







GENERAL NOTES:

1. PV PANELS, MOUNTING BRACKETS, AND POWER INVERTER WILL BE PROVIDED BY THE OWNER. CONTRACTOR SHALL INSTALL AND CONNECT ALL EQUIPMENT. PROVIDE RACEWAYS, CABLES, PULL AND JUNCTION BOXES, DISCONNECTS COMBINER BOXES AND WIRING DEVICES AND ANY OTHER NECESSARY EQUIPMENT FOR THIS PV SYSTEM INSTALLATION.

2. CONTRACTOR SHALL COORDINATE WITH PV SYSTEM VENDOR AND OTHER TRADES FOR EXACT EQUIPMENT INSTALLATION REQUIREMENTS AND NEEDS.

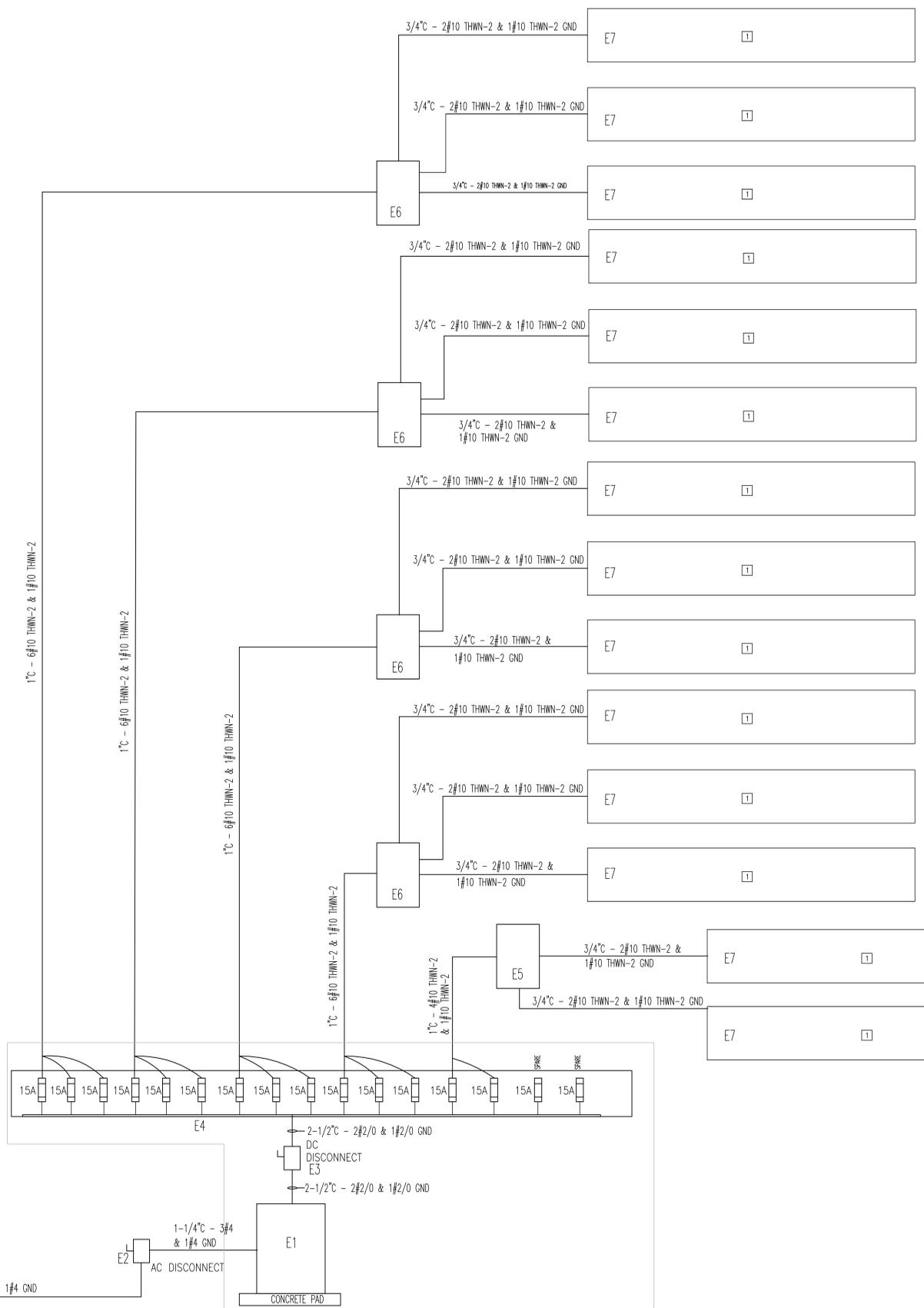
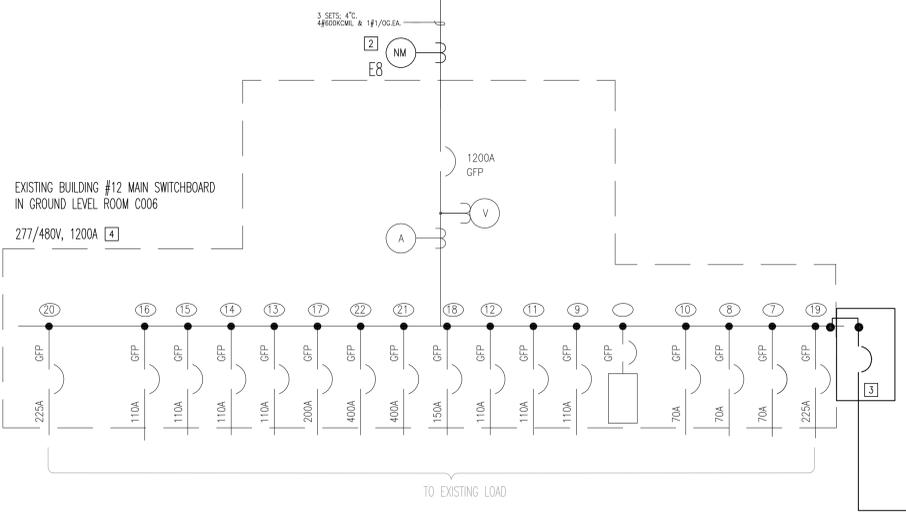
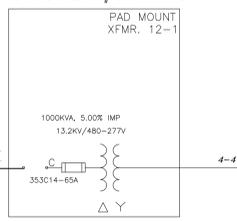
KEYED NOTES:

- 1 MAXIMUM 12 MODULES IN ONE STRING.
- 2 PROVIDE NET METER BY CONTRACTOR. COORDINATE EXACT REQUIREMENTS WITH MIDAMERICAN ENERGY.
- 3 NEW 60A/3P GFP BREAKER IN ENCLOSURE. COORDINATE EXACT LOCATION IN FIELD. NEW BREAKER TYPE TO MATCH EXISTING IN SWITCHBOARD. CONNECT NEW BREAKER TO MAIN SWITCHBOARD BUS.
- 4 PER LOAD READING PROVIDED BY VA FACILITY PERSONNEL, THE 1200AMP MAIN SWITCHBOARD AND FEEDERS ARE ADEQUATE FOR BOTH EXISTING BUILDING LOADS AND ADDED PV SYSTEM LOAD.

EQUIPMENT LIST

E1	PV SYSTEM INVERTER. PV POWERED CAT. # PVP50KW. NEMA 4 POWDER COATED STEEL ENCLOSURE. MAX. DC INPUT VOLTAGE 600 VOLT. MAX. DC INPUT CURRENT 178 AMP. 480 AC. STANDBY LOSSES 33W. POWER FACTOR .99. PAD MOUNTED. OPERATING AMBIENT TEMPERATURE -30 - 50 (C). WITH ISOLATED TRANSFORMER. WEIGHT: 1500LBS. 49"W X 32"D X 68"H
E2	UTILITY AC DISCONNECT. 60AS-60AF-3P, NEMA 1 ENCLOSURE. WALL MOUNTED IN ELECTRICAL ROOM
E3	MAIN DC DISCONNECT. 200AS-200AF. NEMA 4 STAINLESS STEEL ENCLOSURE. PAD MOUNTED ON ROOF.
E4	SUNLINK #HCB16DS SUB-COMBINER. 16 FUSED 30A INPUTS. MAX. DC VOLTAGE 600. MAX. DC CURRENT 180A. NEMA 4 ENCLOSURE. MOUNT ON ROOF. 20"W X 20"L X 6"D. AMBIENT TEMPERATURE -13 - 122 (F).
E5	12" X 18" NEMA 3R COMBINER/J-BOX ON ROOF.
E6	24" X 24" NEMA 3R COMBINER/J-BOX ON ROOF.
E7	ET SOLAR PV MODULE. CAT. #ET-P660325B. STC = 235W. MODULE EFFICIENCY 14.44%. VMP=29.90V, IMP=7.86A, Voc=36.96V, Isc=8.40A
E8	NET METER COORDINATE WITH MIDAMERICAN ENERGY

EXISTING BUILDING #12 TRANSFORMER

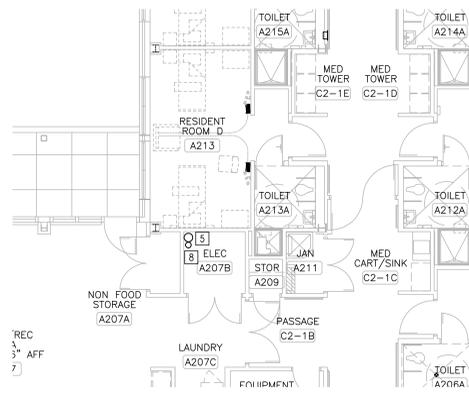


ONE-LINE SYMBOL LEGEND

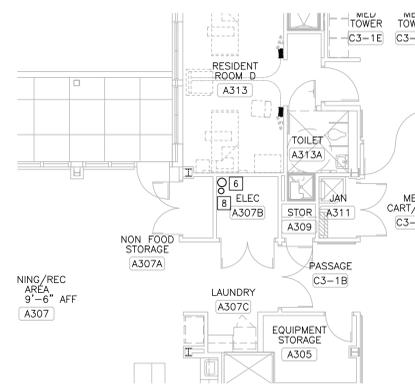
- ⊙ - ENGINE GENERATOR SET
- ⊕ - CURRENT TRANSFORMERS
- ⊕ - AMMETER AND PHASE SELECTOR SWITCH
- ⊕ - VOLTMETER AND PHASE SELECTOR SWITCH
- ⊕ - MOLDED CASE CIRCUIT BREAKER (MCCB) 3P, EXCEPT AS NOTED
- ⊕ - MOTOR - HORSEPOWER AS INDICATED
- ⊕ - 3 POLE COMBINATION SWITCH, FUSES AND STARTER STARTER SIZE
- ⊕ - TRANSFORMER
- ⊕ - BRANCH CIRCUIT PANELBOARDS
- ⊕ - POTENTIAL TRANSFORMERS
- ⊕ - KWH METER WITH 15 MIN. INTERVAL KW DEMAND METER
- ⊕ - FUSED SWITCH
- ⊕ - KIRK KEY INTERLOCKED
- ⊕ - 3P. DISCONNECT SWITCH
- ⊕ - PREWIRED CONTROL PANEL

three inches = one foot  
 one and one half inches = one foot  
 one inch = one foot  
 three quarters inch = one foot  
 one half inch = one foot  
 three eighths inch = one foot  
 one quarter inch = one foot  
 one eighth inch = one foot  
 one sixteenth inch = one foot

<b>CONSULTANTS:</b>  	<b>ARCHITECT/ENGINEERS:</b> <b>LEO A DALY</b> <small>PLANNING ARCHITECTURE ENGINEERING INTERIORS EST. 1915</small> 8600 Indian Hills Drive Omaha, NE 68114-4039 USA Tel 402-391-6111 Fax 402-391-8564	Architect Project No. 003-10121-004	Drawing Title POWER ONE LINE DIAGRAM	Project Title SOLAR PANEL SITE PREP AND INSTALLATION	Project Number 636A6-11-915	Office of Construction and Facilities Management  Department of Veterans Affairs
		Location DES MOINES, IA	Date August 18, 2011	Checked YW	Drawn MRG	

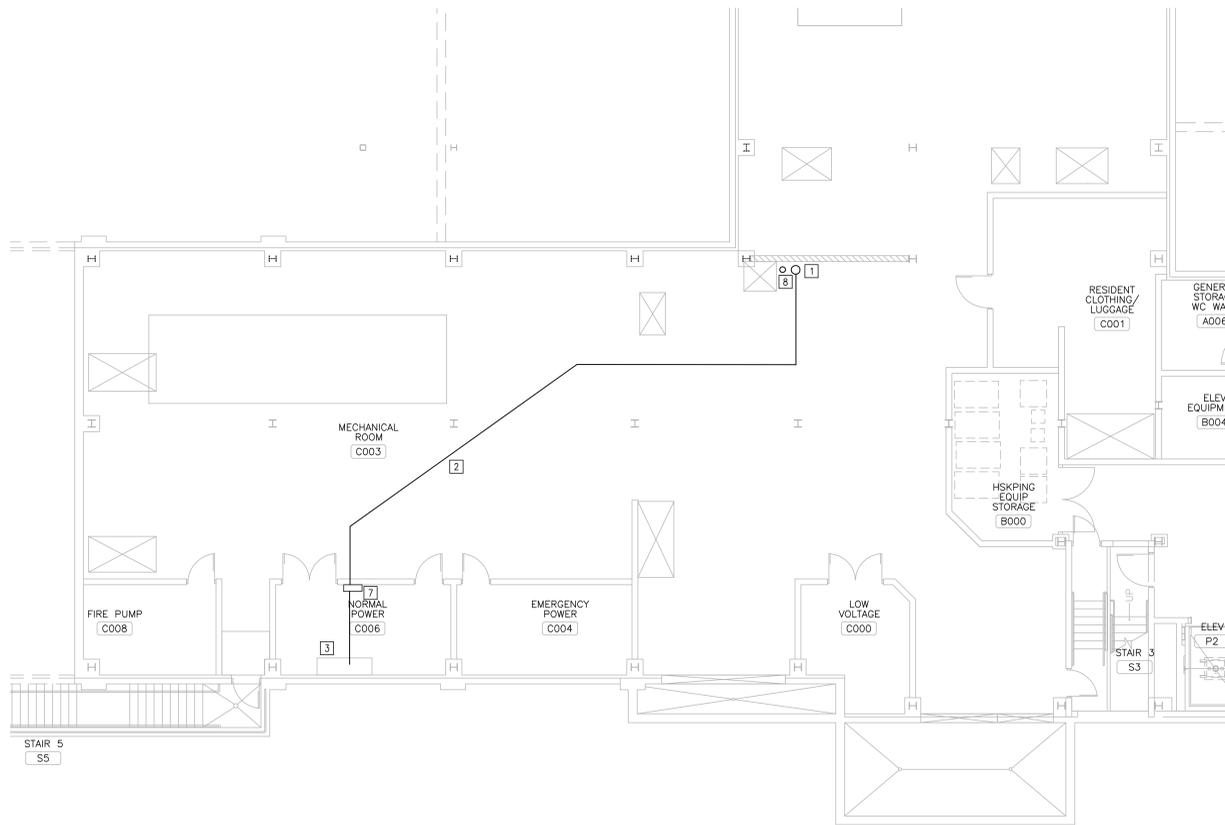


3 PARTIAL PLAN - LEVEL 2  
E1.03 SCALE: 1/8" = 1'

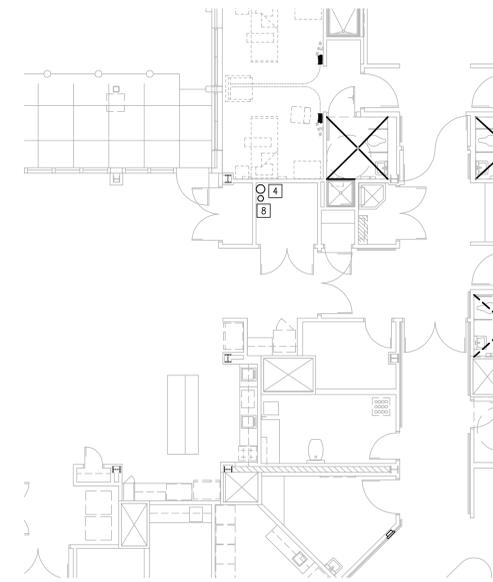


4 PARTIAL PLAN - LEVEL 3  
E1.03 SCALE: 1/8" = 1'

- NOTES:
- 1-1/4" CONDUIT FROM LEVEL 1. SEE SHEET E1.02 FOR CONDUCTOR.
  - 1-1/4" CONDUIT ROUTE CONDUIT IN MECHANICAL ROOM, COORDINATE EXACT LOCATION IN FIELD. SEE SHEET E1.02 FOR CONDUCTOR.
  - TERMINATE CONDUIT IN EXISTING SWITCHGEAR. SEE SHEET E1.02.
  - 1-1/4" CONDUIT FROM LEVEL 2. SEE SHEET E1.02 FOR CONDUCTOR.
  - 1-1/4" CONDUIT FROM LEVEL 3. SEE SHEET E1.02 FOR CONDUCTOR.
  - 1-1/4" CONDUIT FROM ROOF. SEE SHEET E1.01. SEE SHEET E1.02 FOR CONDUCTOR.
  - UTILITY DISCONNECT (E2) AND NET METER (E8). COORDINATE EXACT REQUIREMENTS WITH MIDAMERICAN ENERGY.
  - 1" CONDUIT FOR PV SYSTEM MONITORING. ROUTE CONDUIT TO OWNER'S EXISTING METASYS BUILDING AUTOMATION SYSTEM. COORDINATE IN FIELD FOR EXACT TERMINATION LOCATION. COORDINATE WITH OWNER FOR NUMBER AND TYPE OF WIRES REQUIRED.



1 PARTIAL PLAN - GROUND LEVEL  
E1.03 SCALE: 1/8" = 1'



2 PARTIAL PLAN - LEVEL 1  
E1.03 SCALE: 1/8" = 1'

CONSULTANTS:

ARCHITECT/ENGINEERS:

**LEO A DALY**  
PLANNING  
ARCHITECTURE  
ENGINEERING  
INTERIORS  
EST. 1915

8600 Indian Hills Drive  
Omaha, NE 68114-4039 USA  
Tel 402-391-8111 Fax 402-391-8564

Architect Project No.  
003-10121-004

Drawing Title

PARTIAL POWER PLANS

Project Title  
**SOLAR PANEL SITE PREP AND  
INSTALLATION**

Project Number  
**636A6-11-915**

Building Number  
**12**

Location  
**DES MOINES, IA**

Drawing Number  
**E1.03**

Date  
**August 18, 2011**

Checked  
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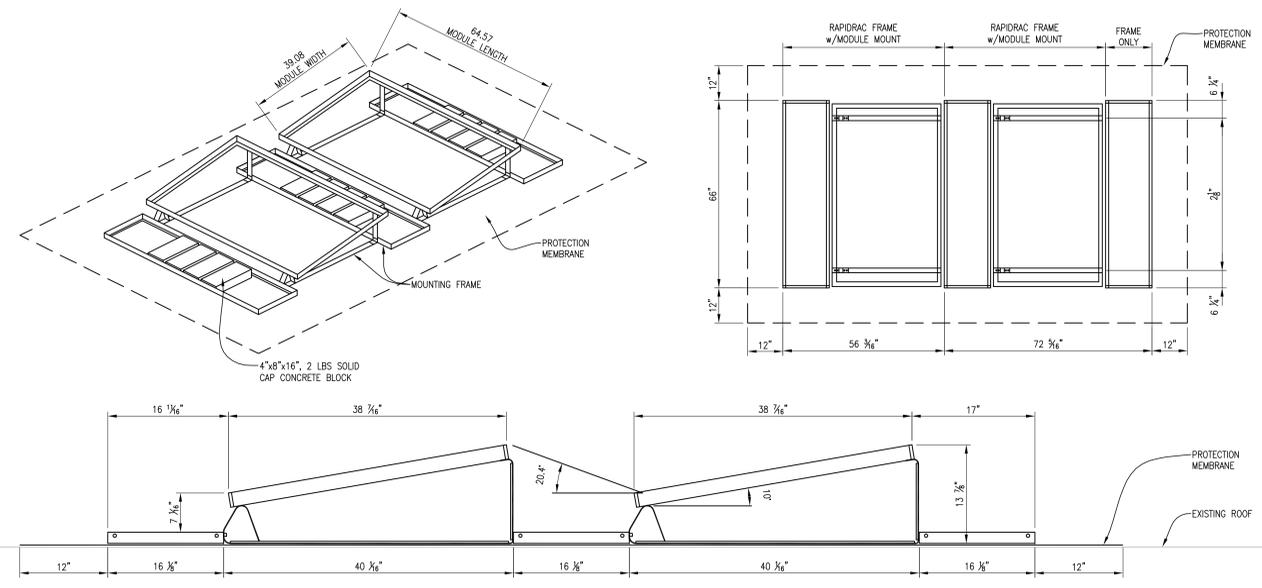
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Construction  
and Facilities  
Management



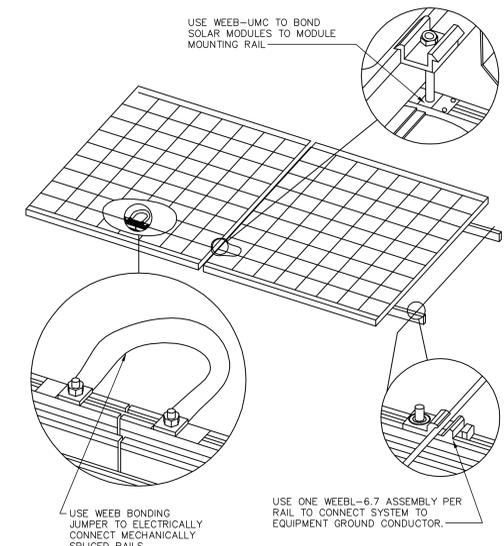
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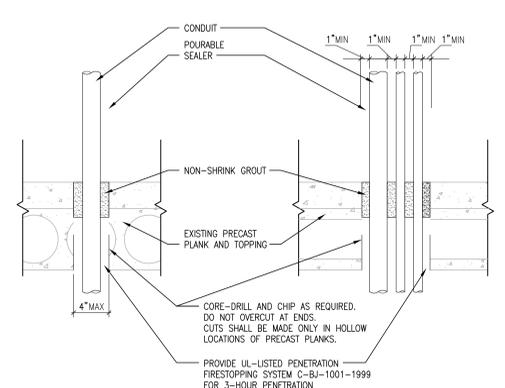


**1 PV PANEL MOUNTING DETAILS**  
 E1.04 N.T.S.

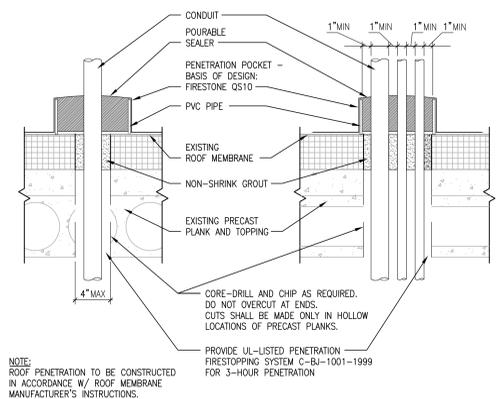
NOTE: INSTALL PROTECTION MEMBRANE (BASIS OF DESIGN: FIRESTONE 60 MIL EPDM) LOOSE-LAID ON TOP OF EXISTING ROOF MEMBRANE. RE-COVER WITH BALLAST.



**2 SYSTEM GROUNDING DETAILS**  
 E1.04 N.T.S.

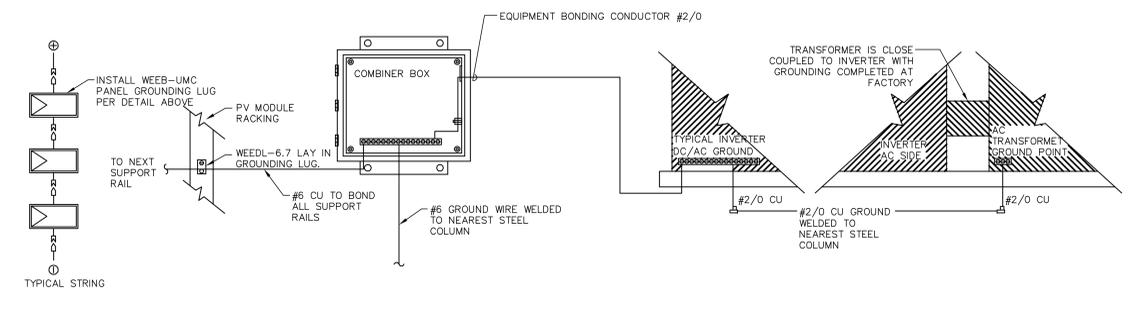


**5 FLOOR PENETRATION DETAILS**  
 E1.04 SCALE: 1 1/2" = 1'-0"

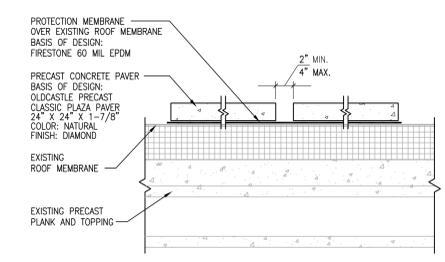


**6 ROOF PENETRATION DETAILS**  
 E1.04 SCALE: 1 1/2" = 1'-0"

NOTE: ROOF PENETRATION TO BE CONSTRUCTED IN ACCORDANCE W/ ROOF MEMBRANE MANUFACTURER'S INSTRUCTIONS.



**3 SYSTEM GROUNDING ONE-LINE DETAILS**  
 E1.04 N.T.S.



**4 EQUIP. ACCESS PAVER DETAIL**  
 E1.04 SCALE: 1 1/2" = 1'-0"

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<b>Revisions</b>	<b>Date</b>			<b>Dwg.</b> 6 of 6		