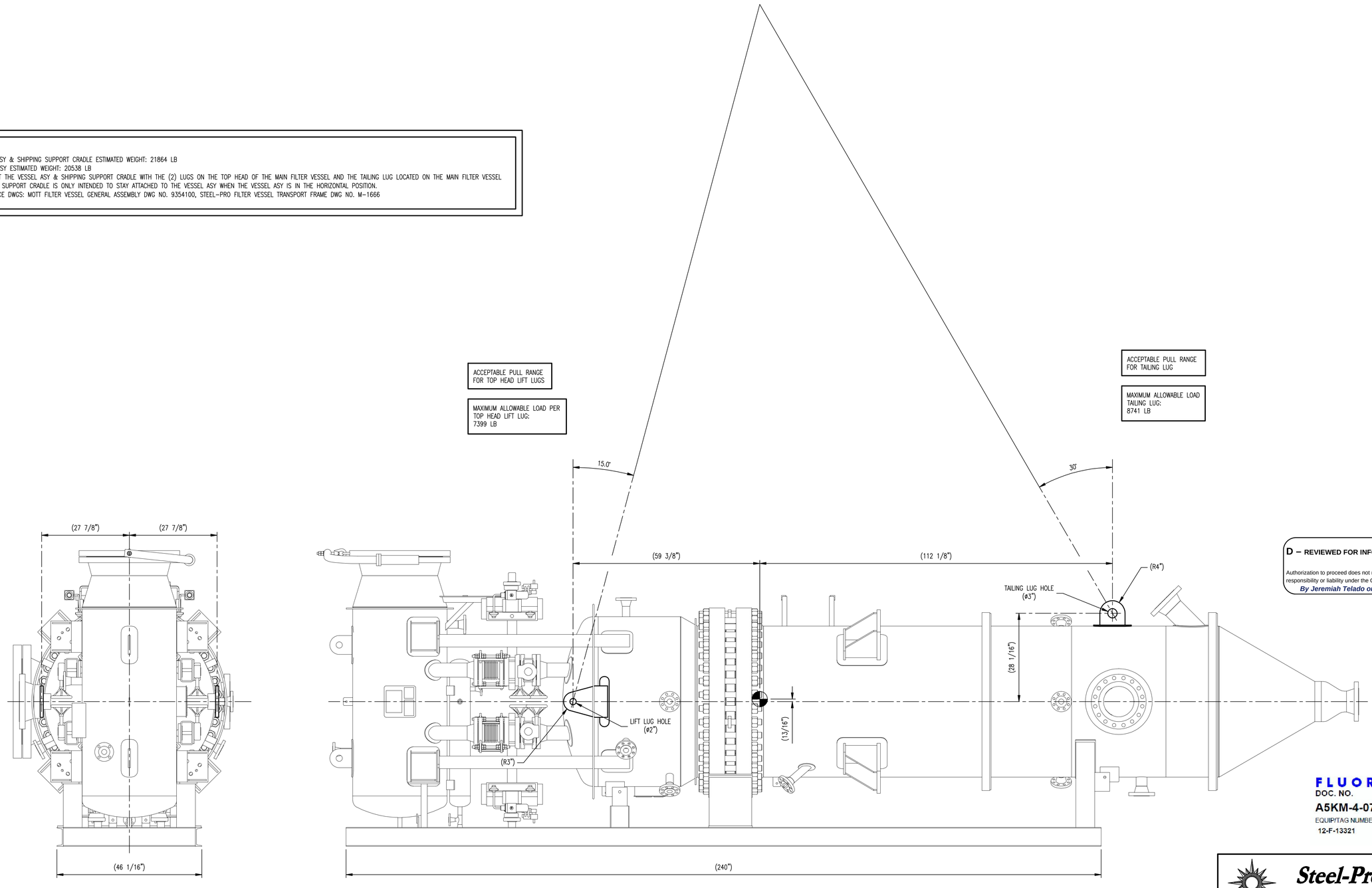
NOTES:
1.) VESSEL ASY & SHIPPING SUPPORT CRADLE ESTIMATED WEIGHT: 21864 LB
2.) VESSEL ASY ESTIMATED WEIGHT: 20538 LB
3.) ONLY LIFT THE VESSEL ASY & SHIPPING SUPPORT CRADLE WITH THE (2) LUGS ON THE TOP HEAD OF THE MAIN FILTER VESSEL AND THE TAILING LUG LOCATED ON THE MAIN FILTER VESSEL
4.) SHIPPING SUPPORT CRADLE IS ONLY INTENDED TO STAY ATTACHED TO THE VESSEL ASY WHEN THE VESSEL ASY IS IN THE HORIZONTAL POSITION.
5.) REFERENCE DWGS: MOTT FILTER VESSEL GENERAL ASSEMBLY DWG NO. 9354100, STEEL-PRO FILTER VESSEL TRANSPORT FRAME DWG NO. M-1666

ACCEPTABLE PULL RANGE FOR TOP HEAD LIFT LUGS

MAXIMUM ALLOWABLE LOAD PER TOP HEAD LIFT LUG: 7399 LB

ACCEPTABLE PULL RANGE FOR TAILING LUG

MAXIMUM ALLOWABLE LOAD TAILING LUG: 8741 LB



D – REVIEWED FOR INFORMATION ONLY FLUOR

Authorization to proceed does not relieve Contractor/Supplier of its responsibility or liability under the Contract and or Purchase Order.
By Jeremiah Telado on Apr 01, 2015

FLUOR DOC. NO. 00A5KM23 REC'D: 24-MAR-2015

A5KM-4-0701-01-00070-1

EQUIP/TAG NUMBER
12-F-13321 12-F-14321

Steel-Pro Incorporated
P.O. Box 449 * Rockland, Maine 04841

TITLE FILTER VESSEL LIFT LIMITATIONS
TRUCK UNLOAD & SET DOWN LIFT

CUST. MOTT CORP. P.O. NO. 0006905-1

APPROVALS	DATE	S.O. NO. 20725	QTY
DRAWN J BUCK	03/20/15		--
ENGR. CHK.		DWG.NO. M-1667	REV. 0
Q.C. CHK.			
QUOTE/SALES CHK.		SCALE AS NOTED	SHEET 1 OF 2 SHEETS

REV	DESCRIPTION	BY	ENGR	QC	DATE
0	-FOR APPROVAL	JB			03/20/15

CUSTOMER: FLUOR/REC
CONTRACT/PROJ No: A5KM
PROJ NAME: REC SILICON REACTOR 25/26 PROJECT
CUSTOMER PO No: A5KM-4-0701-01/MWK100004
ITEM/TAG Nos: 12-F-13321 & 12-F-14321
EQUIP DESCRIPT: EFFLUENT FILTERS

FLUOR

TO BE COMPLETED BY VENDOR	FLUOR TO COMPLETE
CONTRACT No: A5KM	PDDM REC'D DATE: / FLUOR REV. *
P.O. NUMBER: A5KM-4-0701-01/MWK100004	A - PROCEED
FIRST ISSUE: YES [X] NO [ ]	B - PROCEED, CHANGE AS NOTED & RESUBMIT
EDR CODE(S): CDD	C - DO NOT PROCEED, CHANGE AS NOTED & RESUBMIT
ITEM/TAG NUMBERS: 12-F-13321 TO 12-F-14321	D - REVIEWED FOR INFORMATION ONLY
FLUOR CONTROL NUMBER BY FLUOR	Q - QUALITY IS BELOW STANDARDS. CORRECT & RESUBMIT

AUTHORIZATION TO PROCEED DOES NOT RELIEVE CONTRACTOR/VENDOR OF ITS RESPONSIBILITY OR LIABILITY UNDER THE CONTRACT/PURCHASE ORDER.

Fluor Corporation
3 Polaris Way

Aliso Viejo, CA

92698

Status Date: 13-APR-2015
Contract: 00A5KM23
REC REACTOR 25-26

TAG COVER SHEET

Date Received: 13-APR-2015
Supplier: Mott Corporation
Document Title: FILTER VESSEL SPECIFICATION FOR CUSTOMER - HOT EFFLUENT GAS FILTERS

Supplier Doc. No.: MFVSC NO 12-F-13321-14321 **Sheet:** **Rev:**

Projects OnLine Project 13-APR-2015
Fluor Corporation Cont'l No.: 00A5KM23
A5KM-4-0701-01-00019-5

Equip/Tag:	Equip/Tag:	Equip/Tag:	Equip/Tag:	Equip/Tag:
	12-F-13321	12-F-14321		

FLUOR®

A – PROCEED

Authorization to proceed does not relieve Contractor/Supplier of its responsibility or liability under the Contract and or Purchase Order.

By Jeremiah Telado on Apr 13, 2015

MFVSC # 12-F-13321 / 14321: MOTT FILTER VESSEL SPECIFICATION FOR CUSTOMER - BUSINESS CONFIDENTIAL

Mott Sales Order No.: SO2010865

Engineering Contractor:	Fluor Inc., Aliso Viejo, CA	**Service Name & Tag Number:**	HOT EFFLUENT GAS FILTERS 12-F-13321 / 14321	**Quantity:** 2 Required	**DATE:** 04/08/15 **SHEET No.:** 1 of 2
End User:	REC, Moses Lake, WA	**Mott Catalogue No.:**	(2) - Mott Cat. No. 93(54x48)100-124-2.5-2-C*(2R)*(C/D)* w/ Automatic On-Line Cleaning	**Fluor PO No.:**	A5KM-4-0701-01
Filtration Vendor:	Mott Corp.	**Application:**	Continuous Removal of Silicon Dust Fines in a Hot Hydrogen Gas Stream	**Fluor Project ID:**	Reactor 25/26 Project

Each Filter Vessel (FV): 54" x 48" OD Cl 300 TP304/304L SS X 21.8 Ft. H Filter Vessel including: (4) - 4" Cl 300 SS Auto Backpulse Vlvs., (4) - 4" Cl 300 SS Manual Isolation Vlvs., (4) - 4" Cl 300 SS Exp. Joints, Wiring, J-Box

Each Accumulator Tank (AT): 30" OD Cl 150 TP304/304L SS X 7.4 Ft. OAL X 3.8 Ft. H X 29 Ft3 Volume Horizontal Accumulator Tank including (1) - 6" Cl 150 SS Instrument Air Manifold for Auto Backpulse Valve Actuators

Auxilliaries (2) - Local Control Panels w/ NEMA TP316 SS Enclosures, A/B CompactLogix PLC, Intrinsically Safe Barriers, 10" Maple Systems Color Touch HMI, Heater, Alarms, Pilot Lights, Z-Purge, etc.

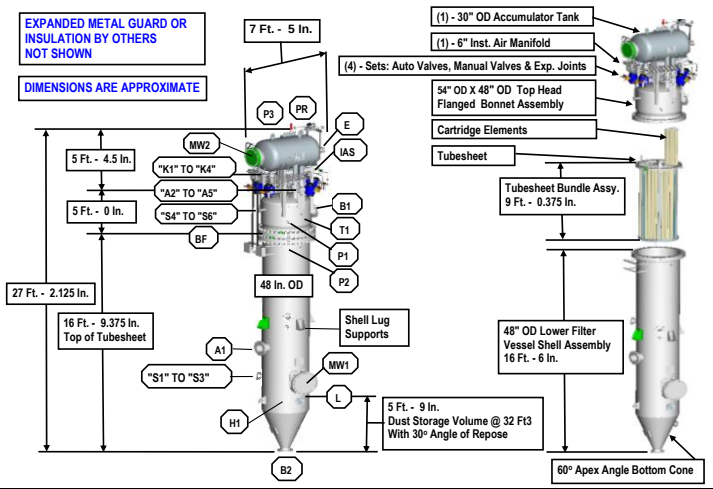
1 STRUCTURAL DESIGN, LAYOUT & COMPONENTS: MOTT GSV DOWNFLOW GAS FILTER VESSEL DESIGN WITH AUTOMATIC ON-LINE CLEANING SYSTEM

2	FV Flanged Top Head Bonnet (Diameter X Height):	54" OD X 48" OD x 60" H	Tubesheet: 52.25" OD X 3" Thick	Est. Unit Filter Vessel System Assembly Dry Weight: 25,800 Lb.
3	FV Flanged Lower Shell (Diameter X Height):	48" OD x 198" H	J-Box NEC Class: Class I Div 2 Groups B/C/D, NEMA 4X Enclosures	Est. Unit Filter Vessel System Shipping Weight: 27,000 Lb
4	AT (Dia X Length X Height):	30" OD x 89" OAL x 46" OAH	Control Panel NEC Class: Unclassified NEMA 4 Enclosures	Est. Unit Filter System Shipping Dimensions: 28 Ft L x 5.5 Ft W x 8.5 Ft H

	Operating / Design	Pressure	Temperature	Corrosion Allowance & MDMT
6	**FILTER VESSEL (ASME Section VIII Div 1 Code)**			
7	Operating	4.8 psig	750 °F / 950 °F	0.0625 In. Vessel
8	Internal Design MAWP	60 psig	980 °F / 0 °F	0.125 In. Vessel Nozzles
9	External Design	FV	980 °F	-20 °F MDMT
10	**ACCUMULATOR TANK (ASME Section VIII Div 1 Code)**			
11	Operating	80 - 100 psig	32 To 120 °F	0.0625 In. Vessel
12	Internal Design MAWP	150 psig	500 °F / 0 °F	0.125 In. Vessel Nozzles
13	External Design	FV	500 °F	-20 °F MDMT
14	**TUBESHEET (ASME Section VIII Div 1 Code)**			
15	Operating Differential	0.35 To 0.66 psi	750 °F / 950 °F	0.0625 In.
16	Diff Pressure Design	30 psi	980 °F / 0 °F	-20 °F MDMT
17	**INSTRUMENT AIR PIPE MANIFOLD (ASME B31.3 Code)**			
18	Operating	80 - 110 psig	32 To 120 °F	0.0625 In.
19	Design MAWP & External	165 psig & FV	250 °F / 0 °F	-20 °F MDMT

20	**TUBESHEET (ASME Section VIII Div 1 Code)**	
21	52.25" OD x 3" Thk x (124) - 21/2" NPT Holes @ 3.125" Pitch, 45° Square Pattern & RF Both Sides	
22	**FILTER VESSEL, TUBESHEET, ACCUMULATOR & INST. AIR MANIFOLD MATERIAL:**	
23	Plate & Pipe (ANSI B 36.10):	SA-240 TP304/304L SS Plate, SA-312 TP304/304L SS Smls/Wld Pipe
24	Butt Wld Pipe Fittings (B16.9):	SA-403 TP304/304L SS Smls & Wld
25	Flanges & Forged Cplgs (B16.11):	SA-182 TP304/304L SS (Flanges per B16.5 & B16.47 Series B)
26	Fasteners:	SA-193 B8 SS Stud Bolts & SA-194 Gr 8 SS Hvy Hex Nuts
27	Flange Gaskets:	TP304/304L SS Spiral Wound Phlogopite Mica Fill, TP304/304L SS Inner & Outer Rings
28	**AUTO BACKPULSE & MANUAL VALVE ASSEMBLIES FOR EACH FILTER VESSEL:**	
29	(4) - 4" Class 300 Flanged Fast Acting Auto Butterfly Valve Assembly w/ CF8M Stn Stl Bodies, Inlet Filter	
30	and Regulator, Single Acting Fail Closed (Spring-To-Close) Actuator, Limit Switch, Position Indicator,	
31	Air Relay, Stn Stl Intrinsically Safe Solenoid Valve w/ Manual Overide, Check Valve & Quick Exhausts.	
32	(4) - 4" Class 300 Flanged Manual Isolation Butterfly Valves with w/ CF8M Stn Stl Bodies & Gear Operators	
33	**EXPANSION JOINTS FOR EACH FILTER VESSEL:**	
34	(4) - 4" Class 300 Flanged TP321 SS Tied Expansion Joints with TP304/304L SS Flanges & Internal Liners	
35	**MOTT CARTRIDGE ELEMENT DATA:**	
36	Quantity & Mott Element Cat. No.:	(124) - Cat # 2240-D40-100-C*-2-C*(2R)* Elements per Filter Vessel
37	Element Material & Grade:	TP 304L Stn Stl Porous Media Grade 2 with TP304/304L SS Hardware
38	Element Size & Open End Seal:	2.5" OD x 100" Porous Length x 2-1/2" NPT Nitronic 60 SS Adapter
39	Element Design Pressure:	59 psi Collapse Pressure & 214 psi Burst Pressure @ 980 °F
40	**APPURTENANCES & SPECIAL FLUOR REQUIREMENTS FOR EACH FILTER VESSEL**	
41	Insulation Clips & Rings:	Yes, Filter Vessel & Accumulator Tank (Exp. Metal Guard By Others)
42	Filter Vessel Grounding Lugs:	(1) - Filter Top Head Bonnet, (1) - Filter Shell & (1) - Accumulator Tank
43	Filter Vessel (FV) Supports:	(4) - Lower Shell Lug Supports
44	Accumulator Tank (AT) Supports:	(4) Sets - TP304 SS Vertical Angles & Base Plates Installed
45	Filter Vessel (FV) Lifting Lugs:	(2) - FV Top Head Bonnet Assembly w/ (1) - Lower Shell Tailing Lug
46	Accumulator Tank Lifting Lugs:	(2) - Accumulator (Lifting of Accumulator & FV Top Head Assembly)
47	Tubesheet Lifting Lugs:	(2) - Top Side of Tubesheet (Bundle Frame Assembly Lift)
48	Filter Vessel Bottom Cone:	Polishesed Internal Surface of Bottom Cone at 32 Ra Surface Finish
49	Manway Davit Arm Assemblies:	Filter 24" MW-1 (without Davit) & Accumulator 24" MW-2 (with Davit)
50	Gaskets & Fasteners:	1 Installed Set Gaskets & Fasteners + 1 Set Commissioning Gaskets
51	Nitrogen Gas Pressure Blanket:	Filter Vessel Assemblies Shipped Pressurized with 0.25 psig GN2
52	Shipping Support Frame:	Filter Vessel Assemblies Shipped on Horizontal CS Structural Frames
53	**DESIGN CODES & FLUOR SPECIFICATION REQUIREMENTS**	
54	Design Code:	Filter Vessels & Accumulators: ASME Sect VIII Div 1 & Piping: B31.3
55	ASME Code Stamp (FV & AT):	ASME U Stamp & National Board Registration Required
56	Inspection & NDE Requirements:	Inspection Test Plan, Quality Plan, Test Reports & FAT
57	Impact / Hardness / Ferrite Tests:	ASME Sect VIII, Div 1 Code, Fluor Specs. & Ferrite Testing 10% Welds
58	PWHT, Stress Relieve:	ASME Section VIII, Div. 1 Code, Fluor Specs.
59	VT, PT, RT, UT & Pressure Test:	ASME Section VIII, Div. 1 Code, Fluor Specs. & UT of Tubesheets
60	Clean, Degrease & Passivate	Clean all wetted surfaces per REC Spec. # STN-GEN-00002F
61	Clean, Degrease & Passivate	Use "Simple Green" as Degreaser and Citric Acid for Passivation
62	Clean, Degrease & Passivate	Chemicals are Not to contain alkali metals (i.e. NaOH) or phosphates (i.e. Phosphoric Acid)
63	**FLUOR/REC SPECS.: DESIGN, MATERIAL, FAB, WELDING, QA, CLEANING & TESTING**	
64	Fluor/REC Attachment "A": Items To Be Purchased Bill of Material (BOM), Rev. 3 dated 02/26/15 (4 pgs.)	
65	Fluor/REC Filter Data Sheet # 59-12-F-13321 Effluent Filters, Rev. 3 dated 12/22/14 (3 shts.)	
66	Fluor/REC Attachment "C": "Engineering Documents And Notes" Rev. 4 dated 02/26/15 (14 pgs) - DOCS	
67	Fluor PDDM Form A5KM.206.F0520 dated 10/22/14 (9 pgs) - DOCS	
68	Fluor SDDC Form 000.255.SD.4000 Rev.1 dated 09/17/14 (2 pgs): Supplier Dwg Data Commitment - DOCS	
69	Fluor Form 000.450.F2001 Rev. 1 dated 09/18/14 (4 pgs): Quality & Cert. Requirements - INSPECTION	
70	REC Spec. No. STN-VES-00023 Rev. 1 dated 3/6/12 (39 pgs) - VESSEL FABRICATION	

54" X 48" OD Class 300 TP304/304L SS Downflow Effluent Gas Filter System - Two Filter Systems Required



HYDROGEN GAS TEMP. INSIDE ACCUMULATOR TANK MUST ALWAYS BE MAINTAINED AT A TEMPERATURE THAT IS GREATER THAN THE DEW POINT TEMPERATURE OF THE EFFLUENT GAS THAT IS BEING FILTERED.

Filter Vendor to provide/attach Stn Stl ID Nameplates with Nozzle Tag ID Numbers to Each Nozzle Using Stn Stl Wire

NOZZLE SCHEDULE: 54" OD X 48" OD CLASS 300 TP304/304L SS EFFLUENT GAS FILTER VESSEL

Nozzle Identification	Mark	Size (In.)	Qty.	Class	Type & Facing
Effluent Gas Inlet - Lower Shell	A1	10"	1	300	RFWN ASME B16.5
Clean Gas Outlet - Top Head Bonnet	B1	10"	1	300	RFWN ASME B16.5
Dust Solids Outlet - Bottom Cone	B2	6"	1	300	RFWN ASME B16.5
Backpulse Gas Inlets	A2 - A5	4"	4	300	RFWN ASME B16.5
Filter Vessel Body Flanges	BF	48"	2	300	RFWN B16.47 Series B
Hi, Lo Pressure Diff. Measurement Across Tubeshe	P1, P2	2"	2	300	RFWN ASME B16.5
Temp. Measurement - Top Head	T1	2"	1	300	RFWN ASME B16.5
Level Measurement - Bottom Shell	L	3"	1	300	RFWN ASME B16.5
Clean Out Handhole Connection - Bottom Shell	H1	6"	1	300	RFWN ASME B16.5
Fabrication Inspection without Davit Arm Assembly	MW1	24"	1	300	RFWN ASME B16.5
Shipping Support Nozzles Top Head	S4 - S6	2"	3	300	RFWN ASME B16.5
Shipping Support Nozzles Lower Shell	S1 - S3	2"	3	300	RFWN ASME B16.5

Filter Vendor to provide/attach Stn Stl ID Nameplates with Nozzle Tag ID Numbers to Each Nozzle Using Stn Stl Wire

NOZZLE SCHEDULE: 30" OD CLASS 150 TP304/304L SS ACCUMULATOR TANK

Nozzle Identification	Mark	Size (In.)	Qty.	Class	Type & Facing
Accumulator Gas (GH2) Inlet	E	1"	1	150	RFWN ASME B16.5
Backpulse Gas (GH2) Outlets	K1 - K4	4"	4	300	RFWN ASME B16.5
Pressure Measurement	P3	2"	1	150	RFWN ASME B16.5
Pressure Relief & Vent	PR	2"	1	150	RFWN ASME B16.5
Bottom Drain	D1	2"	1	150	RFWN ASME B16.5
Manway Inspection with Davit Arm Assembly	MW2	24"	1	150	RFWN ASME B16.5

Filter Vendor to provide/attach Stn Stl ID Nameplates with Nozzle Tag ID Numbers to Each Nozzle Using Stn Stl Wire

NOZZLE SCHEDULE: 6.625" OD CLASS 150 TP304/304L SS INSTRUMENT AIR PIPE MANIFOLD

Nozzle Identification	Mark	Size (In.)	Qty.	Class	Type & Facing
Inst. Air Supply Inlet	IAS	1"	1	150	RFWN ASME B16.5
Inst. Air Drain	IAD	1"	1	150	RFWN ASME B16.5
Inst. Air Vent	IAV	3/4"	1	150	RFWN ASME B16.5
Inst. Air to Valve Actuators	IA1 - IA4	3/4"	4	Lt Wt	Socket Weld Unions

REC Spec. No. STN-GEN-00002 Rev. 7 (22 pgs) & Addendum to STN-GEN-00002 Rev. 7 (3 pgs) - CLEANING	
REC Spec. No. A5KM23-ADD-STN-CSA-00103 Rev. 1 dated 08/20/14 (25 pgs): "Struct. Data For Mech. Equipment" - DESIGN	
REC Spec. No. A5KM23-ADD-STN-VES-00023 Rev. 1 dated 08/26/14 (10 pgs): "Vessel Fabrication Standard" - DESIGN & FAB	
REC Spec. No. A5KM23-ADD-STN-MET-00020 Rev. 1 dated 08/19/14 (18 pgs): "Welding Pressure Vessels" - FAB	
REC Spec. No. STN-ELE-00012 Rev. 1 (16 pgs) & A5KM23-ADD-STN-ELE-00012 Rev. 1 (3 pgs) : "Pkg'd Equipment" - ELECT.	
REC Spec. No. STN-ELE-00012A Rev. 1 (2 pgs) & STN-ELE-00012B (1 pg): "Pkg'd Equipment" - ELECTRICAL	
REC Spec. No. STN-PCI-00085 Rev. 2 (12 pgs): "General Purpose Pkg'd Equipment Instrumentation" - INSTRUMENTATION	
REC Spec. No. STN-PCI-00201 Rev. 0 (44 pgs): "Pkg'd Equipment Instrumentation Standard" - INSTRUMENTATION	

REV				
0	SHEET NO.: 1 OF 2	DATE: 09/25/14 EFM	ISSUE/REV.: 0	DESCRIPTION: Based upon Fluor PO No. A5KM-4-0701-01 and attached specifications except Material-Of-Construction is TP304 SS NOT TP304H SS
1	MOTT CORPORATION	DATE: 10/20/14 EFM	ISSUE/REV.: 1	Revisions requested by REC/Fluor and recorded in Fluor Conference Note CN-R2526-00010 documenting the 10/09/14 REC/Fluor/Mott Project Kick-Off Review Meeting.
2	BUSINESS CONFIDENTIAL	DATE: 11/14/14 EFM	ISSUE/REV.: 2	Re-named Nozzle "T2" as "T1" on Sht. # 1, Added Dew Point Temperatures of Hydrogen Gas & Nitrogen Gas on Sht. # 2
3		DATE: 12/12/14 EFM	ISSUE/REV.: 3	Changed Gaskets to TP304/304L SS Spiral Wound Mica Fill, TP304/304L SS Inner & Outer Rings on Line # 27, Sht # 1
4		DATE: 04/08/15 EFM	ISSUE/REV.: 4	Revised Dimensions, Added TP304/304L SS, Added Phlogopite Mica Fill for Gaskets, Updated Fluor & REC Specs per REC PO # A5KM-4-0701-01/A5KM100004 CO # 1 & CO # 2

REV	MFVSC # 12-F-13321 / 14321: MOTT FILTER VESSEL SPECIFICATION FOR CUSTOMER - BUSINESS CONFIDENTIAL						Mott Sales Order No.: SO2010865	REV
4	Engineering Contractor:	Fluor Inc., Aliso Viejo, CA	Service Name & Tag Number:	HOT EFFLUENT GAS FILTERS 12-F-13321 / 14321	Quantity: 2 Required	DATE: 04/08/15	SHEET No.: 2 of 2	4
1	End User:	REC, Moses Lake, WA	Mott Catalogue No.:	(2) - Mott Cat. No. 93(54x48)100-124-2.5-2-C*(2R)*(C/D)* w/ Automatic On-Line Cleaning		Fluor PO No.:	A5KM-4-0701-01	1
	Filtration Vendor:	Mott Corp.	Application:	Continuous Removal of Silicon Dust Fines in a Hot Hydrogen Gas Stream		Fluor Project ID:	Reactor 25/26 Project	
1	Each Filter Vessel (FV):	54" x 48" OD Cl 300 TP304/304L SS X 21.8 Ft. H Filter Vessel including: (4) - 4" Cl 300 SS Auto Backpulse Vlvs., (4) - 4" Cl 300 SS Manual Isolation Vlvs., (4) - 4" Cl 300 SS Exp. Joints, Wiring, J-Box						1
1	Each Accumulator Tank (AT):	30" OD Cl 150 TP304/304L SS X 7.4 Ft. OAL X 3.8 Ft. H X 29 Ft3 Volume Horizontal Accumulator Tank including (1) - 6" Cl 150 SS Instrument Air Manifold for Auto Backpulse Valve Actuators						1
1	Auxilliaries	(2) - Local Control Panels w/ NEMA TP316 SS Enclosures, A/B CompactLogix PLC, Intrinsically Safe Barriers, 10" Maple Systems Color Touch HMI, Heater, Alarms, Pilot Lights, Z-Purge, etc.						1

71	**PROCESS FILTRATION DUTY:**	**Continuous Removal of Silicon Dust Fines in a Hot Hydrogen Gas Effluent Stream**					
72	Total Filtration Surface Area:	676 Ft2					
73	Effluent Feed Gas Inlet Volumetric Flow Rate:	Case # 1B @ 1,798 ACFM	Case # 4A @ 1,652 ACFM	Case # 4B @ 1,811 ACFM	Case # 2H @ 1,968 ACFM		
74	Effluent Feed Gas Molecular Wt. - Type & Compositi	2 Lb / LbMole Effluent Hydrogen Gas For Operating Cases # 1B, 4A, 4B & 2H					
75	Effluent Feed Gas Operating Temperature:	Case # 1B @ 750°F	Case # 4A @ 950°F	Case # 4B @ 750°F	Case # 2H @ 750°F		
76	Effluent Feed Gas Inlet Operating Pressure:	4.8 psig For Cases # 1B, 4A, 4B, 2H & 2N					
77	Effluent Feed Gas Operating Viscosity:	Case # 1B: 0.016 cP at 750°F	Case # 4A: 0.017 cP at 950°F	Case # 4B: 0.016 cP @ 750°F	Case # 2H: 0.016 cP at 750°F		
78	Effluent Feed Gas Dew Point Temperature:	GH2 Dew Point Temp @ -422 °F	GN2 Dew Point Temp @ -316 °F				
79	Cases # 1B/4A/4B/2H Backpulse Gas Type & Pressu	Clean Dry Hydrogen Gas at 80 - 100 psig For Operating Cases # 1B, 4A, 4B, 2H & 2N					
80	Minimum Required Temp. of Backpulse Gas:	GH2 or GN2 Temperature Inside Accumulator Must Be Maintained at a Temperature Greater than the Dew Point Temperature of the Effluent Gas Being Filtered - See Mott Note # 1					
81	Nitrogen Feed Gas Inlet Volumetric Flow Rate:	Case # 2N @ 869 ACFM					
82	Nitrogen Feed Gas Molecular Weight:	Case # 2N @ 28 Lb / LbMole For Nitrogen Feed Gas					
83	Nitrogen Feed Gas Operating Temperature:	Case # 2N @ 750 °F					
84	Nitrogen Feed Gas Operating Pressure:	Case # 2N @ 4.8 psig					
85	Nitrogen Feed Gas Viscosity:	Case # 2N @ 0.032 cP at 750 °F					
86	Case # 2N Backpulse Gas Type & Supply Pressure:	Case # 2N: Backpulse Gas is Clean Dry Nitrogen Gas at 80 - 100 psig Operating Pressure					
87	Total Dust Solids Loading Rate:	Case # 1B = 42 Lb/Hr;	Case # 4A = 60.3 Lb/Hr;	Case # 4B = 78.7 Lb/Hr	Case # 2H = 0 Lb/Hr	Case # 2N = 0 Lb/Hr	
88	Dust Solids Type, Particle Density & Size Distribution	Silicon Dust at a Particle Density of 30 Lb/Ft3 with a Particle Size Distribution by Weight as follows: 1.55% < 0.1 um, 14.47% < 0.4 um, 36.71% < 1 um, 80.9% < 3 um, 100% < 30 um					
89	Estimated Operating Bulk Dry Density of Dust Cake:	8 To 24 Lb/Ft3 Reported in Fluor Element Filter Data Sheet (Avg @ 16 Lb/Ft3) BUT 25 Lb/Ft3 Measured By Mott Using REC Dust Sample (Refer to Mott Lab Report FN # 1397)					
90	Expected Filtration Efficiency & Dust Holding Capacit	Less Than 0.005 Grains / SFt3 of particulate solids (silicon dust) in filtered effluent gas stream. The estimated dust solids holdup capacity in the bottom of each filter vessel is 32 Ft3.					
91	Maximum Allowable Operating Pressure Drop:	0.35 psi					

	PROCESS FILTRATION DATA TABLE FOR EACH FILTER VESSEL SYSTEM	CASE # 1B	CASE # 4A	CASE # 4B	CASE # 2H	CASE # 2N
93	SFt3 meaured at 60 °F & 14.696 psia	GH2 Peak Production	GH2 Hi Temperature	GH2 Peak Production	GH2 Standby	Nirogen Gas Standby
94	Filter Run Time & Backpulse Gas Consumption Based Upon Bulk Dry Density of Silicon Dust at 16 Lb/Ft3		Poor Yield	Poor Yield		
95	Total Filtration Surface Area [Ft2]	676	676	676	676	676
96	Process Feed Gas Inlet Temperature [°F]	750	950	750	750	750
97	Process Feed Gas Inlet Pressure [psig]	4.8	4.8	4.8	4.8	4.8
98	Process Feed Gas Mass Flow Rate [Lb / Min]	5.401	4.259	5.440	5.912	36.548
99	Process Feed Gas Volumetric Flow Rate [AFt3 / Min]	1798	1652	1811	1968	869
100	Backpulse Gas Pressure Inside Accumulator Tank (Min. REC Plant Supply Pressure) [psig]	80	80	80	80	80
101	Nominal Filtration Face Velocity [AFt / Min]	2.66	2.44	2.68	2.91	1.29
102	Dust Solids Bulk Dry Density [Lb / Ft3]	16	16	16	16	16
103	Dust Solids Loading Rate [Lb / Hr]	42.0	60.3	78.7	0.0	0.0
104	Dust Solids Concentration in Flowing Inlet Process Gas Stream [Grains / AFt3]	2.725	4.258	5.070	0.0	0.0
105	Est. Conditioned Clean Pressure Drop after completion of On-Line Cleaning Cycle [psi]	0.101	0.095	0.102	0.112	0.133
106	Est. Maximum Terminal Dirty Pressure Drop at Start of On-Line Cleaning Cycle [psi]	0.350	0.350	0.350	0.350	0.350
107	Est. Terminal Dust Cake Thickness at Start of On-Line Cleaning Cycle [Inches]	0.146	0.154	0.145	0.000	0.000
108	Est. Filter Vessel Run Time (filter run time between on-line cleaning cycles) [Minutes]	199	146	105	∞	∞
109	Est. On-Line Cleaning Cycle Time Duration [Seconds]	30	30	30	30	30
110	Est. Number of Total Filter Vessel Cleaning Cycles per Day During Operation [CC / Day]	7.23	9.85	13.69	N/A	N/A
111	Est. Backpulse Gas Consumption per Cleaning Cycle [Lb / CC]	0.67	0.65	0.67	0.67	6.84
112	Avg Hourly Backpulse Gas Consumption During Operation (GH2 from Accumulator) [SFt3 / Hr]	38.0	50.5	72.1	N/A	N/A
113	Avg. Daily Backpulse Gas Consumption During Operation (GH2 from Accumulator) [Lb / Day]	4.8	6.4	9.2	N/A	N/A

MOTT ON-LINE CLEANING SYSTEM CONTROL & SET POINTS:

Filter Vessel Auto On-Line Cleaning System is initiated by High Diff. Pressure Set Point and by Timer Set Point. Timer can be set to initiate a cleaning cycle at 3.5 hour intervals depending upon process flow rates.

The Timer Set Point limits extreme dust cake build-up during periods of very low process gas flow rates. Normally a Timer Set Point is the primary control with High Diff. Pressure Set Point as the Over-Ride Control.

MOTT ON-LINE BACKPULSE CLEANING CYCLE OPERATION:

The Fast Acting Auto Backpulse Valves and the Accumulator Tank are sized to provide a high pressure sonic pulse inside each cartridge element during the on-line cleaning cycle which discharges dust cake from the outside surface of each element. Mott also provides a Gas Jet Nozzle/Venturi Assembly located in the open end of each Mott cartridge element which reduces backpulse gas consumption and which also enhances the pulsed jet cleaning process. This Mott design provides for very robust and efficient cleaning cycles. Each complete on-line cleaning cycle consists of four backpulse valves sequentially actuated one-at-a-time with an adjustable lag time set point between each valve actuation. As shown in the Process Data Table above, one complete on-line cleaning cycle lasts for 30 Seconds with valve lag time set at 9 Seconds for each auto backpulse valve. Total Actuation Time (From Full Closed - To - Full Open - Back To - Full Closed) for each Auto Backpulse Valve is less than 1 Second.

MOTT CARTRIDGE ELEMENT EXTERNAL CLEANING REQUIREMENTS:

Periodically, the filter vessel cartridge elements must be removed for external cleaning. Depending upon process conditions, the frequency of required cartridge element change-outs for external cleaning is expected to be once every 2 to 4 years or longer. Mott will provide Customer with a recommended list of international vendors that specialize in the cleaning of Mott porous metal cartridge elements.

MOTT UTILITY REQUIREMENTS:

Mott requires clean dry hydrogen gas at 80 - 100 psig (80 psig minimum) for Re-Fill of Accumulator Tanks during On-Line Filter Vessel Cleaning Cycles.

Mott requires clean dry plant instrument air at 100 psig (80 psig minimum) for powering automatic backpulse valve actuators.

MOTT NOTES TO CUSTOMER:

Mott Note No. 1: The temperature of the backpulse gas inside the Accumulator Tank must always be maintained at a temperature that is greater than the Dew Point Temperature of the Process Feed Gas that is being filtered. Whenever Backpulse Gas Temperature (inside Accumulator Tank) is less than the Dew Point Temperaure of the Process Feed Gas that is being Filtered; then, moisture can condense inside the Porous Media of each Cartridge Element during on-line cleaning cycles. If condensate forms inside the porous media during on-line cleaning cycles; then, the result will be a gradual build-up of permanent cake on the outside surface of each cartridge element which will reduce filtration run times, increase backkpulse gas consumption rates and increase the frequency of cartridge element change-outs. Since on-line cleaning cycles will occur every 3.3 hours or less, the GH2 inside the Accumulator Tank may have to be heated to maintain temperature that is above the Dew Point Temperature of the Process Feed Gas that is being filtered. If this is the case; then, Mott can provide an Electric Immersion Heater and/or other related equipment for each Accumulator Tank for heating the hydrogen or nitrogen backpulse gas inside each Accumulator Tank.

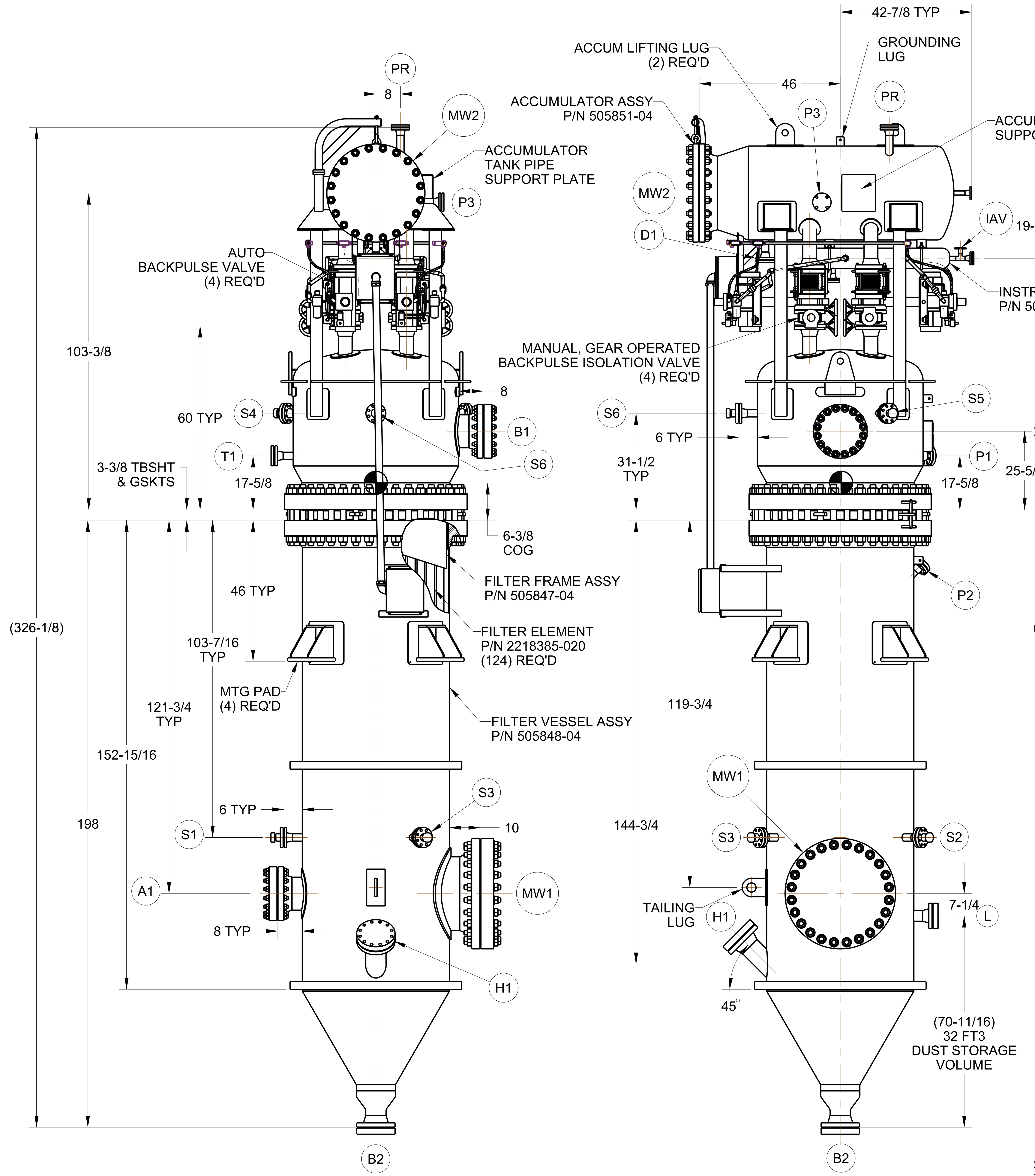
Mott Note No. 2: Mott Proposal includes internal 32 Ra polished surfaces for the bottom cone of each filter vessel plus passivation & cleaning for all filter vessel internal wetted surfaces in contact with the Effluent Gas Stream.

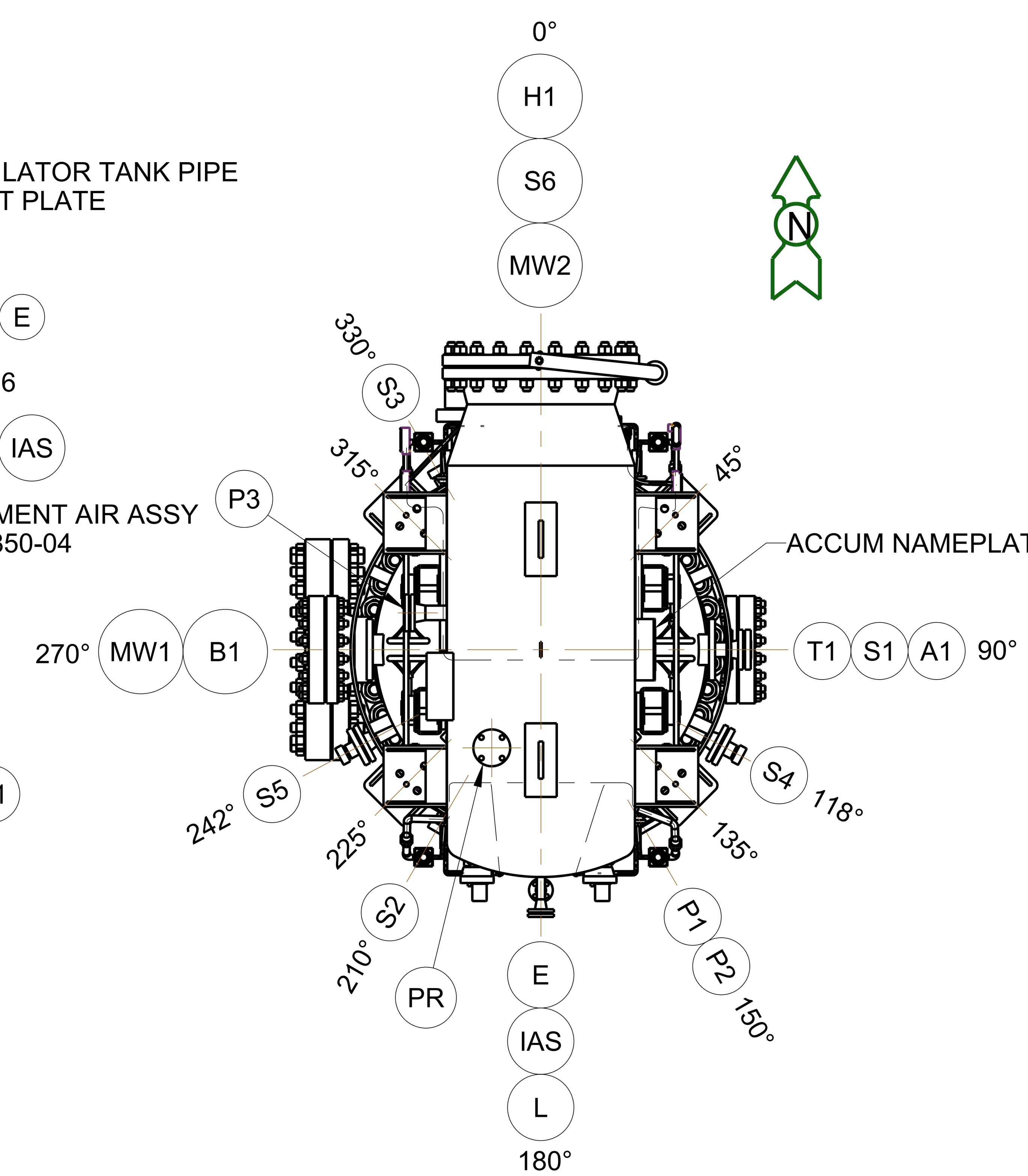
Mott Note No. 3: Mott Proposal includes all Mott cartridge elements equipped with 2-1/2" NPT open end adapters. Mott cartridge elements are easily removed or installed into the top side of each tubesheet by simple thread engagement.

Mott Note No.4: Mott Proposal is for two complete "Fully Assembled", "Pre-Packaged" and "Shop Tested" Filter Systems shipped with pressurized GN2 Blanket including: Filter Vessels, Accumulator Tanks, Instrument Air Pipe Manifolds, Auto BP Vlvs & Manual BP Isolation Vlvs, Exp. Joints, Wiring, Conduit, Junction Boxes and two Local Control Panels. Mott Proposal includes Optional Spare Parts such as Spare Bundle Frame w/ Elements & Spare Auto BP Vlvs.

0	SHEET NO.: 2 OF 2	DATE: 09/25/14 EFM	ISSUE/REV.: 0	DESCRIPTION: Based upon Fluor PO No. A5KM-4-0701-01 and attached Fluor/REC specifications except Material-Of-Construction will be TP304 SS NOT TP304H SS	0
1	MOTT CORPORATION	DATE: 10/20/14 EFM	ISSUE/REV.: 1	Revisions requested by REC/Fluor and recorded in Fluor Conference Note CN-R2526-00010 documenting the 10/09/14 REC/Fluor/Mott Project Kick-Off Review Meeting.	1
2	BUSINESS CONFIDENTIAL	DATE: 11/14/14 EFM	ISSUE/REV.: 2	Re-named Nozzle "T2" as "T1" on Sht. # 1, Added Dew Point Temperatures of Hydrogen Gas & Nitrogen Gas on Sht. # 2	2
3		DATE: 12/12/14 EFM	ISSUE/REV.: 3	Changed Gaskets to TP304/304L SS Spiral Wound Mica Fill, TP304/304L SS Inner & Outer Rings on Line # 27, Sht # 1	3
4		DATE: 04/08/15 EFM	ISSUE/REV.: 4	Increased Dust Storage Volume in bottom of each Effluent Gas Filter Vessel from 10 Ft3 to 32 Ft3	4

REV	ECN	ZONE	DESCRIPTION	DATE	DRAWN	CHK'D
0	2478		RELEASE FOR CUSTOMER REVIEW	09/22/14	BTD	EFM
1	2488		CUSTOMER REQUEST CHANGES	10/17/14	BTD	EFM
2	2500		CHANGED NOZZLE "T2" TO "T1", ADDED NOTE 18, DIMENSIONS CONE ASSY LENGTH (69) & 152 9/16	11/13/14	BTD	EFM
3	2515		CHANGED: NOTE: 8.6. FLEXICARB FILL TO MICA FILL & (PRE-CLEANED FOR OXYGEN SERVICE) TO (PRE-CLEANED & BAGGED FOR OXYGEN SERVICE)	12/11/14	BTD	EFM
4	2578		CHANGED TO FINAL AS BUILT	04/02/15	BTD	EFM
5	2587		ADDED: NOTE 21, CHANGED: ASME CODE SECTION VIII, DIV. 1, LATEST EDITION TO 2013 EDITION, ASME CODE B31.3, LATEST EDITION TO 2014 EDITION, 3.38 TO 3-3/8, 197 119/128 TO 197 15/16, 7.25 TO 7-1/4, 21-9/32 TO 19-1/16	04/28/15	BTD	EFM
6	2604		CHANGED: 59-15/16 TO 60 TYP, 197 15/16 TO 198, 143 TO 144-3/4, 118 TO 119-3/4, 120 TYP TO 121-3/4 TYP, 152-1/2 TO 152-15/16, 25-1/2 TO 25-5/8, 17-1/2 TO 17-5/8	05/08/15	BTD	EFM
7	2615		CHANGED: 103-5/16 TO 103-3/8, 17-1/2 TO 17-5/8, 325-15/16 TO 326-1/8, "T1" TEMP XMITTER TO SPARE CONN	06/03/15	BTD	EFM
8	2633		ADDED NOTE 22	06/22/15	BTD	EFM





NOZZLE SCHEDULE

MARK	DESCRIPTION	SIZE & RATING
A1	PROCESS GAS INLET	10"-300# ANSI WN,RF
B1	PROCESS GAS OUTLET	10"-300# ANSI WN,RF
B2	SOLIDS OUTLET	6"-300# ANSI WN,RF
E	ACCUMULATOR GAS INLET	1"-150# ANSI WN,RF
D1	ACCUMULATOR DRAIN	2"-150# ANSI WN,RF
IAD	INSTRUMENT AIR DRAIN	1"-150# ANSI WN,RF
IAS	INSTRUMENT AIR SUPPLY	1"-150# ANSI WN,RF
IAV	INSTRUMENT AIR VENT	3/4"-150# ANSI WN,RF
H1	CLEAN OUT HANDHOLE	6"-300# ANSI WN,RF
L	LEVEL INDICATOR	3"-300# ANSI WN,RF
MW1	VESSEL INSPECTION MANWAY	24"-300# ANSI WN,RF
MW2	ACCUM INSPECTION MANWAY	24"-150# ANSI WN,RF
P1-P2	DIFFERENTIAL XMITTR	2"-300# ANSI WN,RF
P3	ACCUMULATOR PRESS XMITTR	2"-150# ANSI WN,RF
PR	ACCUMULATOR PRESS RELIEF	2"-150# ANSI WN,RF
S1-S3	SHIPPING SUPPORT	2"-300# ANSI WN,RF
S4-S6	SHIPPING SUPPORT	2"-300# ANSI WN,RF
T1	SPARE CONN	2"-300# ANSI WN,RF

NOTES:

1. APPROX. FILTER AREA PER VESSEL: 676 SQFT
2. No. OF FILTER ELEMENTS PER VESSEL: (124) - 2.5" OD x 100" POROUS LGTH x 108-9/32" OVERALL LENGTH.
3. FILTER VESSEL DESIGNED FOR 60 PSIG MAWP @ 980°F INTERNAL PRESSURE AND HALF VACUUM OR 7.4 PSIG @ 0°F EXTERNAL PRESSURE PER ASME CODE SECTION VIII, DIV. 1, 2013 EDITION - CODE STAMP & NATIONAL BOARD REGISTRATION REQUIRED.
4. ACCUMULATOR TANK DESIGNED FOR 150 PSIG MAWP @ 500°F INTERNAL PRESSURE AND HALF VACUUM OR 7.4 PSIG @ 0°F EXTERNAL PRESSURE PER ASME CODE SECTION VIII, DIV. 1, 2013 EDITION - CODE STAMP & NATIONAL BOARD REGISTRATION REQUIRED.
5. INSTRUMENT AIR PIPE MANIFOLD DESIGNED FOR 165 PSIG MAWP @ 250°F INTERNAL PRESSURE AND HALF VACUUM OR 7.4 PSIG @ 0°F EXTERNAL PRESSURE PER ASME CODE B31.3, 2014 EDITION.
6. MAXIMUM ALLOWABLE DIFFERENTIAL PRESSURE FOR FILTER VESSEL TUBESHEET: 30 PSID @ 980°F
7. CORROSION ALLOWANCE:
   7.1. 1/16" For SHELLS, CONES, HEADS & EXTERNAL ATTACHMENTS FOR FILTER VESSEL, ACCUMULATOR TANK AND INSTRUMENT AIR PIPE MANIFOLD.
   7.2. 1/8" FOR ALL NOZZLES ON FILTER VESSEL, ACCUMULATOR TANK & INSTRUMENT AIR PIPE MANIFOLD.
8. MATERIALS OF CONSTRUCTION:
   8.1. FILTER ELEMENTS: TP304L SS POROUS MEDIA; TP304/304L SS CLOSED END CAP W/ PIN & NITRONIC 60 OPEN END VENTURI THREADED ADAPTER (ALL SURFACES CITRIC PASSIVATED & CLEANED PER REC SPEC. STN-GEN-00002F)
   8.2. FILTER VESSEL & ACCUMULATOR TANK & INTERCONNECTING PIPING INTERNAL WETTED SURFACES INCLUDING TUBESHEET & BUNDLE FRAME: TP304/304L SS (CITRIC PASSIVATED & CLEANED PER REC SPEC. STN-GEN-00002F)
   8.3. FILTER VESSEL & ACCUMULATOR TANK & INTERCONNECTING PIPING EXTERNAL NON-WETTED SURFACES: TP304/304L SS (FREE OF DIRT, FABRICATION DEBRIS, OIL & LUBRICANTS)
   8.4. INSTRUMENT AIR PIPE MANIFOLD INTERNAL WETTED AND EXTERNAL NON-WETTED SURFACES: TP304/304L SS (FREE OF DIRT, FABRICATION DEBRIS, OIL & LUBRICANTS).
   8.5. ELEMENT SEAL TO TUBESHEET: THREADED - 2-1/2" NPT.
   8.6. VESSEL GASKETS: TP304/304L SS SPIRAL WOUND w/PHLOGOPITE MICA FILL & TP304/304L SS INNER & OUTER RINGS (PRE-CLEANED & BAGGED FOR OXYGEN SERVICE)
   8.7. BOLTING: SA-193 Gr. B8 SS BOLTS & SA-194 Gr. 8 SS HEX HEAVY NUTS
9. DUST SOLIDS STORAGE VOLUME: 32 CUFT
10. HYDROSTATIC PRESSURE TEST ALL VESSELS PER ASME CODE.
11. X-RAY: SPOT
12. JOINT EFFICIENCY: 0.85
13. CLEAN ALL WETTED SURFACES PER REC SPEC. STN-GEN-00002F.
14. THREE GROUNDING LUGS REQ'D: ONE WELDED TO ACCUMULATOR TANK, ONE WELDED TO TOP BONNET SHELL ABOVE BODY FLANGE & ONE WELDED TO FILTER VESSEL LOWER SHELL BELOW BODY FLANGE.
15. FILTER VESSEL BOTTOM CONE INTERIOR SURFACE FINISH 32Ra.
16. REFERENCE FLUOR SPECIFICATIONS/DOCUMENTS: FLUOR CONTRACT PO No. A5KM-4-0701-01, ATTACHMENT "C",LATEST REVISION, "ENGINEERING DOCUMENTS & NOTES".
17. REFERENCE MOTT SPECIFICATIONS: MOTT FILTER VESSEL SPECIFICATION FOR CUSTOMER "MFVSC #12-F-13321 / 14321", SHEETS # 1 – 2 of 2
18. QUANTITY (6), SHIPPING SUPPORT NOZZLES (S1-S6) INSTALLED (TO BE REMOVED AFTER FIELD ERECTION). MOTT TO PROVIDE REPLACEMENT BLIND FLANGES & GASKETS (SHIPPED LOOSE) FOR INSTALLATION AFTER FIELD ERECTION BY FLUOR/REC.
19. APPROX. CLEAN FILTER OPERATING WT.: 25800 LBS
20. (2) FILTER VESSEL ASSEMBLIES REQ'D
21. ALL DIMENSIONS ARE IN FRACTIONS.
    LINEAR FRACTIONAL DIMENSIONAL TOLERANCE: ±1/4
    ANGULAR DIMENSIONAL TOLERANCE: ±0 - 30'
22. FOR WAIVER ON PMI TESTING FOR TP304 SS MATERIAL SEE DCR-223 FOR A5KM23-STN-MET-00003.

A – PROCEED **FLUOR**

Authorization to proceed does not relieve Contractor/Supplier of its responsibility or liability under the Contract and or Purchase Order.

By J. Telado on Jun 23, 2015

FLUOR 00A5KM23
DOC. NO. REC'D: 23-JUN-2015
A5KM-4-0701-01-00016-8
EQUIP/TAG NUMBER
12-F-13321 12-F-14321

FLUOR

TO BE COMPLETED BY VENDOR	FLUOR TO COMPLETE
CONTRACT No: A5KM	PDDM REC'D DATE: / FLUOR REV.
P.O. NUMBER: A5KM-4-0701-01/A4WK100004	A - PROCEED
FIRST ISSUE: YES / NO X	B - PROCEED, CHANGE AS NOTED & RESUBMIT
EDR CODE(S): CDO	C - DO NOT PROCEED, CHANGE AS NOTED & RESUBMIT
ITEM/TAG NUMBERS: 12-F-13321 TO 12-F-14321	D - REVIEWED FOR INFORMATION ONLY
FLUOR CONTROL NUMBER BY FLUOR	Q - QUALITY IS BELOW STANDARDS. CORRECT & RESUBMIT
	AUTHORIZATION TO PROCEED DOES NOT RELIEVE CONTRACTOR/VENDOR OF ITS RESPONSIBILITY OR LIABILITY UNDER THE CONTRACT/PURCHASE ORDER.

CUSTOMER: FLUOR/REC
CONTRACT/PROJ No: A5KM
PROJ NAME: REC SILICON REACTOR 25/26 PROJECT
CUSTOMER PO No: A5KM-4-0701-01/A4WK100004
ITEM/TAG Nos: 12-F-13321 & 12-F-14321
EQUIP DESCRIPT: EFFLUENT FILTERS

STANDARD DRAWING TOLERANCES UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
FRACTIONS: ±1/64
1 PLC DECIMALS: ±.030
2 PLC DECIMALS: ±.010
3 PLC DECIMALS: ±.005
ANGLES: ±1°
BREAK SHARP EDGES & CORNERS .005 -.015 APPROX RADIUS

DRAWN BY: BTD	DATE: 09/22/14	CHKD BY: EFM	DATE: 09/22/14
APPVD BY:	DATE:	ET No:	IQ No: QU0202582
SO No: SO2010865	PROJ No: PRJ0000338		

mott *corporation*
84 Spring Lane, Farmington, CT 06032-3159
860-747-6333 FAX 860-747-8529 www.mottcorp.com

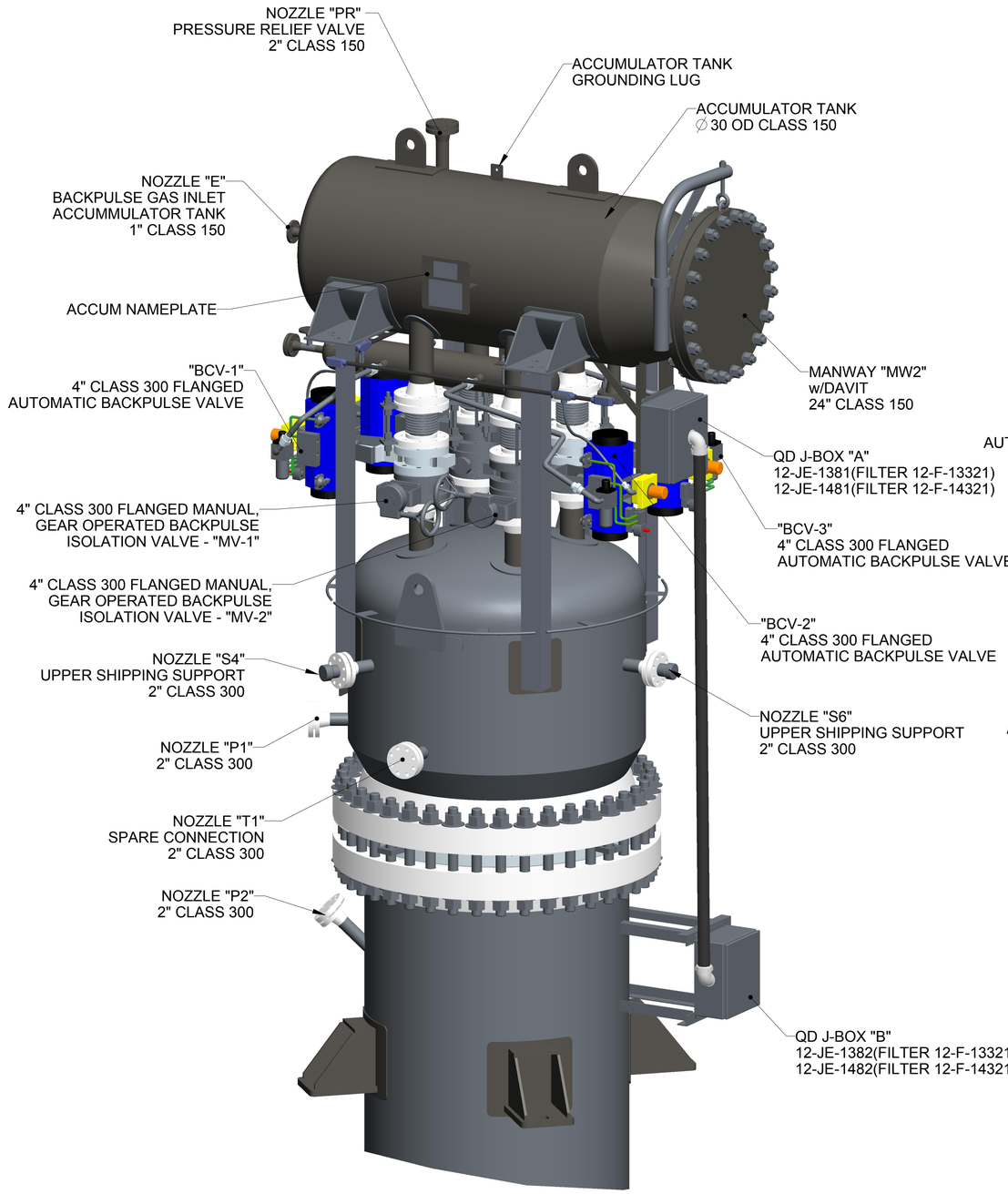
TITLE: FILTER SYSTEM, 54" x 48" HyPULSE® GSV, 124 QTY, 2.5 OD, 100 L, AUTO

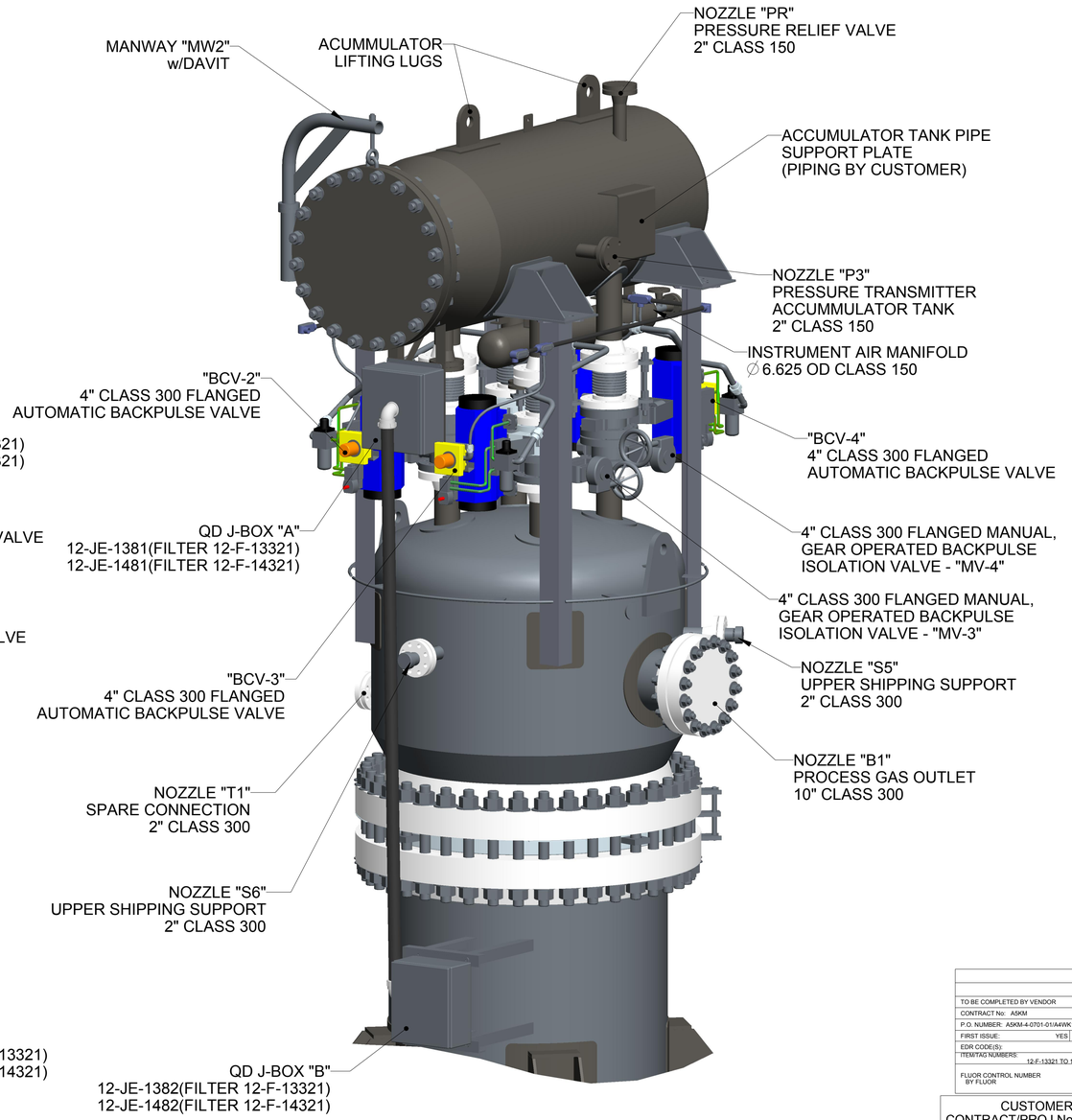
MATERIAL	FINISH	SCALE	SHT	OF
NOTED	NOTED	0.050	1	3

THIRD ANGLE PROJECTION

NEXT ASSY	SIZE	DWG No:	REV
	D	9354100	8

REV	ECN	ZONE	DESCRIPTION	DATE	DRAWN	CHK'D
0	2478		REL FOR FABRICATION	09/22/14	BTD	EFM
1	2488		CUSTOMER REQUEST CHANGES	10/17/14	BTD	EFM
2	2500		CHANGED NOZZLE "T2" TO "T1". ADDED "2" CLASS 150" TO "NOZZLE "P3" PRESSURE TRANSMITTER ACCUMMULATOR TANK"	11/13/14	BTD	EFM
3	2515		SEE SHEET 1	12/11/14	BTD	EFM
4	2578		CHANGED TO FINAL AS BUILT	04/02/15	BTD	EFM
5	2587		SEE SHEET 1	04/28/15	BTD	EFM
6	2604		SEE SHEET 1	05/08/15	BTD	EFM
7	2615		CHANGED: CHANGED: NOZZLE "T1", "TEMPERATURE TRANSMITTER" TO "SPARE CONNECTION", NOZZLE "B1", PROCESS GAS OUTLET, 10" CLASS 300 TO 12" CLASS 300	06/03/15	BTD	EFM
8	2633		SEE SHEET 1	06/22/15	BTD	EFM





FLUOR	
	FLUOR TO COMPLETE
TO BE COMPLETED BY VENDOR	PDDM REC'D DATE: / FLUOR REV.
CONTRACT No: A5KM	
P.O. NUMBER: A5KM-4-0701-01/A4WK100004	A - PROCEED
FIRST ISSUE: YES / NO X	B - PROCEED, CHANGE AS NOTED & RESUBMIT
EDR CODE(S): CDO	C - DO NOT PROCEED, CHANGE AS NOTED & RESUBMIT
ITEM/TAG NUMBERS: 12-F-13321 TO 12-F-14321	D - REVIEWED FOR INFORMATION ONLY
FLUOR CONTROL NUMBER BY FLUOR	Q - QUALITY IS BELOW STANDARDS. CORRECT & RESUBMIT
	AUTHORIZATION TO PROCEED DOES NOT RELIEVE CONTRACTOR/VENDOR OF ITS RESPONSIBILITY OR LIABILITY UNDER THE CONTRACT/PURCHASE ORDER.

CUSTOMER:	FLUOR/REC
CONTRACT/PROJ No:	A5KM
PROJ NAME:	REC SILICON REACTOR 25/26 PROJECT
CUSTOMER PO No:	A5KM-4-0701-01/A4WK100004
ITEM/TAG Nos:	12-F-13321 & 12-F-14321
EQUIP DESCRIPT:	EFFLUENT FILTERS

STANDARD DRAWING TOLERANCES UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
FRACTIONS ±1/64
1 PLC DECIMALS ±.010
2 PLC DECIMALS ±.005
3 PLC DECIMALS ±.005
ANGLES ±1°
BREAK SHARP EDGES & CORNERS .005 - .015 APPROX RADIUS
THIRD ANGLE PROJECTION

DRAWN BY:	BTD	DATE: 09/22/14
CHKD BY:	EFM	DATE: 09/22/14
APVD BY:		DATE:
ET No:		JOB No: QU0202582
PO No:	SO2010865	PRJ0000338

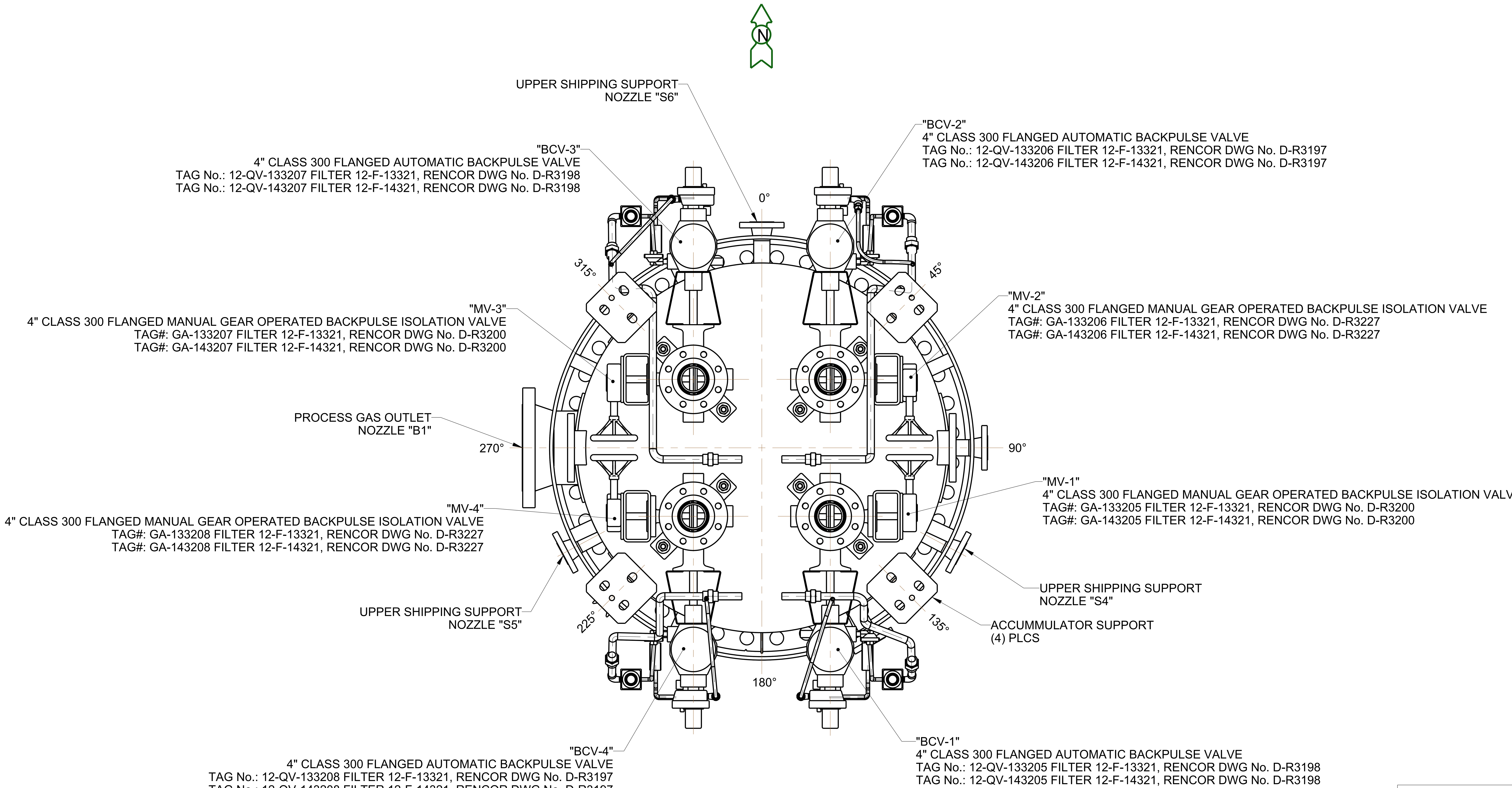
mott *corporation*
84 Spring Lane, Farmington, CT 06032-3159
860-747-6333 FAX 860-747-8529 www.mottcorp.com

TITLE: FILTER SYSTEM, 54" x 48" HyPULSE® GSV, 124 QTY, 2.5 OD, 100 L, AUTO

MATERIAL	FINISH	SCALE	SHT	OF
NOTED	NOTED	0.080	2	3

NEXT ASSY | SIZE: D | DWG No: 9354100 | REV: 8

REV	ECN	ZONE	DESCRIPTION	DATE	DRAWN	CHK'D
0	2478		REL FOR FABRICATION	09/22/14	BTD	EFM
1	2488		CUSTOMER REQUEST CHANGES	10/17/14	BTD	EFM
2	2500		SEE SHEETS 1 & 2	11/13/14	BTD	EFM
3	2515		SEE SHEET 1	12/11/14	BTD	EFM
4	2578		CHANGED TO FINAL AS BUILT	04/02/15	BTD	EFM
5	2587		SEE SHEET 1	04/28/15	BTD	EFM
6	2604		SEE SHEET 1	05/08/15	BTD	EFM
7	2615		SEE SHEETS 1 & 2	06/03/15	BTD	EFM
8	2633		SEE SHEET 1	06/22/15	BTD	EFM



FLUOR

FLUOR TO COMPLETE

TO BE COMPLETED BY VENDOR | PDDM REC'D DATE: | FLUOR REV.

CONTRACT No: A5KM

P.O. NUMBER: A5KM-4-0701-01/A4WK100004

FIRST ISSUE: YES NO X

EDR CODE(S): CDO

ITEM/TAG NUMBERS: 12-F-13321 TO 12-F-14321

FLUOR CONTROL NUMBER BY FLUOR

A - PROCEED
B - PROCEED, CHANGE AS NOTED & RESUBMIT
C - DO NOT PROCEED, CHANGE AS NOTED & RESUBMIT
D - REVIEWED FOR INFORMATION ONLY
Q - QUALITY IS BELOW STANDARDS. CORRECT & RESUBMIT

AUTHORIZATION TO PROCEED DOES NOT RELIEVE CONTRACTOR/VENDOR OF ITS RESPONSIBILITY OR LIABILITY UNDER THE CONTRACT/PURCHASE ORDER.

CUSTOMER: FLUOR/REC
CONTRACT/PROJ No: A5KM
PROJ NAME: REC SILICON REACTOR 25/26 PROJECT
CUSTOMER PO No: A5KM-4-0701-01/A4WK100004
ITEM/TAG Nos: 12-F-13321 & 12-F-14321
EQUIP DESCRIPT: EFFLUENT FILTERS

STANDARD DRAWING TOLERANCES UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
FRACTIONS: ±1/64
1 PLC DECIMALS: ±.030
2 PLC DECIMALS: ±.010
3 PLC DECIMALS: ±.005
ANGLES: ±1°
BREAK SHARP EDGES & CORNERS .005 -.015 APPROX RADIUS

THIRD ANGLE PROJECTION

DRAWN BY: BTD DATE: 09/22/14
CHKD BY: EFM DATE: 09/22/14
APPVD BY: DATE:
ET No: IQ No: QU0202582
SO No: SO2010865 PROJ No: PRJ0000338

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TITLE
BACKPULSE VALVE ORIENTATION 54" x 48" HyPULSE® GSV

MATERIAL NOTED | FINISH NOTED | SCALE .125 | SHT 3 OF 3
NEXT ASSY | SIZE D | DWG No: 9354100 | REV 8