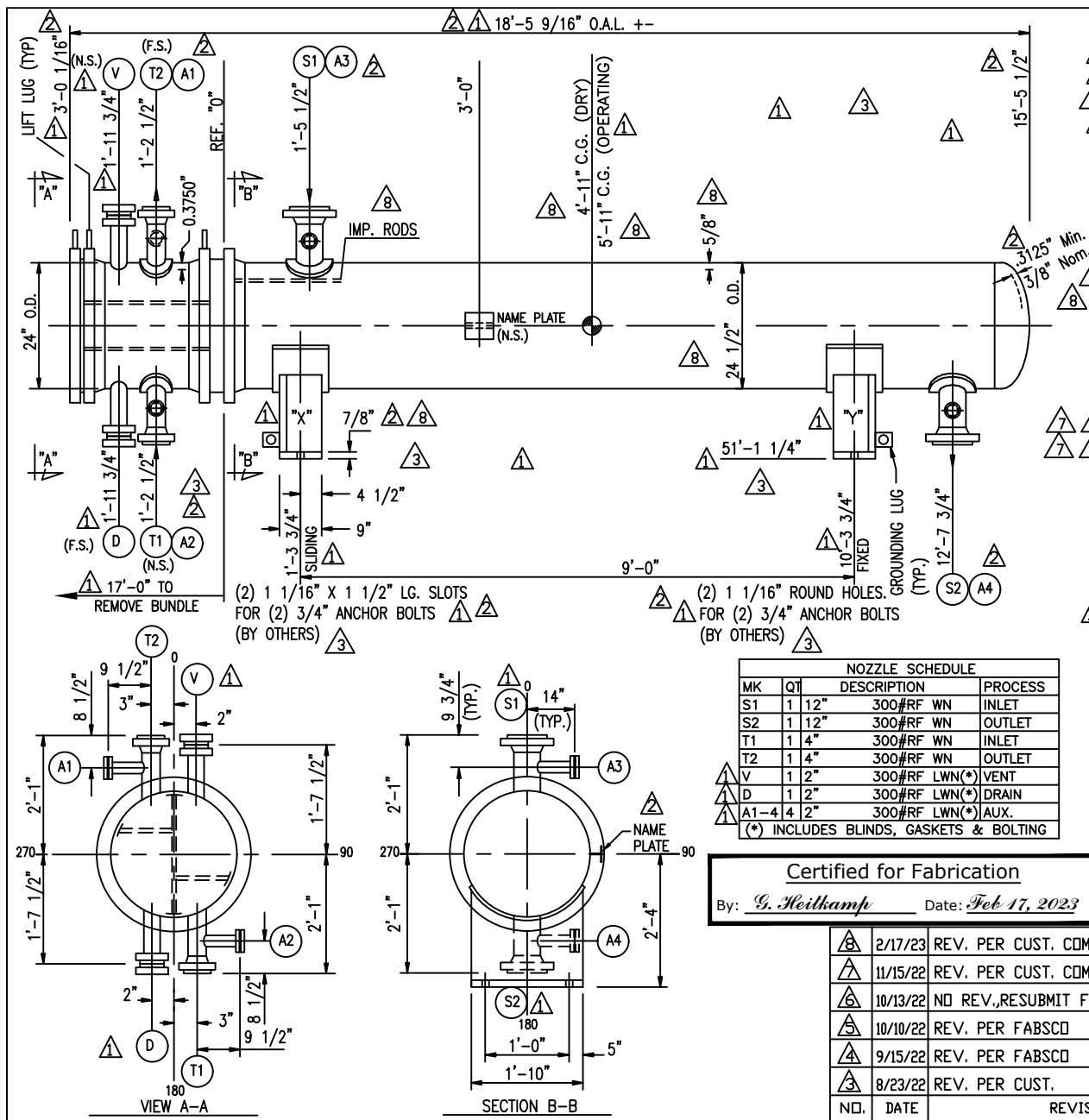




DESIGN DATA	SHELL	TUBE
DESIGN PRESSURE P.S.I.G.	100	120
MAWP PSIG	152	146
MAP PSIG	200	153
LIMITED BY	TUBESHEET	CH. CVR
VACUUM PRESSURE P.S.I.G.	15 @ 300°F.	NA
TEST PRESSURE P.S.I.G.	SHOP 259 / FIELD 198	SHOP 197 / FIELD 190
DESIGN TEMP. Deg.F.	350	150
MDMT Deg. F.	32	32
CORROSION ALLOWANCE	3/16"	1/8"
NUMBER OF PASSES	1	6
RADIOGRAPHY	FULL	FULL
HEAT TREAT REQUIRED	YES	YES

ESTIMATED WEIGHTS, LBS.			
DRY: 8700	HYDRO/WET: 11800	OPER.: 11500	BUNDLE: 3550
CHAN.: 1775	CH.CVR: 440	SHELL: 3500	

SPECIFICATIONS
 ASME Code Section VIII, Division 1, 2021 Ed. (Stamp: Yes)
 TEMA Class R 10th Ed; Nat'l Bd. Reg. is req'd. API-660 9th Ed.
 Design Reviewed For Compliance With The Requirements of UG-120(d).
 Exempt From Impact Testing Per UG-20(f), UCS-66(a),(c),(d),
 Fig. UCS-66 General Note (c), and UCS-67.
 UOP SPECS 3-11-10, 4-11-11

MATERIAL			
CHANNEL:	SA-106-BN KILLED	BAFFLES:	SA-516-70
SHELL:	SA-516-70N KILLED	TUBES:	SA-179 SMLS.
TUBESHEETS:	SA-516-70N KILLED		
SEE REMAINDER OF MAT'L. ON BILL OF MATERIAL			
(155) U's 3/4"	O.D.X 0.0830" MIN. X 14'-0"		LG.
TUBE PITCH 1" 90°		SURFACE 839.16	EFF. SQ.FT.

GENERAL NOTES
 ALL BOLT HOLES TO STRADDLE NATURAL CENTER LINES.
 EXPAND & SEAL WELD TUBES-TO-TUBESHEET.
 STRESS RELIEVE U-BENDS PLUS 1'-0" OF STR. LENGTH.
 NO INSULATION REQ'D.
SHELLSIDE IS IN WET H₂S, FLAMMABLE AND TOXIC SERVICE
 10% SPARE BODY FLG. BOLTING REQ'D.
 GASKETS: .1750" THK. 304L SP. WD. W/ FLEX GRAPH. FILLER AND
 304 S.S. INNER AND OUTER RET. RINGS.
 2 SETS OF SPARE GASKETS REQUIRED.
 PAINT: SEE DWG. -1A

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
 EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
 SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
 LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
 PRODUCT: STRIPPER OVERHEAD
 ITEM NO.: 18-X-360
 AIR PRODUCTS P.O. NO.: 4505600056 / ABKM-4-402-PO-1
 AP PROJECT NO.: EN-20-7119
 VDR CODE NO.: HCO9
 SERIAL NO.: S21-13258-5
 ENGINEER: GH
 CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

NOZZLE SCHEDULE			
MK	QT	DESCRIPTION	PROCESS
S1	1	12" 300#RF WN	INLET
S2	1	12" 300#RF WN	OUTLET
T1	1	4" 300#RF WN	INLET
T2	1	4" 300#RF WN	OUTLET
V	1	2" 300#RF LWN(*)	VENT
D	1	2" 300#RF LWN(*)	DRAIN
A1-4	4	2" 300#RF LWN(*)	AUX.

(*) INCLUDES BLINDS, GASKETS & BOLTING

Certified for Fabrication
 By: G. Heithamp Date: Feb 17, 2023

NO.	DATE	REVISIONS
2/17/23	REV. PER CUST. COMMENTS	DD/DG
11/15/22	REV. PER CUST. COMMENTS	DD/DG
10/13/22	NO REV., RESUBMIT FOR APP'L	DD/DG
10/10/22	REV. PER FABSCO	DD/DG
9/15/22	REV. PER FABSCO	B.W./DD
8/23/22	REV. PER CUST.	DD/DG

ASSEMBLY AND SPECIFICATIONS FOR			
ONE 23-168		A E U	
DWN. BY	G.H.	Fabasco SHELL & TUBE, LLC	
DATE	12/1/21		
CKD. BY	DiCarlo	DWG.NO.	S21-13258-5-1
		REV.	8

-----API-660-----

- HARDNESS READINGS SHALL BE DONE ON INSIDE SURFACE IF ACDESSIBLE.

-----API-660 CONT.-----

- 2

- 2

-----STANDARD SHOP PRACTICES-----

- $\triangle 2$

- 

- 2) CHANNEL: FULL RADIOGRAPH.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: STRIPPER OVERHEAD
ITEM NO.: 18-X-360
AIR PRODUCTS P.O. NO.: 4505600056 / A8KM-4-402-PO-1
AP PROJECT NO: EN-20-7119
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-5
ENGINEER: GH
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			JOB NOTES			
			DWN. BY	B.W.	Fabsco <u>SHELL & TUBE, LLC</u>	
			DATE			
⚠	8/23/22	REV. PER CUST. COMMENTS DD/DG	DATE	7/18/22		
⚠	7/18/22	ADDED DWG./ FABSCO B.W./DD	CKD. BY	EMG	DWG. NO.	REV.
NO.	DATE	REVISIONS			S21-13258-5-1B	2

-----CUST. NOTES-----



-----CUST. NOTES CONT.-----

NOTES 10-19 APPLY TO SHELLSIDE OF EXCHANGER

- 1) ALL SHARP EDGES SHALL BE GROUND TO A .078" RAD. (MIN.)
 - 2) THE INITIAL ROOT PASS OF DBL WELDED GROOVE JOINTS, INCLUDING ROOT TACK WELDS, SHALL BE CHIPPED, GROUND &/OR GOUGED TO SOUND METAL, AREA TO BE EITHER MPE OR DPE PRIOR TO WELDING FROM OTHER SIDE.
 - 3) ON ALL CAT. A,B,C,D WELDS, THE WELDS & ADJACENT METAL TO BE HEATED TO 600°F., WRAPPED WITH INSULATION & ALLOWED TO COOL UNTIL PWHT CAN BE PERFORMED LATER.
 - 4) PRESSURE CONTAINING WELDS, INTERNAL ATTACHMENT WELDS, & SUPPORT WELDS SHALL BE CONTOURED TO PERMIT PROPER INTERPRETATION OF ANY REQ'D. UT EXAMINATION.
 - 5) ALL WELDING CONSUMABLES SHALL BE OF LOW HYDROGEN TYPE. E60XX ELECTRODES SHALL NOT BE USED!
 - 6) THE FOLLOWING APPLIES TO ALL SHELLSIDE PRESSURE CONTAINING WELDS.
 - A) ONLY ELECTRODES LISTED IN NACE-SP0472, TABLE 2, EXCEPT E60XX ELECTRODES ARE ARE NOT ALLOWED.
 - B) CARBON EQUIVALENT TO BE 0.43% (MAX.)
- $$CE = wt\%C + \frac{wt\%Mn}{6} + \frac{(wt\%Ni + wt\%Cu)}{15} + \frac{(wt\%Cr + wt\%Mo + wt\%V)}{5}$$
- C) VANADIUM (V), & NIOBIUM (Nb) ((COLUMBIUM (Cb))), SHALL NOT BE ADDED INTENTIONALLY. THE VANADIUM CONTENT SHALL BE LESS THAN OR EQUAL TO 0.02% WT. TABLE 2, EXCEPT E60XX ELECTRODES ARE THE VANADIUM PLUS NIOBIUM (COLUMBIUM) CONTENT SHALL BE LESS THAN OR EQUAL TO 0.03% WT.
 - 7) ON SHELL SIDE, ONE BRINELL READING SHALL BE TAKEN ON THE INSIDE & OUTSIDE OF EACH SECTION, HEAD, NOZZLE, LONG SEAM, CIRC SEAM & EACH NOZZLE WELD. READING SHALL NOT EXCEED 200 BH (MAX.) READ TO BE DONE AFTER ANY REQ'D. PWHT. HARDNESS TEST & LOCATIONS SHALL BE RECORDED FOR REVIEW. CUST. INSP. TO WITNESS TESTING.
 - 8) TEMPORARY ATTACHMENTS TO BE REMOVED BY MECHANICALLY OR THERMALLY CUT WITHIN 1/8" OF SURFACE. AREA TO BE GROUND FLUSH W/ SURROUNDING AREAS FOLLOWED BY MPE OR DPE. DO NOT "KNOCK OFF."
 - 9) HYDRO TEST WATER TEMP. AT ALL LOCATIONS SHALL BE AT LEAST 50°F. AT ALL TIMES DURING HYDROTEST.

- 10) ON SHELL ONLY, THE INSIDE WELD SURFACE SHALL HAVE THE WELD REINFORCEMENT AS SMOOTH & AS NEARLY FLUSH AS POSSIBLE TO REDUCE STRESS RISERS & TO ALLOW WFMT.
- 11) ON SHELL, DISCONTINUITY GENERATING PROFILES, SUCH AS WELDS OVERLY REINFORCED W/ HIGH CROWNS OR W/ TOPS OF CROWNS GROUND FLAT & HAVING SHARP EDGES OR WELDS W/ ROUGH BEAD PROFILES, SHALL BE CORRECTED.
- 12) ON SHELL, ACCEPTANCE STDS FOR THE WELD PROFILE SHALL BE AGREED W/ THE LEVL II NDE EXAMINER PRIOR TO START OF TESTING.
- 13) ON SHELL, TEMPORARY ATTACHMENTS, LINE-UP CLAMPS, BACKING BARS, ARC STRIKES SHALL BE GROUND FLUSH W/ SURFACE, AREA TO BE WFMT. IF SO AN ADDITIONAL DPT OR MPE OF ALL RESULTS TO BE RECORDED & SUBMITTEL FOR REVIEW.
- 14) PREHEAT TEMP. APPLIES TO ALL TACK WELDING & WELDING TEMP. ATTACHMENTS.
- 15) THE BASE METAL & INTERPASS TEMPERATURE OF ALL WELDS SHALL BE MAINTAINED AT NOT LESS THAN THE MIN. PREHEAT TEMPERATURE UNTIL THE WELD IS COMPLETED. IF WELDING PROCESS IS TERMINATED PRIOR TO COMPLETION OF THE WELD, THE PARTIAL WELD SHALL BE SLOWLY COOLED TO AMBIENT TEMP. & WFMT.
- 16) ALL WELDS SHALL BE 100% WFMT.
- 17) WFMT SHALL BE DONE AFTER ANY REQ'D. PWHT.
- 18) THE AC MAGNETIC YOKE METHOD SHLL BE USED.
- 19) SHEAR WAVE UT SHALL BE USED IN LIEU OF WFMT IF THERE IS NO ACCESS TO INTERNAL WELD SURFACE.
- 20) NOZ. TO CYL. WELDS, BRANCH NOZ. WELDS WHICH CAN'T BE X-RAYED SHALL BE UT.
- 21) ON CHANNEL, ALL ARC STRIKES, START, STOPS SHALL BE CONFINED TO THE WELDING GROOVE OR SHALL BE REMOVED BY LIGHT GRINDING FOLLOWED BY MPT OR DPE.

-----CUST. NOTES CONT.-----

- 22) THE USE OF HIGH NICKEL CONTENT C'STL. WELDING CONSUMABLES OR C-1/2Mo CONSUMABLES IS PROHIBITED.
- 23) ALL WELD SURFACES TO BE VISUALLY INSPECTED TO ENSURE THAT LAMINATIONS &/OR OTHER DEFECTS ARE NOT PRESENT.
- 24) IF PWHT IS REQ'D. ALL PLATE EDGES SHALL BE MPT OR DPE BEFORE WELDING.
- 25) ACCEPTANCE NDE SHALL BE PERFORMED AFTER ANY REQ'D. PWHT.
- 26) PEENING IS NOT PERMITTED FOR PURPOSE OF CLEANING WELDS.
- 27) EXCH'S. TO BE STENCILED W/ THE FOLLOWING"

"HEIGHT" : 4'-8"
 "WIDTH" : 2'-8"
 "LENGTH" : 18'-6"
 "WEIGHT" : 7,855#
- 28) FINISHED EXCHANGER IS TO BE WEIGHTED. TO BE WITHIN +/- 2% OR BETTER ACCURACY. A CALIBRATED WEIGHT CERTIFICATE SHALL BE PROVIDED.
- 29) THE TEMPERATURE OF THE HYDRO TEST WATER & THE EXCHANGER SHALL BE EQUALIZED PRIOR TO HYDROTEST.
- 30) STAMPING TO BE DONE WITH "LOW STRESS" STAMPS.
- 31) LIFTING POINTS & CENTER OF GRAVITY SHALL BE MARKED ON EXCHANGER.
- 32) THE ENTIRE SURFACE OF FORGINGS INCLUDING WELD BEVEL SHALL BE EXAMINED BY MT AFTER FINISH MACHINING & PRIOR TO WELDING.
- 33) EXCHANGER SHALL BE IN A MANNER WHICH KEEPS NOZZLES FROM TOUCHING THE TRUCK BEDS AND/OR SURFACES AT OFF-LOADING AREA AT JOBSITE.
- 34) PRIOR TO WELDING, JOINTS SHALL BE VISUALLY INSPECTED FOR CLEANLINESS, CONDITION OF TACK WELDS IF PRESENT, PREHEAT IF SPECIFIED, AND FILLER METAL TO BE USED.
- 35) REQUIRED PREHEAT TEMPERATURE SHALL ALSO APPLY TO THERMAL CUTTING AND TACK WELDING.
- 36) PREHEAT ALL JOINT TO A MINIMUM OF 125° F. WHEN MOISTURE REMOVAL IS REQUIRED.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
 EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
 SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
 LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
 PRODUCT: STRIPPER OVERHEAD
 ITEM NO.: 18-X-360
 AIR PRODUCTS P.O. NO.: 4505600056 / ABKM-4-402-PO-1
 AP PROJECT NO.: EN-20-7119
 VDR CODE NO.: BED4
 SERIAL NO.: S21-13258-5
 ENGINEER: GH
 CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			JOB NOTES (CONT.)		
			DWN. BY	Fabsco SHELL & TUBE, LLC	
			B.W.		
			DATE	4/20/22	
			CKD. BY	DiCarlo	
			DWG. NO.	S22-13258-5-1C	REV. 2
NO.	DATE	REVISIONS			
△	8/23/22	REV. PER FABSCO DD/DG			
△	7/18/22	ADDED DWG./FABSCO B.W./DD			

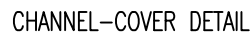
-----CUST. NOTES-----

- 37) FOR THE AUX. NOZZLES, THE BASE METAL ADJACENT TO AUX. NOZZLE OPENINGS ON MAIN NOZZLES SHALL BE THOROUGHLY U.T. & M.P.E. TO ENSURE THAT THERE ARE NO FLAWS. (ETC. LAMINATIONS) 
- 38) WELDS FROM EACH WELD PROCEDURE, WELDER/WELDING OPERATOR SHALL BE FULL RADIOGRAPHED IF ACCESSIBLE. 
- 39) NON PRESSURE PARTS TO PRESSURE CONTAINING COMPONENT WELDS SHALL BE 100% M.P.E. OR D.P.E.
- 40) ALL CIRC SEAMS, NOZZLE ATTACHMENT WELDS SHALL BE FULL PENETRATION WELDED AS SHOWN ON DWG. -13.
- 41) FOR OFFSET NOZZLES, THE MIN. THROAT DIMENSIONS SHALL BE MAINTAINED.
- 42) ALL WELDING SHALL BE IN ACCORDANCE WITH ASME SECT. IX & PROJECT SPECIFICATIONS
A8KM-PP-000-500550-A, A8KM-PP-000-500532-A,
4WEQ-1051, 3-11-10, 4-11-11.
- 43) ALL SHELL & HEAD JOINTS SHALL BE BACK WELDED JOINTS, WHERE POSSIBLE.
- 44) NON-PRESSURE ATTACHMENT WELDS TO PRESSURE PARTS ON SHELL SIDE (IN FLAMMABLE SERVICE) SHALL BE FULL PENETRATION WELDS. 

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
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SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: STRIPPER OVERHEAD
ITEM NO.: 18-X-360
AIR PRODUCTS P.O. NO.: 4505600056/
A8KM-4-402-PO-1
AP PROJECT NO: EN-20-7119
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-5
ENGINEER: GH
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			JOB NOTES (CONT.)		
			DWN. BY		
			<i>DiCarlo</i>		
			DATE		
	10/10/22	REV. PER CUST. COMMENTS DD/DG	8/23/22		
	8/23/22	ADDED DWG./FABSCO DD/DG	CKD. BY	DWG. NO.	REV.
NO.	DATE	REVISIONS	<i>DG</i>	S21-13258-5-1D	2

- 1) MACHINE ALL COVER SURFACES TO 250 RMS EXCEPT GASKET FACES TO BE 125 RMS.
- 2) ALL COVER PASS PLATE GROOVE WIDTHS TO BE 1/2" WIDE.
- 3) ALL COVER PASS PLATE GROOVE JUNCTIONS TO BE NOTCHED 3/8" AT 45 Deg.



1) ALL WELDING TO BE IN ACCORDANCE W/
PROCEDURES ON DWG. -19.

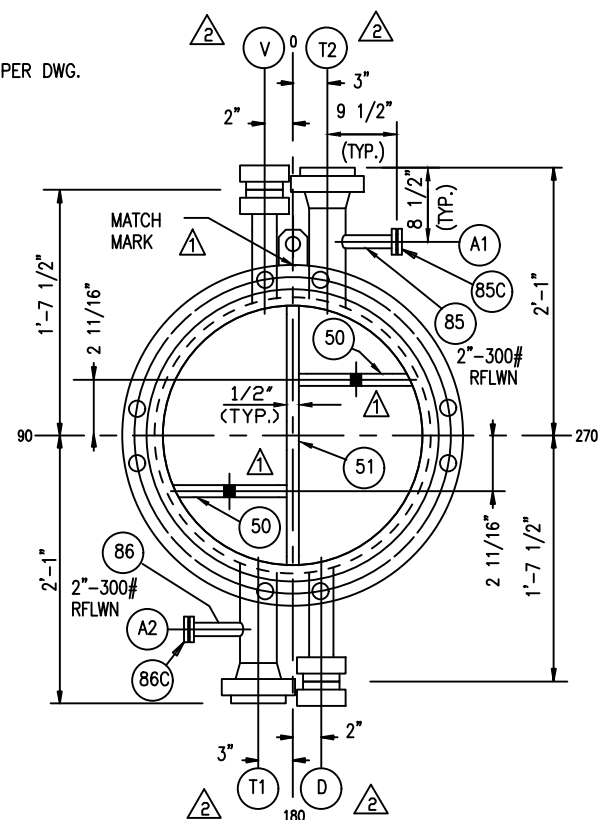
- 2) ALL BOLT HOLES TO STRADDLE CENTER LINES.
- 3) FOR WELD AND BEVEL DETAILS SEE DWG. -13.
- 4) GRIND ALL INSIDE WELDS SMOOTH.
- 5) FULL RADIOGRAPHY.
- 6) POST-WELD HEAT TREAT CHANNEL:
 - A) HEAT FROM 800°F TO 1175°F +0° - 25° AT 400°F PER HOUR.
 - B) HOLD AT 1175°F +0°-25° F FOR 1-HOUR (MIN).
 - C) COOL FROM 1175°F +0° - 25° TO 800°F AT 500°F PER HOUR.
 - D) FURTHER COOLING MAY BE IN STILL AIR.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: STRIPPER OVERHEAD
ITEM NO.: 18-X-360
AIR PRODUCTS P.O. NO.: 4505600056/
ABKM-4-402-PO-1

AP PROJECT NO: EN-20-7119
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-5
ENGINEER: GH
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT



* { MACHINE GASKET FACING TO HAVE 125 RMS
AFTER ALL WELDING AND HEAT TREATMENT.
FOR FLANGE DETAILS SEE DWG. 12



CHANNEL END VIEW

FRONT CHANNEL DETAILS

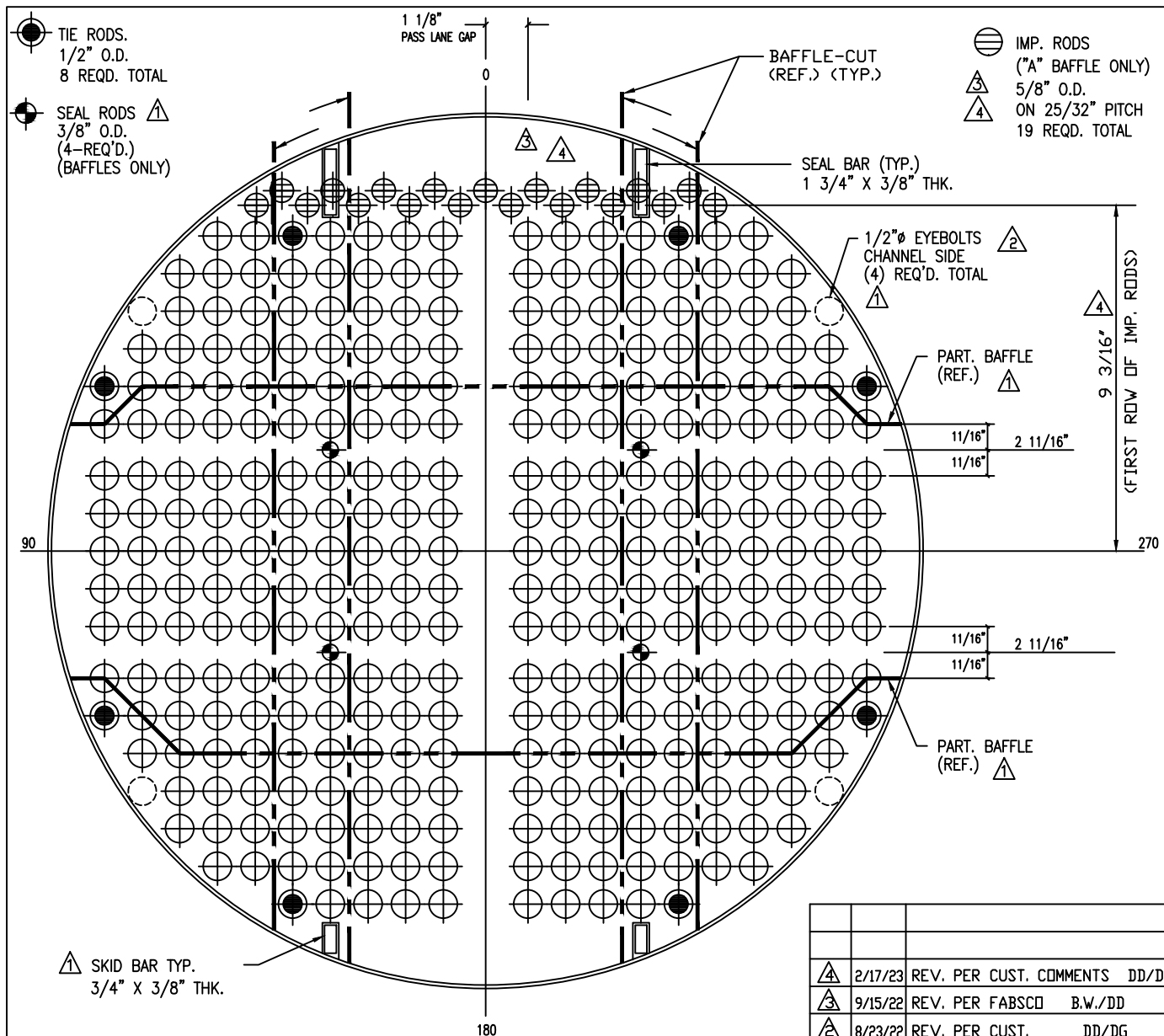
			FRONT CHANNEL DETAILS								
					DWN. BY B.W.	 Fabsco SHELL & TUBE, LLC					
△	2/17/23	REV. PER FABSCO	DD/DG		DATE 5/18/22						
△	8/23/22	REV. PER CUST.	DD/DG								
△	7/6/22	REV. PER CUST.	B.W./DD		CKD. BY DICARLO	DWG.NO. S21-13258-5-2	REV. 3				
NO.	DATE	REVISIONS									

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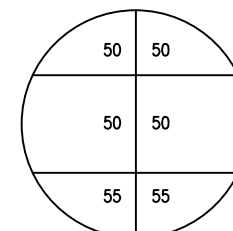
- 1) ALL WELDING TO BE IN ACCORDANCE W/
PROCEDURES ON DWG. -19.
- 2) ALL BOLT HOLES TO STRADDLE CENTER LINES.
- 3) FOR WELD AND BEVEL DETAILS SEE DWG. -13.
- 4) FOR SUPPORT DETAILS SEE DWG. -9.
- 5) GRIND ALL INSIDE WELDS FLUSH.
- 6) FULL RADIOGRAPHY.
- 7) POST-WELD HEAT TREAT SHELL:
 - A) HEAT FROM 800°F TO 1175°F +0° - 25° AT
400°F PER HOUR.
 - B) HOLD AT 1175°F +0°-25° F FOR 1-HOUR (MIN).
 - C) COOL FROM 1175°F +0° - 25° TO
800°F AT 500°F PER HOUR.
 - D) FURTHER COOLING MAY BE IN STILL AIR.

AP PROJECT NO: EN-20-7119
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-5
ENGINEER: GH
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			SHELL DETAILS			
			DWN. BY B.W.		Fabsco SHELL & TUBE, LLC	
			DATE 5/19/22			
			CKD. BY DICARLO			
			DVG.NO.		REV. 3	
			S21-13258-5-3			



VIEW LOOKING AT SHELL SIDE OF NO. 19 TUBESHEET



TUBE DISTRIBUTION

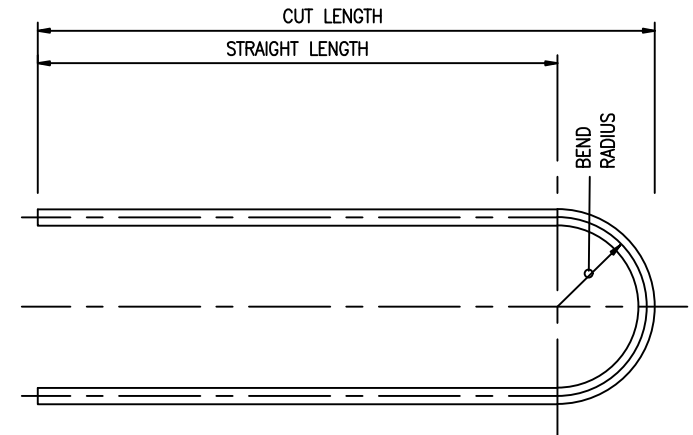
NOTES:

- 1) DRILL AND REAM TUBE HOLES IN TUBESHEETS TO 0.7600" $\pm$ 0.0020" DIA. FOR 155 - 3/4" O.D. U-TUBES. TOTAL HOLES = 310
- 2) TUBE PITCH = 1" SQUARE.
- 3) NUMBER OF PASSES = 6
- 4) SEE DRAWING 4A FOR TUBE GROOVING DETAILS.
- 5) BAFFLE O.D. = 23 1/16"
- 6) O.T.L. = 22 3/4"

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
 EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
 SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
 LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
 PRODUCT: STRIPPER OVERHEAD
 ITEM NO.: 18-X-360
 AIR PRODUCTS P.O. NO.: 4505600056 / A8KM-4-402-PO-1
 AP PROJECT NO: EN-20-7119
 VDR CODE NO.: BE04
 SERIAL NO.: S21-13258-5
 ENGINEER: GH
 CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

TUBE LAYOUT			
NO.	DATE	REVISIONS	REV.
			4
2/17/23	REV. PER CUST. COMMENTS	DD/DG	
9/15/22	REV. PER FABSCD	B.W./DD	
8/23/22	REV. PER CUST.	DD/DG	
7/7/22	REV. PER CUST.	B.W./DD	
DWN. BY			B.W.
DATE			5/17/22
CKD. BY			DiCarlo
DWG. NO.			S21-13258-5-5

ROW	NO.OF TUBES	BEND RADIUS	BEND DIAMETER	BEND LENGTH	STRAIGHT LENGTH	CUT LENGTH	DEVELOPED LENGTH
A	18	1 1/8"	2 1/4"	0'-3 9/16"	14'-0"	14'-1 1/2"	28'-3 9/16"
B	18	2 1/8"	4 1/4"	0'-6 11/16"	14'-0"	14'-2 1/2"	28'-6 11/16"
C	18	3 1/8"	6 1/4"	0'-9 7/8"	14'-0"	14'-3 1/2"	28'-9 7/8"
D	18	4 1/8"	8 1/4"	1'-1"	14'-0"	14'-4 1/2"	29'-1"
E	16	5 1/8"	10 1/4"	1'-4 1/8"	14'-0"	14'-5 1/2"	29'-4 1/8"
F	17	6 1/8"	12 1/4"	1'-7 1/4"	14'-0"	14'-6 1/2"	29'-7 1/4"
G	17	7 1/8"	14 1/4"	1'-10 7/16"	14'-0"	14'-7 1/2"	29'-10 7/16"
H	15	8 1/8"	16 1/4"	2'-1 9/16"	14'-0"	14'-8 1/2"	30'-1 9/16"
J	11	9 1/8"	18 1/4"	2'-4 11/16"	14'-0"	14'-9 1/2"	30'-4 11/16"
K	7	10 1/8"	20 1/4"	2'-7 13/16"	14'-0"	14'-10 1/2"	30'-7 13/16"



TOTAL NO. REQUIRED: 155
 SIZE: 3/4" (.083" MIN.)
 MATERIAL: SA-179 (SMLS)

MAXIMUM OUT-OF-ROUNDNESS OF TUBES AT
 U-BENDS NOT TO EXCEED 10%.

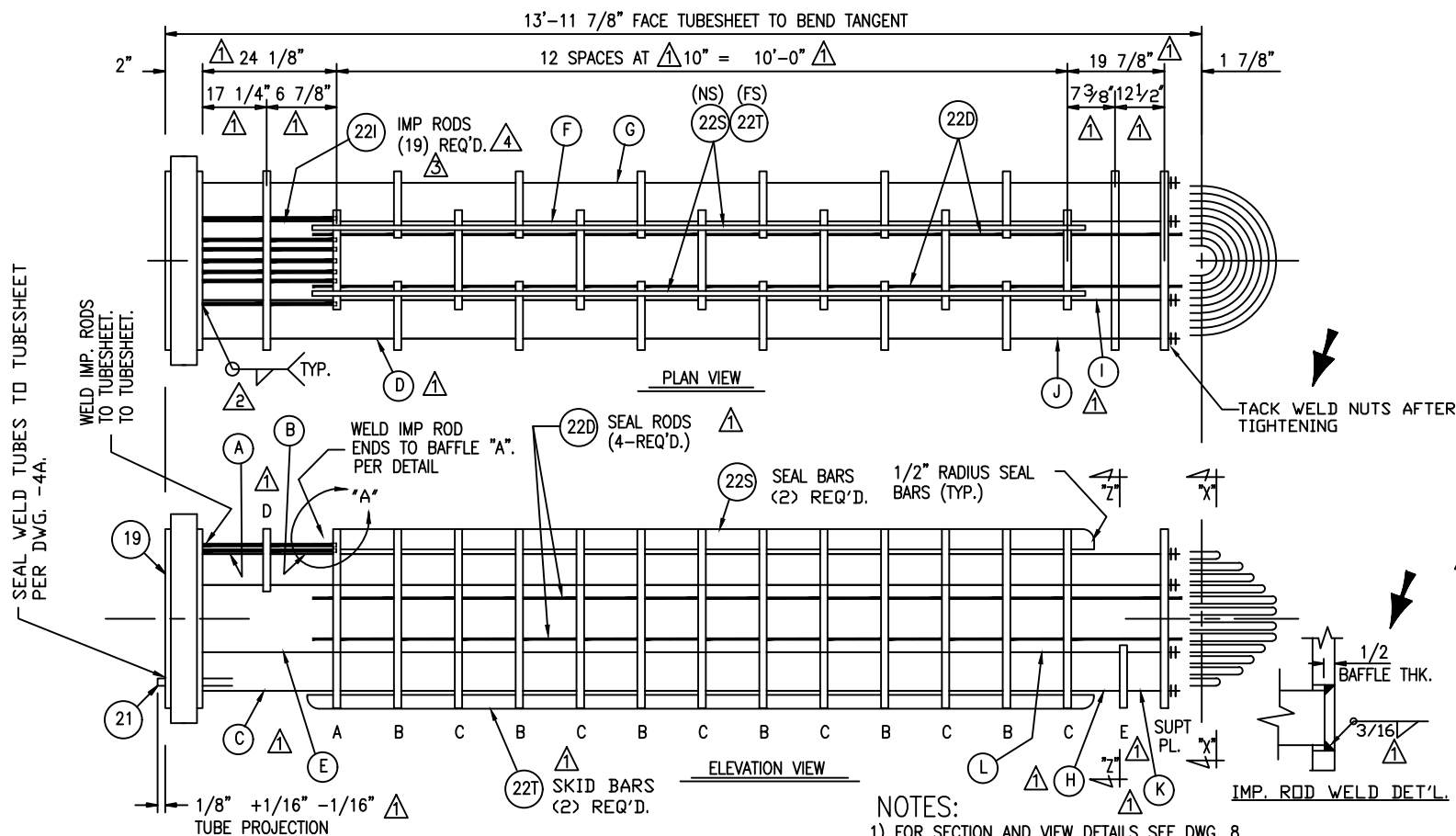
QUANTITIES SHOWN ARE FOR
 ONE SET OF U-TUBES,
 1 -SET REQ'D. TOTAL.

STRESS RELIEF ANNEAL U-BENDS PLUS 1'-0" OF STRAIGHT LGTH.
 @ 1300° F. ± 25°F. BY ELECTRIC RESISTANCE METHOD.



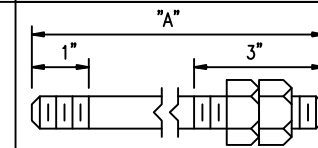
PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
 EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
 SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
 LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
 PRODUCT: STRIPPER OVERHEAD
 ITEM NO.: 18-X-360
 AIR PRODUCTS P.O. NO.: 4505600056 / A8KM-4-402-PO-1
 AP PROJECT NO: EN-20-7119
 VDR CODE NO.: BE04
 SERIAL NO.: S21-13258-5
 ENGINEER: GH
 CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			TUBE BENDING SCHEDULE		
			DWN. BY B.W.	Fabsco SHELL & TUBE, LLC	
			DATE 5/17/22		
			CKD. BY DiCarlo	DWG.NO. S21-13258-5-6	REV. 1
△	10/10/22	REV. PER CUST. COMMENT	DD/DG		
NO.	DATE	REVISIONS			

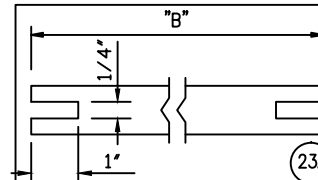


NOTES:

- 1) FOR SECTION AND VIEW DETAILS SEE DWG. 8
- 2) WELD SEAL BARS & SKID BARS TO INTERSECTING BAFFLES ON TWO OPPOSING SIDES (1/4" MIN. F.W.). TO PROJECT 1" PAST BAFFLES. RADIUS EACH END OF SEAL BARS & SKID BARS. SKID BARS TO PROJECT 1/32" PAST THE BAFFLE O.D.
- 3) SEAL RODS SHALL EXTEND 1" PAST FIRST AND LAST BAFFLE. WELD TO FIRST AND LAST BAFFLE W/ 1/4" MIN. F.W.



MAT'L. SA-36	
1/2" O.D. -13 NC TIE RODS	
REQ'D.	"A"
① 8	13'-10 1/2"



SLOTS @ 0° & 180°	
MAT'L. SA-214	
3/4" O.D. SPACER TUBING	
REQ'D.	"B"

REQ'D.	"B"
① 4	17 1/16"
② 2	6 1/2"
③ 2	23 15/16"
④ 2	16 1/2"
⑤ 2	33 15/16"
⑥ 48	9 5/8"
⑦ 20	19 5/8"
⑧ 2	7"
⑨ 2	19 1/2"
⑩ 2	29 1/2"
⑪ 4	12 1/8"
⑫ 2	17"

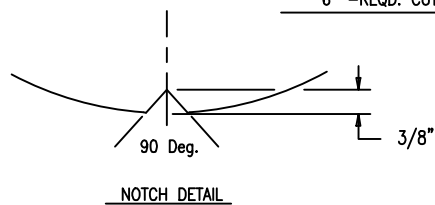
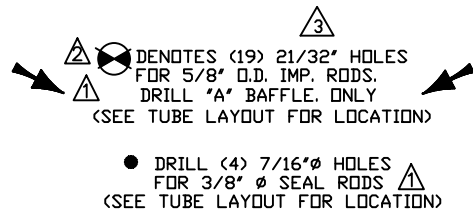
PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: STRIPPER OVERHEAD
ITEM NO.: 18-X-360
AIR PRODUCTS P.O. NO.: 4505600056/A8KM-4-402-PO-1
AP PROJECT NO: EN-20-7119
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-5
ENGINEER: GH
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

BUNDLE DETAILS

Fabsco
SHELL & TUBE, LLC

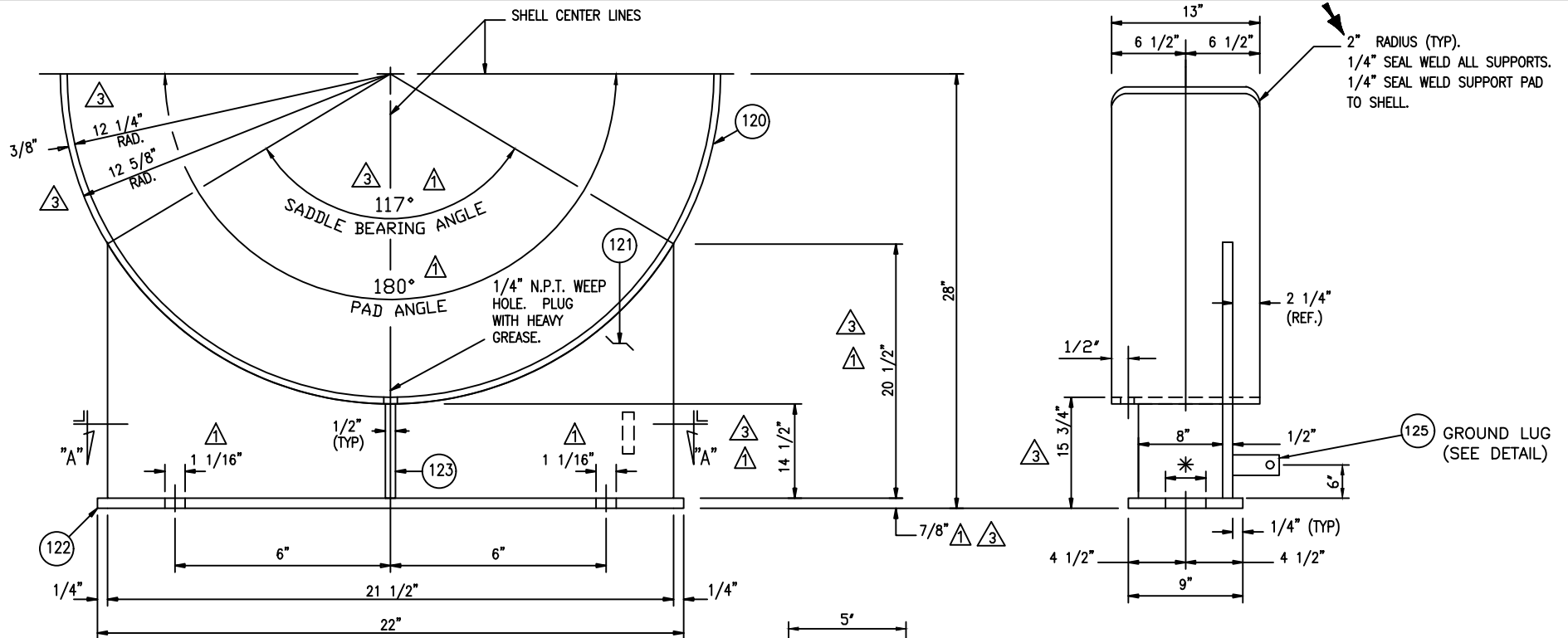
NO.	DATE	REVISIONS
①	2/17/23	REV. IMP. RODS/CUST. DD/DG
②	9/15/22	REV. PER FABSCO B.W./DD
③	8/23/22	REV. PER CUST. DD/DG
④	7/6/22	REV. PER CUST. B.W./DD

DWN. BY	B.W.
DATE	5/19/22
CKD. BY	DICARLO
DWG.NO.	S21-13258-5-7
REV.	4

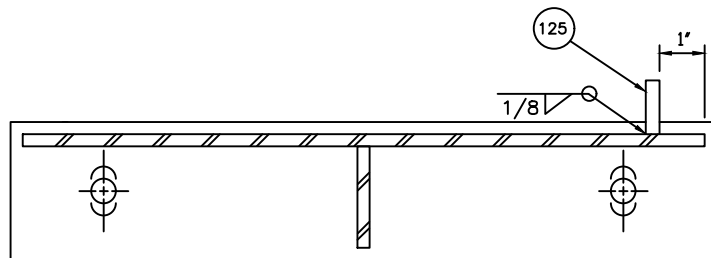


PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: STRIPPER OVERHEAD
ITEM NO.: 18-X-360
AIR PRODUCTS P.O. NO.: 4505600056 / A8KM-4-402-PO-1
AP PROJECT NO.: EN-20-7119
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-5
ENGINEER: GH
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			CUSTOMER / CLIENT WORKED ENERGY INFORMATION			
			BAFFLE DETAILS			
			DWN. BY B.W.	Fabsco SHELL & TUBE, LLC		
3	2/17/23	REV. PER CUST. COMMENTS DD/DG	DATE 5/17/22			
3	9/15/22	REV. PER FABSCO B.W./DD				
3	7/7/22	REV. PER CUST. B.W./DD	CKD. BY DiCarlo	DWG.NO.	S21-13258-5-8	REV. 3
NO.	DATE	REVISIONS				



* ONE REQUIRED MARKED "X" W/ (2) 1 1/16" X 1 1/2" LG. SLOTS
 ONE REQUIRED MARKED "Y" W/ (2) 1 1/16" ROUND HOLES.

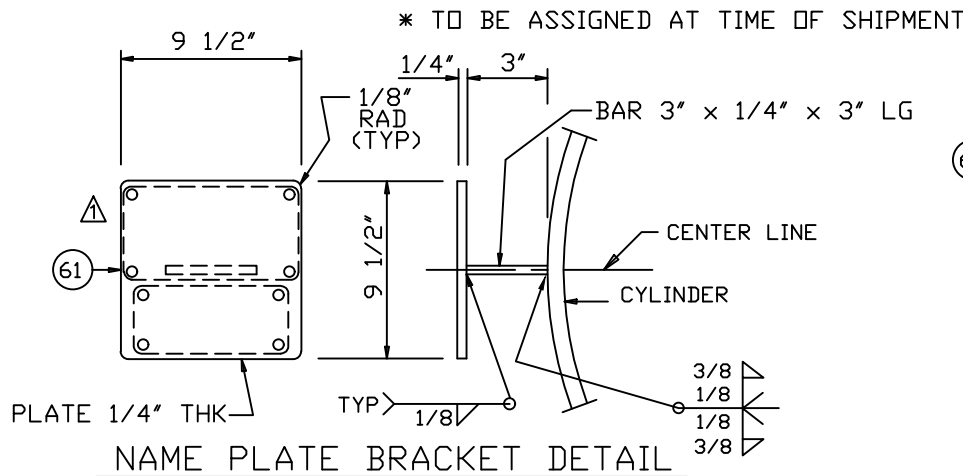


SECTION "A-A"

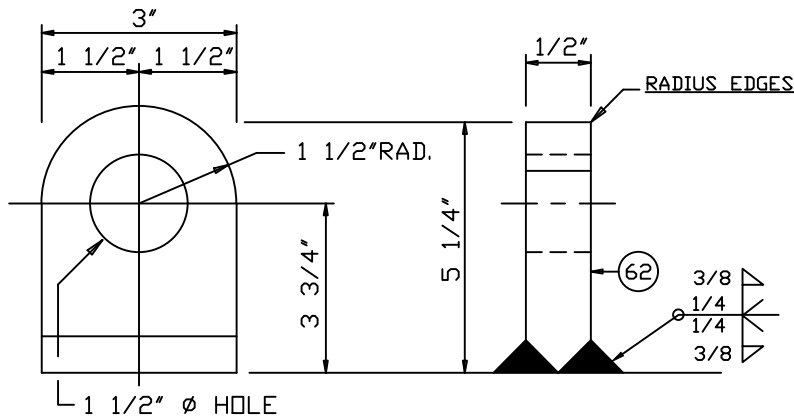
GROUNDING LUG
 (1) REQ'D. FS ON SUPT.
 MK "Y", (1) REQ'D. NS
 ON SUPT. MK "X".
 1/4" THK.
MATERIAL: SA-240-304

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
 EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
 SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
 LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
 PRODUCT: STRIPPER OVERHEAD
 ITEM NO.: 18-X-360
 AIR PRODUCTS P.O. NO.: 4505600056 / A8KM-4-402-PO-1
 AP PROJECT NO: EN-20-7119
 VDR CODE NO.: BE04
 SERIAL NO.: S21-13258-5
 ENGINEER: GH
 CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			SUPPORT DETAILS			
				DWN. BY B.W.	Fabsco SHELL & TUBE, LLC	
				DATE 5/18/22		
				CKD. BY <i>DiCarlo</i>		
					DWG.NO.	REV.
					S21-13258-5-9	3



(ONE) REQUIRED



3-REQUIRED

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: STRIPPER OVERHEAD
ITEM NO.: 18-X-360
AIR PRODUCTS P.O. NO.: 4505600056 / A8KM-4-402-PO-1
AP PROJECT NO.: EN-20-7119
VDR CODE NO.: HC09
SERIAL NO.: S21-13258-5
ENGINEER: GH
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

MATERIAL: 18-8 STN. STL.(16 GA)

ASME

U

RT-1

HT

NAT'L BD. *

CERTIFIED BY

FABSCO SHELL & TUBE, LLC

SAPULPA, OKLAHOMA

	MAWP	PSI AT	MAWT	° F.
SHELL	152		350	
SHELL	15		300	
SHELL	32	°F. AT	152	PSI
TUBES	146	PSI AT	150	° F.
TUBES	N/A	PSI AT	N/A	°F.
TUBES	32	°F. AT	146	PSI

SERIAL NUMBER	YEAR BUILT	ITEM/TAG NUMBER
S21-13258-5	2023	18-X-360

P.O. NO.: 4505600056 WT.: 8700 LBS. TEST DATE:

STRIPPER OVERHEAD TRIM CONDENSER

3/2

3/2/2/2/2

INFORMATION NAME PLATE

HYDRO TEST PRESS PSIG..TUBESIDE: SHOP-197/FIELD-190

HYDRO TEST PRESS PSIG..SHELLSIDE: SHOP-259/FIELD-198

DESIGN PRESS.: SHELLSIDE=100 PSIG; TUBESIDE=120 PSIG

SECT. VIII, DIV 1, 2021 ED; API-660; TEMA "R"

NO.	DATE	REVISIONS	REVISIONS
1	2/17/23	REV. PER C.UST & FABSCO	DD/DG
2	8/23/22	REV. PER CUST.	DD/DG
3	7/7/22	REV. PER CUST.	B.W./DD

LIFT LUG DETAIL w/
NAME PLATE & BRACKET

DWN. BY
B.W.

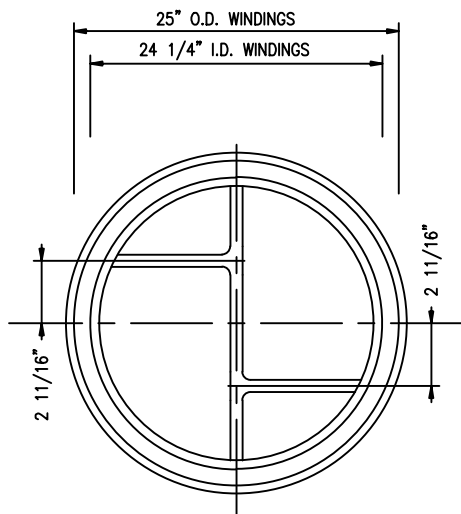
DATE
5/18/22

CKD. BY
DiCarlo

DWG. NO.
S21-13258-5-10

REV.
3

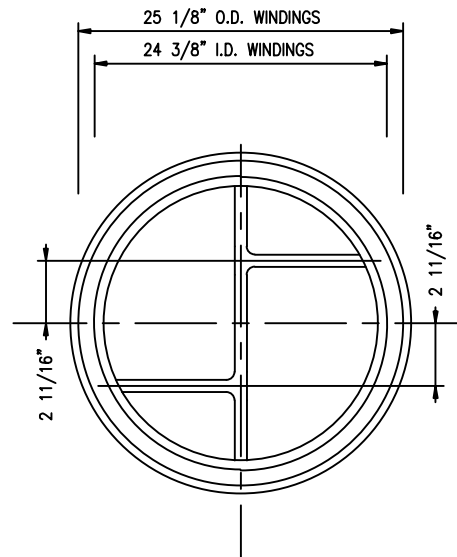
Fabscos
SHELL & TUBE, LLC



(1)-REQUIRED.
CHANNEL COVER GASKET.
0.175" THK. 304L S.S. SPIRAL WOUND
W/ GRAPHITE FILLER & INNER / OUTER COMP. RINGS (A)
RIB TO BE 3/16" THK. X 7/16" WIDE 304L S.S. DBL. JACKETED
⚠ W/ GRAPHITE FILLER AND 1/64" THK. GRAPHITE
FACE ON BOTH SIDES
TEST PRESSURE:
SHOP: 197 / FIELD: 190
RIB WIDTH TO BE 3/8" WIDE.

CHANNEL COVER TO CHANNEL FLANGE BOLTING INFO

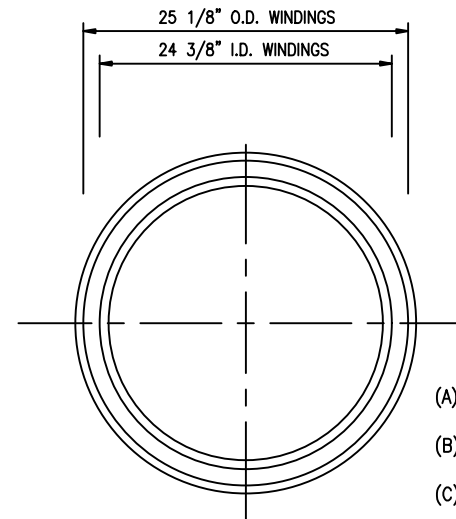
STUD DIAMETER: 1" O.D.
NUMBER STUDS: (36)
STUD MATERIAL: SA-193-B7M
BOLT TORQUE RANGE TO BE ACHIEVED: 507.4 - 513.2 FT-LBS.



(1)-REQUIRED.
CHANNEL GASKET.
0.175" THK. 304L S.S. SPIRAL WOUND
W/ GRAPHITE FILLER & INNER / OUTER COMP. RINGS (B)
RIB TO BE 3/16" THK. X 7/16" WIDE 304L S.S. DBL. JACKETED
⚠ W/ GRAPHITE FILLER AND 1/64" THK. GRAPHITE
FACE ON BOTH SIDES
TEST PRESSURE:
SHOP: 197 / FIELD: 190
RIB WIDTH TO BE 7/16" WIDE.

CHAN. FLG./T'SHT./SHELL FLG. BOLTING INFO

STUD DIAMETER: 1" O.D.
NUMBER STUDS: (40)
STUD MATERIAL: SA-193-B7M
BOLT FORCE RANGE TO BE ACHIEVED: 459.1-498.7 FT-LBS. ⚠



(1)-REQUIRED.
SHELL GASKET.
0.175" THK. 304L S.S. SPIRAL WOUND
W/ GRAPHITE FILLER & INNER / OUTER COMP. RINGS (C)
TEST PRESSURE:
SHOP: 259 / FIELD: 198 ⚠

===== COMPRESSION RINGS =====

- (A) 25.7500 O.D. X .1250 THICK: MATERIAL=SA-240-304
23.5000 I.D. X .1250 THICK: MATERIAL=SA-240-304
(B) 25.8750 O.D. X .1250 THICK: MATERIAL=SA-240-304
23.6250 I.D. X .1250 THICK: MATERIAL=SA-240-304
(C) 25.8750 O.D. X .1250 THICK: MATERIAL=SA-240-304
23.6250 I.D. X .1250 THICK: MATERIAL=SA-240-304

NOTES:

- 1) QUANTITIES SHOWN FOR ONE SET
(3)-SET REQUIRED TOTAL.
ONE SET OF GASKETS TO BE USED IN EXCH. AND
(2) SPARE SETS TO BE BOXED, MARKED WITH
P.O. & ITEM NO. & SHIPPED WITH EXCHANGER.
2) ALL RADII TO BE 1/4"

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ITEM NO.: 18-X-360
AIR PRODUCTS P.O. NO.: 4505600056 / A8KM-4-402-PO-1
AP PROJECT NO: EN-20-7119
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-5
ENGINEER: GH
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

GASKET DETAILS			
DWN. BY B.W.	Fabsco SHELL & TUBE, LLC		
DATE	5/18/22	CKD. BY	DiCarlo
NO.	DATE	REVISIONS	DWG.NO.
2			S21-13258-5-11
			REV. 2



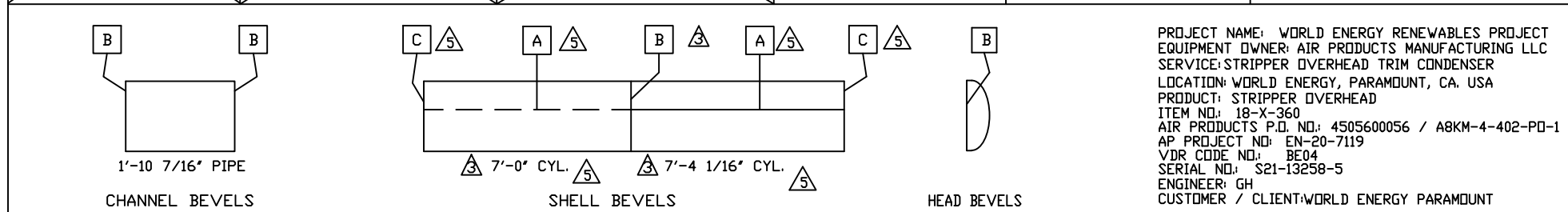
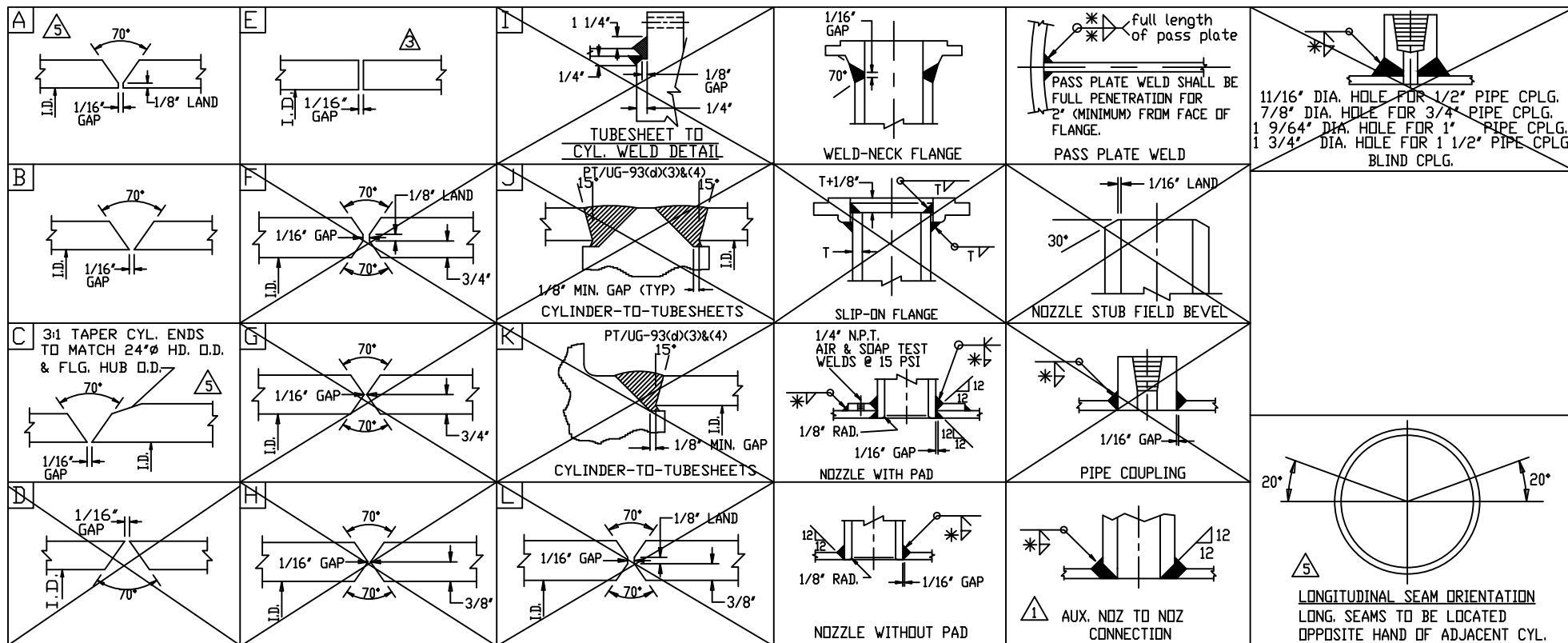
7 GIRTH FLANGE (ONE)REQ'D.

				GIRTH FLANGES		
				DWN. BY B.W.	Fabsco <u>SHELL & TUBE, LLC</u>	
				DATE 5/18/22		
	7/9/22	REV. PER CUST.	B.W./DD	CKD. BY	DWG.NO.	REV
NO.	DATE	REVISIONS		<i>DiCarlo</i>	S21-13258-5-12	1

Fabsco
SHELL & TUBE, LLC

DWG.NO.	S21-13258-5-12
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REV.
1



PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
 EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
 SERVICE: STRIPPER OVERHEAD TRIM CONDENSER
 LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
 PRODUCT: STRIPPER OVERHEAD
 ITEM NO.: 18-X-360
 AIR PRODUCTS P.D. NO.: 4505600056 / A8KM-4-402-PD-1
 AP PROJECT NO.: EN-20-7119
 VDR CODE NO.: BE04
 SERIAL NO.: S21-13258-5
 ENGINEER: GH
 CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

GENERAL NOTES:

- 1) ALL WELDING SHALL BE IN ACCORDANCE WITH ASME CODE (SECTION IX).
- * 2) ALL FILLET WELDS SHALL BE 3/8", UNLESS NOTED OTHERWISE ON DETAIL DRAWINGS.
- 3) LIFTING LUGS SHALL HAVE A 3/8" CONTINUOUS FILLET WELD, UNLESS NOTED OTHERWISE.
- 4) NOZZLE PADS SHALL BE UT OR RT 100% IF SPLIT IS WITHIN 45° OF VESSEL LONGITUDINAL AXIS.

			WELD & BEVEL DETAILS					
	2/17/23	REV. PER CUST. COMMENT					DD/DG	
	10/10/22	REV. PER CUST. COMMENT	DD/DG	DWN. BY B.W.	Fabsco SHELL & TUBE, LLC			
	9/15/22	REV. PER FABSCO	B.W./DD					
	8/23/22	REV. PER CUST.	DD/DG	DATE 5/17/22				
	7/18/22	REV. PER CUST.	B.W./DD	CKD. BY DiCarlo			DWG.NO.	REV 5
NO.	DATE	REVISIONS						

Fabsco
 SHELL & TUBE, LLC