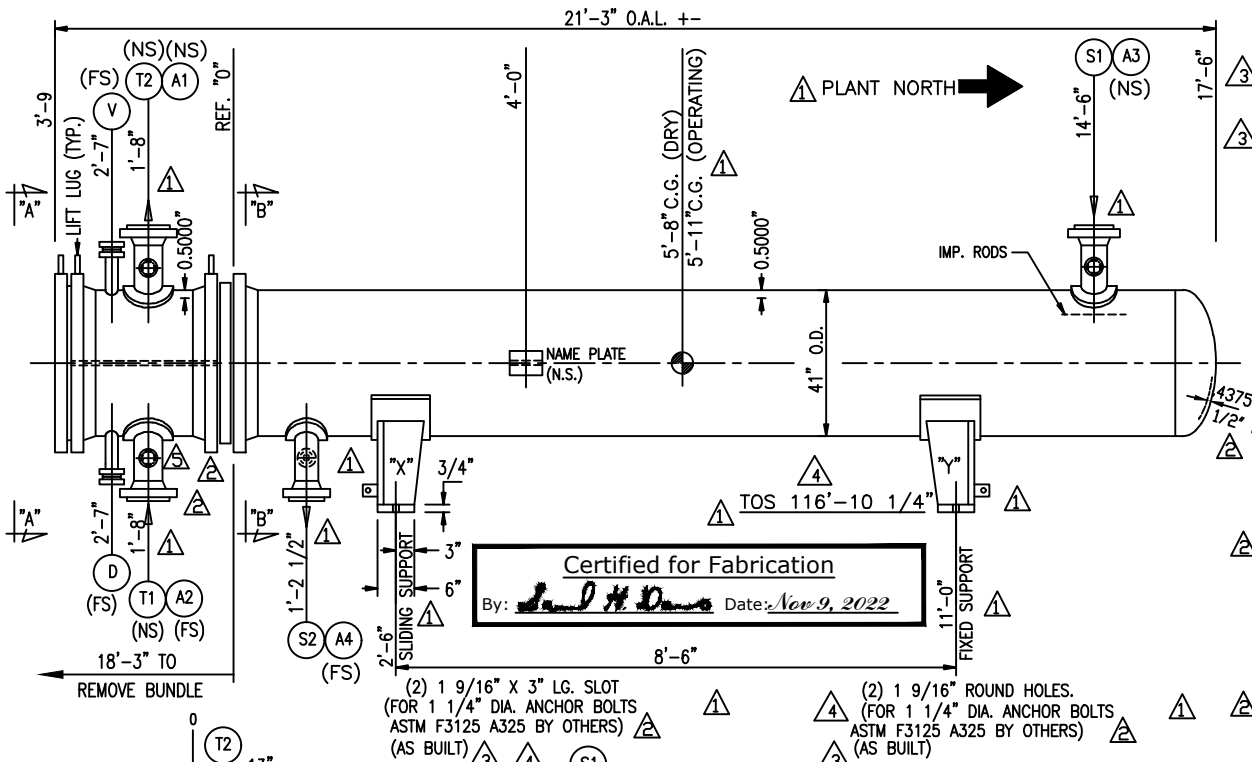
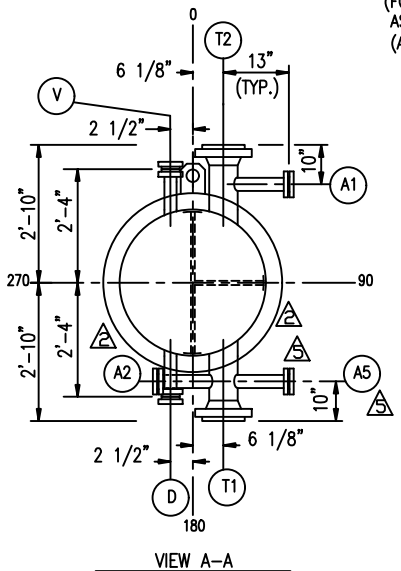
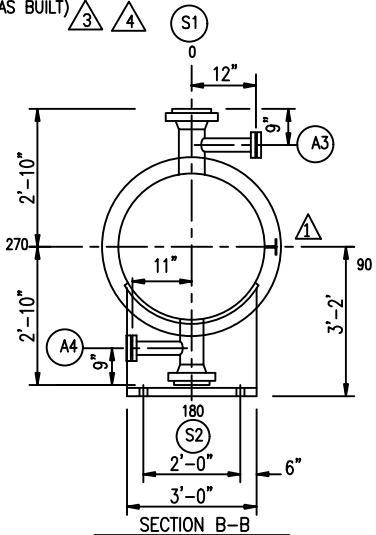




VIEW A-A



SECTION B-B

NOZZLE SCHEDULE			
MK	QT	DESCRIPTION	PROCESS
S1	1	8" 300#RF WN	INLET
S2	1	6" 300#RF WN	OUTLET
T1	1	10" 300#RF WN	INLET
T2	1	10" 300#RF WN	OUTLET
V	1	2" 300#RF LWN(*)	VENT
D	1	2" 300#RF LWN(*)	DRAIN
A1	1	2" 300#RF LWN(*)	AUX.
A2	1	2" 300#RF LWN(*)	AUX.
A3	1	2" 300#RF LWN(*)	AUX.
A4	1	2" 300#RF LWN(*)	AUX.
A5	1	2" 300#RF LWN(*)	AUX.

(*) INCLUDES BLINDS, GASKETS & BOLTING

DESIGN DATA	SHELL	TUBE
DESIGN PRESSURE P.S.I.G.	170	135
MAWP (H&C)	173	158
MAP (N&C)	190	175
LIMITED BY	TUBESHEET	BOLTED CH. COVER
VACUUM PRESSURE P.S.I.G.	15 @ 300°F.	N/A
TEST PRESSURE P.S.I.G.	SHOP-245/FIELD-225	SHOP-228/FIELD-206
DESIGN TEMP. Deg.F.	330	150
MDMT Deg. F.	10	32
CORROSION ALLOWANCE	1/8"	1/8"
NUMBER OF PASSES	1	4
RADIOGRAPHY	SPOT	SPOT
HEAT TREAT REQUIRED	NO	NO

ESTIMATED WEIGHTS, LBS.

DRY: 23400 BUNDLE: 13850 WET/HYDRO: 32950 CHAN.: 3850 SHELL: 5400

SPECIFICATIONS

ASME Code Section VIII, Division 1, 2021 Ed. (Stamp: Yes)
TEMA Class R 10th Ed.; & Natl. Bd. Reg. is reqd. 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),(d),(g)
Fig. UCS-66 General Note (c), and UCS-67.

MATERIAL

CHANNEL: SA-516-70 BAFFLES: SA-36
SHELL: SA-516-70 TUBES: SA-179 (SMLS.)
TUBESHEETS: SA-350LF2CL1
REFER TO BILL OF MAT'L. FOR REMAINING MAT'L.
(538) U's 3/4" O.D.X 0.083" MIN. X 15'-6" LG.
TUBE PITCH 1" 90° □ SURFACE 3169.1 EFF. SQ.FT.

GENERAL NOTES

ALL BOLT HOLES TO STRADDLE NATURAL CENTER LINES.
SEAL WELD & EXPAND TUBES TO TUBESHEET
INSULATION: NONE
FIRE PROOFING: N/A
SHELLSIDE TOXIC & FLAMMABLE; TUBESIDE: ----

10% SPARE BOLTS FOR BODY FLG'S.
GASKETS: .1750" THK. 304 SP. WD. W/ FLEX. GRAPH. FILLER AND 304 SS INNER AND OUTER RET. RINGS.
2 SETS OF SPARE GASKETS REQUIRED.
PAINT: SEE SHT. -1A

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: ***DEBUTANIZER OVERHEAD CONDENSER*** 1
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: DEBUTANIZER OVERHEAD CONDENSER
ITEM NO.: 18-X-379
AIR PRODUCTS P.O. NO.:4505600058 / A8KM-4-402-PO-3
AP PROJECT NO: EN-20-7020
VDR CODE NO.: HC09
SERIAL NO.: S21-13258-15
ENGINEER: SD
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

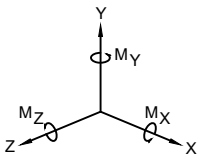
NO.	DATE	REVISIONS
5	4/19/23	REV. "AS BUILT"/ FABSCO AS/DD
4	12/29/22	REV. PER CUST. COMMENTS DD/DG
3	11/9/22	REV. PER CUST. COMMENTS DD/DG
2	8/12/22	REV. PER CUST. B.W./DD
1	5/26/2022	REV./CUST. COMMENTS EMG

ASSEMBLY AND SPECIFICATIONS FOR
ONE 40-186 A E U

DWN. BY SHD
DATE 12/30/21
CKD. BY *DiCarlo*

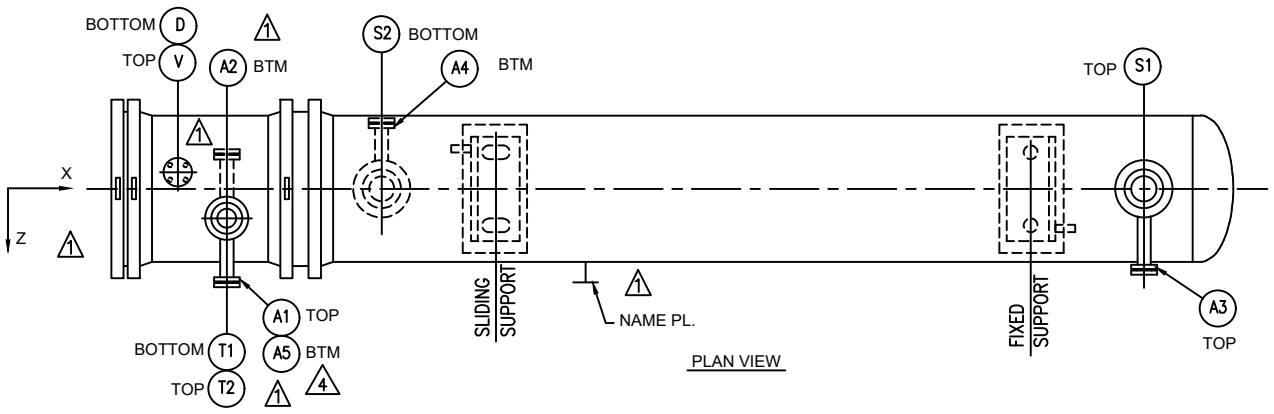
Fabsco
SHELL & TUBE, LLC

DWG.NO. S21-13258-15-1
REV. 5



NOZZLE LOADS

MK.	$M_{X\ LBF-FT}$	$M_{Y\ LBF-FT}$	$M_{Z\ LBF-FT}$	$F_{X\ LBF}$	$F_{Y\ LBF}$	$F_{Z\ LBF}$	LOAD BASES
S1	5160	8340	6560	2600	2080	2600	8"-150#; 2 x API-660
S2	3060	4920	3880	2000	1600	2000	6"-150#; 2 x API-660
T1	8020	12960	10180	3240	2580	3240	10"-150#; 2 x API-660
T2	8020	12960	10180	3240	2580	3240	10"-150#; 2 x API-660



PLAN VIEW

DESIGN DATA	SHELL	TUBE
OPERATING PRESSURE PSIG	90	50
OPERATING TEMP. °F.	IN: 131.8 OUT: 105.5	IN: 80 OUT: 98
HYDROTEST TEMP. °F.	40°(MIN.)	40°(MIN.)
JOINT EFF.	0.85	0.85
FLUID NAME	BUTANE	COOLING WATER
FLUID DENSITY lb/ft^3	IN: 1.01 OUT: 33.39	62.43
LETHAL SERVICE	TOXIC & FLAMMABLE	---
DESIGN DUTY Btu/hr	10338086	
WIND CODE	ASCE 7-16 WIND SPEED: 101 MPH IMP. FACTOR: 1	
SEISMIC CODE	ASCE 7-16 SECTION 13.3.1 W/ ap=1.0 Rp=2.5	
	Ip=1.5 Fa: 1 and z=h Fv: 1.721	
	Ss: 1.616 S_1: 0.579 Site Class: D Sd_1: 0.996	

PAINT SYSTEM 1 (SHELL & TUBE SIDES) :
SOLVENT CLEAN PER SSPC-SP1
SANDBLAST PER SSPC-SP10 (1.5-2.5 MILS ANCHOR PROFILE)
PRIMER: ONE COAT SHERWIN WILLIAMS ZINC CLAD II (2.5-4.0 MILS DFT)
INTERM: ONE COAT SHERWIN WILLIAMS MACROPOXY 646 (4.0-6.0 MILS DFT)
(COLOR: MILLWHITE)
FINISH COAT: ONE COAT SHERWIN WILLIAMS ACROLON 218HS
(2.0-3.0 MILS DFT)
(COLOR: LIGHT GRAY RAL #7035)

APPLICABLE SPECIFICATIONS :

3-11-10, 4-11-11, 4WEQ-1051, 4WGN-10001,
4WPI-670210, A8KM-PP-000-40002-A,
A8KM-PP-000-50720-A, A8KM-PP-000-200001-A,
A8KM-PP-000-500005-A, A8KM-PP-000-500510-A,
A8KM-PP-000-500512-A, A8KM-PP-000-500520-A,
A8KM-PP-000-500550-A, FORM 8232,
SPEC-ENG-DOC001, SPEC-ENG-DOC002,
SPEC-ENG-MQ042, SPEC-ENG-MQ057,
SPEC-MED-DOC001

CHANNEL COVER TO CHANNEL FLANGE BOLTING INFO
STUD DIAMETER: 1" O.D.
NUMBER STUDS: (56)
STUD MATERIAL: SA-193-B7
BOLT TORQUE RANGE TO BE ACHIEVED: 601.1-637-9 FT. LBS

CHAN. FLG./T'SHT./SHELL FLG. BOLTING INFO
STUD DIAMETER: 1" O.D.
NUMBER STUDS: (56)
STUD MATERIAL: SA-193-B7
BOLT TORQUE RANGE TO BE ACHIEVED: 601.1-637.9 FT. LBS.

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VDR CODE NO.: HCO9
SERIAL NO.: S21-13258-15
ENGINEER: SD
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

NO.	DATE	REVISIONS
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1	8/16/22	REV. PER CUST. B.W./DD

SUPPLEMENTAL INFORMATION
ONE 40 - 186 A E U

DWN. BY: EMG
DATE: 5/26/2022
CKD. BY: *DiCarlo*

Fabsco
SHELL & TUBE, LLC

DWG.NO. S21-13258-15-1A
REV. 4