous dangerous goods (also known as "hazardous materials") pursuant to the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air, International Air Transport Association (IATA) Dangerous Goods Regulations, the International Maritime Dangerous Goods (IMDG) Code, European Agreements concerning the International Carriage of Dangerous Goods by Rail (RID) and Road (ADR), and applicable national regulations such as the USA's hazardous materials regulations (see 49 CFR 173.185). These regulations contain very specific packaging, labeling, marking, and documentation requirements. The regulations also require that individuals involved in the preparation of dangerous goods for transport be trained in how to properly package, label, mark and prepare shipping documents.

NOTE: Transportation regulations vary by region. To ensure compliant transportation, always refer to local regulations as applicable.

UN Number	3480
Proper Shipping Name	Lithium-Ion Batteries
Hazard Classification	Class 9 Miscellaneous
Packing Group	N/A

Revision History

Revision	Date	Description
2.6	November 11, 2022	• Decoupled Powerwall information, now focusing on Industrial Energy products (including Megapack and Powerpack). Visit *https://tesla.com/firstresponders* for all versions. • Deleted trademarked brand name from *Firefighting Measures on page 17* • Improved language in *Hazards Associated with Vented Electrolyte on page 14* • Improved language in *Hazards Associated with Elevated Temperature Exposure on page 13* • Simplified language in *Hazards Associated with Leaked Electrolyte on page 14* • Simplified language in *Disposal Procedures on page 23* • Improved overall hazard and firefighting recommendations (*Firefighting Measures on page 17*) • Improved first aid recommendations (*First Aid Measures on page 20*) • Updated Tesla headquarters address (*Identification of Company and Contact Information on page 4*) • Modified SDS language to reflect latest guidance (*SDS Information on page 5*) • Clarified refrigerant volume (*Hazards Associated with Leaked Refrigerant on page 13*)
2.5	May 23, 2022	• Added Megapack 2 XL (*SDS Information on page 5*, *Product Descriptions on page 6*)
2.4	February 16, 2022	• Enhanced firefighting guidance regarding neighboring battery enclosures (*Firefighting Measures on page 17*) • Clarified products of combustion (*Firefighter PPE on page 17*) • Added Powerwall+ and Megapack 2 information. • Provided reference to safety data sheet specific to Australia/New Zealand (*SDS Information on page 5*) • Amended that coolant color can be blue, green, or orange (*Hazards Associated with Leaked Coolant on page 13*) • Added links and QR codes to download this guide in additional languages (*Introduction and Scope on page 2*) • Updated contact information (*Identification of Company and Contact Information on page 4*), including: Tesla headquarters, Powerwall North America hotline, Megapack and Powerpack Japan technical support
2.3	July 28, 2021	• Added coolant volume for separately shipped Megapack battery modules (*SDS Information on page 5*) • Clarified firefighting guidance (*Firefighting Measures on page 17*)

Revision	Date	Description
		• Enhanced product identification information (*Product Descriptions on page 6*) • Simplified emergency shut-down procedures for Megapack and Powerpack (*Shutting Down in an Emergency on page 19*)
2.2	June 23, 2021	• Updated contact information in *Identification of Company and Contact Information on page 4* • Updated specs according to updated products in *SDS Information on page 5* • Added Powerwall part numbers to *SDS Information on page 5* • Enhanced firefighting guidance: *Firefighting Measures on page 17* • Added guidance in case of emergency: *In Case of Emergency on page 15* • Added additional early signs of thermal runaway: *Hazards Associated with Vented Electrolyte on page 14* • Updated Powerwall instructions in *Shutting Down in an Emergency on page 19*
2.1	August 28, 2020	Added spare parts specifications: • Megapack battery module • Powerpack Pod module
2.0	July 8, 2020	• Updated formatting • Updated product specs • Updated contact info • Corrected elevated temperature topic to include Megapack • Corrected name of Tesla Inverter to Powerpack Inverter • Separated information on shutting down into its own topic for visibility • Reorganized the Firefighting section for clarity • Updated language on re-ignition risks
1.8	March 11, 2020	Fixed footer; fixed styles.
07	17-Dec-2019	Updates to contact information (Tesla contact), product specs section, leaked electrolyte section, and inclusion of Megapack throughout the document.
06	27-Feb-2019	Updated storage conditions and firefighting measures section to provide further context on response tactics to Tesla Energy Product fires. Adjusted formatting, included graphics for warnings and notices.
05	22-Oct 2018	Reformatted for ease of use and translation; removed Confidential status; corrected phone number for CHEMTREC
04	30-June-2017	Added fire ground operations response for Powerpack 2, including approach; exhaust gases; and safety. Updated general product information and contacts, as well as part numbers and reman numbers
03	3-Oct-2016	Added part numbers, minor edits

Revision	Date	Description
02	3-Sept-2015	Added part numbers, updated weights, voltages, and temperatures, clarified hazards associated with spilled electrolyte, updated storage requirements, updated warning label icons, updated packing group.
01	14-July-2015	ERG for Tesla Powerpack systems, Powerwalls, and Sub-assemblies

Appendix B

DR TRANS-5 Preliminary Helicopter Use Plan

Darden Clean Energy Project

Helicopter Use Plan

prepared by

IP Darden I, LLC and Affiliates
c/o Intersect Power, LLC
9450 SW Gemini Drive, PMB #68743
Beaverton, Oregon 97008

prepared with the assistance of

Rincon Consultants, Inc.
7080 North Whitney Avenue, Suite 101
Fresno, California 93720

March 2024

RINCON CONSULTANTS, INC. SINCE 1994

Introduction

This Helicopter Use Plan will be updated prior to the start of construction based on final Project design and layout and will incorporate specifications and procedures from the selected Helicopter Contractor. The final Helicopter Use Plan will be submitted to the California Energy Commission for final review and approval prior to commencing helicopter activities.

For the Darden Clean Energy Project (Project), helicopters will be used for wire stringing activities for the approximately 10-to-15-mile 500 kilovolt (kV) generation intertie (gen-tie) line. The gen-tie line would span west from the intersection of South Sonoma Avenue and West Harlan Avenue to immediately west of Interstate 5, where it would connect to the Project's new utility switchyard along Pacific Gas and Electric Company's Los Banos-Midway #2 500 kV transmission line. Helicopter activities are proposed over a temporary two-month period within the Project's proposed 18 to 36-month construction schedule. A full-time avian monitor would be on-site for the full duration of helicopter activities to specifically monitor helicopter activities.

The Applicant will contract with an outside contractor (Applicant's Helicopter Contractor) for helicopter operation who will abide by all requirements in the Helicopter Use Plan and current regulations. All aircraft, pilots, linemen, and mechanics will be in full compliance with applicable Federal Aviation Administration (FAA) requirements and standards. The helicopter crew will be comprised of a qualified pilot, mechanic, and lineman required for Project activities. All linemen will be experienced journeyman lineman and will be Quanta H certified to perform tasks from the helicopter via Human External Cargo (HEC) and/or from the helicopter skid. The Applicant's Helicopter Contractor will utilize an MD-500 helicopter, or similar, capable of performing light lift and other construction support operations. The flight crew will utilize very high frequency radios to communicate with the selected airport's common traffic frequency as well as ground crews within the Project and HLZs. All helicopters will be equipped with geographic positioning system tracking units to track helicopter flight paths.

No helicopter use is proposed during routine operations and maintenance although helicopters may be used for emergency maintenance or repair activities.

Helicopter Activities

Helicopter-related Project activities for construction of the gen-tie line will include wire stringing activities: hanging travelers, pulling conductor and optical ground wire, dead-end activities, and the installation of bird diverters.

There will be one Helicopter Landing Zone (HLZ) located in the Project's 20-acre step-up substation laydown yard, or other designated laydown area. A water truck would be on-site to water the HLZ prior to helicopter activities to prevent fugitive dust from rotor wash. Helicopter refueling will be conducted within the HLZ from a construction vehicle equipped as a fuel truck and in compliance with all applicable laws and regulations and in accordance with the Stormwater Pollution Prevention Plan prepared for the Project. Refueling would also occur at one of the nearest local airports, between 2 (Five Points Ranch Airport) and 10 miles away (San Joaquin Airport), where the helicopter would be hangered overnight, before and/or after each day the helicopter is utilized. All flight paths from the overnight staging area to the right-of-way will be over agricultural-zoned lands to the designated HLZ.

The helicopter may land within other approved disturbance areas along the gen-tie line corridor to pick up equipment, materials, or personnel. Dust control measures will be utilized in accordance with the Dust Control Plan prepared for the Project during helicopter operations. All Helicopter activities will occur within the typical construction hours Monday through Friday 7:00 a.m. to 7:00 p.m. Monday through Friday.

Helicopter Landing Zones

There will be one HLZ located within the 20-acre step-up substation laydown yard, or other designated laydown area. In addition, helicopters will land within the approved right-of-way wire sites and other approved disturbance areas.

Dust control measures to prevent fugitive dust from rotor wash at helicopter activity sites will be implemented. A water truck will be onsite and water the HLZ prior to helicopter activities and as needed. Helicopter flight paths will be at a sufficient elevation above ground to eliminate dust emissions from rotor wash when travelling between the HLZ, work sites, and local airports (Five Points Ranch Airport and/or San Joaquin Airport). Helicopter refueling will be conducted within the HLZ from a construction vehicle equipped with Department of Transportation-approved fuel tanks, as well at one of the nearest local airports. This truck will be relocated off the Project at the end of each day.

The HLZ will be surveyed daily for biological resources by onsite biological monitors and in compliance with all Project mitigation measures. In addition, a full-time avian monitor will be onsite to specifically monitor helicopter activities. All sensitive resource areas will be appropriately marked, and all personnel will be made aware of any biological or culturally sensitive areas to avoid.

Congested Area Plan

A Congested Area Plan (CAP) is required by the FAA if helicopter operations are taking place in any congested area accessible by the public. The Project is located outside of any congested area, so therefore, no CAPs are required. Flight crews will comply with all 14 CFR Part 91 and Part 133 FAA regulations.

Flight Paths

All flight paths from the overnight staging area at one of the nearest local airports to the right-of-way will be over agricultural-zoned lands and completed in the most direct manner. Flight paths will be at the pilot's discretion and at an elevation that will eliminate dust emissions from rotor wash.

Traffic Control Plan

Traffic control will be used with proper notifications to local, state, and federal officials to ensure the safety of general public for any helicopter operations planned over or near commonly used roadways. Approved traffic control plans and associated permits will be made available to the CEC prior to implementation.

Appendix C

DR TRANS-7 Transportation Analysis Supplement

MEMORANDUM

TO: Evelyn Langsdale, Rincon Consultants

FROM: Erik Ruehr, P.E., VRPA Technologies, Inc.

DATE: March 8, 2024

RE: Darden Clean Energy – CEC Traffic and Transportation Analysis
Supplemental Information

VRPA Technologies, Inc. (VRPA) prepared a California Energy Commission (CEC) Transportation and Traffic Analysis dated October 27,2023 for the Darden Clean Energy project. After completion of the analysis, it was noted that the traffic operations analysis included only employee (auto) trips to the site. In actuality, truck trips will be needed on a daily basis to haul sludge from the project site to a disposal facility. This memorandum documents the estimated effect of the additional traffic.

The analysis was conducted as follows:

- ✓ It is expected that 40,600 lbs of sludge will need to be hauled from the project site on days when it is in operation. Sludge-hauling trucks are available in different sizes, but the most efficient operation is expected to result from a single sludge-hauling truck with a capacity of 50,000 lbs. This would result in an additional two trips to the site each day (i.e. one outbound trip to haul sludge and one inbound trip to return to the project site). Truck trips are often analyzed in terms of passenger car equivalents (i.e., the number of passenger car trips that would be equal to one truck trip for capacity analysis purposes) and this would be appropriate for sludge-hauling trucks. The two additional daily trips for sludge hauling would be the equivalent of 6 daily passenger car trips using a standard passenger car equivalent of 3.0 which is typical for large trucks.

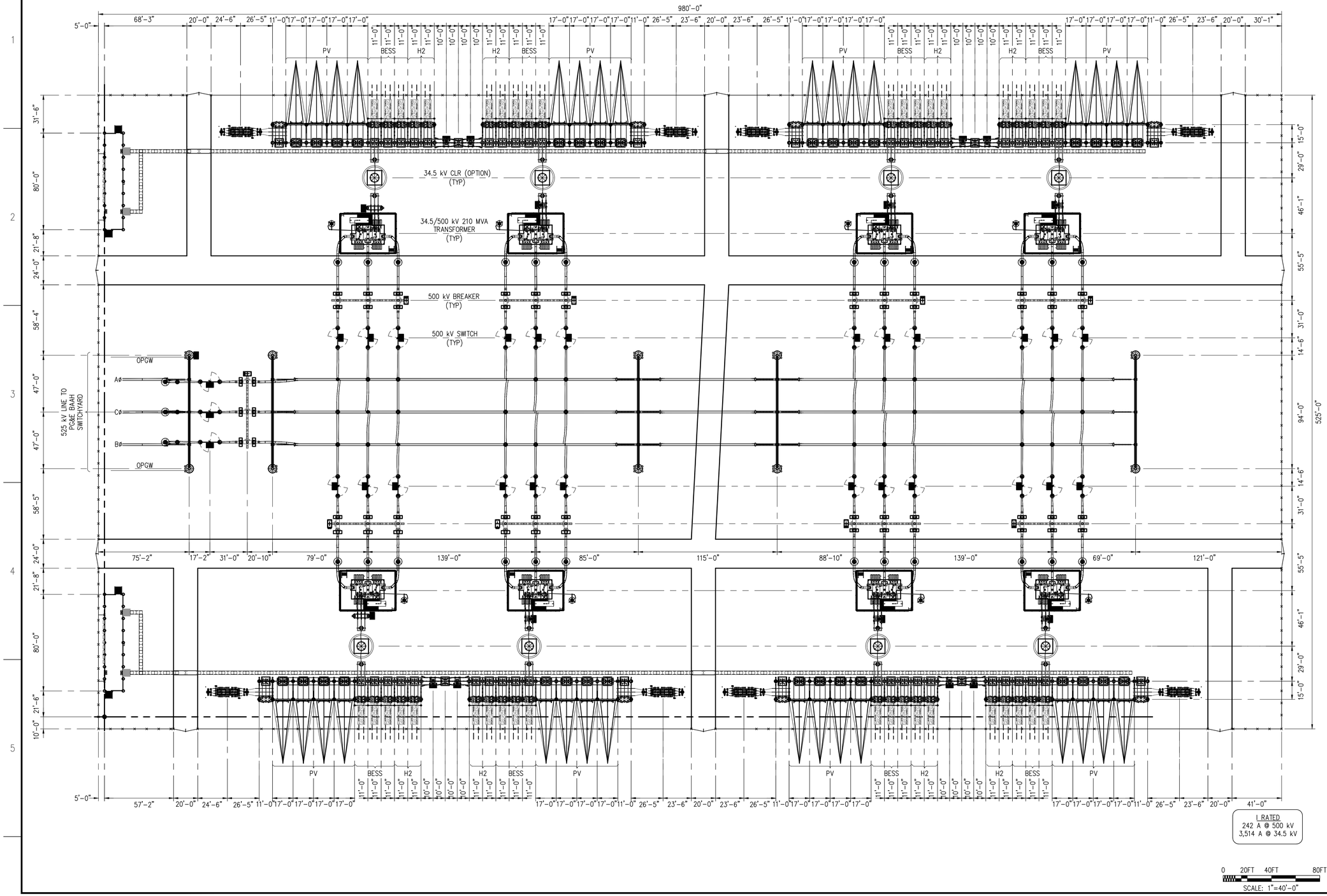
- ✓ The roadway capacity calculations from the CEC Traffic and Transportation Analysis were reviewed to determine the impact of the two additional daily trips. Since the roadway capacity analysis rounded existing daily trips to the nearest 10, the 6 additional trips would be similar to the rounding error and would not change the results of the analysis. Therefore, no changes are needed in the CEC Traffic and Transportation Analysis.

Please feel free to contact me if you have any questions. I can be reached by email at eruehr@vrpatechnologies.com or by phone at 858-361-7151.

4630 W. Jennifer, Suite 105, Fresno, CA 93722 • Phone (559) 271-1200 • Fax (559) 271-1269
www.vrpatechnologies.com

Appendix D

DR TSD-2 Substation and Switchyard Diagram



PRELIMINARY

LEGEND

- BASELINE MARKER
- BASELINE
- SUBSTATION FENCE
- MOD SWITCH OPERATOR
- MANUAL SWITCH OPERATOR
- STRUCTURE MOUNTED YARD LIGHTING

STRUCTURE DESIGN CRITERIA

500 kv CLEARANCE (1800 kV BIL):

LIVE PARTS: MIN ø-G=144"
MIN ø-ø=195"

TO GRADE: 21'-6" (BUS)
42'-6" (DRIVEWAY)

34.5 kV CLEARANCE (200 kV BIL):

LIVE PARTS: MIN ø-G=13"
MIN ø-ø=18"

TO GRADE: 10'-0" (BUS)
22'-0" (DRIVEWAY)

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-00X DARDEN 500KV\100 CADD\110 WORKING\111 PHYSICAL\DAR-D-P003-0_REV A.DWG LAST SAVED BY: icdelaney 11/3/2023 4:31 PM PLOTTED BY: Isaac C. Delaney 11/3/2023 4:35 PM Tab:DAR-D-P003-01 (1)

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

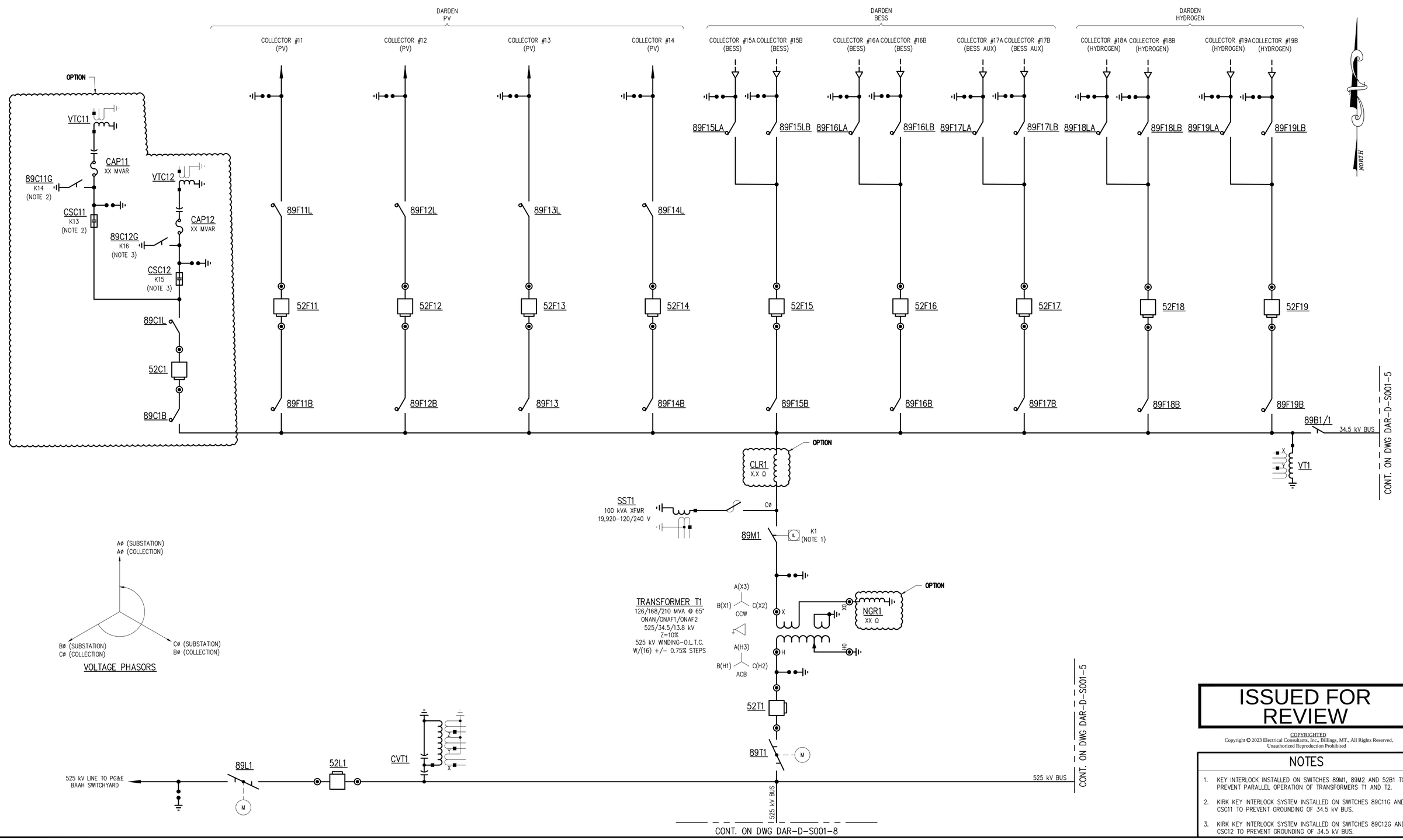
NO	REVISION	DATE	BY	APR
B	ISSUED FOR 10% REVIEW	11/03/23	JCV	MAG
A	PRELIMNARY	09/29/23	JCV	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	VANEK	09/23
DESIGNED	GROFF	09/23
CHECKED		
APPROVED		
DWG SCALE: 1"=40'-0"	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
ULTIMATE ARRANGEMENT – OPT 1

DWG. NAME: DAR-D-P003-01 | REVISION NO : B



ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 89M1, 89M2 AND 52B1 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T1 AND T2.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C11G AND CSC11 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C12G AND CSC12 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-00X DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 1.DWG LAST SAVED BY: icdelaney 11/2/2023 1:45 PM PLOTTED BY: Isaac C. Delaney 11/2/2023 5:32 PM Tab:DAR-D-S001-4

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

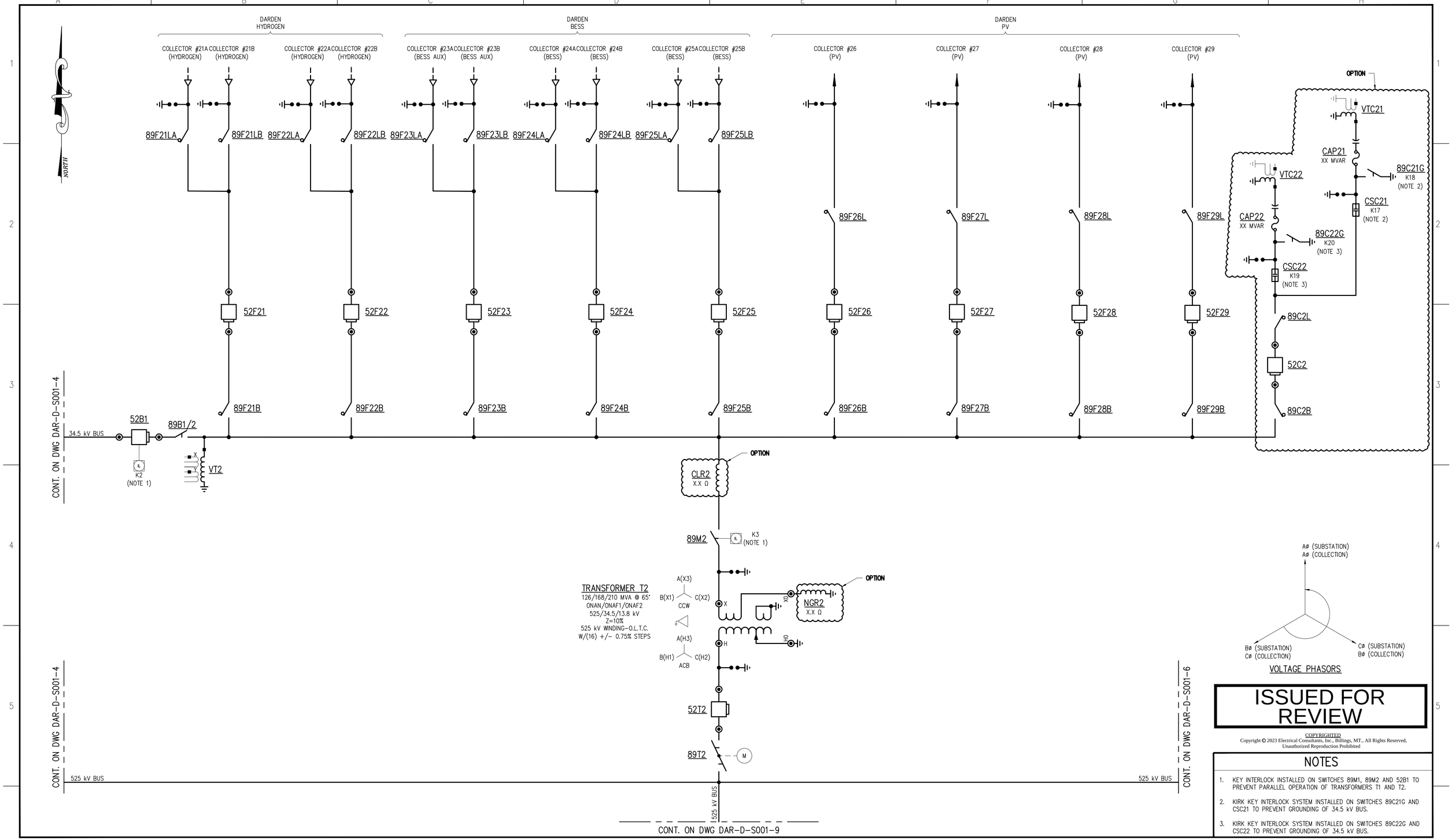
NO	REVISION	DATE	BY	APR
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN SOLAR/BESS PROJECT
34.5 – 525 kV SUBSTATION SWITCHING DIAGRAM (SHEET 1) – OPT. 1

DWG. NAME: DAR-D-S001-4 | REVISION NO : A



ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 89M1, 89M2 AND 52B1 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T1 AND T2.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C21G AND CSC21 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C22G AND CSC22 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-00X DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 1.DWG LAST SAVED BY: icdelaney 11/2/2023 1:45 PM PLOTTED BY: Isaac C. Delaney 11/2/2023 5:32 PM Tab:DAR-D-S001-5

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

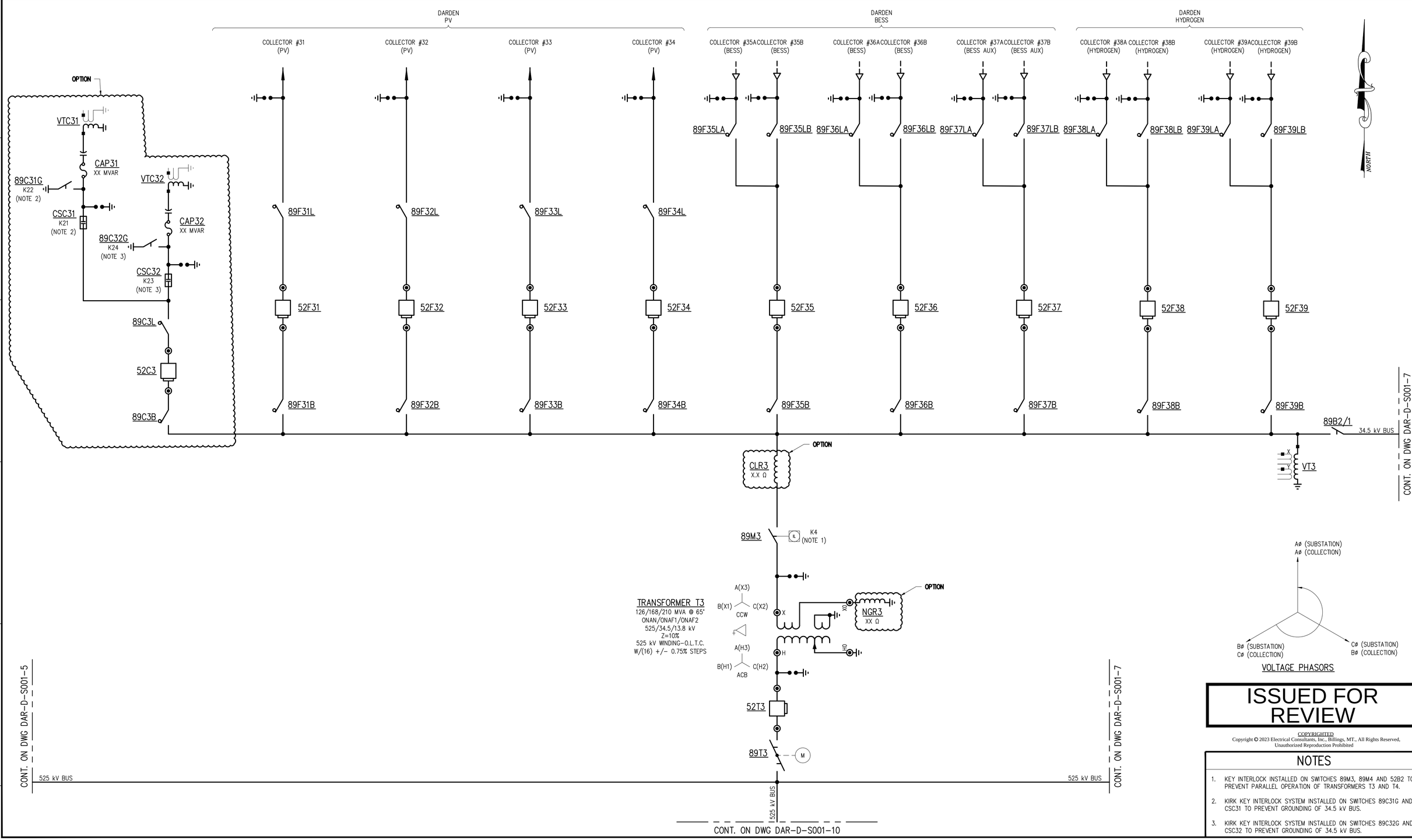
NO	REVISION	DATE	BY	APR
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN SOLAR/BESS PROJECT
34.5 – 525 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 2) – OPT 1

DWG. NAME: DAR-D-S001-5 | REVISION NO : A



ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 89M3, 89M4 AND 52B2 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T3 AND T4.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C31G AND CSC31 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C32G AND CSC32 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-00X DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 1.DWG LAST SAVED BY: icdelaney 11/2/2023 1:45 PM PLOTTED BY: Isaac C. Delaney 11/2/2023 5:32 PM Tab:DAR-D-S001-6

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

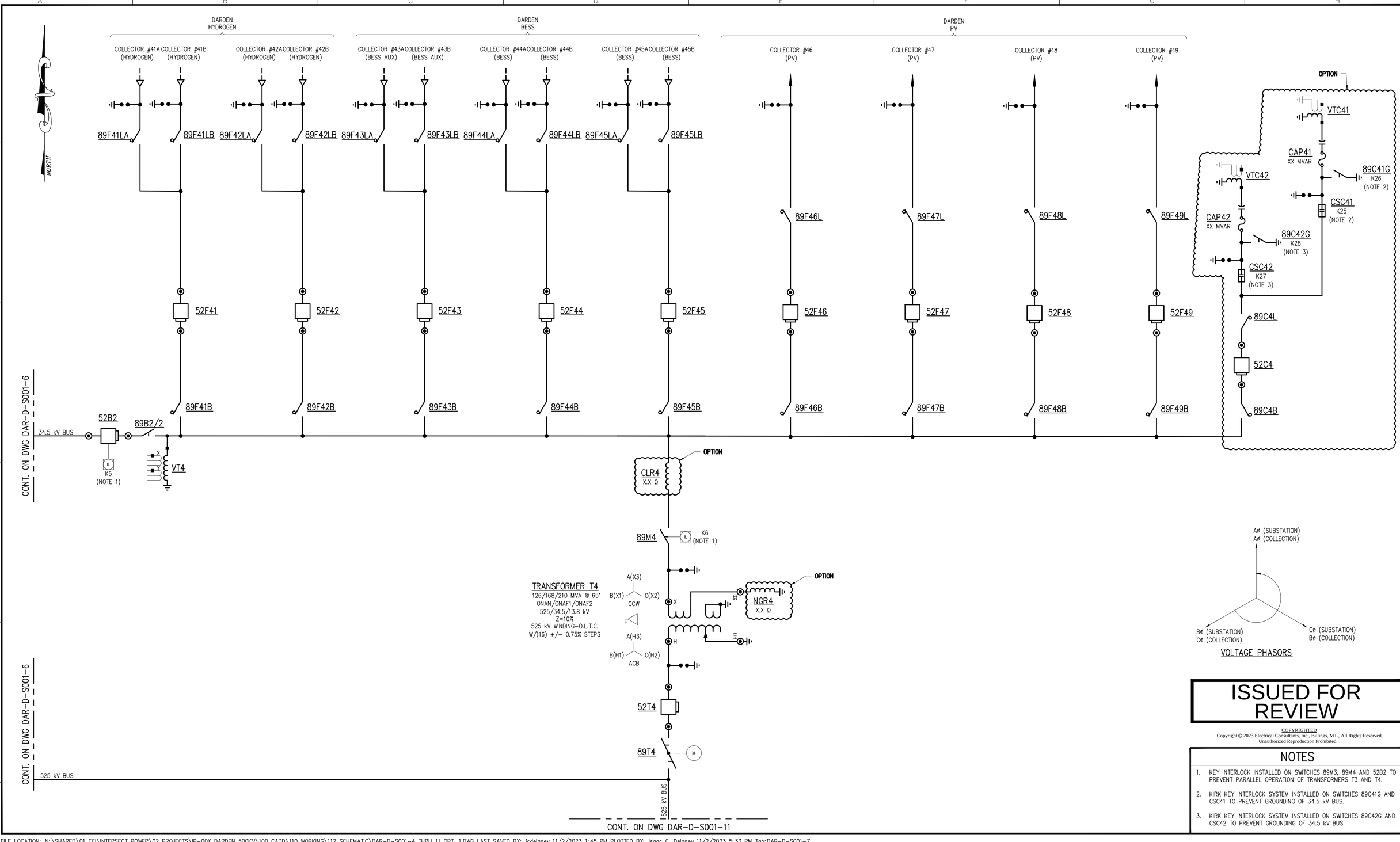
NO	REVISION	DATE	BY	APR
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN SOLAR/BESS PROJECT
34.5 – 525 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 3) – OPT 1

DWG. NAME: DAR-D-S001-6 | REVISION NO : A



ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 89M3, 89M4 AND 52B2 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T3 AND T4.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C41G AND CSC41 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C42G AND CSC42 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-00X DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 1.DWG LAST SAVED BY: tcdelaney 11/2/2023 1:45 PM PLOTTED BY: Isaac C. Delaney 11/2/2023 5:33 PM Tab:DAR-D-S001-7

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN SOLAR/BESS PROJECT
34.5 – 525 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 4) – OPT 1

DWG. NAME: DAR-D-S001-7 | REVISION NO : A

CONT. ON DWG DAR-D-S001-4

NORTH

A∅ (SUBSTATION)
A∅ (COLLECTION)
B∅ (SUBSTATION)
C∅ (COLLECTION)
C∅ (SUBSTATION)
B∅ (COLLECTION)

VOLTAGE PHASORS

525 kV BUS

89T5 (M)

52T5

TRANSFORMER T5
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

A(H1) B(H3) C(H2) ACB — H — HO
A(X1) B(X3) C(X2) CCW — X — XO

OPTION
NGR5
X.X Ω

89M5 (K7 (NOTE 1))

SST2
100 kVA XFMR
19,920-120/240 V
A∅

OPTION
CLR5
X.X Ω

VT5
89B3/1
34.5 kV BUS

CONT. ON DWG DAR-D-S001-9

89C5B
52C5
89C5L
CSC52 (K31 (NOTE 3))
89C52G (K32 (NOTE 3))
CSC51 (K29 (NOTE 2))
CAP52 XX MVAR
89C51G (K30 (NOTE 2))
VTC52
CAP51 XX MVAR
VTC51
OPTION

89F51B 89F52B 89F53B 89F54B 89F55B 89F56B 89F57B 89F58B 89F59B

52F51 52F52 52F53 52F54 52F55 52F56 52F57 52F58 52F59

89F51L 89F52L 89F53L 89F54L

89F55LA 89F55LB 89F56LA 89F56LB 89F57LA 89F57LB 89F58LA 89F58LB 89F59LA 89F59LB

COLLECTOR #51 (PV)
COLLECTOR #52 (PV)
COLLECTOR #53 (PV)
COLLECTOR #54 (PV)
COLLECTOR #55A (BESS)
COLLECTOR #55B (BESS)
COLLECTOR #56A (BESS)
COLLECTOR #56B (BESS)
COLLECTOR #57A (BESS AUX)
COLLECTOR #57B (BESS AUX)
COLLECTOR #58A (HYDROGEN)
COLLECTOR #58B (HYDROGEN)
COLLECTOR #59A (HYDROGEN)
COLLECTOR #59B (HYDROGEN)

DARDEN PV
DARDEN BESS
DARDEN HYDROGEN

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 89M5, 89M6 AND 52B3 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T5 AND T6.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C51G AND CSC51 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C52G AND CSC52 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-00X DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 1.DWG LAST SAVED BY: icdelaney 11/2/2023 1:45 PM PLOTTED BY: Isaac C. Delaney 11/2/2023 5:32 PM Tab:DAR-D-S001-8

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN SOLAR/BESS PROJECT
34.5 – 525 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 5) – OPT 1

DWG. NAME: DAR-D-S001-8
REVISION NO : A

CONT. ON DWG DAR-D-S001-5

525 kV BUS

89T6 (M)

52T6

TRANSFORMER T6
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

A(H1) B(H3) C(H2) ACB — H — H0

A(X1) B(X3) C(X2) CCW — X — X0

OPTION
NGR6
X.X Ω

89M6 (IL) K9 (NOTE 1)

OPTION
CLR6
X.X Ω

A∅ (SUBSTATION)
A∅ (COLLECTION)
B∅ (SUBSTATION)
C∅ (COLLECTION)
C∅ (SUBSTATION)
B∅ (COLLECTION)

VOLTAGE PHASORS

NORTH

CONT. ON DWG DAR-D-S001-8

34.5 kV BUS
52B3
89B3/2
VT6
K8 (IL) (NOTE 1)

89F61B 89F62B 89F63B 89F64B 89F65B 89F66B 89F67B 89F68B 89F69B

52F61 52F62 52F63 52F64 52F65 52F66 52F67 52F68 52F69

89F66L 89F67L 89F68L 89F69L

89C6B
52C6
89C6L
CSC62 K35 (NOTE 3)
89C62G K36 (NOTE 3)
CAP62 XX MVAR
CSC61 K33 (NOTE 2)
89C61G K34 (NOTE 2)
VTC62
CAP61 XX MVAR
VTC61
OPTION

89F61LA 89F61LB 89F62LA 89F62LB 89F63LA 89F63LB 89F64LA 89F64LB 89F65LA 89F65LB

COLLECTOR #61A (HYDROGEN) COLLECTOR #61B (HYDROGEN)
COLLECTOR #62A (HYDROGEN) COLLECTOR #62B (HYDROGEN)
COLLECTOR #63A (BESS AUX) COLLECTOR #63B (BESS AUX)
COLLECTOR #64A (BESS) COLLECTOR #64B (BESS)
COLLECTOR #65A (BESS) COLLECTOR #65B (BESS)
COLLECTOR #66 (PV)
COLLECTOR #67 (PV)
COLLECTOR #68 (PV)
COLLECTOR #69 (PV)

DARDEN HYDROGEN
DARDEN BESS
DARDEN PV

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 89M5, 89M6 AND 52B3 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T5 AND T6.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C61G AND CSC61 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C62G AND CSC62 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-00X DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 1.DWG LAST SAVED BY: icdelaney 11/2/2023 1:45 PM PLOTTED BY: Isaac C. Delaney 11/2/2023 5:32 PM Tab:DAR-D-S001-9

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN SOLAR/BESS PROJECT
34.5 – 525 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 6) – OPT 1

DWG. NAME: DAR-D-S001-9
REVISION NO : A

CONT. ON DWG DAR-D-S001-6

NORTH

A⌀ (SUBSTATION)
A⌀ (COLLECTION)
B⌀ (SUBSTATION)
C⌀ (COLLECTION)
C⌀ (SUBSTATION)
B⌀ (COLLECTION)

VOLTAGE PHASORS

525 kV BUS
89T7
M
52T7

TRANSFORMER T7
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

A(H1)
B(H3) C(H2)
ACB
H
H0
A(X1)
B(X3) C(X2)
CCW
X
X0
OPTION
NGR7
X.X Ω

89M7
K10
(NOTE 1)
OPTION
CLR7
X.X Ω

VT7
89B4/1
34.5 kV BUS
CONT. ON DWG DAR-D-S001-11

89C7B
52C7
89C7L
CSC72
K39
(NOTE 3)
89C72G
K40
(NOTE 3)
CSC71
K37
(NOTE 2)
CAP72
XX MVAR
89C71G
K38
(NOTE 2)
VTC72
CAP71
XX MVAR
VTC71
OPTION

89F71B 89F72B 89F73B 89F74B 89F75B 89F76B 89F77B 89F78B 89F79B

52F71 52F72 52F73 52F74 52F75 52F76 52F77 52F78 52F79

89F71L 89F72L 89F73L 89F74L

89F75LA 89F75LB 89F76LA 89F76LB 89F77LA 89F77LB 89F78LA 89F78LB 89F79LA 89F79LB

COLLECTOR #71 (PV)
COLLECTOR #72 (PV)
COLLECTOR #74 (PV)
COLLECTOR #73 (PV)
DARDEN PV

COLLECTOR #75A (BESS)
COLLECTOR #75B (BESS)
COLLECTOR #76A (BESS)
COLLECTOR #76B (BESS)
COLLECTOR #77A (BESS AUX)
COLLECTOR #77B (BESS AUX)
DARDEN BESS

COLLECTOR #78A (HYDROGEN)
COLLECTOR #78B (HYDROGEN)
COLLECTOR #79A (HYDROGEN)
COLLECTOR #79B (HYDROGEN)
DARDEN HYDROGEN

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 89M7, 89M8 AND 52B4 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T7 AND T8.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C71G AND CSC71 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C72G AND CSC72 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-00X DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 1.DWG LAST SAVED BY: icdelaney 11/2/2023 1:45 PM PLOTTED BY: Isaac C. Delaney 11/2/2023 5:32 PM Tab:DAR-D-S001-10

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN SOLAR/BESS PROJECT
34.5 – 525 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 7) – OPT 1

DWG. NAME: DAR-D-S001-10
REVISION NO : A

CONT. ON DWG DAR-D-S001-7

525 kV BUS

89T8 — M

52T8

TRANSFORMER T8
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

A(H1) / B(H3) / C(H2) — ACB — H — HV

A(X1) / B(X3) / C(X2) — CCW — X — MV

OPTION — NGR8 X.X Ω

89M8 — K12 (NOTE 1)

OPTION — CLR8 X.X Ω

A⌀ (SUBSTATION) / A⌀ (COLLECTION)
B⌀ (SUBSTATION) / C⌀ (COLLECTION)
C⌀ (SUBSTATION) / B⌀ (COLLECTION)

VOLTAGE PHASORS

NORTH

CONT. ON DWG DAR-D-S001-10

34.5 kV BUS

52B4 — K11 (NOTE 1)

89B4/2

VT8

89F81B 89F82B 89F83B 89F84B 89F85B 89F86B 89F87B 89F88B 89F89B

52F81 52F82 52F83 52F84 52F85 52F86 52F87 52F88 52F89

89F86L 89F87L 89F88L 89F89L

89F81LA 89F81LB 89F82LA 89F82LB 89F83LA 89F83LB 89F84LA 89F84LB 89F85LA 89F85LB

COLLECTOR #81A (HYDROGEN) COLLECTOR #81B (HYDROGEN) COLLECTOR #82A (HYDROGEN) COLLECTOR #82B (HYDROGEN) — DARDEN HYDROGEN

COLLECTOR #83A (BESS AUX) COLLECTOR #83B (BESS AUX) COLLECTOR #84A (BESS) COLLECTOR #84B (BESS) COLLECTOR #85A (BESS) COLLECTOR #85B (BESS) — DARDEN BESS

COLLECTOR #86 (PV) COLLECTOR #87 (PV) COLLECTOR #88 (PV) COLLECTOR #89 (PV) — DARDEN PV

89C8B — 52C8 — 89C8L

CSC82 K43 (NOTE 3)

89C82G K44 (NOTE 3)

CAP82 XX MVAR — VTC82

CSC81 K41 (NOTE 2)

89C81G K42 (NOTE 2)

CAP81 XX MVAR — VTC81

OPTION

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 89M7, 89M8 AND 52B4 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T7 AND T8.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C81G AND CSC81 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C82G AND CSC82 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-00X DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 1.DWG LAST SAVED BY: icdelaney 11/2/2023 1:45 PM PLOTTED BY: Isaac C. Delaney 11/2/2023 5:33 PM Tab:DAR-D-S001-11

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

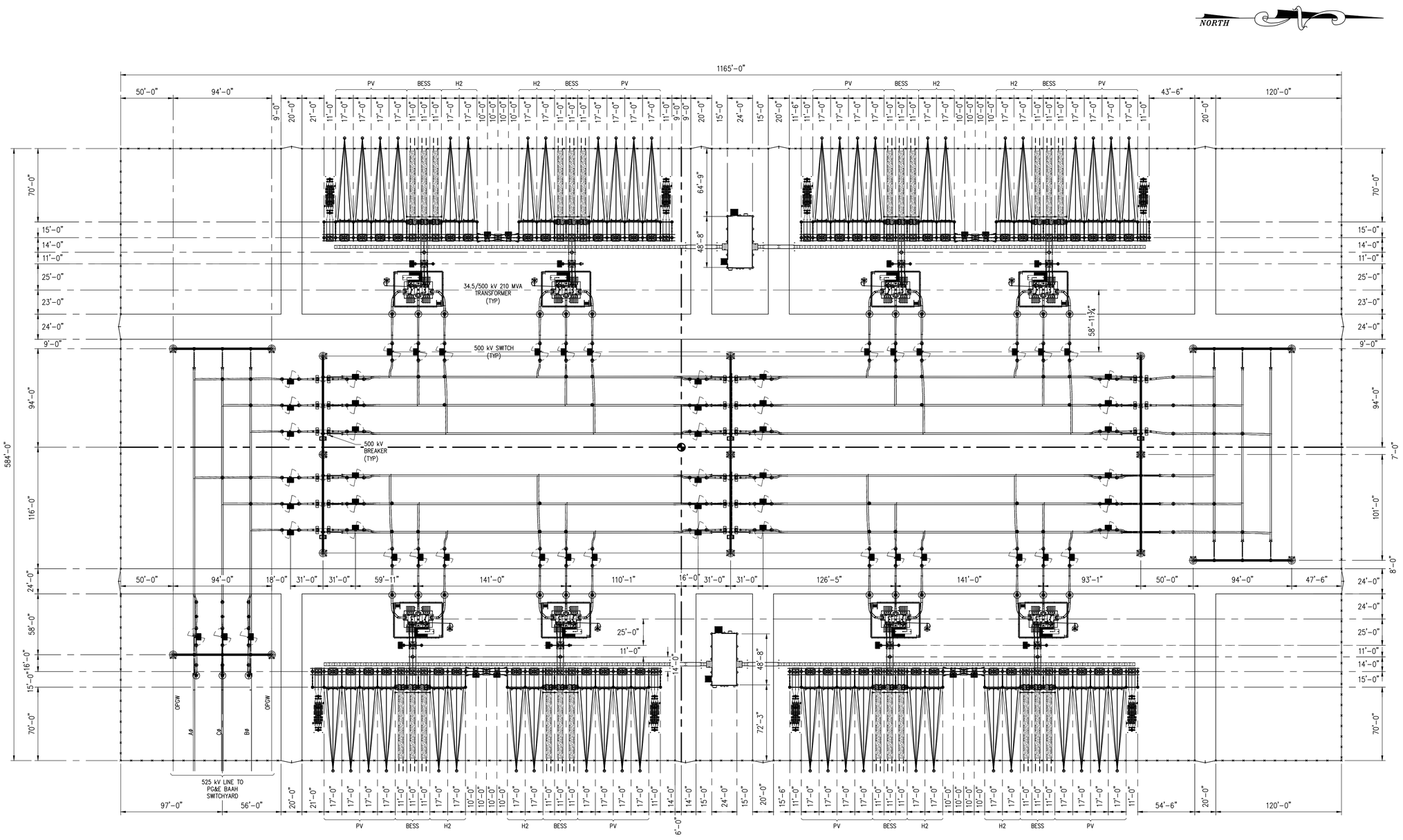
NO	REVISION	DATE	BY	APR
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN SOLAR/BESS PROJECT
34.5 – 525 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 8) – OPT 1

DWG. NAME: DAR-D-S001-11 | REVISION NO : A



I RATED
242 A @ 500 kV
3,514 A @ 34.5 kV

0 20FT 50FT 100FT
SCALE: 1"=50'-0"

LEGEND

- BASELINE MARKER
- BASELINE
- SUBSTATION FENCE
- MOD SWITCH OPERATOR
- MANUAL SWITCH OPERATOR
- STRUCTURE MOUNTED YARD LIGHTING
- A / P004-1 — INDICATES ELEVATION NUMBER / INDICATES DRAWING ON WHICH ELEVATION APPEARS

STRUCTURE DESIGN CRITERIA

500 kV CLEARANCE (1800 kV BIL):

LIVE PARTS: MIN ∅-G=144"
MIN ∅-∅=195"

TO GRADE: 21'-6" (BUS)
42'-6" (DRIVEWAY)

34.5 kV CLEARANCE (200 kV BIL):

LIVE PARTS: MIN ∅-G=13"
MIN ∅-∅=18"

TO GRADE: 10'-0" (BUS)
22'-0" (DRIVEWAY)

PRELIMINARY
NOT FOR CONSTRUCTION

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\111 PHYSICAL\DAR-D-P003-0_REV A.DWG LAST SAVED BY: icdelaney 1/29/2024 2:43 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:44 PM Tab:DAR-D-P003-01

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

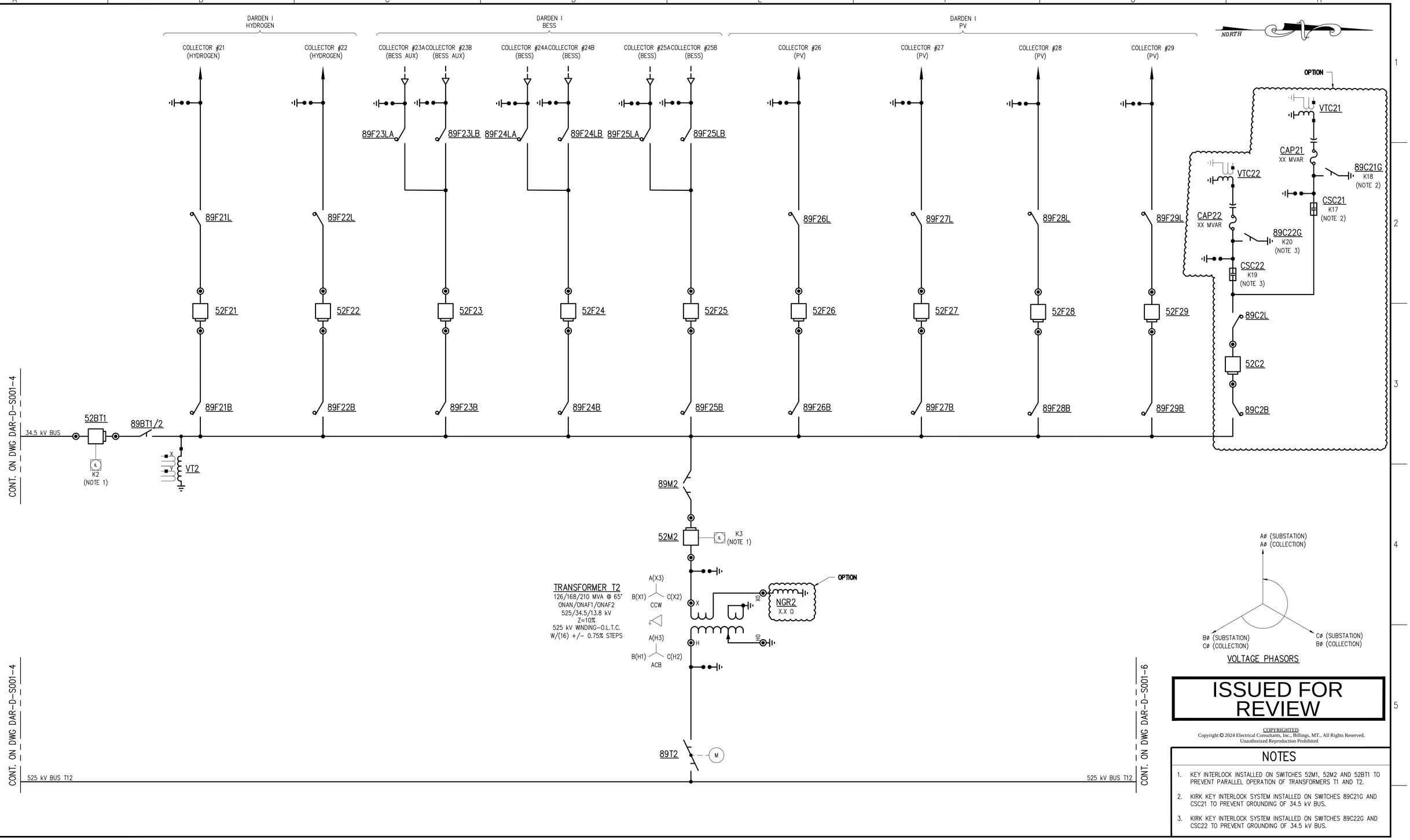
NO	REVISION	DATE	BY	APR
C	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
B	ISSUED FOR 10% REVIEW	11/03/23	JCV	MAG
A	PRELIMINARY	09/29/23	JCV	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	VANEK	09/23
DESIGNED	GROFF	09/23
CHECKED		
APPROVED		
DWG SCALE: 1"=50'-0"	PLT SCALE:	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
ULTIMATE ARRANGEMENT – OPT 2

DWG. NAME: DAR-D-P003-01 REVISION NO : C



ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M1, 52M2 AND 52BT1 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T1 AND T2.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C21G AND CSC21 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C22G AND CSC22 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:05 PM Tab:DAR-D-S001-5

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

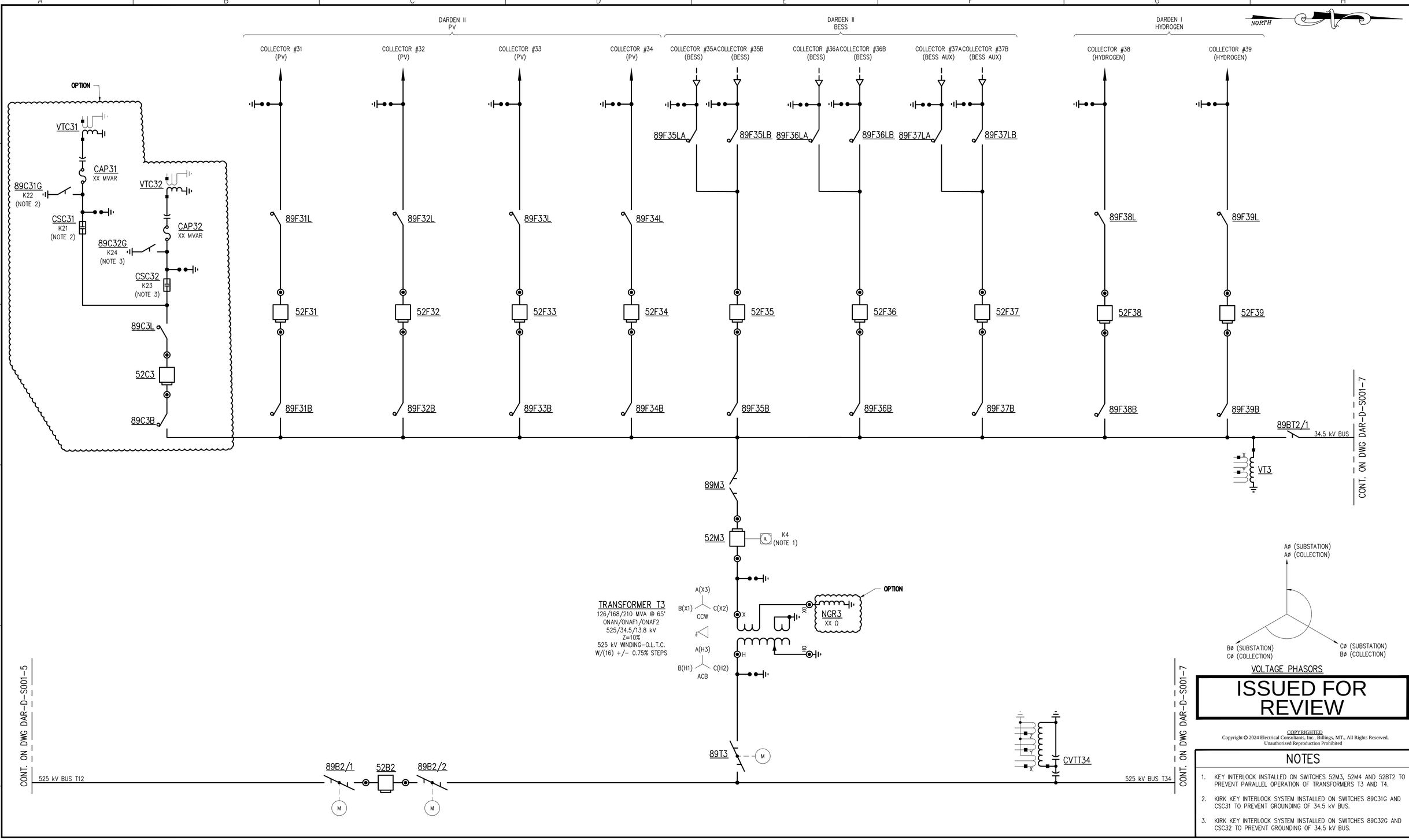
NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 2) – OPT 2

DWG. NAME: DAR-D-S001-5 | REVISION NO : B



ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M3, 52M4 AND 52BT2 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T3 AND T4.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C31G AND CSC31 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C32G AND CSC32 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:05 PM Tab:DAR-D-S001-6

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 3) – OPT 2

DWG. NAME: DAR-D-S001-6 | REVISION NO : B

DARDEN I HYDROGEN

DARDEN II BESS

DARDEN II PV

COLLECTOR #41 (HYDROGEN)
COLLECTOR #42 (HYDROGEN)
COLLECTOR #43A (BESS AUX)
COLLECTOR #43B (BESS AUX)
COLLECTOR #44A (BESS)
COLLECTOR #44B (BESS)
COLLECTOR #45A (BESS)
COLLECTOR #45B (BESS)
COLLECTOR #46 (PV)
COLLECTOR #47 (PV)
COLLECTOR #48 (PV)
COLLECTOR #49 (PV)

89F43LA 89F43LB 89F44LA 89F44LB 89F45LA 89F45LB

89F41L 89F42L 89F46L 89F47L 89F48L 89F49L

52F41 52F42 52F43 52F44 52F45 52F46 52F47 52F48 52F49

89F41B 89F42B 89F43B 89F44B 89F45B 89F46B 89F47B 89F48B 89F49B

OPTION

VTC41
CAP41 XX MVAR
89C41G K26 (NOTE 2)
VTC42
CSC41 K25 (NOTE 2)
CAP42 XX MVAR
89C42G K28 (NOTE 3)
CSC42 K27 (NOTE 3)
89C4L
52C4
89C4B

CONT. ON DWG DAR-D-S001-6

34.5 kV BUS
52BT2
K5 (NOTE 1)
89BT2/2
VT4

89M4
52M4
K6 (NOTE 1)

TRANSFORMER T4
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

A(X3) B(X1) C(X2) CCW
X
X0
NGR4 X.X Ω
OPTION
A(H3) B(H1) C(H2) ACB
H
H0

89T4
89B3/1
52B3
525 kV BUS

CONT. ON DWG DAR-D-S001-6
525 kV BUS T34

CONT. ON DWG DAR-D-S001-11

NORTH

Aø (SUBSTATION)
Aø (COLLECTION)
Bø (SUBSTATION)
Cø (COLLECTION)
Cø (SUBSTATION)
Bø (COLLECTION)

VOLTAGE PHASORS

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M3, 52M4 AND 52BT2 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T3 AND T4.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C41G AND CSC41 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C42G AND CSC42 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-7

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

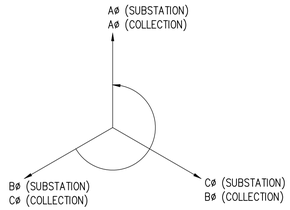
Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 4) – OPT 2

DWG. NAME: DAR-D-S001-7 | REVISION NO : B

CONT. ON DWG DAR-D-S001-4



VOLTAGE PHASORS

525 kV BUS L1

89B4/1 — 52B4 — 89B4/2 — 525 kV BUS T56

89T5

CVTL1

CVTT56

NORTH

89L1

525 kV LINE TO PG&E BAAH SWITCHYARD

TRANSFORMER T5
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

A(H1) B(H3) C(H2) ACB — H — H0

A(X1) B(X3) C(X2) CCW — X — X0

OPTION

NGR5
X.X Ω

52M5 — K7 (NOTE 1)

89M5

SST2
100 kVA XFMR
19,920-120/240 V

Aø

VT5 — 89BT3/1 — 34.5 kV BUS

CONT. ON DWG DAR-D-S001-9

89C5B — 52C5 — 89C5L

CSC52 K31 (NOTE 3)

89C52G K32 (NOTE 3)

CSC51 K29 (NOTE 2)

89C51G K30 (NOTE 2)

CAP52 XX MVAR

CAP51 XX MVAR

VTC52

VTC51

OPTION

89F51B — 52F51 — 89F51L — COLLECTOR #51 (PV)

89F52B — 52F52 — 89F52L — COLLECTOR #52 (PV)

89F53B — 52F53 — 89F53L — COLLECTOR #53 (PV)

89F54B — 52F54 — 89F54L — COLLECTOR #54 (PV)

DARDEN III PV

89F55B — 52F55 — 89F55LA — COLLECTOR #55A (BESS)

89F55LB — COLLECTOR #55B (BESS)

89F56B — 52F56 — 89F56LA — COLLECTOR #56A (BESS)

89F56LB — COLLECTOR #56B (BESS)

89F57B — 52F57 — 89F57LA — COLLECTOR #57A (BESS AUX)

89F57LB — COLLECTOR #57B (BESS AUX)

DARDEN III BESS

89F58B — 52F58 — 89F58L — COLLECTOR #58 (HYDROGEN)

89F59B — 52F59 — 89F59L — COLLECTOR #59 (HYDROGEN)

DARDEN II HYDROGEN

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M5, 52M6 AND 52BT3 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T5 AND T6.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C51G AND CSC51 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C52G AND CSC52 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-8

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 5) – OPT 2

DWG. NAME: DAR-D-S001-8 | REVISION NO : B

525 kV BUS T56

525 kV BUS T56

CONT. ON DWG DAR-D-S001-8

CONT. ON DWG DAR-D-S001-10

NORTH

89T6

M

TRANSFORMER T6
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

A(H1)
B(H3) C(H2)
ACB
H
HO
A(X1)
B(X3) C(X2)
CCW
X
XO
OPTION
NGR6
X.X Ω

52M6
K9
(NOTE 1)

89M6

VT6

52BT3

89BT3/2

34.5 kV BUS

K8
(NOTE 1)

89F61B 89F62B 89F63B 89F64B 89F65B 89F66B 89F67B 89F68B 89F69B

52F61 52F62 52F63 52F64 52F65 52F66 52F67 52F68 52F69

89F61L 89F62L

89F63LA 89F63LB 89F64LA 89F64LB 89F65LA 89F65LB

89F66L 89F67L 89F68L 89F69L

COLLECTOR #61 (HYDROGEN)
COLLECTOR #62 (HYDROGEN)
COLLECTOR #63A (BESS AUX)
COLLECTOR #63B (BESS AUX)
COLLECTOR #64A (BESS)
COLLECTOR #64B (BESS)
COLLECTOR #65A (BESS)
COLLECTOR #65B (BESS)
COLLECTOR #66 (PV)
COLLECTOR #67 (PV)
COLLECTOR #68 (PV)
COLLECTOR #69 (PV)

DARDEN II HYDROGEN
DARDEN III BESS
DARDEN III PV

89C6B
52C6
89C6L
CSC62
K35
(NOTE 3)
89C62G
K36
(NOTE 3)
CAP62
XX MVAR
VTC62
CSC61
K33
(NOTE 2)
89C61G
K34
(NOTE 2)
CAP61
XX MVAR
VTC61
OPTION

A∅ (SUBSTATION)
A∅ (COLLECTION)
B∅ (SUBSTATION)
C∅ (COLLECTION)
C∅ (SUBSTATION)
B∅ (COLLECTION)
VOLTAGE PHASORS

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M5, 52M6 AND 52BT3 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T5 AND T6.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C61G AND CSC61 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C62G AND CSC62 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-9

"Engineering with Distinction"
ECI ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 6) – OPT 2

DWG. NAME: DAR-D-S001-9 | REVISION NO : B

CONT. ON DWG DAR-D-S001-9

525 kV BUS T56

89B5/1 — 52B5 — 89B5/2

525 kV BUS T78

89T7

CVTT78

NORTH

CONT. ON DWG DAR-D-S001-11

A∅ (SUBSTATION)
A∅ (COLLECTION)
B∅ (SUBSTATION)
C∅ (COLLECTION)
C∅ (SUBSTATION)
B∅ (COLLECTION)

VOLTAGE PHASORS

TRANSFORMER T7
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

A(H1) B(H3) C(H2) ACB — H — H0
A(X1) B(X3) C(X2) CCW — X — X0

OPTION
NGR7
X.X Ω

52M7 — K10 (NOTE 1)

89M7

VT7

89BT4/1

34.5 kV BUS

89C7B — 52C7 — 89C7L — CSC72 K39 (NOTE 3) — 89C72G K40 (NOTE 3) — CAP72 XX MVAR — CSC71 K37 (NOTE 2) — 89C71G K38 (NOTE 2) — CAP71 XX MVAR — VTC72 — VTC71

OPTION

89F71B 89F72B 89F73B 89F74B 89F75B 89F76B 89F77B 89F78B 89F79B

52F71 52F72 52F73 52F74 52F75 52F76 52F77 52F78 52F79

89F71L 89F72L 89F73L 89F74L

89F75LA 89F75LB 89F76LA 89F76LB 89F77LA 89F77LB

89F78L 89F79L

COLLECTOR #71 (PV)
COLLECTOR #72 (PV)
COLLECTOR #73 (PV)
COLLECTOR #74 (PV)

DARDEN IV PV

COLLECTOR #75A (BESS)
COLLECTOR #75B (BESS)
COLLECTOR #76A (BESS)
COLLECTOR #76B (BESS)
COLLECTOR #77A (BESS AUX)
COLLECTOR #77B (BESS AUX)

DARDEN IV BESS

COLLECTOR #78 (HYDROGEN)
COLLECTOR #79 (HYDROGEN)

DARDEN II HYDROGEN

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M7, 52M8 AND 52BT4 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T7 AND T8.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C71G AND CSC71 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C72G AND CSC72 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-10

"Engineering with Distinction"
ECI ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 7) – OPT 2

DWG. NAME: DAR-D-S001-10 | REVISION NO : B

CONT. ON DWG DAR-D-S001-7

525 kV BUS T78

89B3/2

525 kV BUS

89T8

M

A(H1)
B(H3) C(H2)
ACB

TRANSFORMER T8
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

H
HO

A(X1)
B(X3) C(X2)
CCW

X
XO

OPTION

NGR8
X.X Ω

52M8

K12
(NOTE 1)

89M8

CONT. ON DWG DAR-D-S001-10

34.5 kV BUS

52BT4

K11
(NOTE 1)

89BT4/2

VT8

89F81B 89F82B 89F83B 89F84B 89F85B 89F86B 89F87B 89F88B 89F89B

89C8B

52C8

89C8L

CSC82
K43
(NOTE 3)

89C82G
K44
(NOTE 3)

CAP82
XX MVAR

VTC82

CSC81
K41
(NOTE 2)

89C81G
K42
(NOTE 2)

CAP81
XX MVAR

VTC81

OPTION

52F81 52F82 52F83 52F84 52F85 52F86 52F87 52F88 52F89

89F81L 89F82L 89F86L 89F87L 89F88L 89F89L

89F83LA 89F83LB 89F84LA 89F84LB 89F85LA 89F85LB

COLLECTOR #81 (HYDROGEN)
COLLECTOR #82 (HYDROGEN)
COLLECTOR #83A (BESS AUX)
COLLECTOR #83B (BESS AUX)
COLLECTOR #84A (BESS)
COLLECTOR #84B (BESS)
COLLECTOR #85A (BESS)
COLLECTOR #85B (BESS)
COLLECTOR #86 (PV)
COLLECTOR #87 (PV)
COLLECTOR #88 (PV)
COLLECTOR #89 (PV)

DARDEN II HYDROGEN
DARDEN IV BESS
DARDEN IV PV

Aø (SUBSTATION)
Aø (COLLECTION)
Bø (SUBSTATION)
Cø (COLLECTION)
Cø (SUBSTATION)
Bø (COLLECTION)

VOLTAGE PHASORS

NORTH

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M7, 52M8 AND 52BT4 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T7 AND T8.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C81G AND CSC81 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C82G AND CSC82 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-11

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

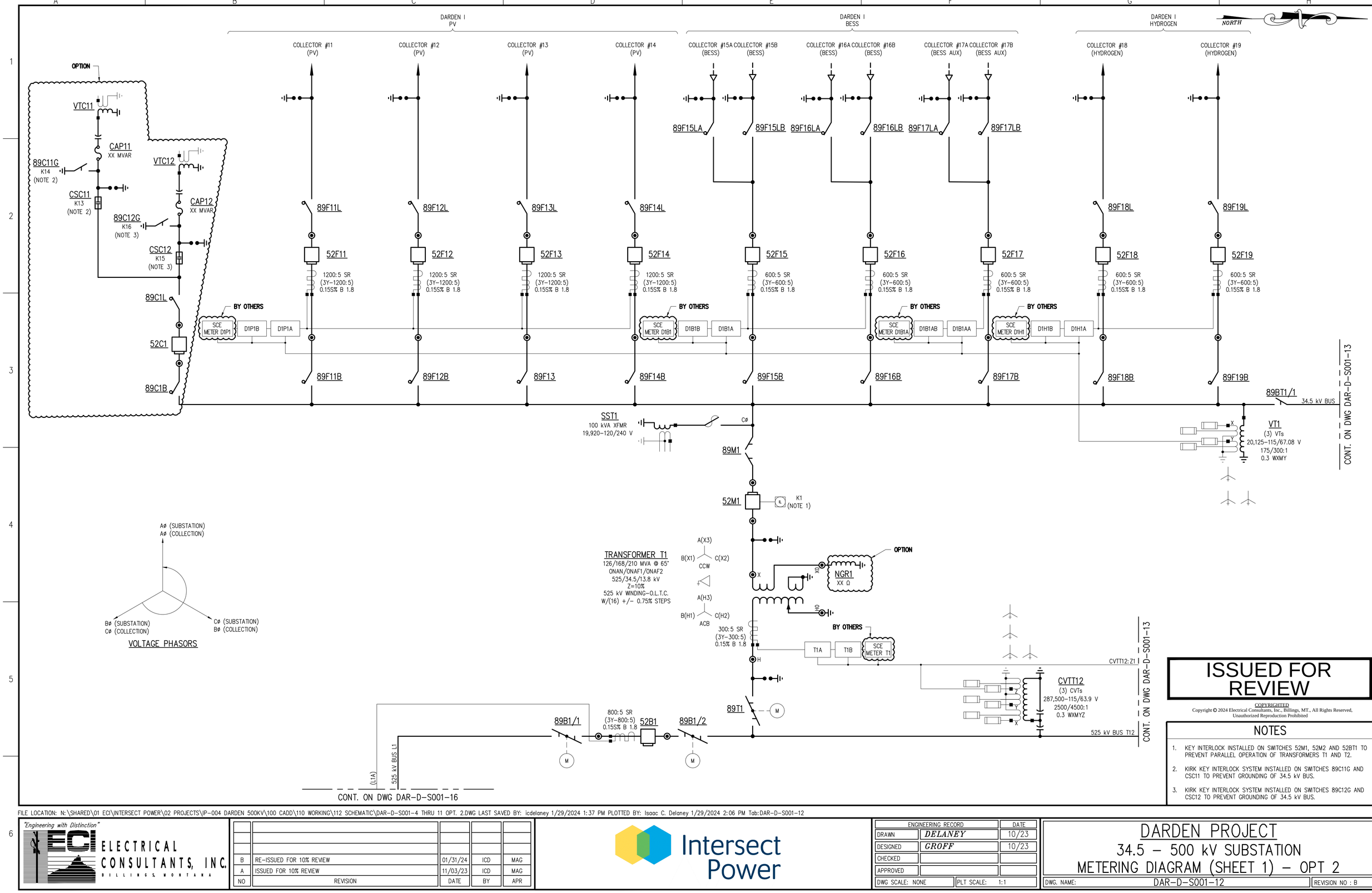
NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
SWITCHING DIAGRAM (SHEET 8) – OPT 2

DWG. NAME: DAR-D-S001-11 | REVISION NO : B



ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M1, 52M2 AND 52BT1 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T1 AND T2.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C11G AND CSC11 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C12G AND CSC12 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-12

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
METERING DIAGRAM (SHEET 1) – OPT 2

DWG. NAME: DAR-D-S001-12 | REVISION NO : B

DARDEN I HYDROGEN

DARDEN I BESS

DARDEN I PV

NORTH

COLLECTOR #21 (HYDROGEN)
COLLECTOR #22 (HYDROGEN)
COLLECTOR #23A (BESS AUX)
COLLECTOR #23B (BESS AUX)
COLLECTOR #24A (BESS)
COLLECTOR #24B (BESS)
COLLECTOR #25A (BESS)
COLLECTOR #25B (BESS)
COLLECTOR #26 (PV)
COLLECTOR #27 (PV)
COLLECTOR #28 (PV)
COLLECTOR #29 (PV)

89F23LA 89F23LB 89F24LA 89F24LB 89F25LA 89F25LB

89F21L 89F22L 89F26L 89F27L 89F28L 89F29L

52F21 52F22 52F23 52F24 52F25 52F26 52F27 52F28 52F29

600:5 SR (3Y-600:5) 0.15% B 1.8
1200:5 SR (3Y-1200:5) 0.15% B 1.8

BY OTHERS

SCE METER D1H2 — D1H2B — D1H2A
SCE METER D1B2A — D1B2AB — D1B2AA
SCE METER D1B2 — D1B2B — D1B2A
SCE METER D1P2 — D1P2B — D1P2A

89F21B 89F22B 89F23B 89F24B 89F25B 89F26B 89F27B 89F28B 89F29B

OPTION

VTC21
CAP21 XX MVAR
89C21G K18 (NOTE 2)
VTC22
CSC21 K17 (NOTE 2)
CAP22 XX MVAR
89C22G K20 (NOTE 3)
CSC22 K19 (NOTE 3)
89C2L
52C2
89C2B

CONT. ON DWG DAR-D-S001-12

34.5 kV BUS
52BT1
89BT1/2
K2 (NOTE 1)

VT2
(3) VTs
20,125-115/67.08 V
175/300:1
0.3 WXMY

89M2
52M2
K3 (NOTE 1)

TRANSFORMER T2
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

A(X3) B(X1) C(X2) CCW
A(H3) B(H1) C(H2) ACB

X0 NGR2 X.X Ω
H0

300:5 SR (3Y-300:5) 0.15% B 1.8

BY OTHERS
SCE METER T2 — T2B — T2A

89T2 M

CONT. ON DWG DAR-D-S001-12 — CVTT12:Z1

525 kV BUS T12

CONT. ON DWG DAR-D-S001-14

Aø (SUBSTATION) Aø (COLLECTION)
Bø (SUBSTATION) Cø (COLLECTION)
Cø (SUBSTATION) Bø (COLLECTION)

VOLTAGE PHASORS

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M1, 52M2 AND 52BT1 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T1 AND T2.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C21G AND CSC21 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C22G AND CSC22 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-13

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
METERING DIAGRAM (SHEET 2) – OPT 2

DWG. NAME: DAR-D-S001-13 | REVISION NO : B

DARDEN II PV

DARDEN II BESS

DARDEN I HYDROGEN

COLLECTOR #31 (PV)
COLLECTOR #32 (PV)
COLLECTOR #33 (PV)
COLLECTOR #34 (PV)
COLLECTOR #35A (BESS)
COLLECTOR #35B (BESS)
COLLECTOR #36A (BESS)
COLLECTOR #36B (BESS)
COLLECTOR #37A (BESS AUX)
COLLECTOR #37B (BESS AUX)
COLLECTOR #38 (HYDROGEN)
COLLECTOR #39 (HYDROGEN)

NORTH

OPTION

VTC31
CAP31
XX MVAR
89C31G
K22
(NOTE 2)
CSC31
K21
(NOTE 2)
VTC32
CAP32
XX MVAR
89C32G
K24
(NOTE 3)
CSC32
K23
(NOTE 3)
89C3L
52C3
89C3B

89F31L
89F32L
89F33L
89F34L
89F35LA
89F35LB
89F36LA
89F36LB
89F37LA
89F37LB
89F38L
89F39L

52F31
52F32
52F33
52F34
52F35
52F36
52F37
52F38
52F39

1200:5 SR
(3Y-1200:5)
0.15% B 1.8

600:5 SR
(3Y-600:5)
0.15% B 1.8

BY OTHERS
SCE METER D2P1
D2P1B
D2P1A
SCE METER D2B1
D2B1B
D2B1A
SCE METER D2B1A
D2B1AB
D2B1AA
SCE METER D1H3
D1H3B
D1H3A

89F31B
89F32B
89F33B
89F34B
89F35B
89F36B
89F37B
89F38B
89F39B

89BT2/1
34.5 kV BUS

CONT. ON DWG DAR-D-S001-15

VT3
(3) VTs
20,125-115/67.08 V
175/300:1
0.3 WXMY

89M3
52M3
K4
(NOTE 1)

TRANSFORMER T3
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

A(X3)
B(X1)
C(X2)
CCW
A(H3)
B(H1)
C(H2)
ACB

OPTION
NGR3
XX Ω

300:5 SR
(3Y-300:5)
0.15% B 1.8

BY OTHERS
T3A
T3B
SCE METER T3

89T3

CVTT34:Z1

CVTT34
(3) CVTs
287,500-115/63.9 V
2500/4500:1
0.3 WXMYZ

A∅ (SUBSTATION)
A∅ (COLLECTION)
B∅ (SUBSTATION)
C∅ (COLLECTION)
C∅ (SUBSTATION)
B∅ (COLLECTION)

VOLTAGE PHASORS

CONT. ON DWG DAR-D-S001-13
525 kV BUS T12
89B2/1
52B2
89B2/2
525 kV BUS T34
CONT. ON DWG DAR-D-S001-15

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M3, 52M4 AND 52BT2 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T3 AND T4.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C31G AND CSC31 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C32G AND CSC32 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-14

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
METERING DIAGRAM (SHEET 3) – OPT 2

DWG. NAME: DAR-D-S001-14
REVISION NO : B

DARDEN I HYDROGEN

DARDEN II BESS

DARDEN II PV

NORTH

COLLECTOR #41 (HYDROGEN)
COLLECTOR #42 (HYDROGEN)
COLLECTOR #43A (BESS AUX)
COLLECTOR #43B (BESS AUX)
COLLECTOR #44A (BESS)
COLLECTOR #44B (BESS)
COLLECTOR #45A (BESS)
COLLECTOR #45B (BESS)
COLLECTOR #46 (PV)
COLLECTOR #47 (PV)
COLLECTOR #48 (PV)
COLLECTOR #49 (PV)

89F43LA 89F43LB 89F44LA 89F44LB 89F45LA 89F45LB

89F41L 89F42L 89F46L 89F47L 89F48L 89F49L

52F41 52F42 52F43 52F44 52F45 52F46 52F47 52F48 52F49

600:5 SR (3Y–600:5) 0.15S% B 1.8

1200:5 SR (3Y–1200:5) 0.15S% B 1.8

BY OTHERS

SCE METER D1H4 — D1H4B — D1H4A

SCE METER D2B2A — D2B2AB — D2B2AA

SCE METER D2B2 — D2B2B — D2B2A

SCE METER D2P2 — D2P2B — D2P2A

89F41B 89F42B 89F43B 89F44B 89F45B 89F46B 89F47B 89F48B 89F49B

OPTION

VTC41

CAP41 XX MVAR

89C41G K26 (NOTE 2)

VTC42

CSC41 K25 (NOTE 2)

CAP42 XX MVAR

89C42G K28 (NOTE 3)

CSC42 K27 (NOTE 3)

89C4L

52C4

89C4B

CONT. ON DWG DAR–D–S001–14

52BT2

89BT2/2

34.5 kV BUS

K5 (NOTE 1)

VT4
(3) VTs
20,125–115/67.08 V
175/300:1
0.3 WXMY

89M4

52M4

K6 (NOTE 1)

TRANSFORMER T4
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING–O.L.T.C.
W/(16) +/– 0.75% STEPS

A(X3) B(X1) C(X2) CCW

A(H3) B(H1) C(H2) ACB

OPTION

NGR4 X.X Ω

X0

H0

300:5 SR (3Y–300:5) 0.15% B 1.8

BY OTHERS

SCE METER T4 — T4B — T4A

CVTT34:Z1

89T4

525 kV BUS T34

89B3/1 52B3 89B3/2

525 kV BUS

CONT. ON DWG DAR–D–S001–19

A∅ (SUBSTATION)
A∅ (COLLECTION)
B∅ (SUBSTATION)
C∅ (COLLECTION)
C∅ (SUBSTATION)
B∅ (COLLECTION)

VOLTAGE PHASORS

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M3, 52M4 AND 52BT2 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T3 AND T4.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C41G AND CSC41 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C42G AND CSC42 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP–004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR–D–S001–4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR–D–S001–15

"Engineering with Distinction"

ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE–ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
METERING DIAGRAM (SHEET 4) – OPT 2

DWG. NAME: DAR–D–S001–15 | REVISION NO : B

CONT. ON DWG DAR-D-S001-12

A∅ (SUBSTATION)
A∅ (COLLECTION)
B∅ (SUBSTATION)
C∅ (COLLECTION)
C∅ (SUBSTATION)
B∅ (COLLECTION)
VOLTAGE PHASORS

(L1A)
525 kV BUS L1

BY OTHERS
SCE METER L1
L1B
L1A

CVT1
(3) CVTs
287,500–115/63.9 V
2500/4500:1
0.3 WXMYZ

89L1

525 kV LINE TO PG&E BAAH SWITCHYARD

89B4/1
800:5 SR
(3Y–800:5)
0.15% B 1.8
52B4
89B4/2

525 kV BUS T56

89T5

BY OTHERS
T5A
T5B
SCE METER T5

CVTT56
(3) CVTs
287,500–115/63.9 V
2500/4500:1
0.3 WXMYZ

CVTT56: Z1

NORTH

TRANSFORMER T5
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING–O.L.T.C.
W/(16) +/– 0.75% STEPS

300:5 SR
(3Y–300:5)
0.15% B 1.8

A(H1) B(H3) C(H2) ACB
A(X1) B(X3) C(X2) CCW

OPTION
NGR5
X.X Ω

52M5
K7
(NOTE 1)

89M5

SST2
100 kVA XFMR
19,920–120/240 V
A∅

VT5
(3) VTs
20,125–115/67.08 V
175/300:1
0.3 WXMY

89BT3/1

34.5 kV BUS

89C5B
52C5
89C5L
CSC52
K31
(NOTE 3)
89C52G
K32
(NOTE 3)
CSC51
K29
(NOTE 2)
CAP52
XX MVAR
89C51G
K30
(NOTE 2)
CAP51
XX MVAR
VTC52
VTC51
OPTION

89F51B 89F52B 89F53B 89F54B 89F55B 89F56B 89F57B 89F58B 89F59B

BY OTHERS
D3P1A D3P1B SCE METER D3P1
D3B1A D3B1B SCE METER D3B1
D3B1AA D3B1AB SCE METER D3B1A
D2H1A D2H1B SCE METER D2H1

1200:5 SR (3Y–1200:5) 0.15% B 1.8
600:5 SR (3Y–600:5) 0.15% B 1.8

52F51 52F52 52F53 52F54 52F55 52F56 52F57 52F58 52F59

89F51L 89F52L 89F53L 89F54L 89F55LA 89F55LB 89F56LA 89F56LB 89F57LA 89F57LB 89F58L 89F59L

COLLECTOR #51 (PV)
COLLECTOR #52 (PV)
COLLECTOR #53 (PV)
COLLECTOR #54 (PV)
DARDEN III PV

COLLECTOR #55A (BESS)
COLLECTOR #55B (BESS)
COLLECTOR #56A (BESS)
COLLECTOR #56B (BESS)
COLLECTOR #57A (BESS AUX)
COLLECTOR #57B (BESS AUX)
DARDEN III BESS

COLLECTOR #58 (HYDROGEN)
COLLECTOR #59 (HYDROGEN)
DARDEN II HYDROGEN

CONT. ON DWG DAR-D-S001-17

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M5, 52M6 AND 52BT3 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T5 AND T6.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C51G AND CSC51 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C52G AND CSC52 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-16

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
METERING DIAGRAM (SHEET 5) – OPT 2

DWG. NAME: DAR-D-S001-16 | REVISION NO : B

525 kV BUS T56

525 kV BUS T56

CONT. ON DWG DAR-D-S001-16

CONT. ON DWG DAR-D-S001-18

NORTH

CVTT56: Z1

89T6

M

BY OTHERS

SCE METER T6

T6B

T6A

300:5 SR (3Y-300:5) 0.15% B 1.8

H

HO

X

XO

OPTION

NGR6

X.X Ω

TRANSFORMER T6

126/168/210 MVA @ 65°

ONAN/ONAF1/ONAF2

525/34.5/13.8 kV

Z=10%

525 kV WINDING-O.L.T.C.

W/(16) +/- 0.75% STEPS

A(H1)

B(H3) C(H2)

ACB

A(X1)

B(X3) C(X2)

CCW

52M6

K9 (NOTE 1)

89M6

A∅ (SUBSTATION)
A∅ (COLLECTION)

B∅ (SUBSTATION)
C∅ (COLLECTION)

C∅ (SUBSTATION)
B∅ (COLLECTION)

VOLTAGE PHASORS

VT6

(3) VTs

20,125-115/67.08 V

175/300:1

0.3 WXMY

52BT3

89BT3/2

34.5 kV BUS

K8 (NOTE 1)

89F61B 89F62B 89F63B 89F64B 89F65B 89F66B 89F67B 89F68B 89F69B

89C6B

52C6

89C6L

CSC62 K35 (NOTE 3)

89C62G K36 (NOTE 3)

CAP62 XX MVAR

CSC61 K33 (NOTE 2)

89C61G K34 (NOTE 2)

VTC62

CAP61 XX MVAR

VTC61

OPTION

BY OTHERS

SCE METER D2H2

D2H2B

D2H2A

BY OTHERS

SCE METER D3B2A

D3B2AB

D3B2AA

BY OTHERS

SCE METER D3B2

D3B2B

D3B2A

BY OTHERS

SCE METER D3P2

D3P2B

D3P2A

600:5 SR (3Y-600:5) 0.15S% B 1.8

1200:5 SR (3Y-1200:5) 0.15S% B 1.8

52F61 52F62 52F63 52F64 52F65 52F66 52F67 52F68 52F69

89F61L 89F62L 89F66L 89F67L 89F68L 89F69L

89F63LA 89F63LB 89F64LA 89F64LB 89F65LA 89F65LB

COLLECTOR #61 (HYDROGEN)

COLLECTOR #62 (HYDROGEN)

COLLECTOR #63A (BESS AUX)

COLLECTOR #63B (BESS AUX)

COLLECTOR #64A (BESS)

COLLECTOR #64B (BESS)

COLLECTOR #65A (BESS)

COLLECTOR #65B (BESS)

COLLECTOR #66 (PV)

COLLECTOR #67 (PV)

COLLECTOR #68 (PV)

COLLECTOR #69 (PV)

DARDEN II HYDROGEN

DARDEN III BESS

DARDEN III PV

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M5, 52M6 AND 52BT3 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T5 AND T6.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C61G AND CSC61 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C62G AND CSC62 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-17

"Engineering with Distinction"

ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

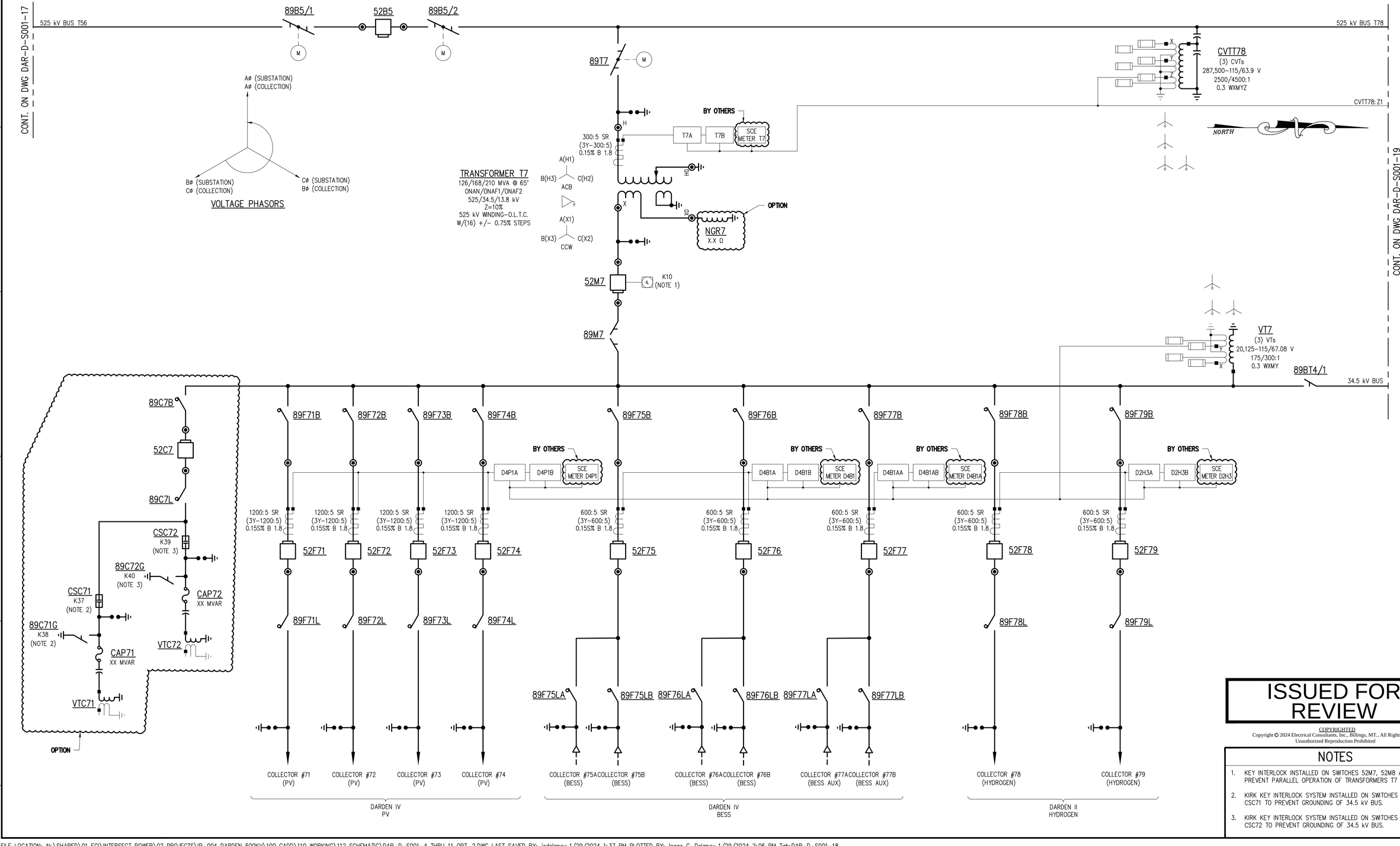
Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
METERING DIAGRAM (SHEET 6) – OPT 2

DWG. NAME: DAR-D-S001-17

REVISION NO : B



ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M7, 52M8 AND 52BT4 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T7 AND T8.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C71G AND CSC71 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C72G AND CSC72 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-18

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN PROJECT
34.5 – 500 kV SUBSTATION
METERING DIAGRAM (SHEET 7) – OPT 2

DWG. NAME: DAR-D-S001-18 | REVISION NO : B

CONT. ON DWG DAR-D-S001-15

525 kV BUS

CONT. ON DWG DAR-D-S001-18

525 kV BUS T78

CVTT78: Z1

89T8

M

BY OTHERS

SCE METER T8

T8B

T8A

H

300:5 SR
(3Y-300:5)
0.15% B 1.8

TRANSFORMER T8
126/168/210 MVA @ 65°
ONAN/ONAF1/ONAF2
525/34.5/13.8 kV
Z=10%
525 kV WINDING-O.L.T.C.
W/(16) +/- 0.75% STEPS

A(H1)
B(H3) C(H2)
ACB

A(X1)
B(X3) C(X2)
CCW

X

H0

X0

OPTION

NGR8
X.X Ω

52M8

K12
(NOTE 1)

89M8

VT8
(3) VTs
20,125-115/67.08 V
175/300:1
0.3 WXMY

52BT4

89BT4/2

34.5 kV BUS

K11
(NOTE 1)

89F81B

89F82B

89F83B

89F84B

89F85B

89F86B

89F87B

89F88B

89F89B

89C8B

52C8

89C8L

CSC82
K43
(NOTE 3)

89C82G
K44
(NOTE 3)

CAP82
XX MVAR

VTC82

CSC81
K41
(NOTE 2)

89C81G
K42
(NOTE 2)

CAP81
XX MVAR

VTC81

OPTION

BY OTHERS

SCE METER D2H4

D2H4B

D2H4A

SCE METER D4B2A

D4B2AB

D4B2AA

SCE METER D4B2

D4B2B

D4B2A

SCE METER D4P2

D4P2B

D4P2A

600:5 SR
(3Y-600:5)
0.15S% B 1.8

1200:5 SR
(3Y-1200:5)
0.15S% B 1.8

52F81

52F82

52F83

52F84

52F85

52F86

52F87

52F88

52F89

89F81L

89F82L

89F83LA

89F83LB

89F84LA

89F84LB

89F85LA

89F85LB

89F86L

89F87L

89F88L

89F89L

COLLECTOR #81
(HYDROGEN)

COLLECTOR #82
(HYDROGEN)

COLLECTOR #83A
(BESS AUX)

COLLECTOR #83B
(BESS AUX)

COLLECTOR #84A
(BESS)

COLLECTOR #84B
(BESS)

COLLECTOR #85A
(BESS)

COLLECTOR #85B
(BESS)

COLLECTOR #86
(PV)

COLLECTOR #87
(PV)

COLLECTOR #88
(PV)

COLLECTOR #89
(PV)

DARDEN II
HYDROGEN

DARDEN IV
BESS

DARDEN IV
PV

A∅ (SUBSTATION)
A∅ (COLLECTION)

B∅ (SUBSTATION)
C∅ (COLLECTION)

C∅ (SUBSTATION)
B∅ (COLLECTION)

VOLTAGE PHASORS

NORTH

ISSUED FOR REVIEW

NOTES

1. KEY INTERLOCK INSTALLED ON SWITCHES 52M7, 52M8 AND 52BT4 TO PREVENT PARALLEL OPERATION OF TRANSFORMERS T7 AND T8.
2. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C81G AND CSC81 TO PREVENT GROUNDING OF 34.5 kV BUS.
3. KIRK KEY INTERLOCK SYSTEM INSTALLED ON SWITCHES 89C82G AND CSC82 TO PREVENT GROUNDING OF 34.5 kV BUS.

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\100 CADD\110 WORKING\112 SCHEMATIC\DAR-D-S001-4 THRU 11 OPT. 2.DWG LAST SAVED BY: icdelaney 1/29/2024 1:37 PM PLOTTED BY: Isaac C. Delaney 1/29/2024 2:06 PM Tab:DAR-D-S001-19

"Engineering with Distinction"

ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
B	RE-ISSUED FOR 10% REVIEW	01/31/24	ICD	MAG
A	ISSUED FOR 10% REVIEW	11/03/23	ICD	MAG

Intersect Power

ENGINEERING RECORD		DATE
DRAWN	DELANEY	10/23
DESIGNED	GROFF	10/23
CHECKED		
APPROVED		
DWG SCALE: NONE	PLT SCALE: 1:1	

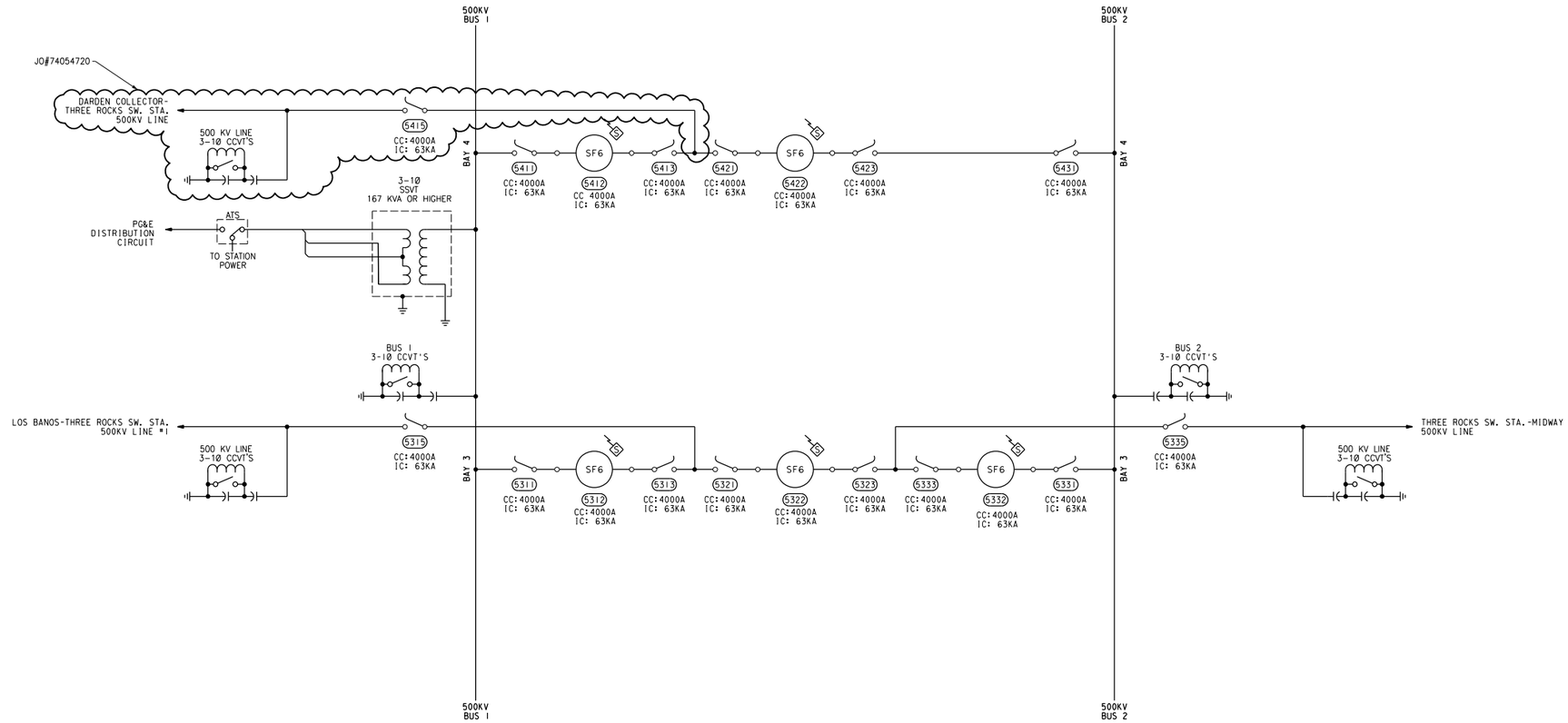
DARDEN PROJECT
34.5 – 500 kV SUBSTATION
METERING DIAGRAM (SHEET 8) – OPT 2

DWG. NAME: DAR-D-S001-19

REVISION NO : B

LINE NAMES CHECKED BY
CH
DATE - -

PRELIMINARY - NOT FOR CONSTRUCTION



ASSUMPTIONS

NOTES

REFERENCES

	DWG NO.
ULTIMATE SINGLE LINE DIAGRAM	DARDEN USLD
GENERAL ARRANGEMENT OUTDOORS	DARDEN GAO
ULTIMATE GENERAL ARRANGEMENT OUTDOORS	DARDEN UGAO

LEGEND

- (SF6) - 500KV CIRCUIT BREAKER
- - 500KV VERTICAL BREAK DISCONNECT SWITCHES
- (XXXX) - EQUIPMENT NUMBERS
- IC - INTERRUPTING CAPACITY
- CC - CONTINUOUS CURRENT
- (S) - SUPERVISORY CONTROL

P.G.&E. SYSTEM PHASE SEQUENCE A-C-B

OPTION 2

THREE ROCKS SWITCHING STATION NAME TO BE CONFIRMED BY PG&E

ELECTRIC TRANSMISSION ENGINEERING & CONSTRUCTION
FOR QUESTIONS ON REV A-C OF THIS DWG
Call DASHIELL-MATT CLARK at 713-578-6263
Call DASHIELL-RAJA KODURU at 713-578-6218

TRANSMISSION & SUBSTATION	SUBSTATION	ELECTRICAL	THREE ROCKS SWITCHING STATION	SINGLE LINE DIAGRAM	ACTIVE		SUBSTATION	500KV
BUSINESS LINE	FACILITY TYPE	DISCIPLINE	FACILITY NAME	DRAWING TYPE	STATUS	DWG STATE	FACILITY COMPONENT	UNIT
								500KV BAAH

REV	DATE	DESCRIPTION	JOB NO	DSC/DWG	CHKD	SUPV	APVD
C	01/23/24	REVISED STATION NAME	74054722	MC/EC	MC	RKK	RKK
–	–	AND BREAKER AMPACITY	74054720	–	–	–	–
B	11/28/23	UPDATED PER PG&E INITIAL COMMENTS	74054722	CC/CM	CC	RKK	RKK
			74054720				
A	–	ISSUED FOR PRELIMINARY USE		JE/CM	CC	RKK	RKK

W.O.	REV. A
DSG	J. EMMERT
DWN	C. MARTIN
CHKD	C. CHARPENTIER
SUPV	R. KODURU
APVD	R. KODURU
APVD	
DATE	

PG&E

SINGLE LINE DIAGRAM
THREE ROCKS SWITCHING STATION
DEPARTMENT OF ENGINEERING
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

SCAN	IC
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO	SHEETS
THREE SLD 2	REV C

DRAWING NUMBER THREE SLD 2

CAD USER: CWN DATE: 07-22-22
FILE: THREE ROCKS SLD.DGN
KEYSH:

ETECAS (44x34)

Appendix E

DR TSD-4 Grounding Detail

STRUCTURE GROUNDING PROCEDURE

TESTING TO BE PERFORMED AFTER CONSTRUCTION IS COMPLETED AND ALL CONNECTIONS ARE MADE TO OVERHEAD STATIC WIRE.

↓

DRIVE ONE (1) 5/8" X 10' GROUNDING ELECTRODE LOCATED AS SHOWN IN DETAIL 1 (ROD #1).

↓

TEST GROUND RESISTANCE PER SPECIFICATION.

↓

GROUND RESISTANCE MEASUREMENT IS 25 OHMS OR LESS?

YES → FINISHED: CONNECTION TO THE STRUCTURE CAN BE COMPLETED AT THIS TIME. ALL READINGS SHALL BE RECORDED AND PROVIDED TO OWNER.

NO ↓

DRIVE SECOND 5/8" X 10' GROUNDING ELECTRODE LOCATED AS SHOWN IN DETAIL 1 (ROD #2) AND CONNECT TO THE FIRST GROUNDING ELECTRODE USING CONNECTOR.

↓

TEST GROUND RESISTANCE PER SPECIFICATION.

↓

GROUND RESISTANCE MEASUREMENT IS 25 OHMS OR LESS?

YES → FINISHED: CONNECTION TO THE STRUCTURE CAN BE COMPLETED AT THIS TIME. ALL READINGS SHALL BE RECORDED AND PROVIDED TO OWNER.

NO ↓

DRIVE THIRD 5/8" X 10' GROUNDING ELECTRODE LOCATED AS SHOWN IN DETAIL 1 (ROD #3) AND CONNECT TO THE FIRST GROUNDING ELECTRODE USING CONNECTOR.

↓

TEST GROUND RESISTANCE PER SPECIFICATION.

↓

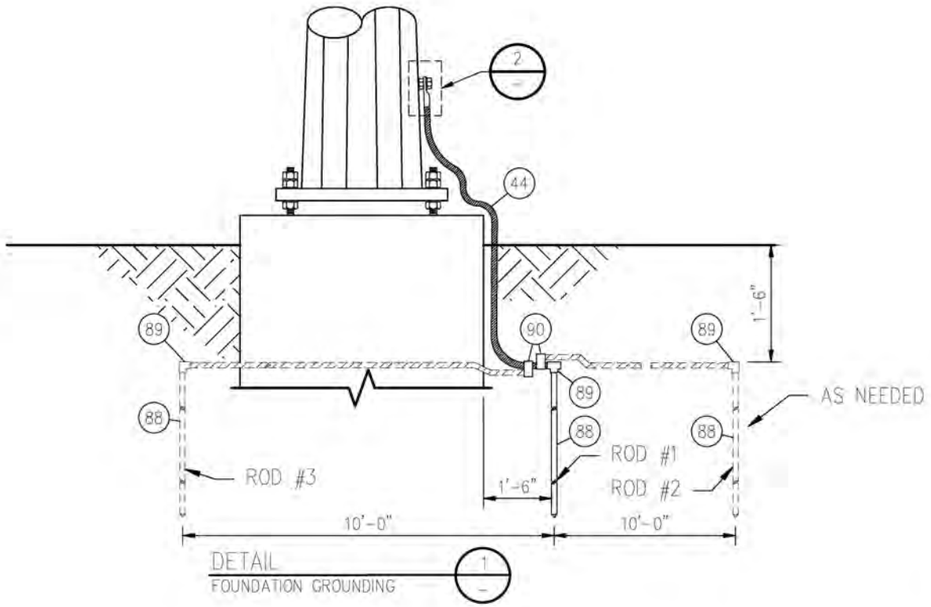
FINISHED

CONNECTION TO THE STRUCTURE CAN BE COMPLETED AT THIS TIME. ALL READINGS SHALL BE RECORDED AND PROVIDED TO OWNER. GROUND CONNECTIONS NOT MEETING THE SPECIFIED 25 OHM RESISTANCE. REPEAT ABOVE STEPS UNTIL RESISTANCE IS MET.

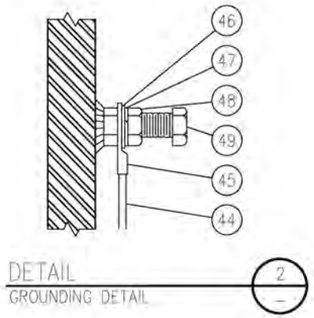
ITEM	QTY	MATERIAL DESCRIPTION FOR TM-SPG	VENDOR	PART NO.
44	40	CONDUCTOR, #2 AWG, 7-STRANDED COPPER	ANY	[illegible]
45	1	COMPRESSION TERMINAL, 1-HOLE, FOR #2 COPPER	BURNDY	YA2CN
46	1	WASHER, ROUND, 1/2", SILICON BRONZE	HUBBELL	HFB500
47	1	WASHER, BELLEVILLE, 1/2", STAINLESS STEEL	HUBBELL	BW500
48	1	NUT, HEX, 1/2", SILICON BRONZE	HUBBELL	HNB500
49	1	BOLT, 1/2" X 1-1/2", SILICON BRONZE	HUBBELL	HBB150
88	3	GROUND ROD, 5/8" X 10" LENGTH, COPPER CLAD, PER UL467U	ERICO	615800
89	3	CADWELD, CABLE TO GROUND ROD, WITH TAP, #2 AWG STRANDED	ERICO	NCR161V
90	2	CONNECTOR, C-TAP, #2 - #2	BURNDY	YC2C2

GENERAL NOTES

1. MATERIAL SHOWN FOR ONE ASSEMBLY WIH THREE (3) GROUND RODS.



DETAIL 1 — FOUNDATION GROUNDING



DETAIL 2 — GROUNDING DETAIL

ISSUED FOR REVIEW

FILE LOCATION: N:\SHARED\01 ECI\INTERSECT POWER\02 PROJECTS\IP-004 DARDEN 500KV\04 T-LINE\100 CADD\110 WORKING\113 STRUCTURE FRAMING\DAR-B-T003-SH08-A.DWG LAST SAVED BY: dlwee 1/17/2024 8:14 AM PLOTTED BY: David J. Weir 1/17/2024 8:23 AM Tab:TWDE-3450CS-J

"Engineering with Distinction" ECI ELECTRICAL CONSULTANTS, INC. BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
A	ISSUED FOR 10% REVIEW	01/17/24	DJW	KWV

Intersect Power

ENGINEERING RECORD		DATE
DRAWN:	DJW	01/17/24
DESIGNED:	RMH	01/17/24
CHECKED:	KWV	01/17/24
APPROVED:	AJM	01/17/24
DWG SCALE: NONE	PLT SCALE: 1:1	

DARDEN SOLAR 500kV TRANSMISSION LINE

STRUCTURE GROUNDING ASSEMBLY TM-SPG

DWG NAME: DAR-B-T003-8 | REVISION NO.: A