INDEX OF PLANS

SHEET No.	DESCRIPTION
1	TITLE AND LOCATION MAP
STRUCTURE PLANS	
2	GENERAL PLAN AND LEGEND
3-5	ELECTRICAL PLANS

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS NCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK.

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR BUILDING CONSTRUCTION

IN HUMBOLDT COUNTY
IN EUREKA
AT THE DISTRICT 1 OFFICE BUILDING
AT 1656 UNION STREET

TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2006

Dist	COUNTY	LOCATION CODE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	5506		1	5

LOCATION MAP

CALIFORNIA STATE FIRE MARSHAL APPROVED

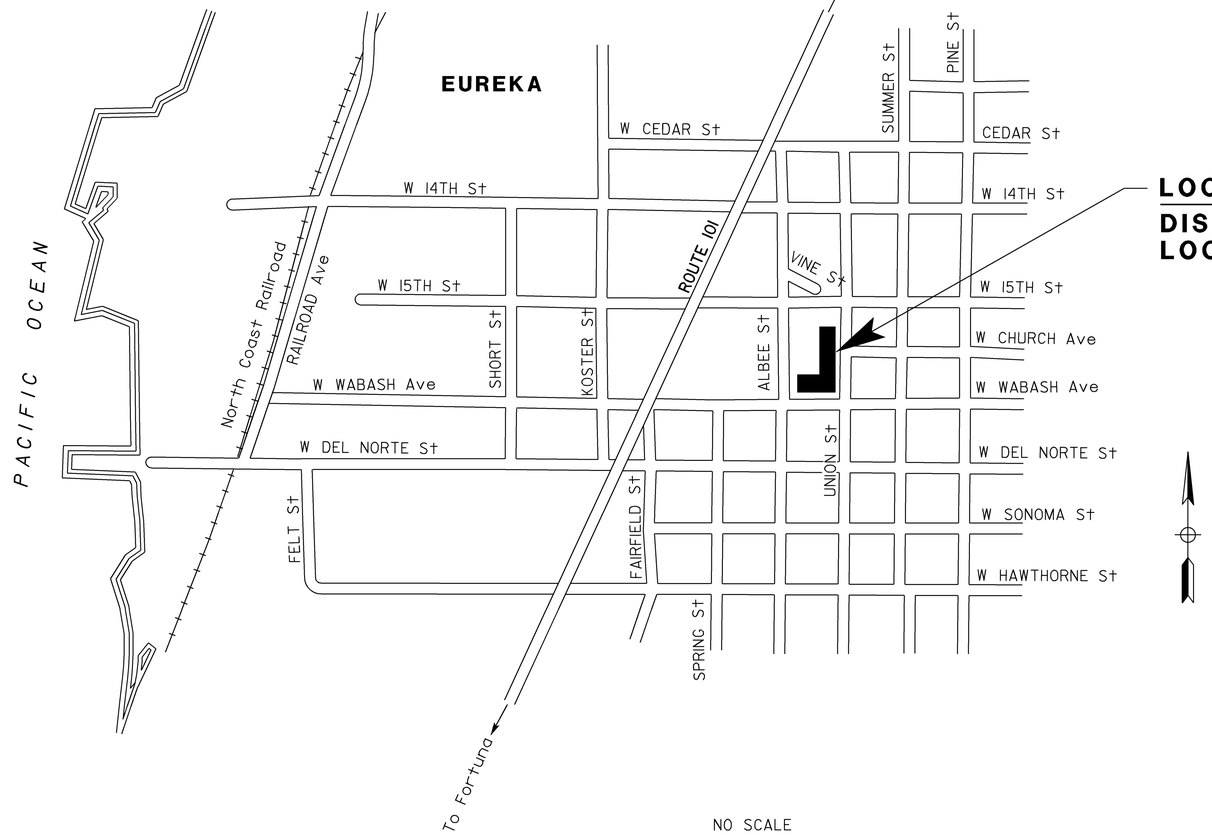
Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by: JASON D. DeWITT

Approval date: 01-19-10

PHOTOVOLTAIC SYSTEM

CSFM FILE #15-12-11-0001



LOCATION OF CONSTRUCTION
DISTRICT 1 OFFICE BUILDING
LOCATION CODE No. 5506

NO SCALE

01-14-10
PROJECT ENGINEER — DATE
REGISTERED ELECTRICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER
J. TORKELSON
No. E 13742
Exp. 6-30-11
ELEC
STATE OF CALIFORNIA

01-14-10
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

PROJECT MANAGER: SHERI RODRIGUEZ
DESIGN ENGINEER: ALAN TORRES

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

LAST REVISION 1-14-10
DATE PLOTTED => 21-JAN-2010
TIME PLOTTED => 15:38

CONTRACT No. 01-0AA004

INDEX OF SHEETS

EXISTING ADMINISTRATION BUILDING DATA ASSUMPTIONS

2007 CBC

BUILDING/ PORTION	OCCUPANCY GROUP	CONSTRUCTION TYPE	ALLOWABLE AREA	ACTUAL AREA	YEAR BUILT
ADMINISTRATION BUILDING - 1	B	V-B	- SF	34,548 SF	1953
ADMINISTRATION BUILDING - 2	B	V-B	- SF	45,243 SF	1964

* TOTAL FLOOR AREA OF ALL 3 FLOORS

ROOF DATA : COMPOSITE ROOF OVER RIGID INSULATION OVER CONCRETE SLAB.

APPLICABLE CODES

2007 California Building Code (CBC) Title 24, Part 2 CCR

2007 California Electrical Code (CEC) Title 24, Part 3 CCR

2007 California Fire Code (CEC) Title 24, Part 9 CCR

CALIFORNIA STATE FIRE MARSHAL APPROVED

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Reviewed by: JASON D. DeWITT

Approval date: 01-19-10

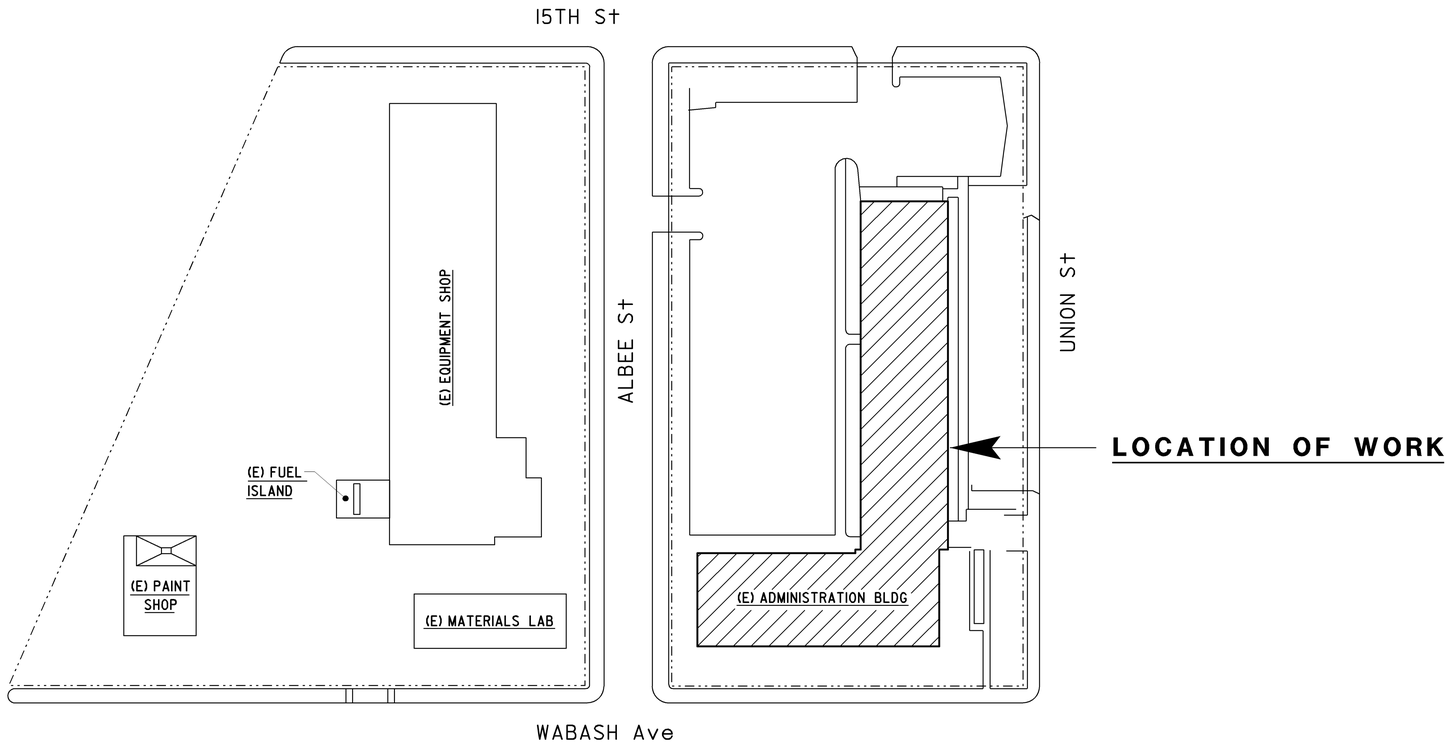
DIST.	COUNTY	LOCATION CODE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	5506		2	5

REGISTERED ELECTRICAL ENGINEER — DATE 1-14-10

REGISTERED PROFESSIONAL ENGINEER — J. TORKELSON — No. E 13742 — Exp. 6-30-11 — ELEC — STATE OF CALIFORNIA

01-14-10
PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



SITE PLAN

SCALE 1" = 50'-0"

LEGEND

- CONDUIT EXPOSED
- MC — CONDUIT, METALLIC UNDERGROUND
- PVC — CONDUIT, POLYVINYL CHLORIDE, UNDERGROUND
- CONDUIT, FLEXIBLE
- CONDUIT, TURN UP
- CONDUIT, TURN DOWN
- CIRCUIT BREAKER
- GROUNDING ELECTRODE
- ENCLOSURE BOND
- ADAPTER, ONE TYPE CONDUIT TO ANOTHER
- (J) EXISTING JUNCTION BOX
- EXISTING UNDERGROUND CONDUIT AND CONDUCTORS - REMOVE
- --E----E-- EXISTING CONDUIT AND CONDUCTORS-TO REMAIN UNLESS OTHERWISE NOTED
- A / EE-2 — SECTION/ELEVATION LETTER, SHEET NUMBER
- 1 / EE-2 — DETAIL NUMBER, SHEET NUMBER

ABBREVIATIONS

Ø	PHASE	JB	JUNCTION BOX
A	AMPERE	kW	KILOWATT
AC	ALTERNATING CURRENT	MC	METALLIC CONDUIT
Ah	AMPERES - HOUR	MDP	MAIN DISTRIBUTION PANEL
AL	ALUMINUM	MIN	MINIMUM
BC	BATTERY CHARGER	MT	EMPTY CONDUIT
BLDG	BUILDING	(N)	NEW
C	CONDUIT	P	POLE
CB	CIRCUIT BREAKER	PB	PULL BOX
CKT	CIRCUIT	PTC	PV USA TEST CONDITIONS
DC	DIRECT CURRENT	PV	PHOTOVOLTAIC
DP	DUPLEX RECEPTACLE	STC	STANDARD TEST CONDITIONS
(E)	EXISTING	TYP	TYPICAL
EO	ELECTRICALLY OPERATED	V	VOLTS
G	GROUND		

THIS DRAWING ACCURATE FOR ELECTRICAL WORK ONLY.

DESIGN SUPERVISOR

DESIGN ENGINEER

	BY	CHECKED
DESIGN	Nate Dekens	Alan Torres
DETAILS	Kathl Andreasen	Nate Dekens
QUANTITIES	Nate Dekens	Alan Torres

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN

CU 01232
EA 0AA001

BRIDGE NO. 04M5506
POST MILE

EUREKA DISTRICT 1 OFFICE BUILDING
PHOTOVOLTAIC SYSTEM
GENERAL PLAN AND LEGEND

SHEET GP

DOES SD Imperial Rev. 1/07

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 7/9/09 | 7/14/09 | 9/14/09 | 1/14/10

SHEET OF

21-JAN-2010 14:03

gp.dgn

DIST.	COUNTY	LOCATION CODE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	5506		3	5

REGISTERED ELECTRICAL ENGINEER — 1-14-10 DATE

REGISTERED PROFESSIONAL ENGINEER
J. TORKELSON
No. E 13742
Exp. 6-30-11
ELEC
STATE OF CALIFORNIA

01-14-10
PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

CALIFORNIA STATE FIRE MARSHAL APPROVED

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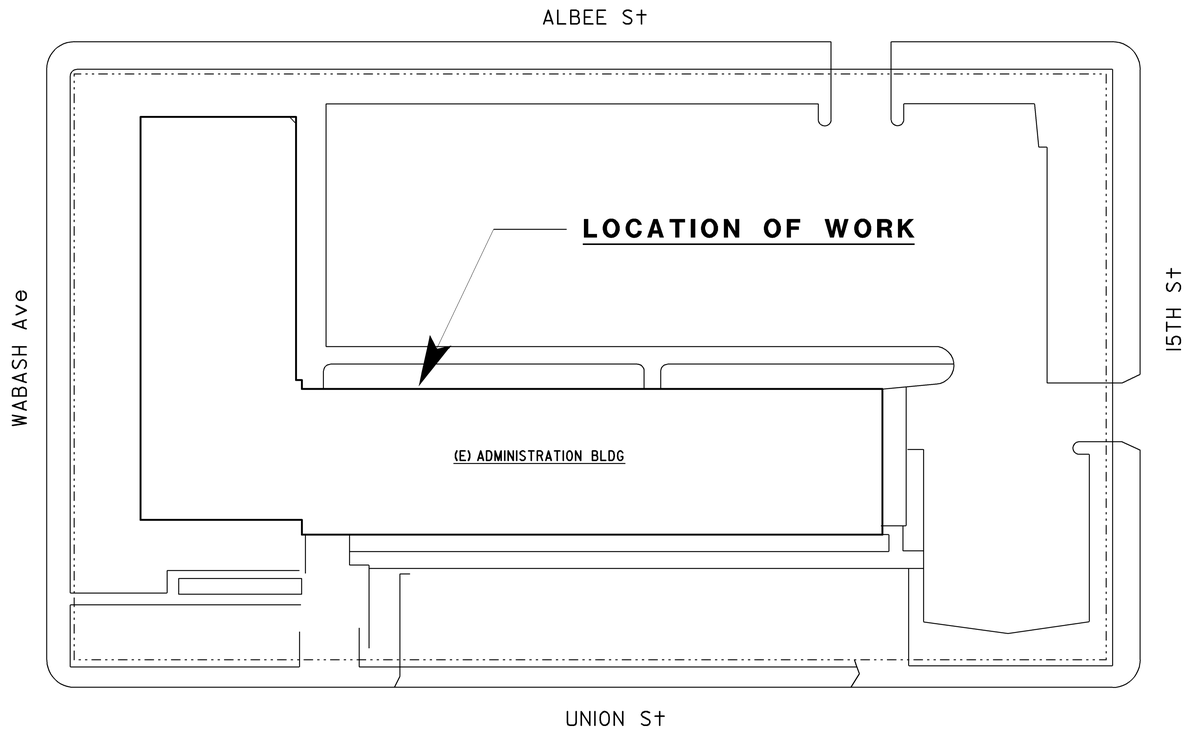
Reviewed by: JASON D. DeWITT

Approval date: 01-19-10



SITE PLAN

SCALE 1" = 30'-0"

General Notes:

A. *The Contractor shall verify true north prior to installation of PV system.*

B. *All AC/DC feeder conduit and conductors and equipment grounding conductors shall be sized to meet or exceed the following:*

- *Total net voltage drop of the PV electrical power generation system from PV source to the existing Main Switchboard to be equal to or less than 2%.*
- *Upon occurrence of any kind of fault at any point in the system, overcurrent protective devices shall trip instantaneously.*

C. *Upon a written request, the Contractor may obtain as-built drawings from the Engineer in the field.*

D. *Not all electrical/mechanical equipment and conduit systems are shown.*

E. *Location of all existing equipment and conduit systems as shown are approximate only. Contractor shall verify the exact location of all equipment and conduit systems in the field if needed.*

F. *Saw cut existing paved surfaces at places where required for installation of underground conduit system and repair disturbed surfaces to match existing.*

G. *Penetrations of walls and wall membranes required to have a fire-resistance rating shall be protected with through-penetration fire stops suitable for the method of penetration. Through-penetration fire stops shall be tested using ASTM E-814 or UL-1479 (C.B.C. Section 712). This note applies to all electrical sheets.*

THIS DRAWING ACCURATE FOR ELECTRICAL WORK ONLY.

DESIGN	BY Nate Dekens	CHECKED Alan Torres	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN	BRIDGE NO. 04M5506 POST MILE
DETAILS	BY Kathl Andreasen	CHECKED Nate Dekens			
QUANTITIES	BY Nate Dekens	CHECKED Alan Torres			

EUREKA DISTRICT 1 OFFICE BUILDING
PHOTOVOLTAIC SYSTEM
SITE PLAN

SHEET **EE-1**

DOES SD Imperial Rev. 1/07

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 01232
EA 0AA001

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 7/8/09, 7/14/09, 9/14/09, 1/14/10

SHEET OF

21-JAN-2010 14:03

ee_01.dgn

DIST.	COUNTY	LOCATION CODE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	5506		4	5

CALIFORNIA STATE FIRE MARSHAL APPROVED
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Reviewed by: JASON D. DeWITT
Approval date: 01-19-10

REGISTERED ELECTRICAL ENGINEER — 1-14-10 DATE

REGISTERED PROFESSIONAL ENGINEER — J. TORKELSON — No. E 13742 — Exp. 6-30-11 — ELEC — STATE OF CALIFORNIA

01-14-10
PLANS APPROVAL DATE

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Photovoltaic Module

PV modules shall be polycrystalline silicon cell type module with interconnection connectors rated for 90°C. PV modules shall be UL 1703 listed with a maximum system voltage of 600 VDC.

The factory installed label shall include the following PV performance parameters:
- Open circuit voltage (Voc)
- Maximum power voltage (Vmp)
- Maximum power current (Imp)
- Short circuit current (Isc)
- Maximum series fusing rating
- Maximum permissible system voltage
- Polarity of output terminals or leads
- Grounding location

Photovoltaic Array Circuit Combiner Box

PV array circuit combiner box shall be factory assembled 600 VDC rated combiner box with fused input circuits (As required), two isolated DC bus bars, ground bus bar, all enclosed inside NEMA 3R lockable hinged cover enclosure. The combiner box shall be UL 1741 listed.

PV array circuit combiner box shall have the following components:
- DIN rail mounted touch safe fuse holders with fuse
- Positive DC bus bar, negative DC bus bar and ground bus bar
- DIN rail mounted Grid-Tie surge arrestor: The surge arrestor shall be rated to withstand 40 kA (8/20 us) induced transient surges, type surge arrestor, and compatible for use with grounded PV arrays.
- Over current protection

Weather Station

Weather station shall be outdoor type, factory assembled system consisting of the following equipment:
- Irradiance transducers, Silicon Pyranometer type
- Ambient Temperture transducers, K-type thermistor type
- Module Temperture transducers, K-type thermistor type
- Wind speed and Direction transducers, Anemometer type
- Communications controller, Scaling board, Power supply, and RS485 Surge Suppressor all enclosed inside NEMA 3R Enclosure
- NEMA 3R Enclosure, exterior door shall be lockable with a padlock.

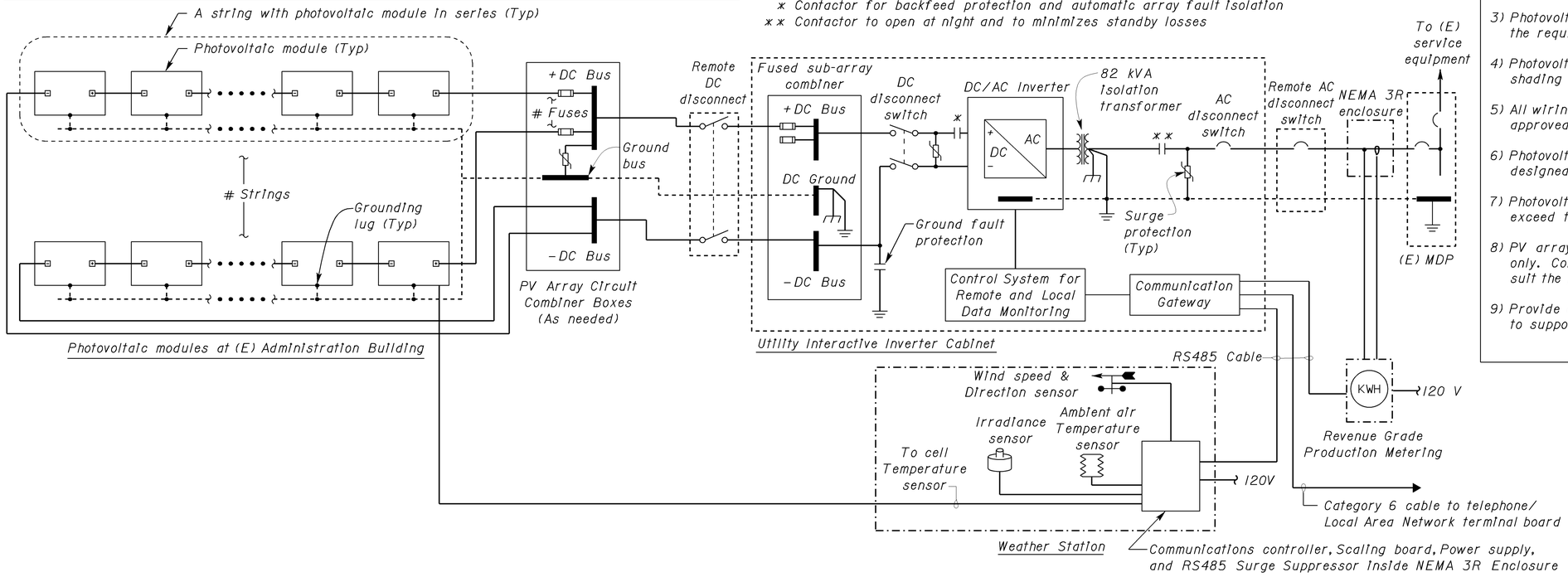
Utility Interactive Inverter Cabinet

Utility Interactive Inverter Cabinet shall be outdoor type, factory assembled cabinet consisting of the following equipment:
- DC/AC Inverter:
  DC/AC Inverter rated at maximum continuous output power of 82 kW (82 kVA), 208/120 V, 3-phase, 4-wire, at a power factor of 0.99 or greater, efficiency 95.5%, with input operating voltage range between 330 to 500 VDC, and maximum DC input current shall be 248 A. Inverter shall be capable of operating at ambient temperature range (Full power) of -25°C to +50°C. DC/AC Inverter manufacturer shall be one of those manufacturers listed as an eligible California Solar Initiative (CSI) DC/AC Inverter manufacturer.
- Fused sub-array combiner, with minimum of 4 array inputs for positive DC, negative DC, and DC ground bus bars. Positive array inputs fuse size to match loading.
- Built-in DC and AC disconnect switches, size to match loading.
- Integrated 82 kVA, 208/120 V, 3-phase, 4-wire, output isolation type transformer.
- Ground fault protection.
- Integrated AC and DC surge protections.
- Integrated AC and DC contactors.
- AC ground bus bars.
- NEMA 3R enclosure:
  Enclosure shall be NEMA 3R, 14-gauge, and powder-coated standard factory finish steel enclosure. All screws, latches, hinge pins, and similar hardware shall be stainless steel. AC and DC disconnect switches shall be pad lockable, with equipment rating labels mounted on the exterior door. Exterior door shall have interlock switch and be lockable with a padlock. The cabinet shall have filtered top entry forced air cooling system, and shall be suitable for Seismic Design Category D compliance.

Revenue Grade Production Metering

Revenue Grade Production Metering shall be outdoor type, factory assembled metering system with CSI approved System Performance and consisting of the following equipment:
- Revenue Grade Production Meter
- Power supply
- RS485 Surge Suppressor
- NEMA 3R Enclosure, exterior door shall be lockable with a padlock.

* Contactor for backfeed protection and automatic array fault isolation
** Contactor to open at night and to minimizes standby losses



General Notes:

A. Provide and Install all necessary warning labels per Article 690 of NEC and the State Fire Marshal's guideline.

B. Solar PV Installation shall comply with the latest guideline from California Department of Forestry & Fire Protection, Office of the State Fire Marshal.

Photovoltaic System Requirements

Photovoltaic system complete design and Installation details Inclusive of all engineering calculations signed by a Professional Engineer of the respective field (Both Electrical and Civil Engineering) In the State of California shall be submitted for approval by the Contractor. The PV design shall meet or exceed the following requirements:

1) Total designed Installed capacity of photovoltaic system at existing District 1 Office Building shall be 75 kW per CEC-AC rating.

2) Number of PV module per string shall be arranged In a manner to meet or exceed the following:
- System maximum open circuit voltage at the site's minimum expected temperature shall be no less than 1% of the Inverter's maximum Input DC voltage range.
- Minimum system operating voltage at full load and at 55°C ambient temperature shall be 20% greater than the Inverter's minimum Input DC voltage range.

3) Photovoltaic system modules shall be mounted In a manner to provide the required 75 kW.

4) Photovoltaic system module row spacing shall be designed to prevent shading from adjacent module.

5) All wiring, except at module Interconnection, shall be concealed Inside approved conduit system.

6) Photovoltaic system modules structural support system shall be designed to withstand wind forces of 85-mile per hour or greater.

7) Photovoltaic system wiring and protective devices shall meet or exceed the requirements of all applicable codes.

8) PV array circuit combiner box location as shown plans are arbitrary only. Contractor shall Install the combiner boxes at locations that best suit the photovoltaic system strings layout.

9) Provide and Install approved conduit system support on top of roof to support conduit system.

DESIGN	BY Nate Dekens	CHECKED Alan Torres	
DETAILS	BY Kathl Andreasen	CHECKED Nate Dekens	
QUANTITIES	BY Nate Dekens	CHECKED Alan Torres	

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN

BRIDGE NO. 04M5506
POST MILE

EUREKA DISTRICT 1 OFFICE BUILDING PHOTOVOLTAIC SYSTEM
SINGLE LINE DIAGRAM GRID-TIED PV SYSTEM

SHEET EE-2

DOES SD Imperial Rev. 1/07

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 01232
EA 0AA001

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)						SHEET	OF
7/9/09	7/14/09	8/31/09	9/1/09	9/14/09	1/14/10		

21-JAN-2010 14:04

ee_02.dgn

DIST.	COUNTY	LOCATION CODE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	5506		5	5

REGISTERED ELECTRICAL ENGINEER — 1-14-10 DATE

REGISTERED PROFESSIONAL ENGINEER — J. TORKELSON — No. E 13742 — Exp. 6-30-11 — ELEC — STATE OF CALIFORNIA

01-14-10
PLANS APPROVAL DATE

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Notes:

(1) *Existing Main Switchboard is 120/208-volt, 3-phase, 4-wire, with 1,200-ampere main circuit breaker.*

(2) *See Detail 3 on this sheet. Install weather station on existing roof as directed by the Engineer.*

(3) *Conduit and conductors as required.*

Photovoltaic System Requirements:

Photovoltaic system complete design and installation details, inclusive of all engineering calculations signed by an Professional Engineer of the respective field (both Electrical and Civil Engineering), in the State of California, shall be submitted for approval by the Contractor. The PV design shall meet or exceed the following requirements:

CALIFORNIA STATE FIRE MARSHAL
APPROVED
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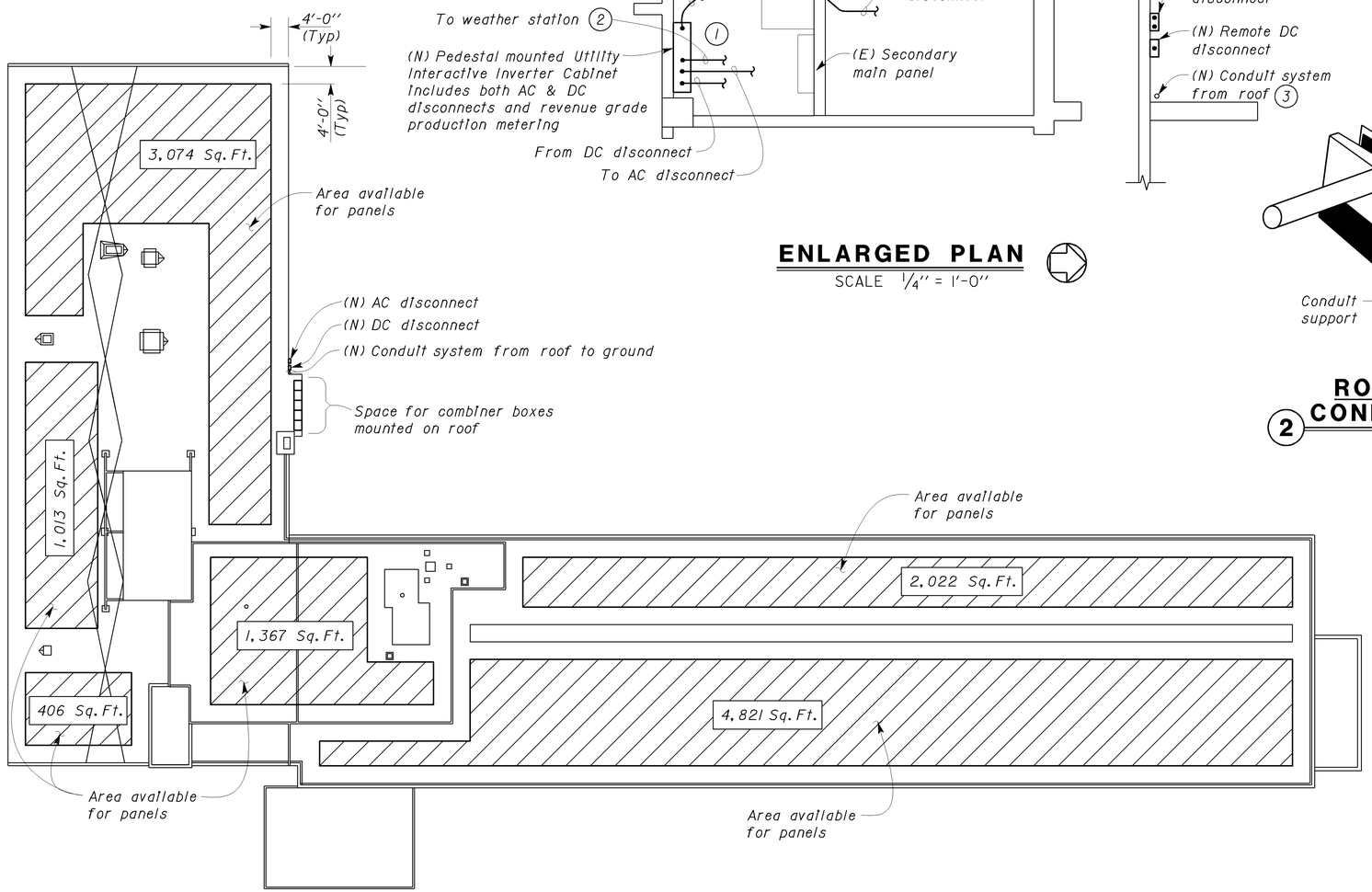
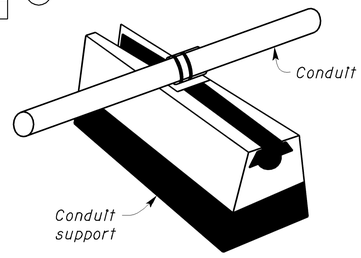
Reviewed by: JASON D. DeWITT
Approval date: 01-19-10

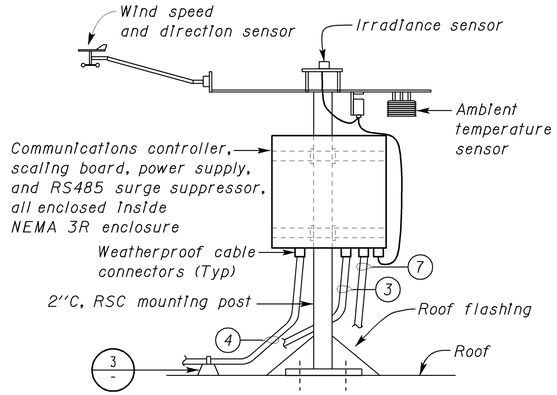


PLAN
SCALE 1/16" = 1'-0"

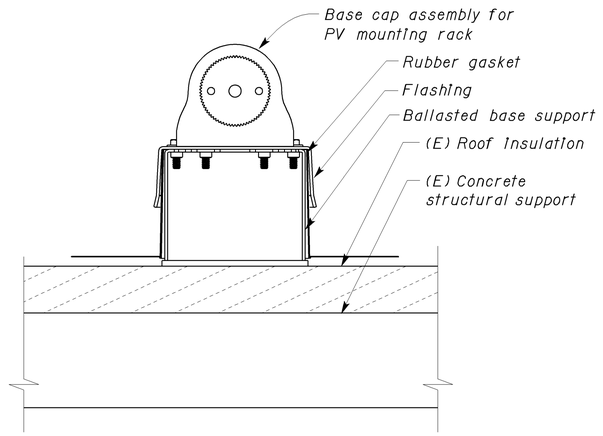
ENLARGED PLAN
SCALE 1/4" = 1'-0"



2 ROOF EXPOSED CONDUIT SUPPORT
NO SCALE



3 WEATHER STATION
NO SCALE



1 ROOF ATTACHMENT
NO SCALE

THIS DRAWING ACCURATE FOR ELECTRICAL WORK ONLY.

DESIGN	BY Nate Dekens	CHECKED Alan Torres	
DETAILS	BY Kathl Andreasen	CHECKED Nate Dekens	
QUANTITIES	BY Nate Dekens	CHECKED Alan Torres	

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
ELECTRICAL-MECHANICAL-WATER AND WASTEWATER DESIGN

BRIDGE NO. 04M5506
POST MILE

EUREKA DISTRICT 1 OFFICE BUILDING
PHOTOVOLTAIC SYSTEM
ROOF PLAN AND SWITCHBOARD ROOM ENLARGED PLAN

SHEET EE-3

DOES SD Imperial Rev. 1/07

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 01232
EA 0AA001

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 7/9/09 | 7/14/09 | 9/1/09 | 9/14/09 | 9/25/09 | 1/14/10

SHEET OF

21-JAN-2010 15:28

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