

DOCKETED

Docket Number:	09-AFC-05C
Project Title:	Abengoa Mojave Compliance
TN #:	200121
Document Title:	Abengoa Mojave Solar's Responses to CEC's Informal Data Request
Description:	N/A
Filer:	Tiffani Winter
Organization:	Ellison, Schneider & Harris L.L.P.
Submitter Role:	Applicant's Representative
Submission Date:	8/7/2013 3:34:47 PM
Docketed Date:	8/7/2013

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August 7, 2013

Dale Rundquist
Project Manager
California Energy Commission
Siting, Transmission, and
Environmental Protection Division
1516 Ninth Street, MS 15
Sacramento, CA 95814

Re: Mojave Solar Project (09-AFC-05C) Responses to Informal Data Requests

Dear Mr. Rundquist:

On July 30, 2013, California Energy Commission Staff submitted informal data requests on the subject matters of hazardous materials management and worker safety relating to the Mojave Solar Project ("MSP") amendment dated July 24, 2013. On behalf of Mojave Solar LLC ("MSLLC"), the project owner, we hereby submit the attached responses to the requests for additional information.

If you have any questions, please contact me at (916) 447-2166.

Thank you.

Sincerely,



Samantha G. Pottenger

Attorneys for Mojave Solar LLC

SGP/kam
enc.

DATA RESPONSES

1. Please provide more details about the exact heater being proposed.

Attached are three engineering documents that provide additional information regarding the proposed electric heaters. Attachment 1 (6007-PLN-GAU-58-62-0001 Rev2) provides a general arrangement drawing. Attachment 2 (6007-PLN-GAU-58-62-0004.0) provides tube bundle details. Attachment 3 (6007-PLN-GAU-58-62-0005) is a diagram of the 24” enclosure and wiring.

2. Will the heat transfer fluid (“HTF”) be heated directly by a heating element immersed in HTF?

Please see the response below.

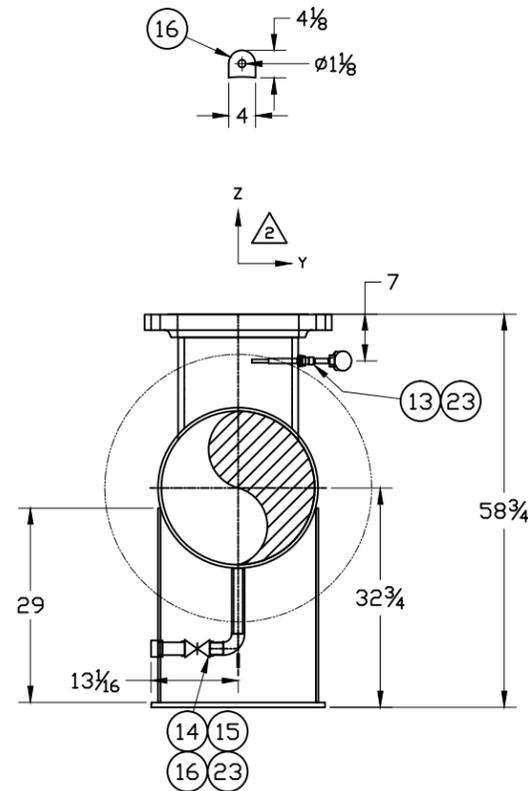
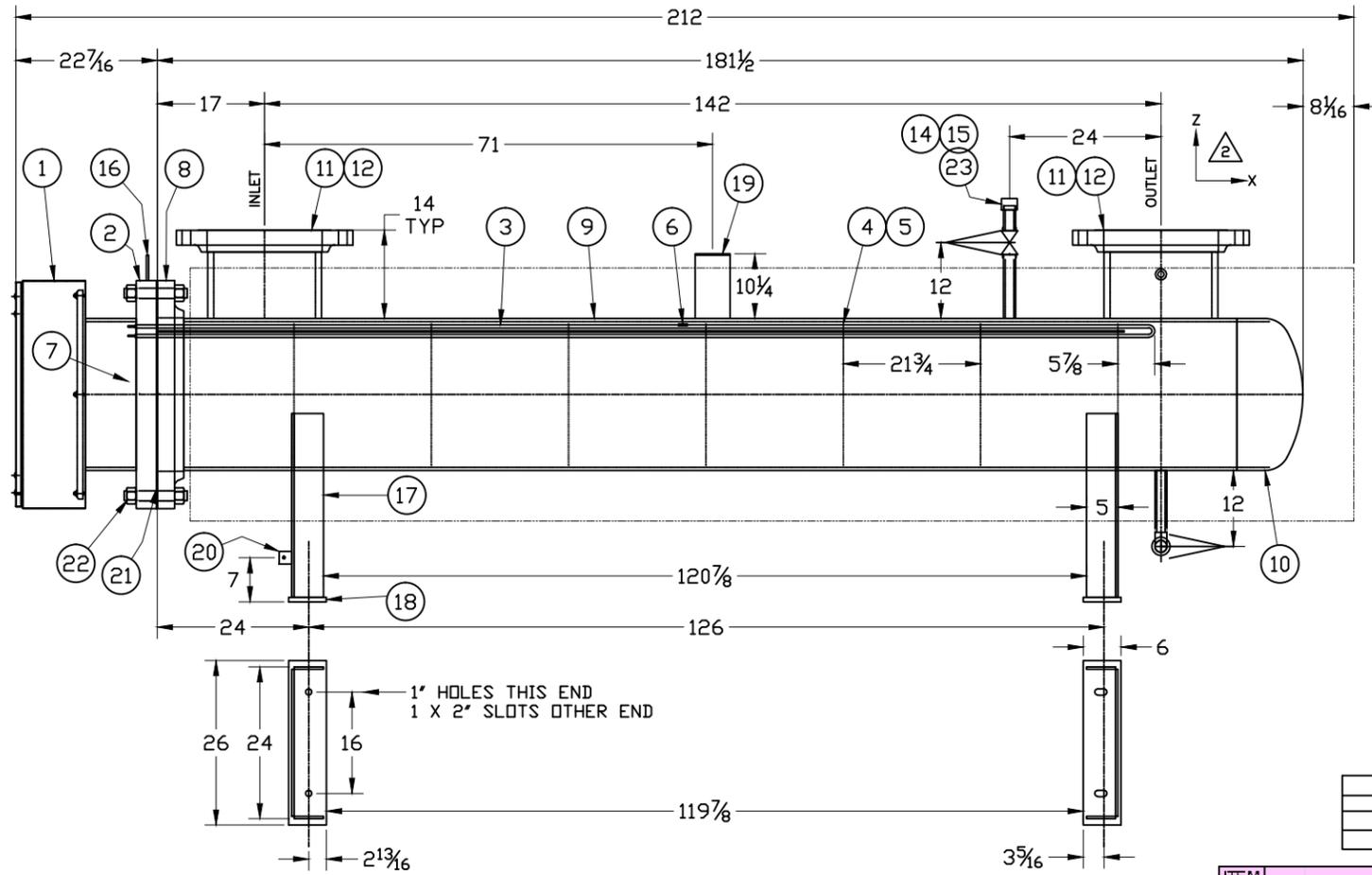
3. Will the HTF be heated indirectly by heating a vessel which then transfers heat to the HTF?

The HTF electric heaters will operate similar to a shell and tube heat exchanger. As shown on Attachment 2, heating filaments are enclosed inside the tubes. The HTF will flow through the vessel around the tubes. As a result, the HTF is indirectly heated since the filament heats the tube, and the tube heats the HTF.

ATTACHMENT 1

**Engineering Document
6007-PLN-GAU-58-62-0001 REV 2**

All Dimensions Are In Inches Unless Indicated Otherwise



18" NOZZLE LOADS						
	LBS			FT-LBS		
	Fx	Fy	Fz	Mx	My	Mz
	3782	6500	7000	20050	21000	4205

PROCESS CONDITIONS	
FLUID	Therminol VP1
QTY	2488257 lbs/hr
INLET °F	114
OUTLET °F	120
INLET PSIG	155.3
DESIGN °F	750
DESIGN PSIG	340
CORR. ALLOW	1/16"
HEATER ASSEMBLY	
VOLTS	480
PH	3
KW	2028
# CIRC.	26
OHMS/CIRC.	5.91
AMPS/CIRC.	93.82
AMPS + 25%	117.28
FUSE SIZE	120
CUST. CONN.	Terminal Block
LEAD WIRE SIZE	(2) 6 Ga
LEAD WIRE TYPE	RHTW
HEATER ELEMENTS	
PART NO.	160G4
KW	13
RATED VOLTS	480
RESISTANCE	17.72
HOUSING DETAIL	
PART NO.	LT24X
SIZE	24"
MATERIAL	CS
AREA CLASS.	Outdoor
APPROVAL	NA
PWR. CONDUIT SIZE	2"
PWR. CONDUIT QTY.	13
INST. CONDUIT SIZE	3/4"
INST. CONDUIT QTY.	1
DWG. REF.	15810B12-ME-FAB-03

QTY-2 THERMINOL VP1 HEATERS	
SERIAL NO.	TAG NO.
12-15810A	A-MX-208
12-15810B	B-MX-208

GENERAL NOTES:

- VESSEL IS DESIGNED, BUILT AND STAMPED PER ASME SECTION VIII, DIVISION 1.
- PRESSURE TEST VESSEL AT 582 PSI FOR 1 HOUR.
- CLEAN AND PAINT PER GAUMER SPEC P-200.5. HI-HEAT ALUM FOR HEATER AND CARBOZINC 11 (2-3 MILS) FOR VESSEL.
- HEATER IS WIRED INTO 26 CIRCUITS WITH 6 ELEMENTS PER CIRCUIT (78 KW/CIRCUIT). TERMINATE EACH CIRCUIT WITH (2) 6 GA. RHTW LEADS TO DISTRIBUTION BLOCKS. SEE DRAWING 6007-PLN-GAU-58-62-0005 FOR ENCLOSURE DETAILS AND WIRING DIAGRAM.
- CLAMP RTDS WHERE SHOWN IN WIRING DIAGRAM AND TERMINATE IN JBOX.
- HEATER WEIGHT 2375 LBS. VESSEL WEIGHT 4665 LBS. FDW WEIGHT 9275 LBS.
- 8" THICK INSULATION PROVIDED BY OTHERS.
- FLANGE LAYOUT FILE NO. IS LQ24F156NSXH-300#3TC.

BILL OF MATERIALS				
ITEM NO.	QTY	DESCRIPTION	MATERIAL	PART NUMBER
1	1	HEATER ENCLOSURE - 36"x36"x12" With 8" Long Transition	CS	
2	1	HEATER FLANGE - 24" 300# RF Bld Special Thickness 3.25" ANSI B16.5	SA-105	
3	156	ELEMENTS -13 KW, 480 V, 161.5" Sheath, 18" Unheated	INCOLOY 800	160G4
4	7	ELEMENT SPACER - 12 Ga. x 22.43" OD	SA-240T304	
5	6	ELEMENT SUPPORT RODS - 1/4" Rnd. Bar x 153.25" Long	A-479T304	
6	3	OVERTEMP THERMOCOUPLE - Type "RTD"	316	RTD-5-96SD
7	3	COMPRESSION FITTING - 1/8" Tube x 1/8" MNPT	304	
8	1	VESSEL FLANGE - 24" 300# RFSO ANSI B16.5	SA-105	
9	1	SHELL - 24" Sch XH x 171" RF-S	SA-106C	
10	1	CAP - 24" Sch XH	SA-234WPC	
11	2	INLET/OUTLET FLANGE - 18" 300# RFSO ANSI B16.5	SA-105	
12	2	INLET/OUTLET NOZZLE - 18" Sch 140 x 18" Long	SA-106C	
13	1	TTW CONNECTION - 3/4" 6000# SOL	SA-105	
14	2	VENT / DRAIN NOZZLE / NIPPLE - 1 1/2" Sch 160 TOE Nipple	SA-106B	
15	2	VENT / DRAIN GATE VALVE - 1 1/2" SW 800# Conv Port, Trim 8 BB OS&Y	SA-105N	0800-0000W
16	1	DRAIN - 1 1/2" Sch 160 Elbow	SA-234WPC	
17	1	SADDLE WEB / STIFFENER / LIFT LUG - 3/8" Plate	A-36	
18	2	SADDLE BASE - 3/4" Plate	A-36	
19	1	NAME PLATE BRACKET 1/4" Plate	A-36	
20	1	GROUND LUG - 2" Sq. W 7/16" Hole	SA-240T304	
21	1	GASKET - 24" 300# Flexitallic Style Graphoil Filled	304	
22	24	STUD/NUT SETS - 1 1/2" x 10" Long Zinc Plt'd	SA-193-B7/194-2H	
23	1	PROCESS TTW - 100 Ohm 3 Wire "RTD" 3/4" SW x 7.5" U Dim	316	TTWRD-7.5-316X
23	2	VALVE CAP - 1 1/2" 3000# Thrd'd Cap	SA-105	

DISTRIBUTION											
MANUFACTURING			ADMINISTRATION			OTHER					
FAB	1	MACHINE	1	PURCHASING	0	ROUTING	0	QC	1	PROJECT MGR	1
PANEL	0	HEATER	0			CUSTOMER	1	FILE	1		1

NO.	DATE	DESCRIPTION	BY	BY	BY

NO.	DATE	DESCRIPTION	BY	BY	BY
2	3-APR	ADD AXIS REFERENCE			
1	25-MAR	GENERAL REVISION			
0	06-FEB	ISSUED FOR CONSTRUCTION			
C	16-JAN	ADD NOZZ LOAD			
B	20-DEC	ADD DOC CODE			

NO.	DATE	DESCRIPTION	BY	BY	BY

NO.	DATE	DESCRIPTION	BY	BY	BY

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06-FEB-13 CONSTRUCTION
 ISSUE DATE PURPOSE OF ISSUE

MOJAVE SOLAR, LLC		HINKLEY, CALIFORNIA	
BY	DATE	APP'D.	DATE

JOB NO. 12-15810

DRAWING NUMBER 15810B12-ME-FAB-01

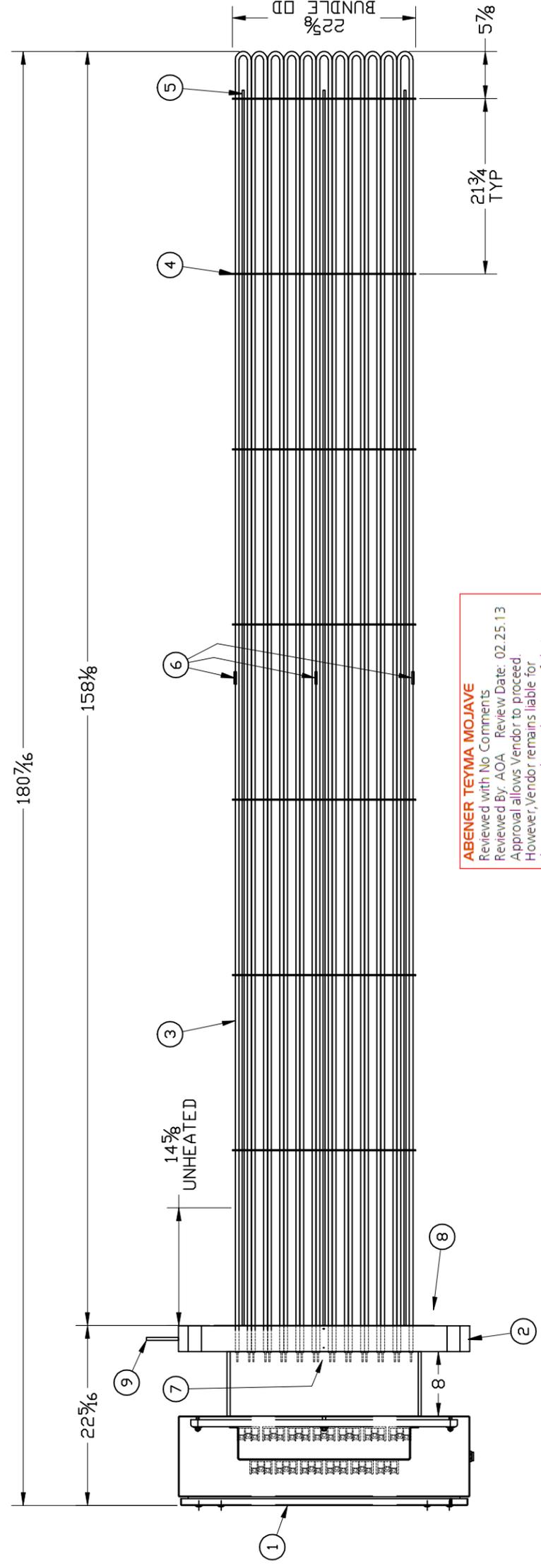
ATTACHMENT 2

**Engineering Document
6007-PLN-GAU-58-62-0004.0**

H G F E D C B A

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All Dimensions Are In Inches Unless Indicated Otherwise

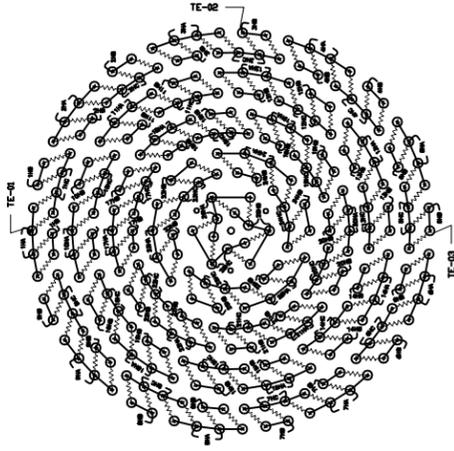


- GENERAL NOTES:
 1. HEATER IS DESIGNED PER ASME SECTION VIII DIV. 1 APP. 41.
 2. HYDRO-TEST HEATER AT 498 PSI.
 3. CLEAN AND PAINT PER GAUMER SPEC P-200.5 HI-HEAT ALUMINUM.
 4. HEATER WEIGHT APPROX. 2450 LBS.
 5. HEATER IS WIRED INTO 26 CIRCUITS WITH 6 ELEMENTS PER CIRCUIT (78 KW/CIRCUIT). TERMINATE EACH CIRCUIT WITH (2) 6 GA. RHTW LEADS TO DISTRIBUTION BLOCKS.
 6. SEE DRAWING 15810B12-ME-FAB-03 FOR ENCLOSURE DETAILS AND WIRING DIAGRAM.
 7. CLAMP RTDS WHERE SHOWN IN WIRING DIAGRAM AND TERMINATE IN JBOX.

ABENER TEYMA MOJAVE
 Reviewed with No Comments
 Reviewed By: AOA Review Date: 02.25.13
 Approval allows Vendor to proceed.
 However, Vendor remains liable for
 the accuracy and completeness of design.

ITEM NO.	QTY	DESCRIPTION	MATERIAL	PART NUMBER
1	1	HEATER ENCLOSURE - 36"x36"x12" With 8" Long Transition	CS	15810B12-ME-FAB-03
2	1	HEATER FLANGE - 24" 300# RF Bid Special Thickness 3.25"	SA-105	
3	156	ELEMENTS -13 KW, 480 V, 161.5" Sheath, 18" Unheated	INCOLOY 800	160G4
4	7	ELEMENT SPACER - 12 Ga. x 22.43" OD	SA-240T304	
5	6	ELEMENT SUPPORT RODS - 1/4" Rnd. Bar x 153.25" Long	A-479T304	
6	3	OVERTEMP THERMOCOUPLE - Type "RTD"	316	RTD-5-96SD
7	3	COMPRESSION FITTING - 1/8" Tube x 1/8" MNPT	304	
8	1	GASKET - 24" 300# Flexitallc Style Graphoil Filled	304	
9	1	LIFT LUG - 4" x 4" x 3/8" Plate	A-36	

U
 CERTIFIED BY GAUMER PROCESS
 MAWP 340 PSI AT 750°F
 MDMT -20°F AT 340 PSI
 SERIAL NO. 12-15810C
 PART YEAR BUILT 2012
 PO# 00131P-0919



LD24F156NSXH-300#3TC

MANUFACTURING		ADMINISTRATION		OTHER	
FAB 0	MACHINE 1	BUYING 1	ROUTING 1	QC 1	PROJECT 1
PANEL 0	HEATER 1			CUSTOMER 1	FILE 1

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0	06-FEB	ISSUED FOR CONSTRUCTION			0	06-FEB	ADD DOC CODE		
B	20-JEC								

PROCESS CONDITIONS	
FLUID	Thermal VP1
QTY	2488257 lbs/hr
INLET °F	114
OUTLET °F	120
INLET PSIG	155.3
DESIGN °F	750
DESIGN PSIG	340
CORR. ALLOW	1/16"
HEATER ASSEMBLY	
VOLTS	480
PH	3
KW	2028
# CIRC.	26
OHMS/CIRC.	5.81
AMPS/CIRC.	93.82
AMPS + 25%	117.28
FUSE SIZE	120
CUST. CONN.	Terminal Block
LEAD WIRE SIZE	(2) 6 Ga
LEAD WIRE TYPE	RHTW
HEATER ELEMENTS	
PARTNO.	160G4
KW	13
RATED VOLTS	480
RESISTANCE	17.72
HOUSING DETAIL	
PARTNO.	LT24X
SIZE	24"
MATERIAL	CS
AREA CLASS.	Outdoor
APPROVAL	NA
PWR. CONDUIT SIZE	2"
PWR. CONDUIT QTY.	13
INST. CONDUIT SIZE	3/4"
INST. CONDUIT QTY.	1
DWG. REF.	15810B12-ME-FAB-03



13616 HEMPSTEAD ROAD
 HOUSTON TEXAS USA
 PHONE (713) 460-5200

CAT NO. 324F156NI60G4LRTD
 480V 3PH 2028KW 30 WATTS SQ/IN.
 PO# 00131P-0919

ABENER TEYMA
 MOJAVE

ABENGOA SOLAR

6007-PLN-GAU-58-62-0004

MOJAVE SOLAR, LLC
 HINKLEY, CALIFORNIA

BY	DATE	APPD.	DATE	JOB NO.	REVISION
					0

DRAWN
 CHECKED
 SCALE
 NONE
 15810B12-ME-FAB-04
 DRAWING NUMBER
 PURPOSE OF ISSUE
 CONSTRUCTION
 ISSUE DATE
 06-FEB-13

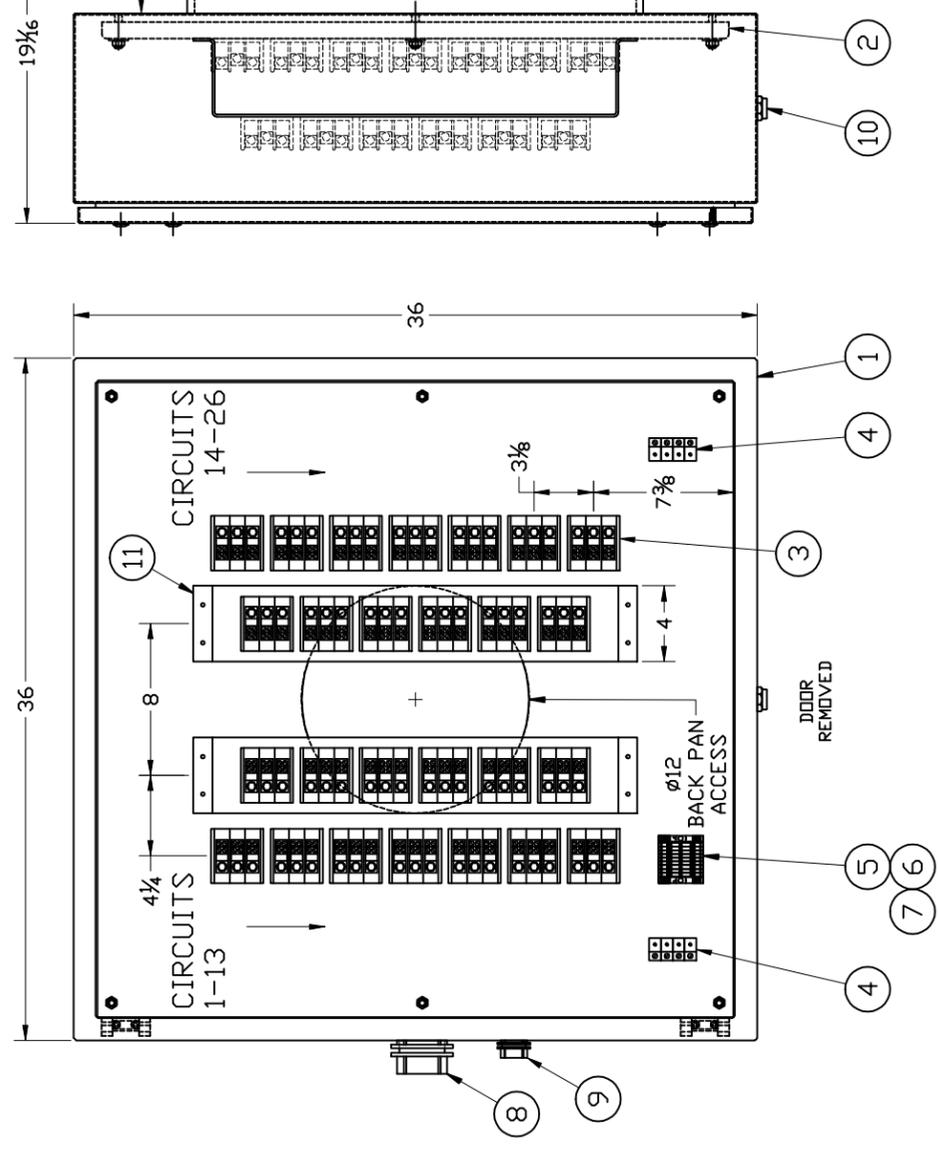
LAST SAVED BY ROBERTS

ATTACHMENT 3

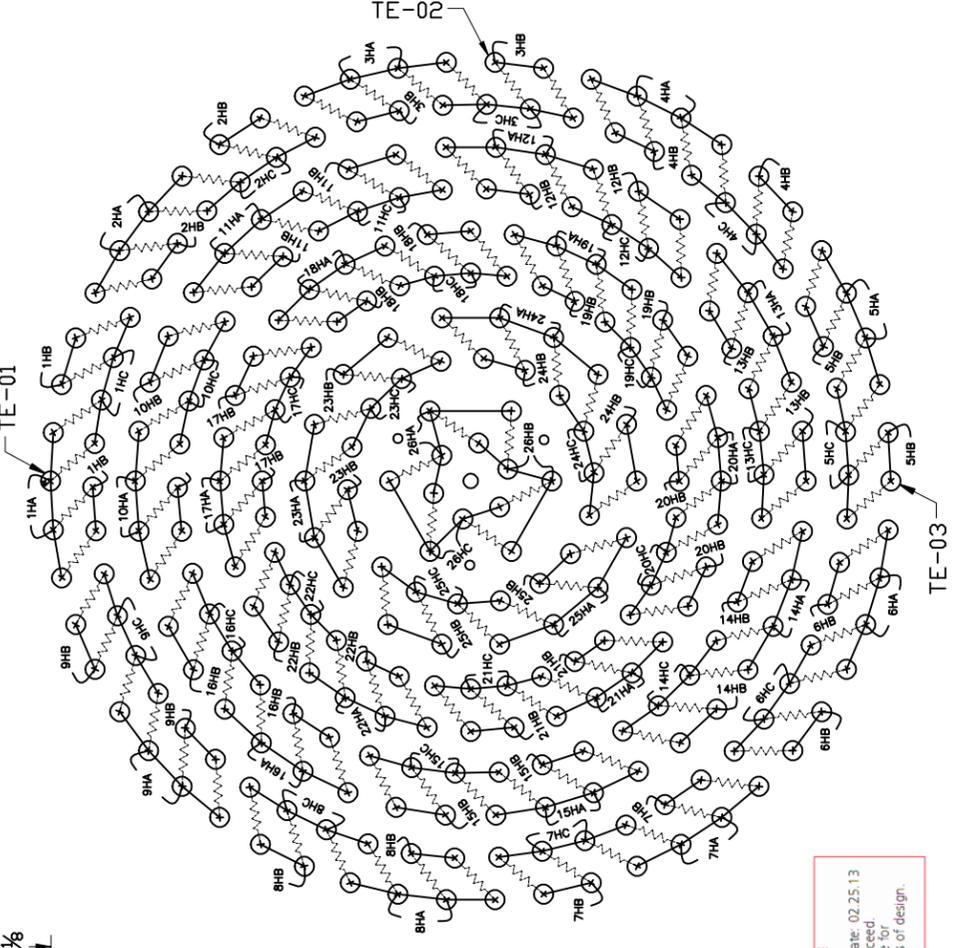
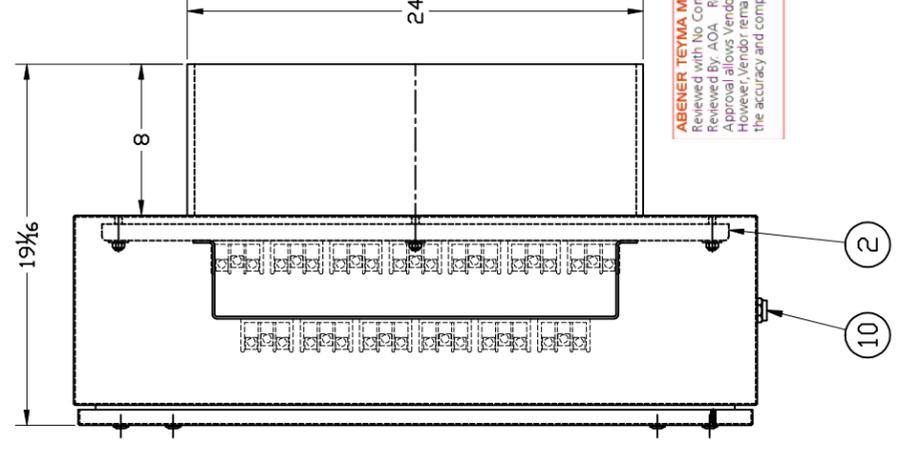
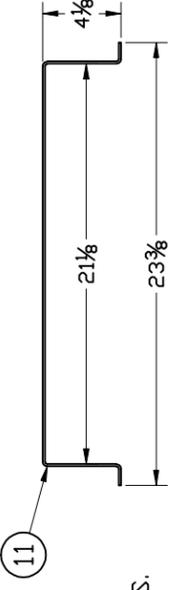
**Engineering Document
6007-PLN-GAU-58-62-0005**

All Dimensions Are In Inches Unless Indicated Otherwise

FINISH - ANSI-61 GRAY URETHANE POLYESTER POWDER COATING INSIDE AND OUT OVER PHOSPHATIZED SURFACES. BACK PANEL IS FINISHED WITH A WHITE POLYESTER POWDER COAT.



ABENER TEYMA MOJAVE
 Reviewed By: LOA, Permit Date: 02.25.13
 Approval allows Vendor to proceed.
 However, Vendor remains liable for
 the accuracy and completeness of design.



LO24F156NSXH-300#3TC

PROCESS CONDITIONS	
FLUID	Thermal VP1
QTY	2488257 lbs/hr
INLET °F	114
OUTLET °F	120
INLET PSIG	155.3
DESIGN °F	750
DESIGN PSIG	340
CORR. ALLOW	1/16"
HEATER ASSEMBLY	
VOLTS	480
PH	3
KW	2028
# CIRC.	26
OHMS/CIRC.	5.91
AMPS/CIRC.	93.82
AMPS + 25%	117.28
FUSE SIZE	120
CUST. CONN.	Terminal Block
LEAD WIRE SIZE	(2) 6 Ga
LEAD WIRE TYPE	RHTW
HEATER ELEMENTS	
PART NO.	160G4
KW	13
RATED VOLTS	480
RESISTANCE	17.72
HOUSING DETAIL	
PART NO.	LT24X
SIZE	24"
MATERIAL	CS
AREA CLASS.	Outdoor
APPROVAL	NA
PWR. CONDUIT SIZE	2"
PWR. CONDUIT QTY.	13
INST. CONDUIT SIZE	3/4"
INST. CONDUIT QTY.	1
DWG. REF.	NA

QTY-3 ENCLOSURES	
2	VESSELS
1	SPARE HEATER

BILL OF MATERIALS			
ITEM NO.	DESCRIPTION	PART NO.	MANUFACTURER
1	NEMA 4 ENCLOSURE 36X38X12	SCE-36EL3612LP	SAGINAW
2	ENCLOSURE SUB PANEL	SCE36P36	SAGINAW
3	DISTRIBUTION BLOCK (1)#14-2/0 / (4)#14-#4	LBA362104	BUSSMAN
4	GROUND LUGS	TA-0	ILSCO
5	TERMINAL BLOCK 25A 600V	102000	WEIDMULLER
6	TERMINAL BLOCK END PIECE	105000	WEIDMULLER
7	TERMINAL BLOCK ANCHORS	106120	WEIDMULLER
8	MYERS HUB 2"	ST-6	MYERS
9	MYERS HUB 3/4"	ST-2	MYERS
10	DRAIN/BREATHER	DPE3029S3	REDAPT
11	TERMINAL BLOCK BRACKET - 31 1/8" x 4 X 10 Ga	304	

NOTES
 1. 26 POWER CIRCUITS WILL BE RUN IN (13) 2" CONDUITS, MINIMUM SPACING FOR 2" CONDUIT IS 3 1/2".
 2. DISTRIBUTE POWER TO ELEMENTS WITH (2) 6 GA RHTW LEADS PER PHASE.
 3. "B" PHASE JUMPER HAS BEEN ELIMINATED AND RESISTANCE CHECK CANNOT BE MADE UNTIL BOTH B PHASE LEADS HAVE BEEN TERMINATED TO DISTRIBUTION BLOCK.
 4. DEBURR BACK PAN ACCESS HOLE TO PREVENT WIRE CHAFFING.
 5. CLEAN AND PAINT PER GAUMER SPEC P-200.5 HI-HEAT ALUM.
 6. CLAMP RTDS WHERE SHOWN IN DIAGRAM AND TERMINATE IN ENCLOSURE.



13616 HEMPSTEAD ROAD
 HOUSTON TEXAS USA
 PHONE (713) 460-5200

24" ENCLOSURE AND WIRING DIAGRAM
 480V 3PH 2028KW 30 WATTS SQ./IN.
 PD# 00131P-0919

ABENER TEYMA
 MOJAVE

ABENGOA SOLAR

6007-PLN-GAU-58-62-0005

DISTRIBUTION		
MANUFACTURING	ADMINISTRATION	OTHER
FAB 0	PURCHASING 1	QC 1
PANEL 0	ROUTING 1	PROJECT 1
	CUSTOMER 1	FILE 1
	HEATER 1	

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NO.	DATE	DESCRIPTION	BY	BY
0	06-FEB-13	ISSUE DATE		
A	20-DEC-13	ADD DDC CODE		

NO.	DATE	DESCRIPTION	BY	BY
0	06-FEB-13	ISSUED FOR CONSTRUCTION		

NO.	DATE	DESCRIPTION	BY	BY
0	06-FEB-13	ISSUED FOR CONSTRUCTION		

NO.	DATE	DESCRIPTION	BY	BY
0	06-FEB-13	ISSUED FOR CONSTRUCTION		

NO.	DATE	DESCRIPTION	BY	BY
0	06-FEB-13	ISSUED FOR CONSTRUCTION		

NO.	DATE	DESCRIPTION	BY	BY
0	06-FEB-13	ISSUED FOR CONSTRUCTION		