



FOURTH FLOOR ROOF  
PV ARRAY PANEL  
INSTALLTION LAYOUT

GENERAL SHEET NOTES

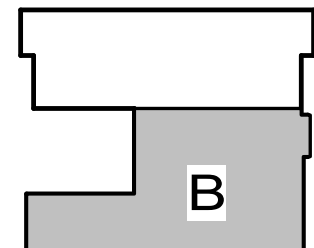
- A. REFER TO GENERAL SHEET NOTES ON SHEET E2.3.B.  
B. ALL PV MODULES ARE USING AGENCY FURNISHED. CONTRACTOR INSTALLED. REFER TO PHOTOVOLTAIC ARRAY SCHEDULE ON SHEET E5.1 FOR INFORMATION REGARDING PROCUREMENT AND INSTALLATION OF THE PHOTOVOLTAIC INVERTERS.

SHEET KEYNOTES

- E201 REMOVE EXISTING COLUMN MOUNTED FIRE ALARM DEVICE. PROVIDE BLANK WALL PLATE FOR VACATED JUNCTION BOX. PAINT WALL PLATE TO MATCH EXISTING FINISH. CUT/EXTEND CONDUIT AND WIRE TO NEW CEILING MOUNTED FIRE ALARM COMBINATION SPEAKER/STROBE.  
E202 PROVIDE NEW FIRE ALARM CEILING MOUNTED COMBINATION SPEAKER/STROBE. MAKE AND MODEL: SIEMENS SEF-MC-CW. CONNECT TO NEAREST FIRE ALARM CIRCUIT. EXTEND CONDUIT AND WIRE AS REQUIRED. REFER TO KEYNOTE E201 FOR MORE INFORMATION.  
E204 CONDUIT PENETRATION: REFER TO SHEET E2.3.B FOR CONDUIT ROUTING INSIDE BUILDING. COORDINATE EXACT ROUTING IN THE FIELD PRIOR TO CONSTRUCTION. REFER TO ARCHITECTURAL DRAWINGS FOR PENETRATION DETAIL.  
E207 EXTEND EXISTING CONDUITS FROM FLOOR INTO BOTTOM OF PV TERMINAL BOX.  
E208 RAPID SHUTDOWN STATION FOR THE RESEARCH ARRAY TO BE WIRED AND CONNECTED WHEN RESEARCH ARRAY INVERTERS ARE INSTALLED. MOUNT ABOVE EXISTING LIGHT SWITCH AND CARD READER AT 5'-0" AFF TO BOTTOM OF DEVICE. COORDINATE INSTALLATION WITH USING AGENCY PRIOR TO CONSTRUCTION.  
E211 PROVIDE DRIP PAN PROTECTION ABOVE TRANSFORMER.

1 FOURTH LEVEL POWER PLAN - AREA B  
SCALE: 1/8" = 1'-0"

KEYPLAN



NOTE: CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE AND BE FULLY RESPONSIBLE FOR SAME.

REVISIONS			DRAWN M. Nowicki	PREPARED M. Nowicki	CHECKED A. Varlone	APPROVED M. Weingartz
NO.	DATE	REMARKS				
1	05/01/18	ISSUED FOR BID	TRACED	APPROVED M. Weingartz		
2	08/22/18	ISSUED FOR CONSTRUCTION				

DRAWN M. Nowicki	PREPARED M. Nowicki	CHECKED A. Varlone	APPROVED M. Weingartz

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FOURTH LEVEL POWER PLAN AREA B

**ELECTRICAL & COMPUTER ENGINEERING FACILITY  
PV ARRAY PROJECT**  
**UNIVERSITY OF ILLINOIS AT URBANA CHAMPAIGN  
CHAMPAIGN COUNTY, ILLINOIS**  
University of Illinois Project No. U08032

PROJECT NO.  
[830-010-331] PHASE 2

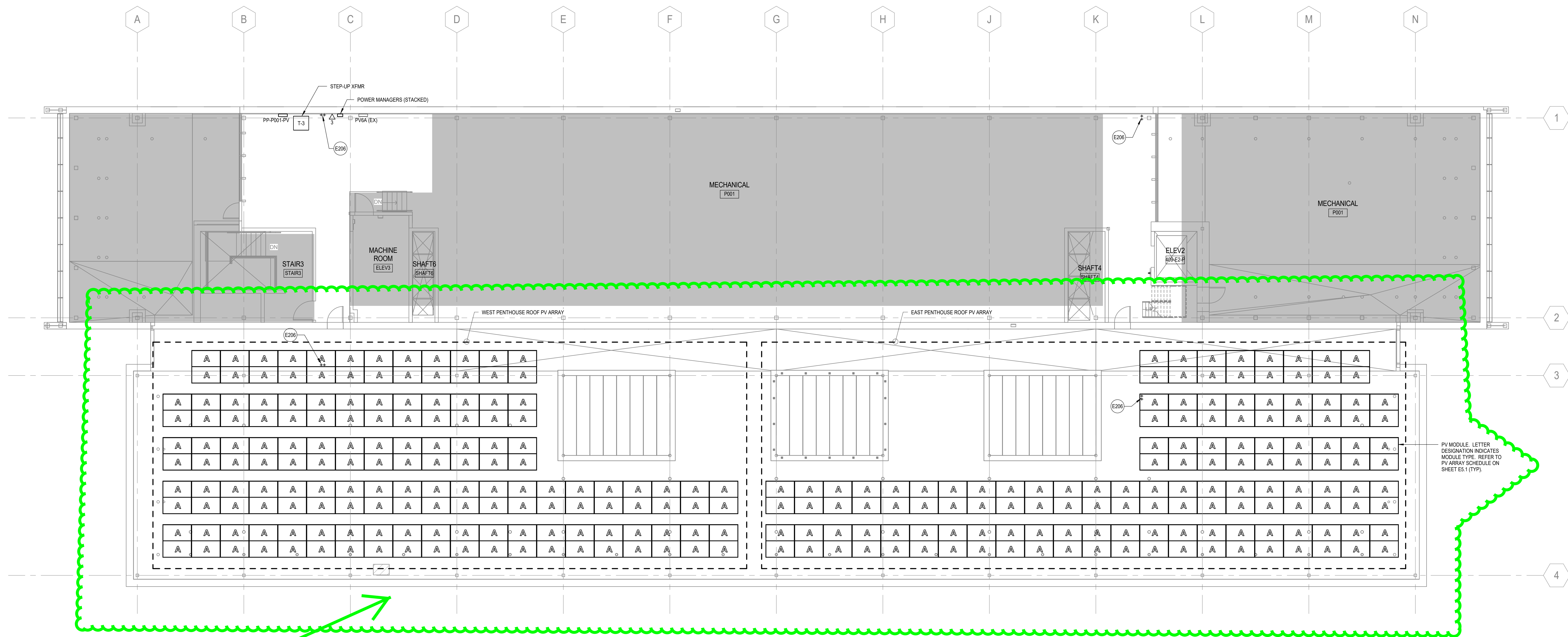
DATE  
08/22/18

SHEET NO.

**E2.4.B**

OF ( ) SHEETS





PENTHOUSE ROOF PV  
ARRAY PANEL  
INSTALLTION LAYOUT

1 SIXTH LEVEL POWER PLAN - AREA A  
SCALE: 1/8" = 1'-0"

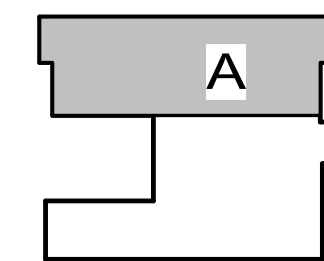
GENERAL SHEET NOTES

- A. REFER TO GENERAL SHEET NOTES ON SHEET E2.3.B.  
B. ALL PV MODULES ARE USING AGENCY FURNISHED CONTRACTOR INSTALLED. REFER TO PHOTOVOLTAIC ARRAY SCHEDULE ON SHEET E5.1 FOR INFORMATION REGARDING PROCUREMENT AND INSTALLATION OF THE PHOTOVOLTAIC INVERTERS.

SHEET KEYNOTES

E206 CONDUIT PENETRATION. REFER TO SHEET E2.5.A FOR CONDUIT ROUTING INSIDE BUILDING. COORDINATE EXACT ROUTING IN THE FIELD PRIOR TO CONSTRUCTION. REFER TO ARCHITECTURAL DRAWINGS FOR PENETRATION DETAIL.

KEYPLAN



NOTE: CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE AND BE FULLY RESPONSIBLE FOR SAME.

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TRACED	APPROVED M. Weingartz
CHECKED A. Varlone	APPROVED M. Weingartz

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Illinois Capital Development Board

SIXTH LEVEL POWER PLAN AREA A

**ELECTRICAL & COMPUTER ENGINEERING FACILITY  
PV ARRAY PROJECT**  
**UNIVERSITY OF ILLINOIS AT URBANA CHAMPAIGN  
CHAMPAIGN COUNTY, ILLINOIS**  
University of Illinois Project No. U08032

**PROJECT NO.**  
[830-010-331] PHASE 2  
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**SHEET NO.**  
**E2.6.A**  
OF ( ) SHEETS

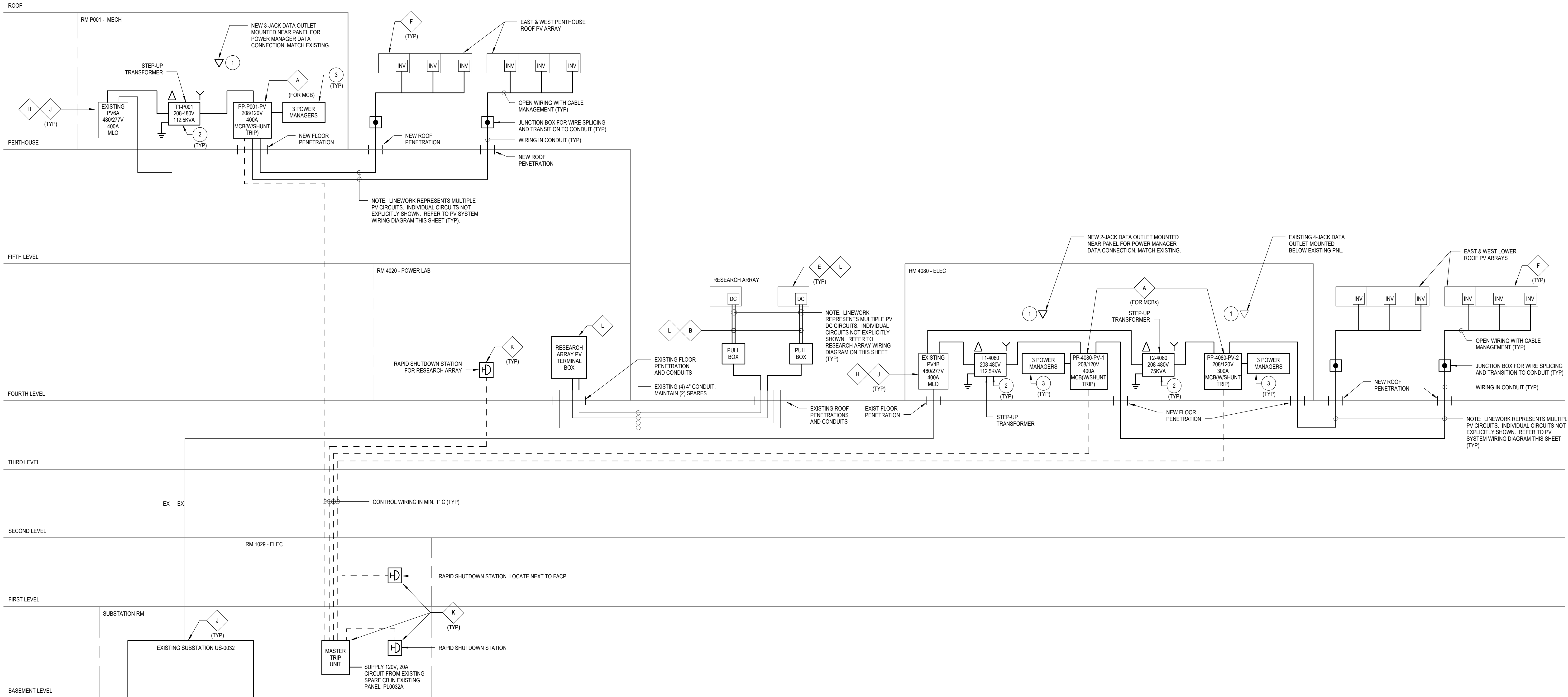


PHOTOVOLTAIC ARRAY SCHEDULE						
MODULE LETTER DESIGNATION	MODULE TYPE	QUANTITY OF MODULES	INVERTER TYPE AND INSTALLATION SCOPE OF WORK			
			MICROINVERTER INTEGRAL TO PV MODULE (NOTE 1)	LOOSE INVERTER (NOTE 2)	STRING INVERTER (NOTE 3)	DC OPTIMIZER (NOTE 4)
EAST LOWER ROOF ARRAY						
B	SUNPOWER SPR-240	7		●		
C	SUNPOWER SPR-335	115		●		
D	SUNPOWER SPR-308	126		●		
E	SUNPOWER SPR-315	4		●		
F	SUNPOWER SPR-315	10		●		
G	SUNPOWER SPR-320	75		●		
TOTAL MODULES		338				
ARRAY DC POWER RATING		104 kW				
EAST PENTHOUSE ROOF ARRAY						
A	ET SOLAR ET-P80208BAC	140	●			
TOTAL MODULES		140				
ARRAY DC POWER RATING		35 kW				
RESEARCH ARRAY						
H	SUNPOWER SPR-400	10			●	●
I	SUNPOWER SPR-415	7			●	●
K	SUNPOWER SPR-425	43			●	●
TOTAL MODULES		60				
ARRAY DC POWER RATING		25 kW				
WEST LOWER ROOF ARRAY						
A	ET SOLAR ET-P80208BAC	253	●			
B	SUNPOWER SPR-240	23		●		
TOTAL MODULES		276				
ARRAY DC POWER RATING		69 kW				
WEST PENTHOUSE ROOF ARRAY						
A	ET SOLAR ET-P80208BAC	196	●			
TOTAL MODULES		196				
ARRAY DC POWER RATING		39 kW				
TOTAL MODULES		970				
TOTAL ARRAY DC POWER RATING		272 kW				

- SCHEDULE NOTES:
- MICROINVERTER IS USING AGENCY FURNISHED AND INSTALLED. WIRING AND CONNECTIONS ARE BY THE CONTRACTOR.
  - MICROINVERTER IS USING AGENCY FURNISHED AND CONTRACTOR INSTALLED. WIRING AND CONNECTIONS ARE BY THE CONTRACTOR.
  - STRING INVERTERS ARE USING AGENCY FURNISHED AND INSTALLED IN THE FUTURE.
  - DC OPTIMIZERS ARE USING AGENCY FURNISHED AND INSTALLED. WIRING AND CONNECTIONS ARE BY THE CONTRACTOR.
  - FIELD VERIFY PV MODULE AND INVERTER INVENTORY PRIOR TO CONSTRUCTION. NOTIFY USING AGENCY IF THERE ARE DISCREPANCIES.

PHOTOVOLTAIC SYSTEM IDENTIFICATION, MARKING, LABELING AND SIGNAGE SCHEDULE		
ID TAG	DESCRIPTION	NEC CODE REFERENCE
A	MARKING REQUIRED FOR PV SYSTEM DISCONNECTING MEANS	690.13(B)
B	PV CIRCUIT WIRING IDENTIFICATION	690.31(B)(1)
C	WHERE MARKING AND LABELING IS REQUIRED FOR PV SYSTEM DC CIRCUITS ON OR IN A BUILDING	690.31(G)(3)
D	MARKING AND LABELING METHODS AND LOCATIONS FOR PV SYSTEM DC CIRCUITS ON OR IN A BUILDING	690.31(G)(4)
E	MARKING REQUIRED FOR PV MODULES	690.51
F	MARKING REQUIRED FOR PV AC MODULES	690.52
G	LABEL REQUIREMENTS FOR DC PV SYSTEM INDICATING SPECIFIC INFORMATION PROVIDED BY THE INSTALLER	690.53
H	MARKING REQUIRED AT POINT OF INTERCONNECTION	690.54
I	PLAQUE DIRECTORY REQUIREMENT FOR IDENTIFICATION OF ALL FACILITY POWER SOURCES, INCLUDING UTILITY AND PV SOURCES	690.55(B)
J	PLAQUE DIRECTORY REQUIREMENT FOR IDENTIFICATION OF ALL FACILITY POWER SOURCES, INCLUDING UTILITY AND PV SOURCES	705.10
K	LABEL REQUIREMENTS FOR THE RAPID SHUTDOWN EQUIPMENT AND DEVICES	690.56(C)
L	RESEARCH ARRAY PV MODULE AND DC WIRING IDENTIFICATION. REFER TO SHEET S.1 DETAIL 3 FOR ADDITIONAL INFORMATION	NA

- NOTES:
- ALL IDENTIFICATION, MARKING, LABELING AND SIGNAGE SHALL BE IN ACCORDANCE WITH THE NEC AND ELECTRICAL INDUSTRY STANDARD PRACTICE.
  - ALL IDENTIFICATION, MARKING, LABELING AND SIGNAGE SHALL BE PERMANENT AND SUITABLE FOR THE ENVIRONMENT WHERE INSTALLED.
  - COORDINATE EXACT LOCATION OF SIGNAGE IN THE FIELD WITH THE USING AGENCY AND A/J PRIOR TO FINAL PLACEMENT.



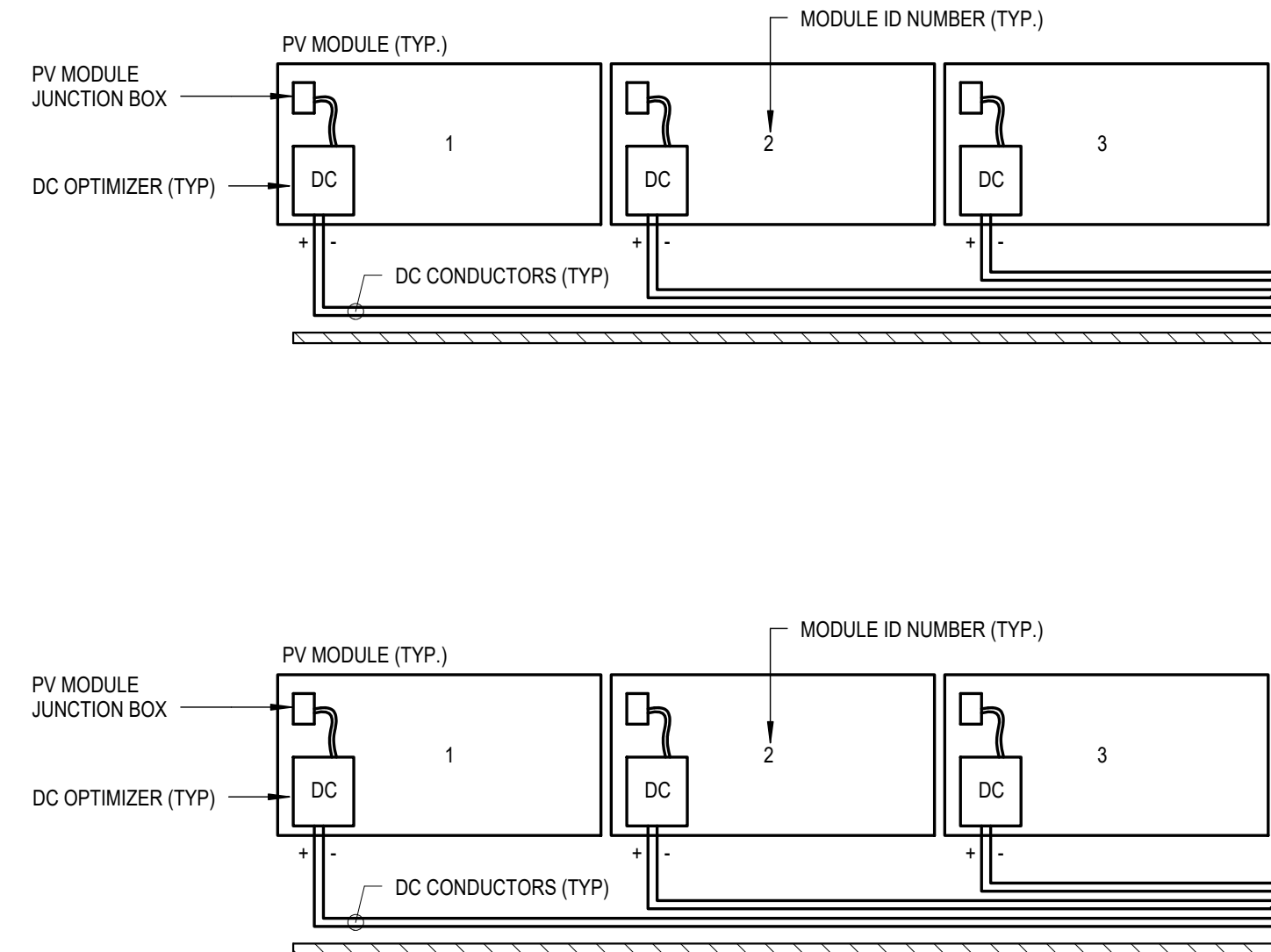
### 1 ELECTRICAL RISER DIAGRAM

SCALE: NOT TO SCALE

- NOTES:
- THE PHOTOVOLTAIC SYSTEM DESIGN IS IN ACCORDANCE WITH THE 2017 NEC. THE PV SYSTEM SHALL CONFORM TO THE REQUIREMENTS OF NEC SECTION 690. CONSULT WITH A/J FOR ADDITIONAL REQUIREMENTS PRIOR TO INSTALLATION. ALL EQUIPMENT AND PRODUCTS SHALL BE UL LISTED AND LABELED.
  - ACTUAL ROUTING OF ALL CONDUCTORS, CONDUITS, LOCATION OF ALL EQUIPMENT AND COORDINATION WITH OTHER TRADES SHALL BE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR.
  - OPEN WIRING CONNECTING THE INDIVIDUAL PV MODULES SHALL BE PERMITTED. TRANSITION TO CONDUIT UPON ENTERING THE BUILDING. PV CONDUIT LOCATED ON ABOVE AND PENETRATING THE ROOF SHALL BE GALVANIZED STEEL RMC, UNLESS OTHERWISE NOTED. REFER TO SPECIFICATION SECTION 200533 FOR CONDUIT INSTALLATION SCHEDULE.
  - INCREASE WIRE SIZE TO COMPENSATE FOR POTENTIAL VOLTAGE DROP, ELEVATED AMBIENT TEMPERATURE, EXPOSURE TO SUNLIGHT AND CONDUCTOR BUNDLING, WHERE REQUIRED.
  - PV SYSTEM CIRCUIT BREAKERS AND FUSES SHALL BE SUITABLE FOR BACK-FED OPERATION. WHEN INSTALLING CIRCUIT BREAKERS IN PANELBOARDS, LOCATE THE BACKFED BREAKER ON THE OPPOSITE END OF BUS FROM THE MAIN BREAKER. CONTRACTOR SHALL FIELD SURVEY ANY EXISTING PANELBOARDS, SUBSTATIONS OR OTHER POWER DISTRIBUTION EQUIPMENT CONNECTED TO THE PV SYSTEM EQUIPMENT TO ENSURE EXISTING CIRCUIT BREAKERS, FUSES OR OTHER OVERCURRENT PROTECTIVE DEVICES ARE CAPABLE OF BACKFED OPERATION.
  - ALL NEW CIRCUIT BREAKERS TO BE INSTALLED IN EXISTING PANELBOARDS SHALL MATCH THE MAKE, MODEL AND SHORT CIRCUIT RATING OF THE EXISTING PANELBOARD IN WHICH THEY ARE INSTALLED. ALL NEW BREAKERS SHALL BE LISTED FOR PV USE.

#### KEYED NOTES:

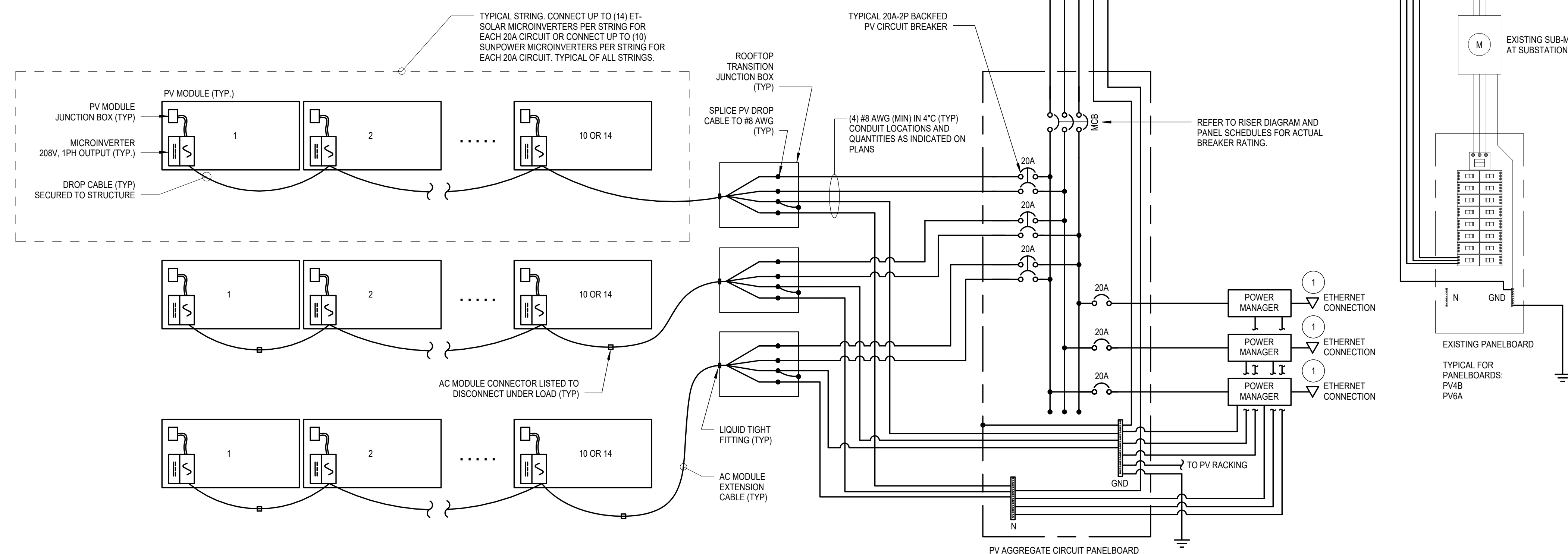
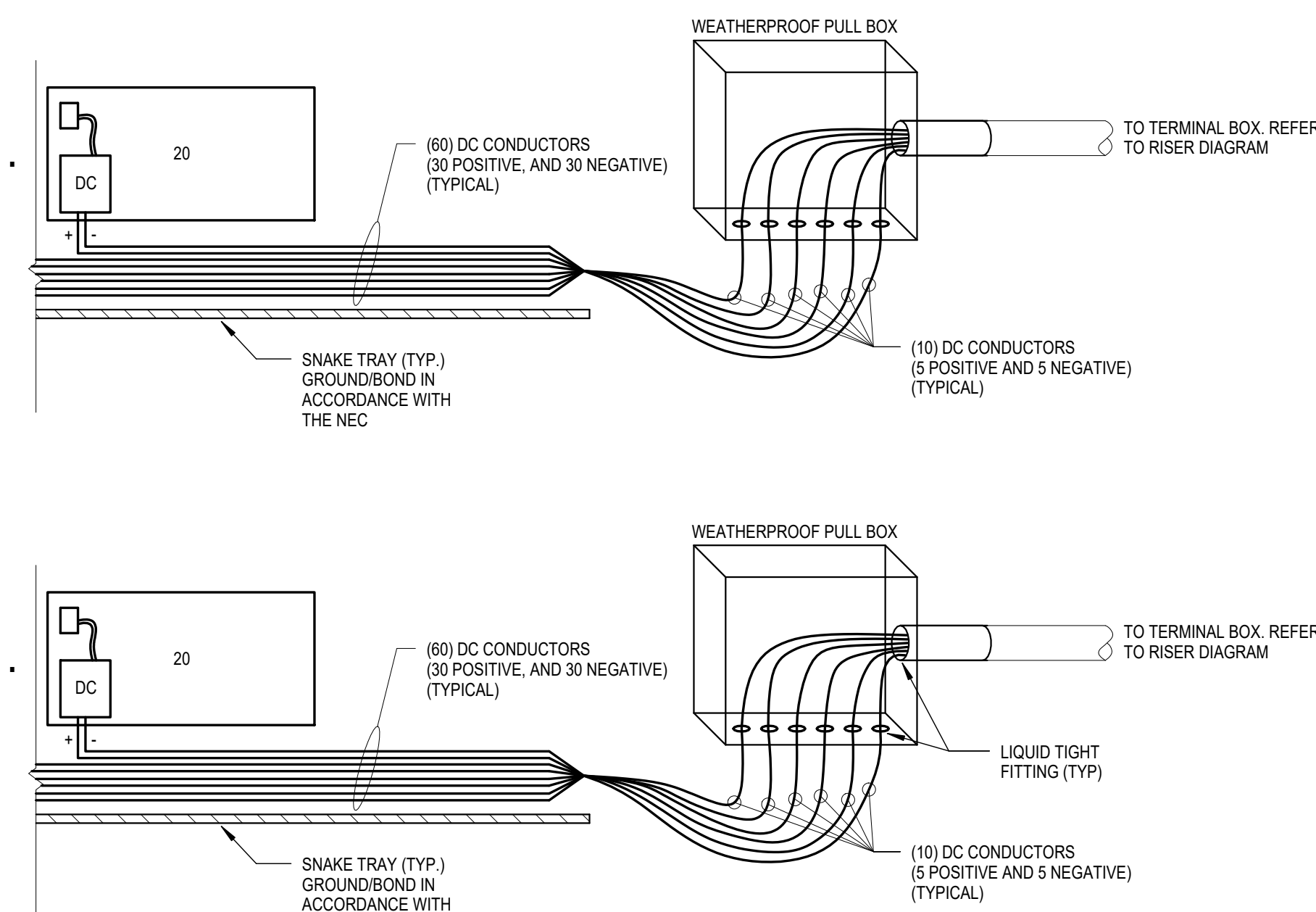
- PROVIDE PATCH CORD TO NEAREST EXISTING DATA OUTLET. MATCH EXISTING CABLE TYPE AND LABELING STANDARD. COORDINATE WORK WITH USING AGENCY IT/COMMUNICATIONS PERSONNEL PRIOR TO CONSTRUCTION.
- REFER TO TRANSFORMER SIZING SCHEDULE ON SHEET E0.1 FOR PRIMARY AND SECONDARY FEEDER SIZES.
- POWER MANAGERS ARE USING AGENCY FURNISHED AND CONTRACTOR INSTALLED.



### 3 RESEARCH ARRAY WIRING DIAGRAM

SCALE: NOT TO SCALE

- NOTES:
- PROVIDE ADHESIVE LABEL WITH MODULE ID NUMBER ON EACH RESEARCH ARRAY PV MODULE.
  - INDIVIDUALLY LABEL EACH CONDUCTOR WITHIN EACH PULL BOX AND THE TERMINAL BOX WITH THE MODULE TYPE LETTER DESIGNATION, NUMBER DESIGNATION, AND POLARITY DESIGNATION. HANDWRITTEN LABELS ARE NOT ALLOWED.
- EXAMPLE:
- MODULE TYPE "K", NUMBER 1, POSITIVE CONDUCTOR: K1+  
MODULE TYPE "K", NUMBER 1, NEGATIVE CONDUCTOR: K1-





### 2 PHOTOVOLTAIC SYSTEM TYPICAL WIRING DIAGRAM

SCALE: NOT TO SCALE

#### KEYED NOTES:

- PROVIDE PATCH CORD TO NEAREST EXISTING DATA OUTLET. MATCH EXISTING CABLE TYPE AND LABELING STANDARD. COORDINATE WORK WITH USING AGENCY IT/COMMUNICATIONS PERSONNEL PRIOR TO CONSTRUCTION.

NOTE: CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT JOB SITE AND BE FULLY RESPONSIBLE FOR SAME.

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2	08/22/18	ISSUED FOR CONSTRUCTION								UNIVERSITY OF ILLINOIS AT URBANA CHAMPAIGN CHAMPAIGN COUNTY, ILLINOIS University of Illinois Project No. U08032	SHEET NO. <b>E5.1</b> OF ( ) SHEETS
			CHECKED A.Varlone	APPROVED M. Weingartz							