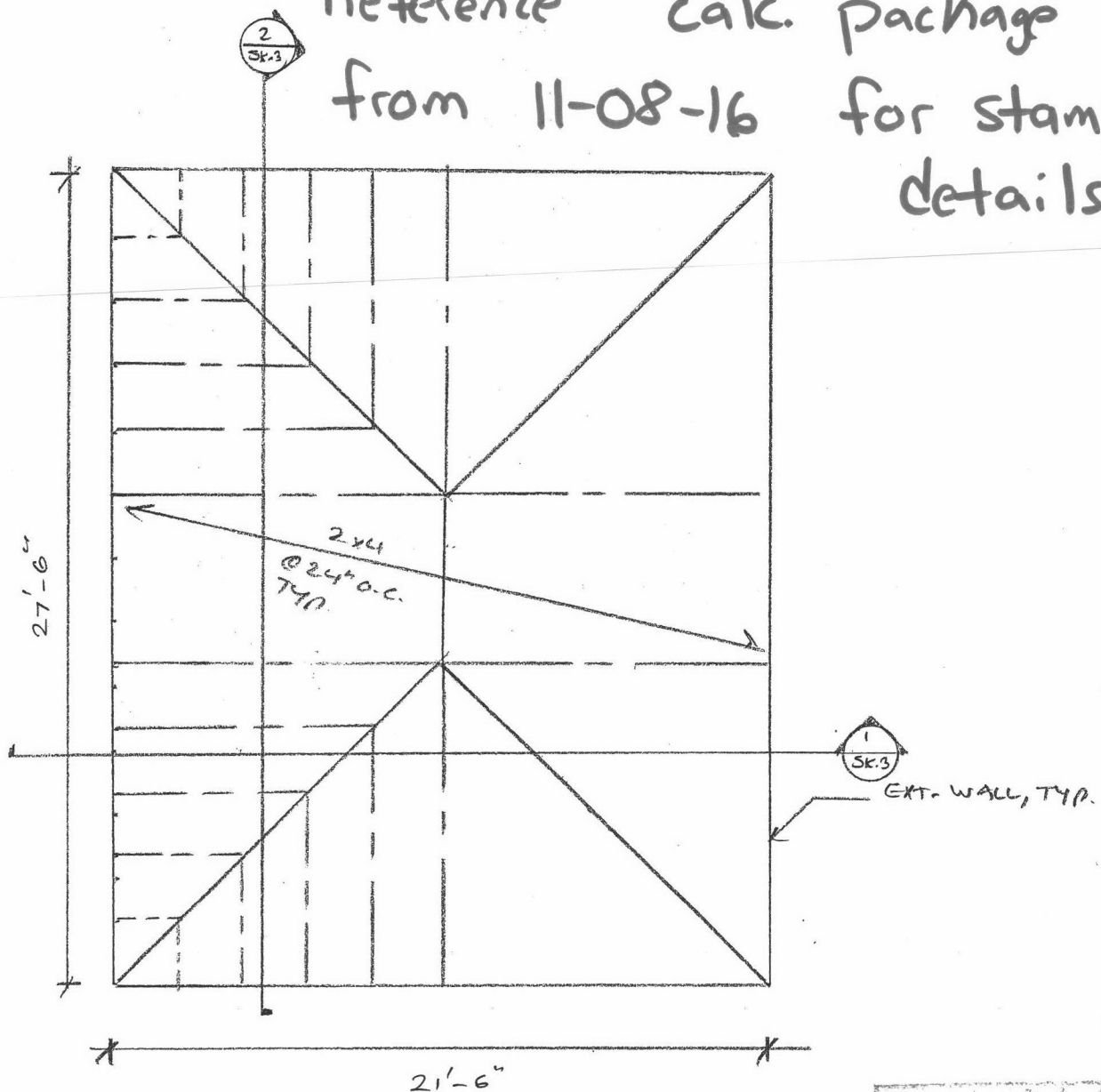
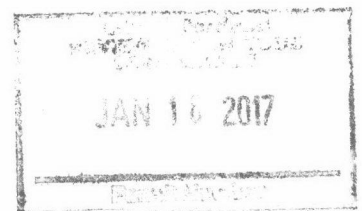


Reference calc. package
from 11-08-16 for stamped
details

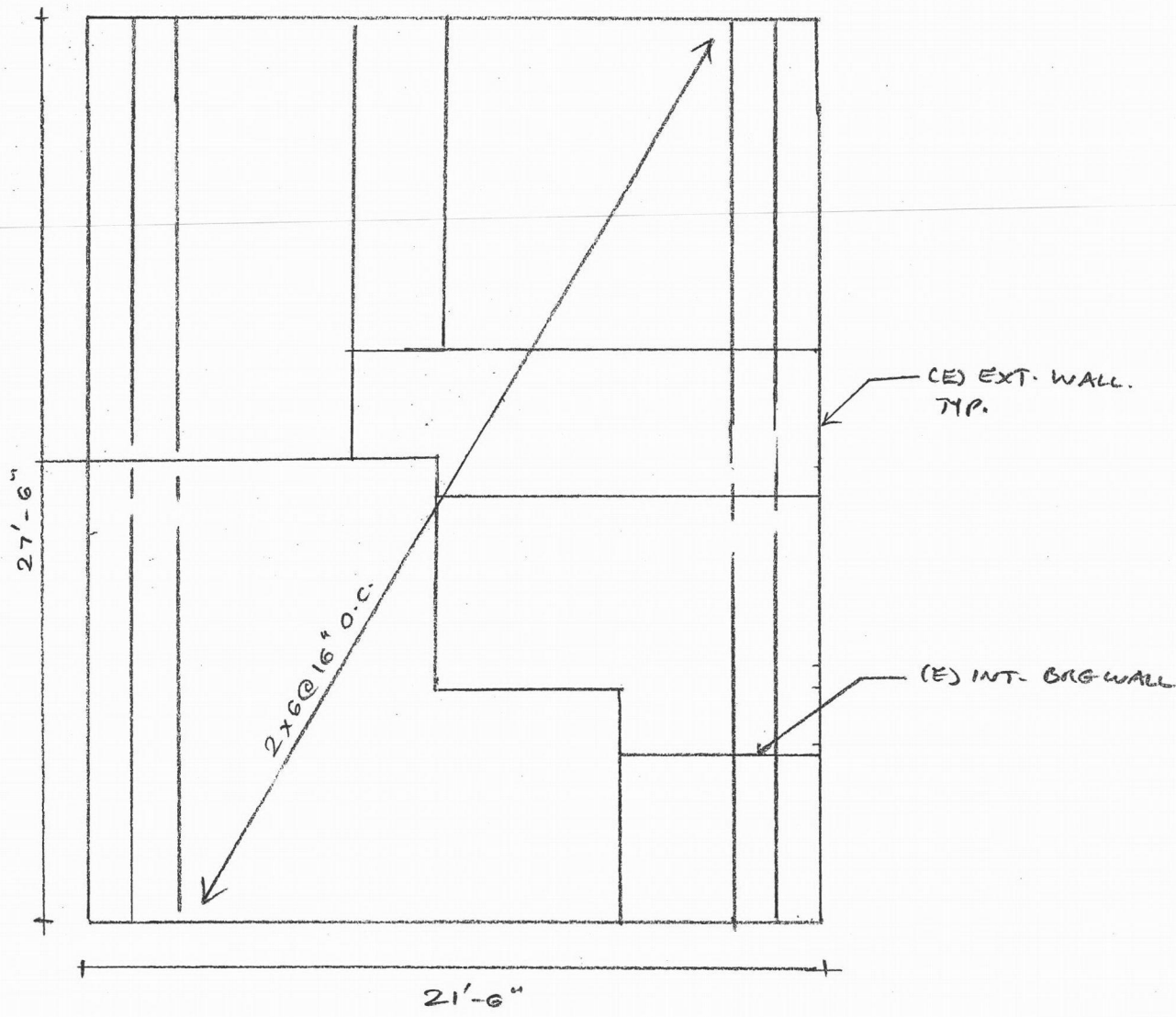


ACCF FRAMING PLAN

$3\frac{1}{16}" = 1'-0"$

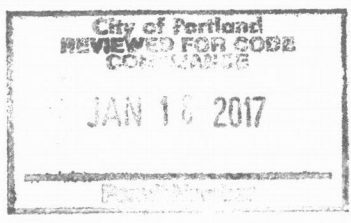


FILE NO. 161034 SHEET NO. SK.1
MADE BY BK DATE 10/27/16
CLIENT ELEMENTAL ENERGY
PROJECT TCHCV SOLAR PANELS

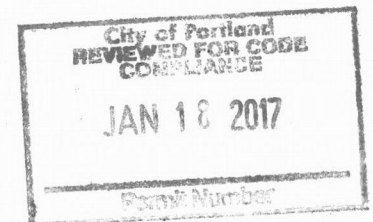
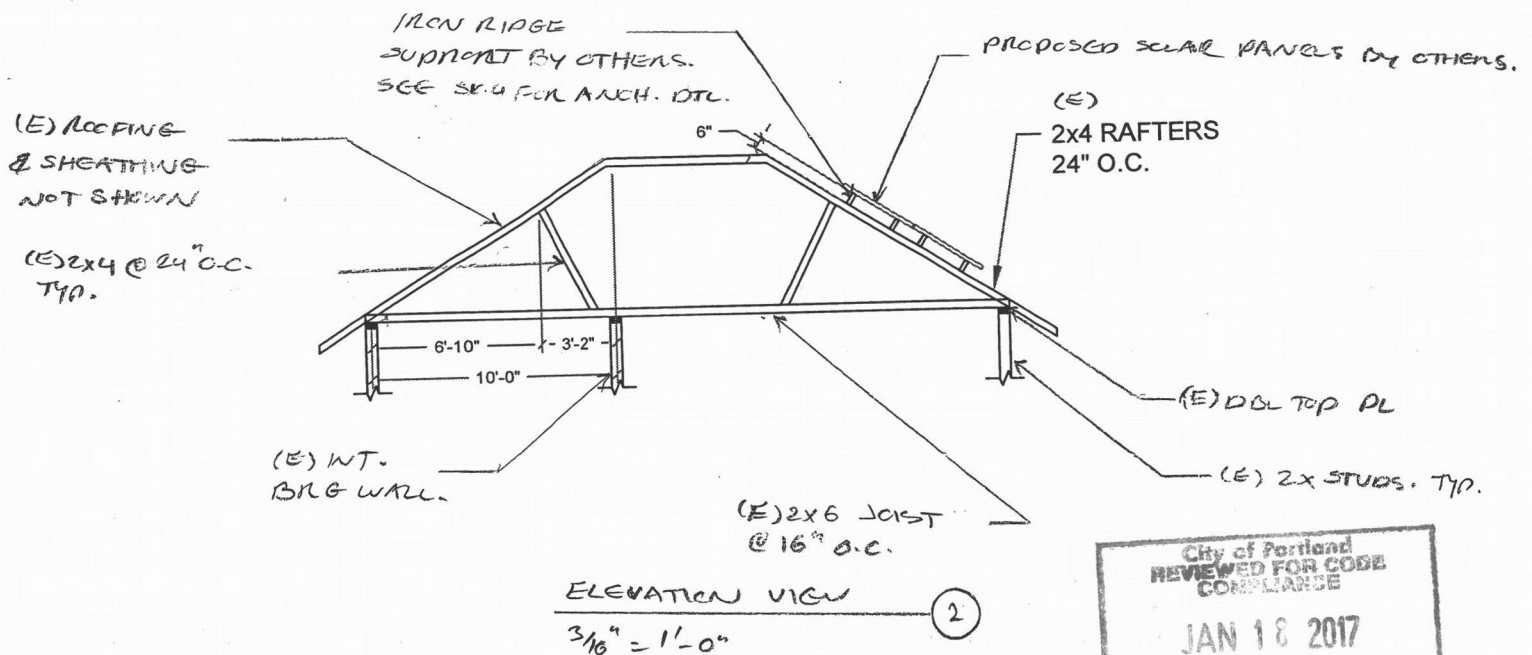
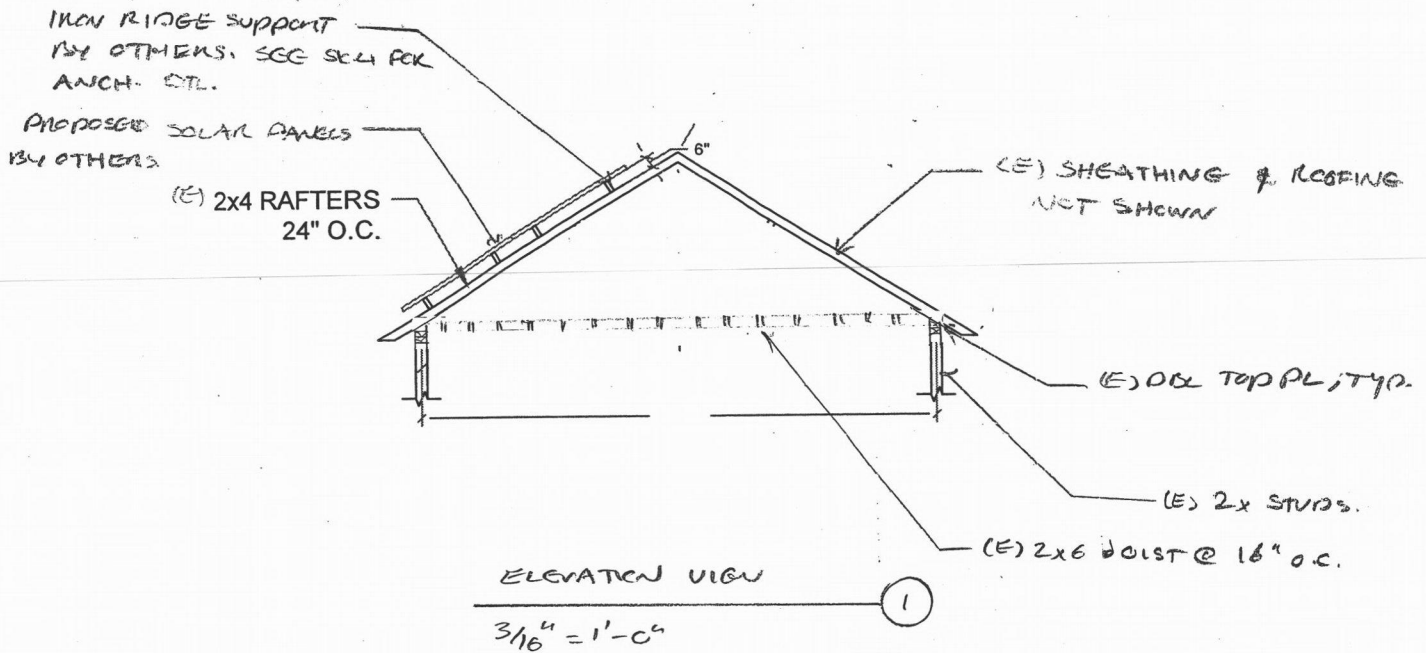


CEILING PLAN

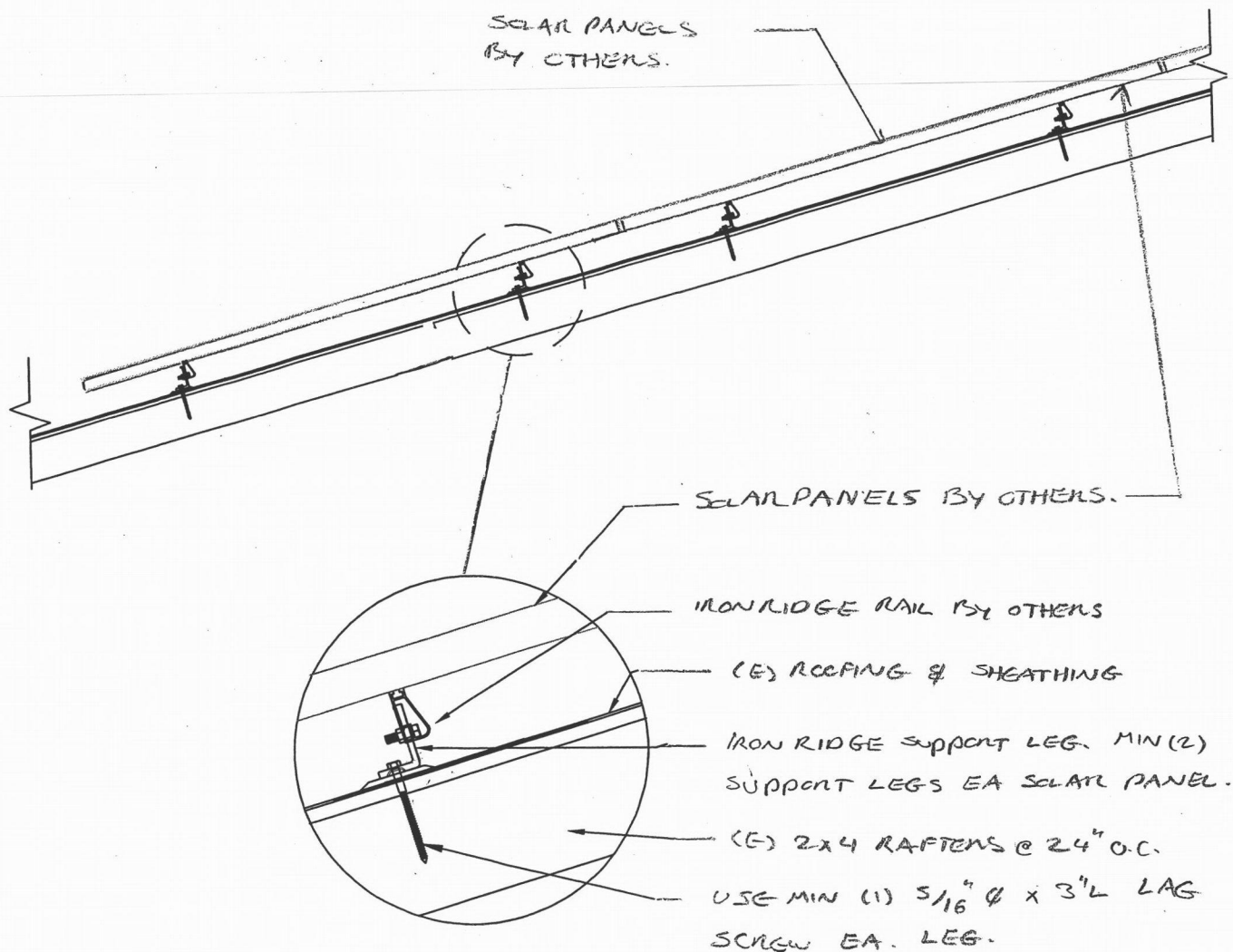
$3/16" = 1'-0"$



FILE NO. 161034 SHEET NO. SK.2
 MADE BY BK DATE 10/27/16
 CLIENT ELEMENTAL ENERGY
 PROJECT TCHOU SOLAR PANELS

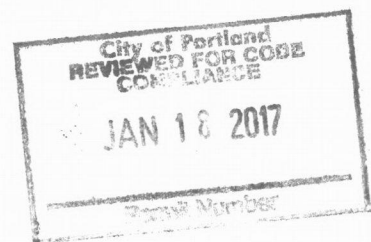


NOTE: WATER PROOFING & FLASHING BY OTHERS.



ANCHORAGE DET

N.T.S.



FILE NO. 161034 SHEET NO. SK-4
MADE BY PHC DATE 11/08/16
CLIENT ELEMENTAL ENERGY
PROJECT TCHOU SOLAR PANELS

PROJECT NOTES:
1. 3.705 KW DC, 2.795 KW AC SOLAR PHOTOVOLTAIC SYSTEM
2. 1 STORY COMP SHINGLE ROOF AT 32° PITCH.
3. CONSTRUCTION FOREMAN TO CONFIRM FINAL CONDUIT RUN PLACEMENT WITH CUSTOMER.
4. CONTACT: CAYLEIGH A.
5. DESIGN CRITERIA:
5.1. SYSTEM WEIGHT: 3LBS/SQFT.
5.2. EFFECTIVE WIND SPEED: 95 MPH 3-SEC GUST.
5.3. WIND EXPOSURE CATEGORY: B
5.4. SNOWLOAD: 25 PSF
5.5. OCCUPANCY CATEGORY: II

SYSTEM INFORMATION			
ARRAY	PITCH	MAGNETIC ORIENTATION	TRUE ORIENTATION
AR-01	32°	195°	180°
AR-02	32°	285°	270°

OSISC 304.9.1

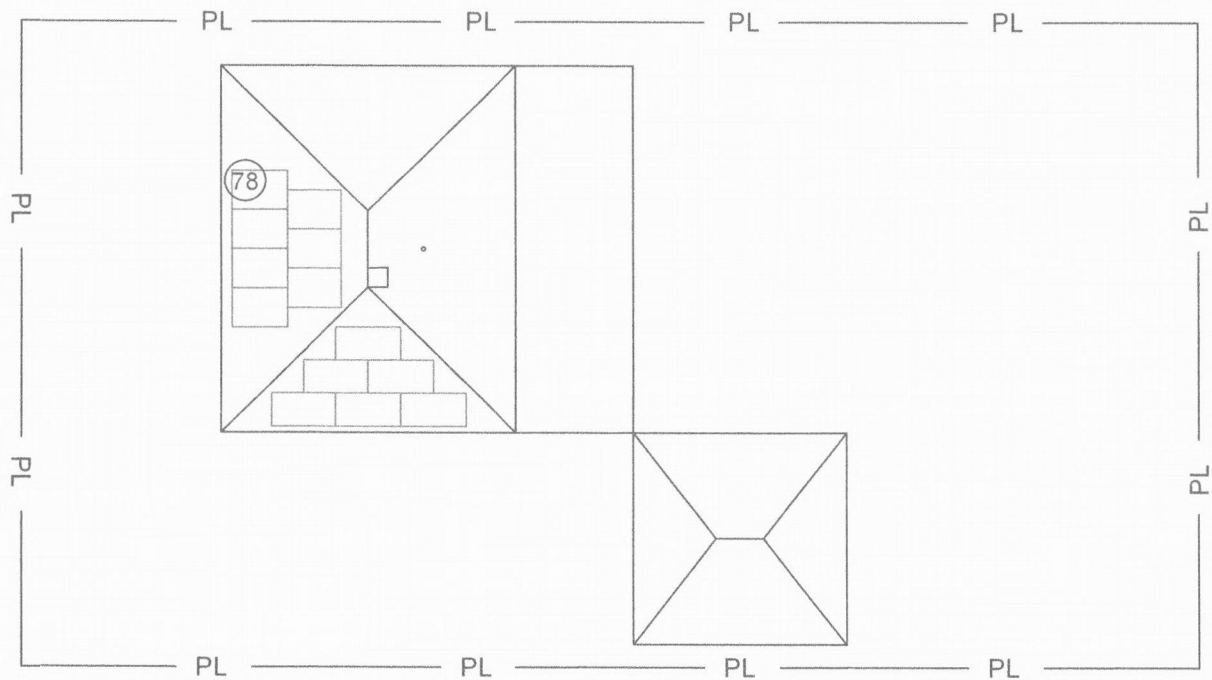
TOTAL PV ARRAY AREA: 238 FT²
LARGEST PV SECTION: 16.5 FT
ROOF SLOPE: 32°
ROOF AREA MEASURED IN PLAN VIEW: 1400FT²
PV ARRAY/ROOF AREA: 17.02 %

TABLE OF CONTENT	
PAGE #	DESCRIPTION
PV-01	SITE PLAN & MECHANICAL
PV-02	RACKING LAYOUT
PV-03	RACKING DETAIL
PV-04	SINGLE LINE DIAGRAM

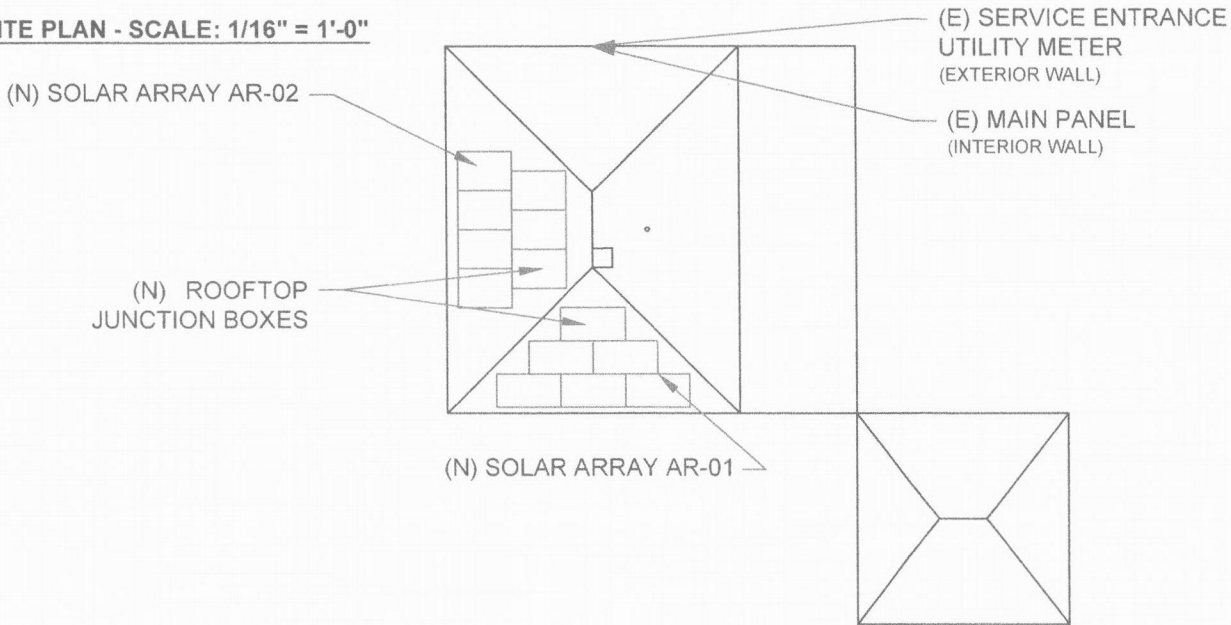
PROPERTY LINE PLAN - SCALE = 1/16" = 1'-0"



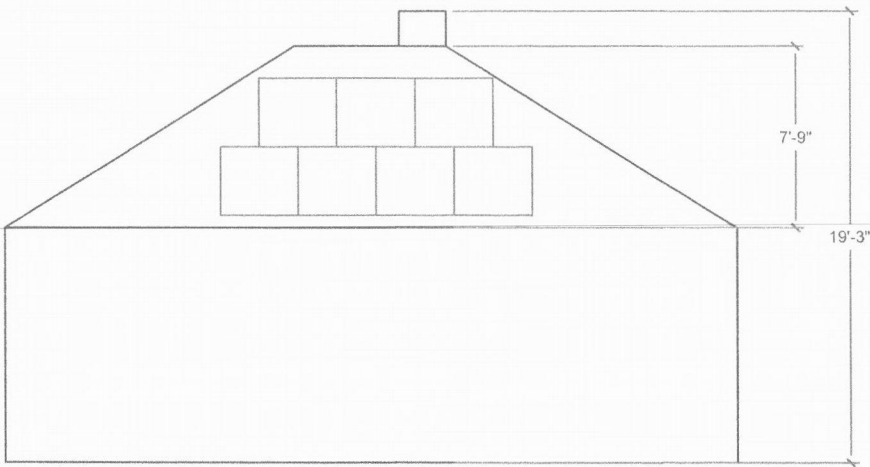
City of Portland
Bureau of
Development Services
By *Helman* Date *12.13.16*
Approved by
Planning and Zoning Review



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



WEST-FACING ELEVATION - SCALE: 1/8" = 1'-0"



⊗ INDICATES TSRF PERCENTAGE
ELECTRICAL EQUIPMENT LOCATIONS NTS

City of Portland
REVIEWED FOR CODE
COMPLIANCE
JAN 18 2017



CHECKED BY: D. JANOSEC
DESIGNED BY: D. JANOSEC

ELEMENTAL ENERGY
OR CCB#: 195141

JEREMY TCHOU
1304 NE 77TH AVE, PORTLAND, OR 97213

SITE PLAN &
MECHANICAL

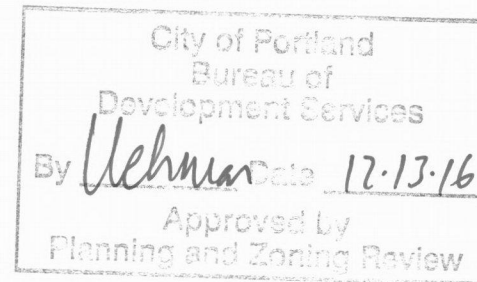
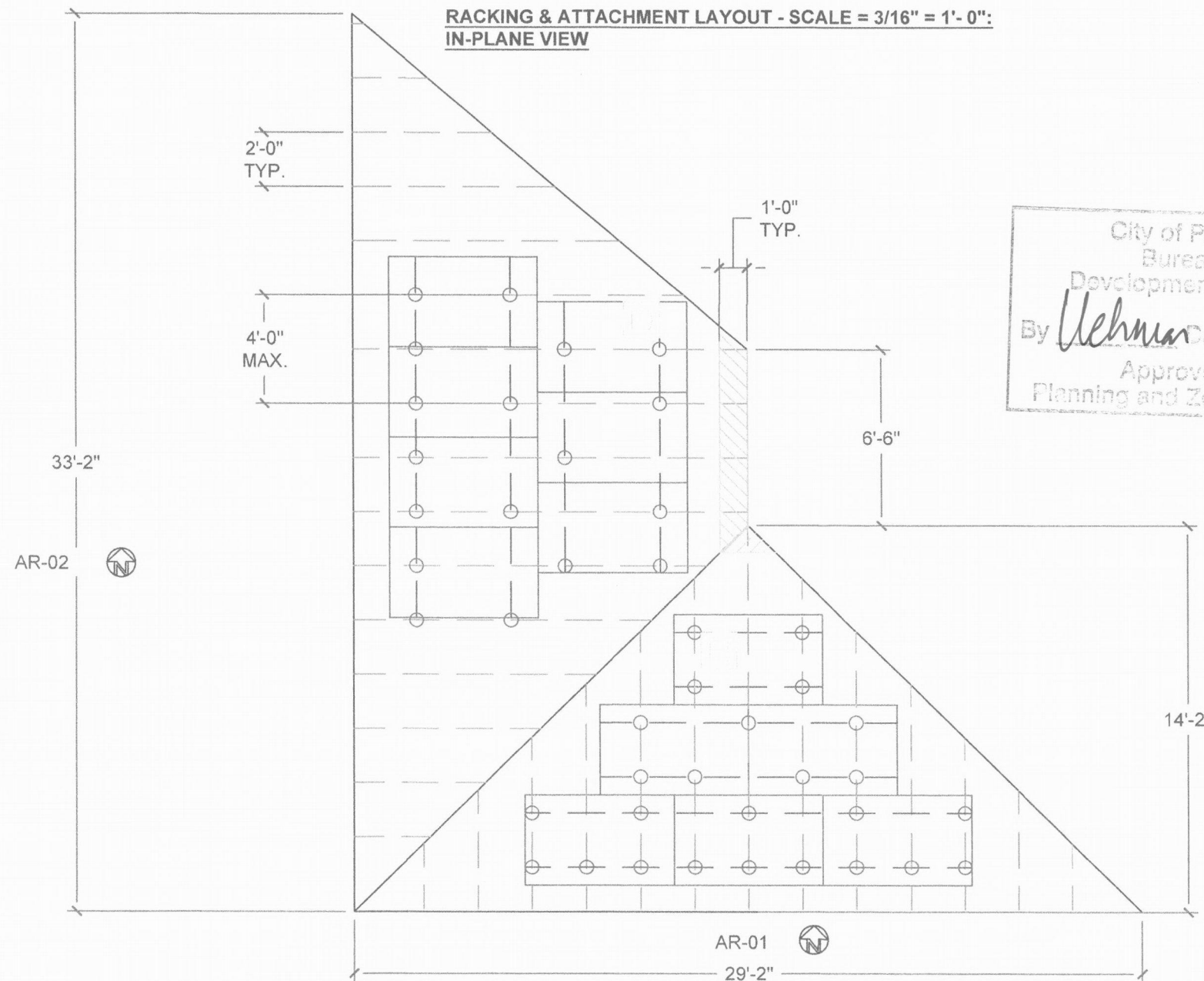
PV-01

REV: A
11/10/2016

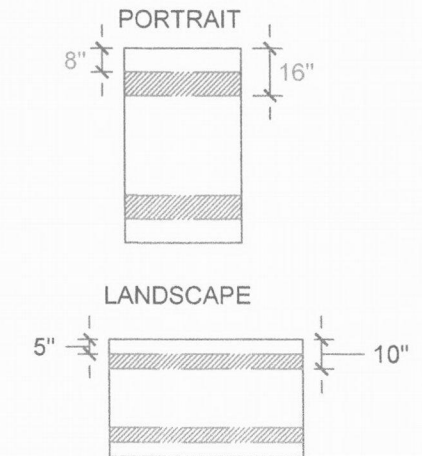
16-218581 Rev 01 RS

RACKING LAYOUT

RACKING & ATTACHMENT LAYOUT - SCALE = 3/16" = 1'-0":
IN-PLANE VIEW



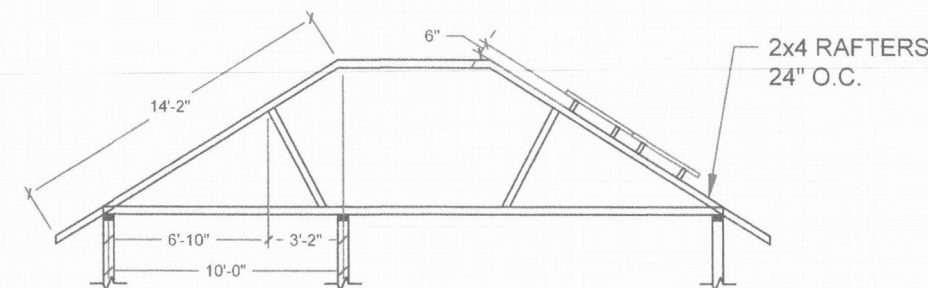
ALLOWABLE RAIL LOCATIONS
SOLARWORLD SW285 MONO
typ. 40" x 66" (Including Clamp Spacing)



- MATERIALS NOTES TO INSALLER:**
- (43) MOUNTING ASSEMBLIES
 - (20) END CLAMPS
 - (16) MID CLAMPS
 - (2) SOLADECKS
 - 132" RAILS
 - 168" RAILS
 - 204" RAILS
 - SPLICES

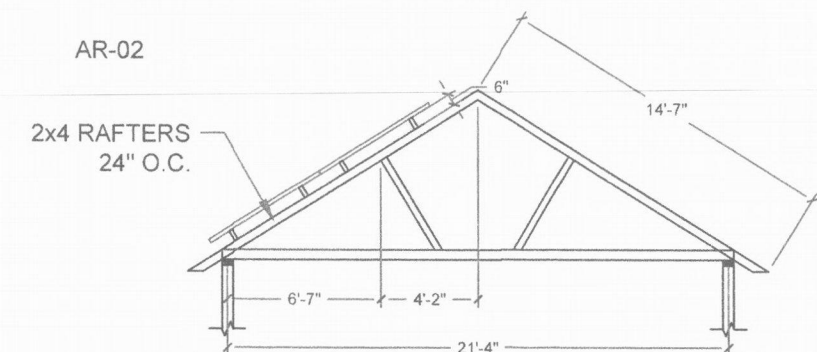
STRUCTURAL DETAILS - SCALE: 1/8" = 1'-0":
See Engineering Analysis for further details

AR-01



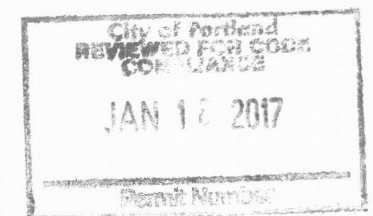
STRUCTURAL DETAILS - SCALE: 1/8" = 1'-0":
See Engineering Analysis for further details

AR-02

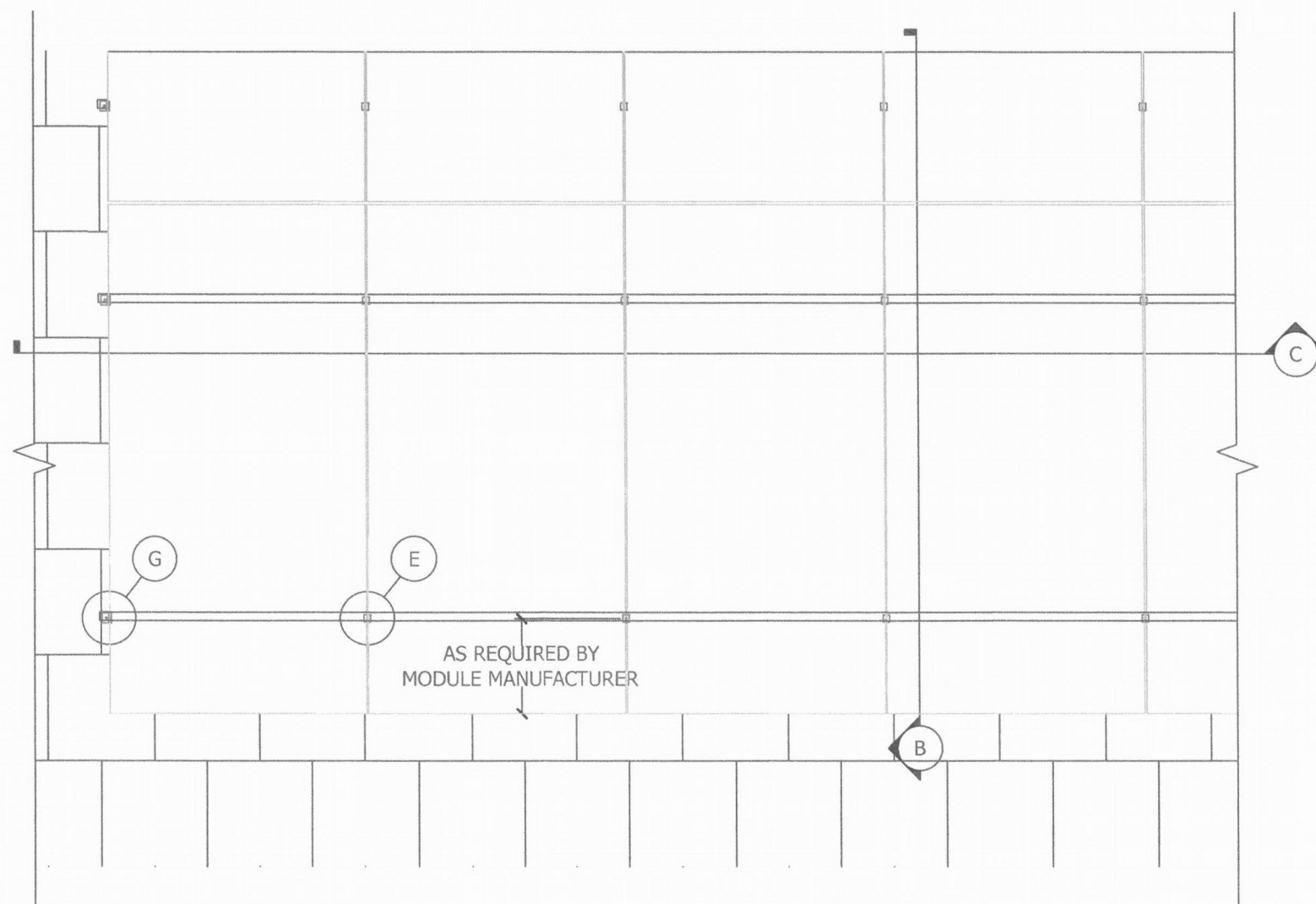


DRAWING KEY:

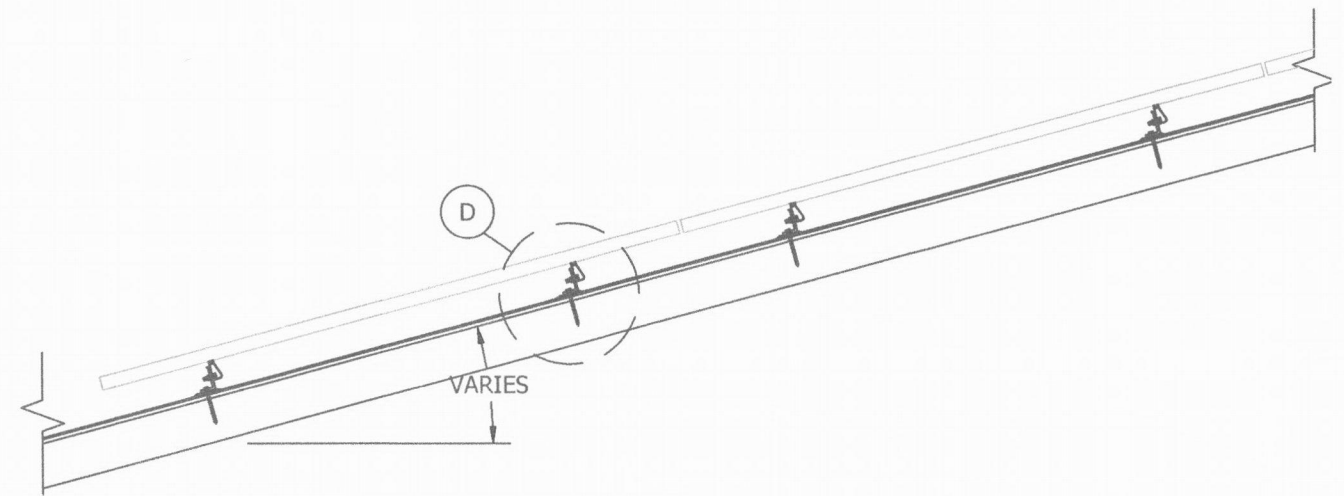
- | | | | |
|--|-----------------------------|--|--|
| | MODULE | | 12" ROOF VENT |
| | RIDGE SETBACK (1' TYP) | | JUNCTION BOX |
| | FIRE SETBACK (3' TYP) | | SOLADECK |
| | RAFTER | | ENPHASE M215 MICROINVERTER |
| | Ironridge XR-10 Rail | | ENPHASE M215 TRUNK CABLE |
| | Ironridge Mount & Flashing | | THHN IN CONDUIT
(SEE WIRING SCHEDULE ON PV-03 FOR SIZING) |
| | 5/16" ϕ X 3" LAG SCREW | | |



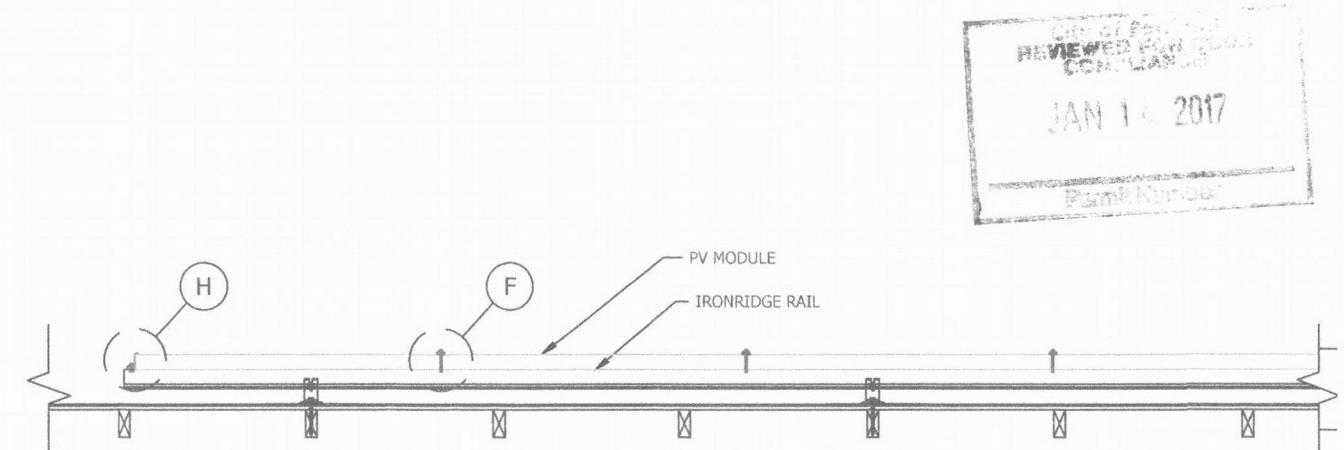
RACKING DETAILS



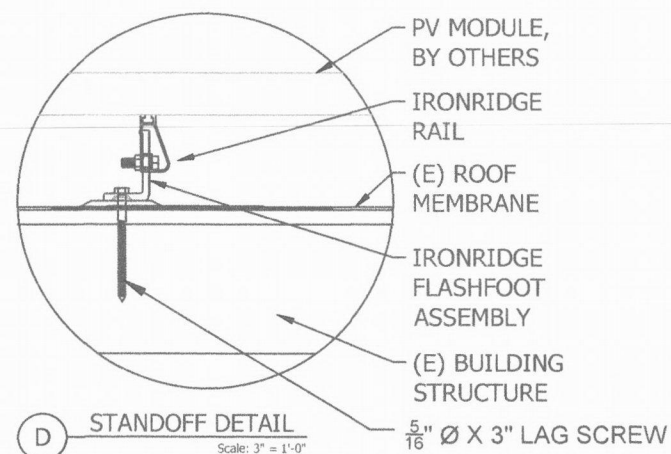
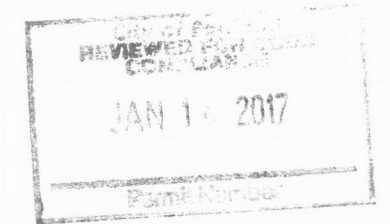
A PLAN VIEW, FLUSH MOUNT ON PITCHED ROOF
Scale: 1" = 1'-0"



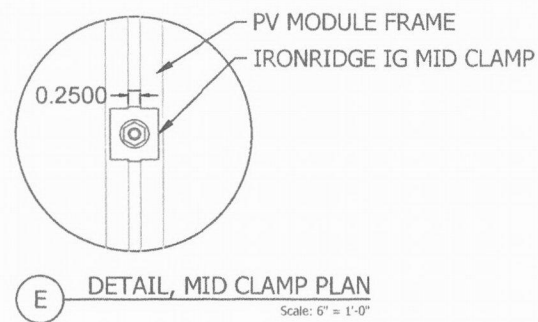
B SIDE VIEW, FLUSH MOUNT ON PITCHED ROOF
Scale: 1" = 1'-0"



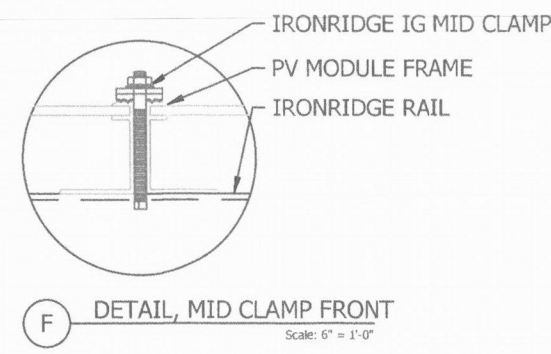
C FRONT VIEW, FLUSH MOUNT ON PITCHED ROOF
Scale: 1" = 1'-0"



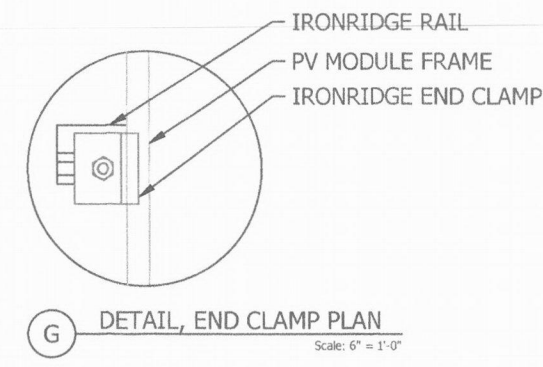
D STANDOFF DETAIL
Scale: 3" = 1'-0"



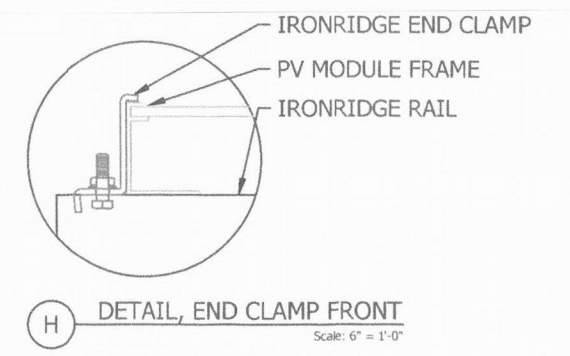
E DETAIL, MID CLAMP PLAN
Scale: 6" = 1'-0"



F DETAIL, MID CLAMP FRONT
Scale: 6" = 1'-0"

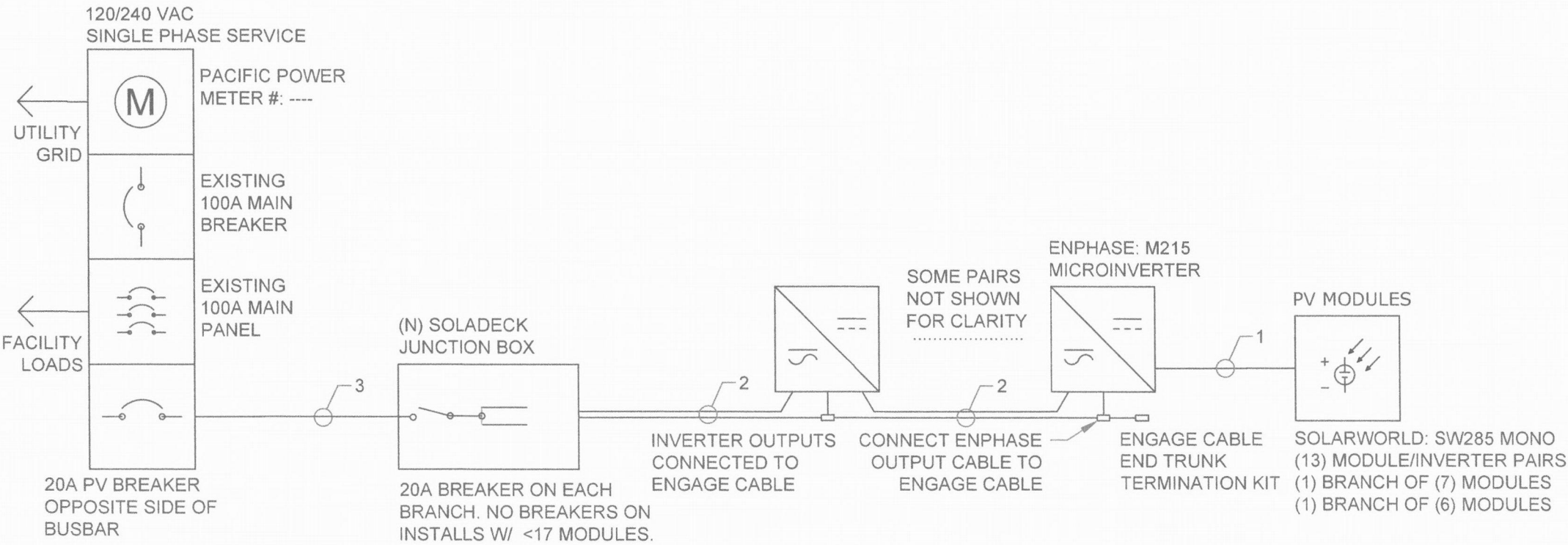


G DETAIL, END CLAMP PLAN
Scale: 6" = 1'-0"



H DETAIL, END CLAMP FRONT
Scale: 6" = 1'-0"

LINE DIAGRAM:

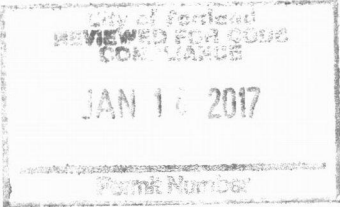


VOLTAGE DROP CALCULATIONS

MODULES TO COMBINER:
VOLTAGE DROP FOR 240 VAC, 4 WIRE, 1.0M
LANDSCAPE ENGAGE CABLES AND M215s, END FED
(FROM SPEC. SHEET) IS 0.18%.

COMBINER TO MAIN PANEL, 55 ft. MAX:
%VD = (2 x 55 ft x 11.7 A x 2.05 Ω/1000 ft.)/240 V = 1.10%

TOTAL V.D. = 0.18% + 1.10% = 1.28%



CONDUIT SCHEDULE

#	CONDUIT	CONDUCTOR	NEUTRAL	GROUND
1	NONE	(2) 10 AWG PV WIRE	NONE	(1) 6 AWG BARE COPPER
2	NONE	ENPHASE ENGAGE CABLE	NONE	(1) 6 AWG THHN/THWN-2
3	3/4" EMT OR EQUIV. IF EXT; NONE IF INTERIOR	(2) 12 AWG: THHN/THWN-2 IN CONDUIT OR NM-B IF NO CONDUIT	(1) 12 AWG: THHN/THWN-2 IN CONDUIT OR NM-B IF NO CONDUIT	(1) 12 AWG THHN/THWN-2

POINT OF INTERCONNECTION:

BACKFED BREAKER ON MAIN PANEL

1. ADD 20 AMP PV BREAKER TO MAIN PANEL
2. MAIN PANEL RATING: 100 A
3. MAIN PANEL MAIN BREAKER RATING: 100 A

ELECTRICAL NOTES:

1. PHOTOVOLTAIC SYSTEM WILL COMPLY WITH 2014 NEC.
2. ELECTRICAL SYSTEM GROUNDING WILL COMPLY WITH 2014 NEC.
3. MODULES CONFORM TO AND ARE LISTED UNDER UL 1703.
4. INVERTER CONFORMS TO AND IS LISTED UNDER UL 1741.
5. ARRAY DC CONDUCTORS ARE SIZED FOR DERATED CURRENT.
9.84 AMPS MODULE SHORT CIRCUIT CURRENT.
15.35 AMPS DERATED SHORT CIRCUIT CIRCUIT (690.8 (a) & 690.8 (b)).

NOTES TO INSTALLER:

1. UTILITY CONDUCTORS TO LOAD SIDE, BOTTOM
2. PV CONDUCTORS TO LINE SIDE, TOP
3. AC/DC VOLTAGE DROP MAXIMUM AT 2% RESPECTIVELY

MODULE CHARACTERISTICS

SOLARWORLD: SW285 MONO	285	W
OPEN CIRCUIT VOLTAGE	39.7	V
OPEN CIRCUIT VOLTAGE: (690.7)	43.4	V
MAX POWER VOLTAGE	31.3	V
SHORT CIRCUIT CURRENT	9.84	A
SHORT CIRCUIT CURRENT (690.8(A)(1))	12.30	A

SYSTEM CHARACTERISTICS

NOMINAL OPERATING AC VOLTAGE	240	V
NOMINAL OPERATING AC FREQUENCY	60	HZ
MAXIMUM AC POWER	2795	W
MAXIMUM AC CURRENT	11.65	A
MAXIMUM OVERCURRENT DEVICE RATING FOR AC MODULE PROTECTION	20	A

LABELLING REQUIREMENTS:

WARNING: PHOTOVOLTAIC
POWER SOURCE

LOCATED AT UTILITY METER OUTSIDE & INSIDE PANEL
CODE SECTION: NEC 690.64.B.4

PHOTOVOLTAIC AC DISCONNECT

MAXIMUM AC OPERATING CURRENT:
NOMINAL OPERATING AC VOLTAGE:

LOCATION: ON AC DISCONNECT (IF INSTALLED, WHEN AC
INVERTER OUTPUT IS GREATER THAN 30A PER UTILITY NET
METERING REQUIREMENT AND CODE).
CODE SECTION: NEC 690.14.C.2 & NEC 690.54

NOMINAL OPERATING AC VOLTAGE:

NOMINAL OPERATING AC FREQUENCY:

MAXIMUM AC POWER:

MAXIMUM AC CURRENT:

MAX OVERCURRENT DEVICE RATING
FOR AC MODULE PROTECTION:

LOCATION: AT POINT OF INTERCONNECTION CODE
SECTION: NEC 690.53

SOLAR ELECTRIC SYSTEM
DISCONNECT LOCATED IN MAIN
SERVICE PANEL

LOCATION: NEAR UTILITY METER, ON UTILITY
METER OR SOLAR PRODUCTION METER

WARNING
INVERTER OUTPUT CONNECTION. DO NOT
RELOCATE THIS OVERCURRENT DEVICE.

LOCATION: NEXT TO SOLAR BREAKER INSIDE
ELECTRIC PANEL