

## PROJECT DATA SHEETS - REVISION 0

### Customer

Name

Address:

City:

State:

Contact:

Email:

Phone:

Fax:

### End User

Name

Address:

City:

State:

ZIP:

Contact:

Email:

Phone:

Fax:

### Destination Rep.

Name CB Sales and Service

Address:

City:

State:

ZIP:

Contact:

Email:

Phone:

Fax:

### Cleaver-Brooks

Project Manager

Randy Frazier

Email:

Project Engineer

Dan Carlson

Email:

### Unit Definition

Boiler Model No.:

CP-NB-801D-125-550-AL-LH-EZ-420-650-NAT-SCR-NG-FM-3

Year Built:

2019

Unit Identification:

Watertube Boiler Assembly Drawing No.: 648-01032

Boiler S/N:

CP-4581-83

Boiler Unit No.:

CP-4581-83

Customer Unit number:

Customer to specify

### Site Conditions

Site Elevation:

9 FASL

3 MASL

Boiler Location

Outdoor

### Shipping

Shipping Method:

Truck

Packaging:

Domestic

Shipped on its side:

YES

### Design Data

Boiler Design Pressure:

550 psig

3,792 kPag

Boiler Design Temperature:

650 °F

343 °C

Boiler Gross Capacity:

250,000 lbs/hr

113,398 kg/hr

Boiler Net Capacity to Process:

250,000 lbs/hr

113,398 kg/hr

Drum Operating Pressure:

455 psig

3,137 kPag

Outlet Header Pressure:

420 psig

2,895 kPag

Feedwater Supply Pressure Normal/Maximum @ Control Valve Station Inlet:

600 / 650

psig

4,136 / 4,481

kPag

Feedwater Temperature:

240 °F

115 °C

Main Steam Temperature:

650 °F ± 25°F

343 °C ± 14°C

Drum Safety Valve Set Pressure #1

545 psig

3,757 kPag

Drum Safety Valve Set Pressure #2

550 psig

3,792 kPag

SH Safety Valve Set Pressure

465 psig

3,206 kPag

Boiler is connected to a Common Header. Set pressure of safety valves of boilers on this header can only differ by 6%. (NBIC Part 2 §2.5.5.1)

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<u>Additional Equipment</u>	<u>Vendor</u>	<u>Model No.</u>	<u>Serial No.</u>
<u>Burner:</u>	Natcom		
<u>Combustion Air Fan:</u>	Howden		
<u>Stack:</u>	Cheminee Lining		
<u>Economizer:</u>	Eco		
<u>SCR</u>	Umicore		

### Codes

<u>ASME Section I Code Year:</u>	2017	Addenda: N/A	Code Cases:	2906
<u>Burner Code:</u>	NFPA 85			
<u>Structural Code:</u>	IBC 2012			
<u>Wind Speed</u>	158 mph		254 kph	
<u>Wind Importance Factor (Iw):</u>	1.15			
<u>Seismic Importance Factor (Is):</u>	1.25			
<u>Insurance:</u>	FM			

### Paint

PAINT BOTTOM OF BOILER BASE
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Refer to Paint Specification Document: "PAINT-CP-4581"

<u>Deliverables</u>	<u>Customer</u>	<u>Destination Rep.</u>
<u>Electronic Submittals:</u>	1	1
<u>Electronic O &amp; M Manuals:</u>	1	1
<u>Hard Copy O &amp; M Manuals:</u>	1	

## PROJECT DATA SHEETS - REVISION 0

### ASME Heating Surface

<u>Boiler Convection:</u>	10,823 ft <sup>2</sup>	1,005 m <sup>2</sup>
<u>Boiler Radiant:</u>	1,830 ft <sup>2</sup>	170 m <sup>2</sup>
<u>Boiler Total:</u>	12,653 ft <sup>2</sup>	1,175 m <sup>2</sup>
<u>Furnace Volume:</u>	4,050 ft <sup>3</sup>	115 m <sup>3</sup>
<u>Superheater:</u>	975 ft <sup>2</sup>	90 m <sup>2</sup>

### Boiler Data

<u>Arrangement:</u>	Left Hand				
<u>Gas Side Baffling:</u>	N/A				
<u>Turning Lane Tubes:</u>	14				
<u>Turning Lane Tube Spacing:</u>	5 in	12 cm			
<u>Exit Lane Tubes:</u>	24				
<u>Finned tubes in convection bank?</u>	YES	# of rows: 13			
	Fins/in: 4	Height: 1/4 "	Thickness: 0.050"	Width: Solid Fin	
<u>Second section of finned tubes?</u>	YES	# of rows: 15			
	Fins/in: 4	Height: 1/2 "	Thickness: 0.050"	Width: Solid Fin	

### Water Levels from Drum CL:

HWCO: -2.00"      HWA: -3.00"      NWL: -8.00"      LWA: -13.00"      LWCO: -14.50"      ALWCO: -15.50"

Steam Quality:      0.03 ppm

Boiler Internals:      Chevron Separators with Full Belly Pan

Belly Pan Height above Drum I.D.:      4 in

# Rows uncovered from the burner end:      25

Air Casing Test Pressure:      24 in H<sub>2</sub>O      Casing Stiffeners Required:      YES

Exterior Casing:      Corrugated Aluminum

### Fuel Data

<u>Natural Gas:</u>	80 psig	551 kPag
<u>#2 Fuel Oil:</u>	N/A psig	N/A kPag
<u>#6 Fuel Oil:</u>	N/A psig	N/A kPag
<u>Other:</u> Customer Gas	N/A psig	N/A kPag
<u>Atomizing Saturated Steam:</u>	N/A psig	N/A kPag
<u>Atomizing Air:</u>	N/A psig	N/A kPag

### Utility Data

<u>Instrument Air:</u>	80 psig	551 kPag	SCFM
<u>Service Air:</u>	5 psig	34 kPag	SCFM
<u>Electrical:</u> <u>Motors</u>	4,160 Volt	3 Phase	60 Hertz
	<u>Controls</u>	120 Volt	1 Phase      60 Hertz
	<u>Enclosures</u>	NEMA4X	<u>Control Panel Enclosures</u> NEMA4X
<u>Site Supplied Steam Pressure:</u>	N/A psig	N/A kPag	
<u>Site Supplied Steam Temp.:</u>	N/A °F	N/A °C	



## PROJECT DATA SHEETS - REVISION 0

### Boiler Construction Data

#### Corrosion Allowance

<u>Boiler C.A. Drums</u>	0.125 in
<u>Boiler C.A. Piping</u>	N/A
<u>Boiler C.A. Tubes</u>	N/A

Drums	Diameter	Length	Thickness	Material
<u>Steam Drum</u>	60 in ID	45' - 0"	2.2500 in	SA-516 70
<u>Water Drum</u>	30 in ID	45' - 0"	1.2500 in	SA-516 70

Drum Drilling	Hole Dia.	Tube Pitch	Angle
<u>Steam Drum</u>	2.0432 in	4.0000 in	9.50 °
<u>Water Drum</u>	2.0432 in	4.0000 in	13.00 °

Heads - 2:1 Elliptical	Diameter	Thickness	Material
<u>Steam Drum</u>	60 in ID	2.0000 in	SA-516 70
<u>Water Drum</u>	30 in ID	1.0000 in	SA-516 70

Manways	Size	Ring Thickness	Height	Material
<u>Steam Drum (Burner End)</u>	14 x 18 in	1.5 in	5.00 in	SA-516 70
<u>Water Drum (Burner End)</u>	14 x 18 in	1 in	5.00 in	SA-516 70
<u>Steam Drum (Target End)</u>	24" CL300 RFLWN Flange			
<u>Water Drum (Target End)</u>	24" CL300 RFWN Flange			

	Outside Fillet, WL1	Inside Fillet, WL3	Inside Projection
<u>Steam Drum</u>	0.6875 in	0.6875 in	1.3750 in
<u>Water Drum</u>	0.6875 in	0.6875 in	1.3750 in

Headers	Nominal Size, in	Sch or Thickness	Material	Pitch	Hole Diameter
<u>Front/Rear Wall Header</u>	6 in	80	SA-106 B	3.5 in	2.0625 in
<u>Burner Ring Header</u>	4 in	80	SA-106 B	4 in	1.5 in
<u>Access Door Header</u>	3 in	80	SA-106 B	4 in	1.76 in
<u>Access Header End Plate</u>		1/2	SA-516 70		

Boiler Tubes	O. D.	m.w. thk.	Material	Design Temp.
<u>Furnace Tubes</u>	2.00 in	0.120 in	SA-178 A	700 °F
<u>Convection Tubes</u>	2.00 in	0.120 in	SA-178 A	700 °F

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### Boiler Nozzles

#### Steam Drum Shell

Name	Type	Nominal Size, in	Schedule	Outside Connection	Rating	Material
Steam Outlet	PIPE	12	80	BW		SA-106 B
Safety Valve #1	LWN	3	N/A	RFLWN Flg	600#	SA-105
Safety Valve #2	LWN	4	N/A	RFLWN Flg	600#	SA-105
Water Wall Header	Pipe	6	160	BW		SA-106 B
Vent	LWN	1	N/A	RFLWN Flg	300#	SA-105
Nitrogen Blanket	LWN	1	N/A	RFLWN Flg	300#	SA-105
Feedwater (connection to piping is NPS 6)	Pipe	8	160	RFWN Flg	600#	SA-106 B

## PROJECT DATA SHEETS - REVISION 0

### Boiler Nozzles

#### Water Drum Shell

Name	Type	Nominal Size, in	Schedule	Outside Connection	Rating	Material
Blowoff	Pipe	2	80	BW		SA-106 B
Water Wall Header	Pipe	6	120	BW		SA-106 B

## PROJECT DATA SHEETS - REVISION 0

### Boiler Nozzles

#### Steam Drum Heads

Name	Type	Coupling Size	Nominal Size, in	Schedule	Outside Connection	Rating	End	Material
Upper Water Column	Pipe		1 1/2	80	RFWN Flg	300#	BE	SA-106 B
Lower Water Column	Pipe	2 1/2" SCH 80 Pipe	1 1/2	80	RFWN Flg	300#	BE	SA-106 B
Upper Drum Level	Pipe		1	80	RFWN Flg	300#	BE	SA-106 B
Lower Drum Level	Pipe		1	80	RFWN Flg	300#	BE	SA-106 B
Upper Aux LWCO	Pipe		1	80	RFWN Flg	300#	BE	SA-106 B
Lower Aux LWCO	Pipe	2" SCH 80 Pipe	1	80	RFWN Flg	300#	BE	SA-106 B
Cont. Blowdown	Pipe		1	80	SW		TE	SA-106 B
Chemical Feed	Pipe	2" SCH 80 Pipe	1	80	SW		TE	SA-106 B
Manway Flange	LWN		24	N/A	RFLWN Flg	300#	TE	SA-105
Upper Drum Level	Pipe		1	80	RFWN Flg	300#	TE	SA-106 B
Lower Drum Level	Pipe		1	80	RFWN Flg	300#	TE	SA-106 B



## PROJECT DATA SHEETS - REVISION 0

### Boiler Nozzles

#### Water Drum Heads

Name	Type	Coupling Size	Nominal Size, in	Schedule	Outside Connection	Rating	End	Material
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## PROJECT DATA SHEETS - REVISION 0

### Superheater Data

#### Design Data

<u>S.H. Design Pressure:</u>	550 psig	3792 kPag
<u>S.H. Header Design Temperature:</u>	825 °F	440 °C
<u>S.H. Inlet Temperature:</u>	460 °F	237 °C
<u>S.H. Outlet Temperature:</u>	650 °F ± 25°F	343 °C ± 14°C

#### S.H. Tube Design Temperature:

<u>Low Temp. Bundle</u>	975 °F
<u>High Temp. Bundle</u>	N/A

<u>Corrosion Allowance Piping:</u>	N/A
<u>Corrosion Allowance Tubing:</u>	N/A

Superheater Headers	Size	Sch	Material	Pitch	Hole Diameter
<u>Inlet Header Details</u>	12 in	100	SA-335 P22	5.00 in	* in
<u>Outlet Header Details</u>	12 in	100	SA-335 P22	5.00 in	* in

Superheater Tubes	O. D.	m.w. thk.	Material
<u>Low Temperature Bundle</u>	2.00 in	0.135 in	SA-213 T22
<u>High Temperature Bundle</u>	N/A in	N/A in	N/A

#### Superheater Connections

<u>Inlet</u>	10 in - Sch 80 BW
<u>Outlet</u>	10 in - Sch 80 BW

#### Superheater Inlet/Outlet Header Endplates

1 in thk. SA-387 Gr22 Cl.2

\* Holes are stepped drilled: 1st = 2.5" dia. x 1/4" deep; 2nd = 2.015625" dia. x 1/8" deep; 3rd = 1.625" dia. through hole





**PROJECT TRIM LIST**

<b>CUSTOMER</b> :	_____	<b>CB JOB REF.</b> :	CP-4581, CP-4582, CP-4583
<b>END USER</b> :	_____	<b>BOILER MODEL NUMBER</b> :	NB-801D-125-550-AL-LH
<b>LOCATION</b> :	_____	<b>ARRANGEMENT</b> :	Left Hand
		<b>CUSTOMER UNIT NUMBER(S)</b> :	MS-502, MS-602, MS-702
		<b>BOILER SERIAL NUMBER(S)</b> :	CP-4581, CP-4582, CP-4583
<b>PROJECT MANAGER</b> :	_____	<b>BOILER CAPACITY (GROSS)</b> :	250,000 lbs/hr.
PHONE NUMBER :	_____	<b>BOILER CAPACITY (NET)</b> :	250,000 lbs/hr.
EMAIL ADDRESS :	_____	<b>BOILER DESIGN PRESSURE</b> :	550 psig
<b>PROJECT ENGINEER</b> :	_____	<b>STEAM DRUM OPER. PRESSURE</b> :	455 psig (approx.)
PHONE NUMBER :	_____	<b>STEAM OUTLET OPER. PRESSURE</b> :	420 psig (at steam header)
EMAIL ADDRESS :	_____	<b>STEAM TEMPERATURE</b> :	650 °F ± 25 °F
		<b>FEEDWATER SUPPLY TEMPERATURE</b> :	240 °F to Econ.

**NOTES:** 1. To determine the ship loose items, please refer to the Product Structure column on the following pages. The last three digits of the Product Structure Number signify the following shipping categories -

- 000 This item will be shop mounted on and shipped with the Boiler.
- 007 This item will be part of a subassembly which will be shipped loose and mounted by others, at the job site.
- 008 This item will be shipped loose and mounted by others, at the job site.
- 009 This item will be shipped loose and mounted by others, at the job site.

- 2. An X in the "SP" column indicates that the item itself should be purchased as a spare part.
- 3. An X in the "RSP" column indicates that a spare parts kit should be purchased for this item.

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SPECIFICATION REQUIREMENTS RELATED TO DUCTING & STRUCTURAL ITEMS												REVISION
1	Design per International Building Code 2012											
2	All structures, ducts, platforms, etc. to be prepped and painted per page 2 of Project Data Sheets (PDS).											
3	Platform framing & handrails to be Angle Iron. Platform walking surfaces to be Flat Bar grating.											
4	Main Steam Outlet terminal point is coordinated between CB and Stress piping analysis											
Allowable Boiler nozzle Loads, Bending Moments and Thermal movements	Size (Inches)	Allowable Loads (Lbf)			Allowable Bending Moments (Ft-Lbf)			Thermal Movements (inches)				
		Fx	Fy	Fz	Mx	My	Mz	δx	δy	δz		
Drum and Superheater Nozzles	Feedwater	6" 600# RFWN	± 1500	± 1500	± 1500	± 1800	± 1800	± 1800	+0.13	+ 0.57 in	+ 1.47 in	1
	Continuous Blowdown	1" Sch 80 SW	± 100	± 100	± 100	± 200	± 200	± 200	- 0.08 in	+ 0.53 in	+ 1.69 in	1
	Chemical Feed	1" Sch 80 SW	± 100	± 100	± 100	± 200	± 200	± 200	+ 0.07 in	+ 0.52 in	+ 1.69 in	1
	Bottom Blowdown (Burner End)	2" Sch 80 SW	± 200	± 200	± 200	± 400	± 400	± 400	+0.06	+ 0.01 in	+ 0.07 in	1
	Bottom Blowdown (Target End)	2" Sch 80 SW	± 200	± 200	± 200	± 400	± 400	± 400	+0.06	+ 0.01 in	+ 1.47 in	1
	Superheater Outlet Nozzle	10" Sch 80 BW	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	2
X : Positive going right to left when facing Burner End, Y : Positive UP, Z : Positive from Burner End to Target End												
DUCTING, EXPANSION JOINTS & STACKS												
Tag Number	Description	Part Number	BOM	Hot or Cold	Indoors/Outdoors	Material	Supplied By	Insulation Needed	Instrument Connections	Additional Notes		
X2205	Duct, Fan Inlet Transition	426-13388-000	643-01963-009	Cold	Outdoors	Carbon Steel	Cleaver-Brooks	No	-	-	B	
X2210	Expansion Joint, Fan Inlet	426-13374-000	643-01963-009	Cold	Outdoors	Fabric	Howden	No	-	-	B	
X2220	Expansion Joint, Fan Outlet	426-13373-000	643-01963-009	Cold	Outdoors	Fabric	Howden	No	-	-	B	
X2230	Duct, Fan Outlet Duct	426-13389-000	643-01963-009	Cold	Outdoors	Carbon Steel	Cleaver-Brooks	No	-	(1) 24" x 24" access door.		
X2240	Expansion Joint, Windbox Inlet	426-13390-000	643-01963-009	Cold	Outdoors	Fabric	Cleaver-Brooks	No	-	-	B	
X2500	Expansion Joint, Boiler Outlet	426-13365-000	643-01963-009	Hot	Outdoors	Fabric	Cleaver-Brooks	No	-	-	B	
X2100	Duct, FGR	TBD	643-01963-009	Hot	Outdoors	Carbon Steel	Cleaver-Brooks	Required (3" Mineral Wool,	-	-	4	
X2105	Expansion Joint, FGR, near Windbox	TBD	643-01963-009	Hot	Outdoors	Fabric	Cleaver-Brooks	No	-	-	4	
X2106	Expansion Joint, FGR, Mid duct	TBD	643-01963-009	Hot	Outdoors	Fabric	Cleaver-Brooks	No	-	-	4	
X2107	Expansion Joint, FGR, near Stack	TBD	643-01963-009	Hot	Outdoors	Fabric	Cleaver-Brooks	No	-	-	4	
X2510	Duct, Boiler Outlet	426-13366-000	643-01963-009	Hot	Outdoors	Carbon Steel	Cleaver-Brooks	Required (4" Mineral Wool, by others)	(Qty 3) 1" FNPT	(1) 24" x 24" access door. (O2 analyzer connection is in Natcom's AIG)	2	
X2515	Expansion Joint, Flue Gas Outlet Elbow	426-13367-000	643-01963-009	Hot	Outdoors	Fabric	Cleaver-Brooks	No	-	-	B	
X2518	Duct, Boiler Outlet Elbow to SCR Inlet Transition	426-13454-000	643-01963-009	Hot	Outdoors	Carbon Steel	Cleaver-Brooks	Required (4" Mineral Wool, by others)	-	-	2	

X2520	Duct, SCR Inlet	426-13368-000	643-01963-009	Hot	Outdoors	Carbon Steel	Cleaver-Brooks	Required (4" Mineral Wool, by others)	(Qty 6) 1" FNPT	(1) 24" x 24" access door.	B
X2550	SCR Catalyst Housing	426-13369-000	643-01963-009	Hot	Outdoors	Carbon Steel	Cleaver-Brooks	Required (4" Mineral Wool, by others)	-	with access door for loading catalyst on top of unit	B
X2560	Duct, Economizer Inlet Transition	426-13370-000	643-01963-009	Hot	Outdoors	Carbon Steel	Cleaver-Brooks	Required (4" Mineral Wool, by others)	(Qty 6) 1" FNPT	(1) 18" x 24" access door.	B
X2600	Duct, Economizer Outlet	426-13371-000	643-01963-009	Hot	Outdoors	Carbon Steel	Cleaver-Brooks	Required (3" Mineral Wool, by others)	(Qty 6) 1" FNPT	(1) 24" x 24" access door.	B
X2610	Expansion Joint, Stack Inlet	426-13372-000	643-01963-009	Hot	Outdoors	Fabric	Cleaver-Brooks	No	-	-	B

**SUPPORT STRUCTURES**

Tag Number	Description	Part Number	BOM	Windload	Indoors/ Outdoors	Material	Supplied By	ADDITIONAL NOTES			
X2720	Structure, Air Handling Support	TBD	643-01963-009	See pg. 2 of PDS	Outdoors	Carbon Steel	Cleaver-Brooks	-	-	-	4
X2730	Structure, Start-Up Vent Silencer Support	446-01703-000	643-01963-009	See pg. 2 of PDS	Outdoors	Carbon Steel	Cleaver-Brooks	-	-	-	B
X2740	Structure, FGR Duct Support	TBD	643-01963-009	See pg. 2 of PDS	Outdoors	Carbon Steel	Cleaver-Brooks	-	-	-	4

**PLATFORMS AND LADDERS**

Tag Number	Description	Part Number	BOM	Handrail	Grating	Material	Supplied By	ADDITIONAL NOTES			
X2800	Platform, Burner End	264-09084-000	643-01963-009	Angle Iron	Flat Bar	Carbon Steel	Cleaver-Brooks	-	-	-	B
X2810	Platform, Target End	264-09085-000	643-01963-009	Angle Iron	Flat Bar	Carbon Steel	Cleaver-Brooks	-	-	-	B
X2820	Platform, Boiler Roof	264-09086-000	643-01963-009	Angle Iron	Flat Bar	Carbon Steel	Cleaver-Brooks	-	-	-	B
X2830	Platform, Burner Front	264-09087-000	643-01963-009	Angle Iron	Flat Bar	Carbon Steel	Cleaver-Brooks	-	-	-	B
X2840	Platform, SCR Catalyst	264-09088-000	643-01963-009	Angle Iron	Flat Bar	Carbon Steel	Cleaver-Brooks	-	-	-	B
X2850	Platform, Furnace Observation Ports	264-09089-000	643-01963-009	Angle Iron	Flat Bar	Carbon Steel	Cleaver-Brooks	-	-	-	B

TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
<b>BURNER, FD FAN, &amp; ASSOCIATED INSTRUMENTATION</b>																
BNR-	X1300	B-502	Burner	829-11751-000	643-01963-009	-	Burner	-	-	-	by NatCom	-	Natural Gas fuel. See NatCom documents for details.		X	B
-	-	-	Fuel Rack	829-11752-000	643-01963-009	-	-	-	-	-	by NatCom	-	See NatCom documents for details.		X	
-	-	-	Air Handling System	829-11753-000	643-01963-009	-	-	-	-	-	by NatCom	-	See NatCom documents for details.		X	
-	-	-	Control System: BMS & Combustion	829-11754-000	643-01963-009	-	Control	-	-	-	by NatCom	-	See NatCom documents for details.		X	
-	-	-	Ammonia Injection Grid	829-11755-000	643-01963-009	-	-	-	-	-	by NatCom	-	See NatCom documents for details.		X	
-	-	-	Ammonia Vaporization Skid	829-11756-000	643-01963-009	-	-	-	-	-	by NatCom	-	See NatCom documents for details.		X	
FN-	X2200	PC-502	Forced Draft Fan	813-02914-000	643-01963-009	-	Fan	-	-	-	Howden	-	includes Variable Inlet Vane (VIV) Damper, with pneumatic actuator. See Howden documents for details		X	B
MTR-	X2200	MTR-4525	Forced Draft Fan Motor	Part of Fan	643-01963-009	-	Motor	-	-	-	WEG	-	700 HP, 4160 Volt, 3 Ph, 60 Hz. See Howden/WEG documents for details		X	B
FZ-	X2200	FZ-4525	Variable Inlet Vane Damper Actuator	Part of Fan	-	-	-	-	-	-	-	-	See Howden documents for Details		X	B
ZSL-	X2200	ZSL-4525	Variable Inlet Vane Damper Limit Switch	Part of Fan	-	-	-	-	-	-	-	-	See Howden documents for Details		X	B
FCV- FZ- ZSC- ZSH- ZT-	X2170	FCV-4558 FZ-4558 ZSC-4558 ZSO-4558 ZT-4558	FGR Damper	TBD	643-01963-009	-	-	-	-	-	CB-Terrebonne	-	See CB-Terrebonne documents for details		X	5
<b>X-0.5-SAS-24-XXXX-N</b>			Air Cooled Observation Port Piping	-	504-14211-007	1/2"	Tubing	-	-	304SS	Cleaver-Brooks	-	To be connected to plant's air supply.			
PCV-	X2495	PCV-X2495	Observation Port Air Regulator	918-10220-000	504-14211-007	1/4"	-	NPT	-	Aluminum	Fisher	67CFR	Filter regulator; to be used to regulate instrument air line down to 5 psig for air cooled observation ports.		X	
PI-	X2420	PI-X2420	Pressure Gauge	850-02273-000	504-14211-007	1/4"	Gauge	NPT	-	-	Ashcroft	45-1279-SS-02L	GAUGE,PRESS.4-1/2",0-30 PSI,1/4"NPT LOWER CONN, ASHCROFT#45-1279-SS-02L		X	B
HV-	X2419	HV-X2419	Isolation valve for Pressure gauge	941-02856-000	504-14211-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8			X	B
OBS-	X2496	OBS-X2496	Furnace Observation Port	851-00878-000	504-14211-007	1-1/2"	-	NPT	-	-	SIP, Inc.	CIPBG 1.5	Left, with 1/4" NPT cooling air connection, 1/4" Quartz glass		X	
OBS-	X2497	OBS-X2497	Furnace Observation Port	851-00878-000	504-14211-007	1-1/2"	-	NPT	-	-	SIP, Inc.	CIPBG 1.5	Middle, with 1/4" NPT cooling air connection, 1/4" Quartz glass		X	
OBS-	X2498	OBS-X2498	Furnace Observation Port	851-00878-000	504-14211-007	1-1/2"	-	NPT	-	-	SIP, Inc.	CIPBG 1.5	Right, with 1/4" NPT cooling air connection, 1/4" Quartz glass		X	
<b>AIR PREHEATER PIPING</b>																
<b>X-3-SHP-15-30C2-H</b>			Air Preheater Inlet Steam Piping	900-01000-000	TBD	3"	Pipe	RFF	Sch 40	SA106B	Cleaver-Brooks	-	Customer supply 150 psig, saturated steam to Cleaver Brooks			4
NX-	X1505		APH Steam Inlet Strainer	923-00977-000	TBD	3"	Strainer	RFF	300	A216-WCB	Keckley	SA-7	Y type strainer,		X	4
PI-	X1510	PI-4557	APH Steam Inlet Pressure Gauge	850-02302-000	TBD	1/2"	Indicator	NPT	-	-	Ashcroft	45-1010-S-04L 0/400 PSI	Pressure Gauge: Model 1010 Case: Black epoxy coated aluminum Dial: Aluminum, white w/ black scale Accuracy: 1% full Scale (Grade 1A ASME B40.100) 45 - Size: 4-1/2" 1010 - Type S - System (Tube & Socket): 316L SST 04L - Connection Location: 1/2" MNPT Lower Range: 0-400 PSIG		X	5
HV-	X1510		2-Valve manifold	330-00954-000	TBD	1/2"	Manifold	NPT	-	316SS	ANDERSON, GREENWOOD & CO	M25HPS-44F-XP	M25HP - 3/16" In-Line 2-Valve Manifold S - Body Material: 316 SS 44F - Connection (Inlet/Outlet): 1/2" FNPT x 1/2" MNPT XP - B31.1		X	4
HV-	X1508		Root Valve for pressure gauge	941-03112-000	TBD	1/2"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	-		X	4
HV-	X1520		Isolation Valve for APH Control	941-02306-000	TBD	3"	Gate	RFF	300	A216-WCB	Crane	33XUF	-		X	4
HV-	X1526		Drain Valve for APH Control	941-03112-000	TBD	1/2"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	-		X	4

TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
FCV-	X1550	FCV-4557	APH Control Valve	230-00714-000	TBD	2"	Control	RFF	300	A216-WCB	Fisher	NPS 2 ED 667 Size 40I DVC6200	Class II shutoff, Fail Closed, 4-20mA input signal, 4-20mA position feedback			
HV-	X1535		Drain Valve for APH Control	941-03112-000	TBD	1/2"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	-		X	5
HV-	X1530		Isolation Valve for APH Control	941-02306-000	TBD	3"	Gate	RFF	300	A216-WCB	Crane	33XUF	-		X	4
HV-	X1525		Bypass for APH Control	941-02621-000	TBD	2"	Globe	SW	800	SA105	Vogt	SW12141	-		X	4
<b>X-0.5-SHP-15-30C2-H</b>			Air Preheater Inlet Drain Piping	900-00313-000	TBD	1/2"	Pipe	RFF	Sch 80	SA106B	by Customer	-	-			4
HV-	X1536		Drain Valve	941-03112-000	TBD	1/2"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	-		X	4
HV-	X1537		Isolation Valve for Drip trap	941-02383-000	TBD	1/2"	Gate	SW	800	SA105	Vogt	SW12111	-		X	4
MX-	X1538		Steam Trap for Drip leg	934-00010-000	TBD	1/2"	Steam Trap	NPT	250	Cast Iron	Armstrong	812	7/64" orifice, 1000 lb/hr at 150 psid		X	4
HV-	X1539		Isolation Valve for Drip trap	941-02383-000	TBD	1/2"	Gate	SW	800	SA105	Vogt	SW12111	-		X	4
HV-	X1540		Bypass for Steam Trap Drip leg	941-02378-000	TBD	1/2"	Globe	SW	800	SA105	Vogt	SW12141	-		X	4
TV-	X1545		Air Preheater Thermostatic Air Vent	194-00296-000	TBD	3/4"	Air Vent	NPT	300	304SS	Armstrong	TTF-1	Thermostatic air vent, Straight through pattern		X	4
<b>X-1.5-SHP-15-30C2-H</b>			Air Preheater Condensate Piping	900-00292-000	TBD	1 1/2"	Pipe	SW	Sch 80	SA106B	Cleaver Brooks	-	-			4
VB-	X1545		Vacuum Breaker	934-00460-001	TBD	1"	Vacuum Breaker	NPT	-	316SS	DFT	BSSV6-8094	Vacuum Breaker, 316 SS Seat & Disc, CF8M Guard, 316SS Spring, 316SS Retaining ring, max operating pressure : 3075 psig @ 700 F		X	4
HV-	X1565		Drain Valve for APH Outlet	941-03112-000	TBD	1/2"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	-		X	4
HV-	X1567		Isolation Valve	941-02387-000	TBD	1 1/2"	Gate	SW	800	SA105	Vogt	SW12111	-		X	4
MX-	X1568		Steam Trap for APH Outlet	934-00500-000	TBD	1 1/2"	Steam Trap	NPT	250	Cast Iron	Armstrong	815	5/16" orifice, 6,000 lb/hr at 50 psid. Inverted bucket steam trap, 180 psi Max differential.		X	4
HV-	X1569		Isolation Valve	941-02387-000	TBD	1 1/2"	Gate	SW	800	SA105	Vogt	SW12111	-		X	4
HV-	X1570		Bypass for Steam Trap	941-02381-000	TBD	1 1/2"	Globe	SW	800	SA105	Vogt	SW12141	-		X	4
FV-	X1575		Check Valve for APH Outlet Condensate	940-07364-000	TBD	1 1/2"	Check	SW	800	SA105	Vogt	SWS701	-		X	4
<b>FLUE GAS OUTLET INSTRUMENTATION &amp; ASSOCIATED EQUIPMENT</b>																
PIT-	X2410	PIT-4527	Furnace Pressure Transmitter	817-04619-000	648-01032-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	2051CG2A02A1AKBS 5M5Q4Q8	TRANSMITTER, COPLANAR GAUGE, W/ NON-B31.1 MANIFOLD, -250 TO 250 inH <sub>2</sub> O, 4-20mA HART, W/ LCD  <b>Calibrated for -5 to 35 inH<sub>2</sub>O</b>			X
HV-	X2410	HV-X2410	Furnace Pressure Transmitter 2-Valve manifold	Part of Transmitter	648-01032-008	1/2"	Manifold	NPT	-	316SS	Rosemount	0305RC22B11B4	MANIFOLD, COPLANAR, 2 VALVE, FLANGE, 1/2" NPT PROCESS CONNECTIONS			X
PSHH-	X2400	PSHH-4527	Furnace High High Pressure Switch	836-08828-000	648-01032-008	1/8"	Switch	NPT	-	Fluorosilicone	Dwyer	1950P-2-2F	SWITCH, DIFFERENTIAL AIR PRESSURE, 1SPDT 15 AMP 125/250/480 VAC, 1/8" FNPT, RANGE .5 - 2 PSIG, CE, UL, CSA, FM APPROVED, DWYER# 1950P-2-2F  <b>Set @ 20 inH<sub>2</sub>O, Increasing, Field Adjustable</b>			X
HV-	X2401	HV-X2401	Isolation Valve for Furnace High High Pressure Switch	941-02856-000	648-01032-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8	<b>Lock Open</b>			X
HV-	X2402	HV-X2402	Bleed Valve for Furnace High High Pressure Switch	941-02856-000	648-01032-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8				X
TI-	X2505	TI-4529	Boiler Exit Flue Gas Thermometer	937-00985-000	648-01032-008	1/2"	Indicator	NPT	-	304SS	Ashcroft	50E160E240 200/1000F	50 - Dial Size: 5" EI - Case Style: EI Series Bimetal Thermometer 60 - Stem Connection: 1/2" NPT E - Stem Location: Everyangle 240 - Stem Length: 24" Range: 200 - 1000 F			X



TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
TW-	X2505	TW-4529	Boiler Exit Flue Gas Thermowell	937-00868-000	648-01032-008	3/4"	Protection Tube	MNPT	-	316SS	Pyromation	26-88-23-811Z,(Z350)	26 - Built-Up Protection Well 88 - Well Size and Material: OD X ID (0.5 X 0.26"), 316 SS 23 - Well Dimension: 23" 811 - Mounting Bushing Material/Dimensions: 316 SS/ EXT X INT (3/4 X 1/2"), Bushing Dimension = 1"			
TIT-	X2500	TIT-4528	Boiler Exit Flue Gas Temperature Transmitter	817-03469-000	648-01032-008	1/2"	Transmitter	NPT	-	Aluminum Connection Head 316L SS Diaphragm	Rosemount	644HAKBJ6M5F6Q4	TRANSMITTER, TEMPERATURE, 4 - 20mA HART, DIN HEADMOUNT, SINGLE SENSOR INPUT, 60 Hz FILTER, W/ LCD  <b>Calibrated for Type K Thermocouple, 0 - 1000°F</b>	X		
TE-	X2500	TE-4528	Boiler Exit Flue Gas Temperature Element	496-00013-000	648-01032-008	1/2"	Element	NPT	-	316SS	Pyromation	K48U-024-SL-8HN31,WI	K - Single Element Type K Thermocouple 48 - Sheath Diameter: 1/4" U - Measuring Junction: Ungrounded 024 - Stem Length: 24" SL - Element Options: Spring Loaded 8HN - Head Mounting Fittings: 316 SS Fittings, 1/2" x 1/2" Hex Nipple 31 - Head and Sheath Terminations: Aluminum Screw-Cover Head	X		
TW-	X2500	TW-4528	Boiler Exit Flue Gas Thermowell	937-00868-000	648-01032-008	3/4"	Protection Tube	MNPT	-	316SS	Pyromation	26-88-23-811Z,(Z350)	26 - Built-Up Protection Well 88 - Well Size and Material: OD X ID (0.5 X 0.26"), 316 SS 23 - Well Dimension: 23" 811 - Mounting Bushing Material/Dimensions: 316 SS/ EXT X INT (3/4 X 1/2"), Bushing Dimension = 1"			
AIT-	X2520	AIT-4530	Oxygen Analyzer Transmitter	880-06308-008	648-01032-008	-	Analyzer	RFF	-	-	Yokogawa	ZR402G-T-E-E-A	KIT, YOKOGAWA O2 ANALYZER O2 ANALYZER (ZR402G-T-E-E-A) Separate type Zirconia Oxygen Analyzer, Converter, LCD Touchscreen, 4-20mA Output, NEMA 4X Polyurethane Coated Aluminum Enclosure, 85-264VAC, Power Consumption: Max 300W, 100W Nominal; Panel, Wall or Pipe Mounting, 1/2" FNPT Conduit Connections.  <b>Calibrate For 0 to 25%</b>	X		
AE-	X2520	AE-4530	Oxygen Analyzer Element	Part of 880-06308-008	648-01032-008	2"	Element	RFF	-	-	Yokogawa	ZR22G-070-S-A-E-T-T-E-AIZ	O2 DETECTOR (ZR22G-070-S-A-E-T-T-E-AIZ) ZR22G - Zirconia Oxygen/Humidity Analyzer Detector 070 - 0.7 meter S - Stainless Steel A - ANSI Class 150#-2"-RF Flange E - External Reference Air Connection T - Gas Thread 1/4" NPT T-E-A - Connection Box Thread 1/2" NPT	X		
AW-	X2520	AW-4530	Oxygen Analyzer 6 Conductor Signal Cable - 50ft	Part of 880-06308-008	648-01032-008	-	Cables	-	-	-	Yokogawa	WZL3H-0050 WZL6S-0050	Cable, 3 Conductor Shielded Cable, 50ft. For Zirconia Heater Cable, 6 Conductor Shielded Cable, 50ft. For O2 Signal			
		MR-502	SCR Catalyst	675-00052-000	643-01963-009	-	-	-	-	-	Umicore	-	Sized to reduce Nox from 120ppm at inlet to 8.5ppm at exit. See vendor documents for details	X		

TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
PDIT-	X2525	PDIT-4531	SCR Catalyst Differential Pressure Transmitter	817-04645-000	648-01032-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	2051CD1A02A1AKBS 5M5Q4Q8	TRANSMITTER, COPLANAR GAUGE, W/ NON-B31.1 MANIFOLD, -25 TO 25 inH2O, 4-20mA HART, W/ LCD  <b>Calibrated -1 to 3 inH2O</b>			
														X		
HV-	X2525	HV-X2525	SCR Catalyst Differential Pressure Transmitter 3-Valve manifold	Part of Transmitter	648-01032-008	1/2"	Manifold	NPT	-	316SS	Rosemount	0305RC32B11B4	MANIFOLD, COPLANAR, 3 VALVE, FLANGE, 1/2" NPT PROCESS CONNECTIONS			
HV-	X2524	HV-X2524	Root Valve for SCR Differential Pressure Transmitter	941-02856-000	648-01032-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8	-			B
HV-	X2526	HV-X2526	Root Valve for SCR Differential Pressure Transmitter	941-02856-000	648-01032-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8	-	X		B
TIT-	X2600	TIT-4555	Economizer Exit Flue Gas Temperature Transmitter	817-03469-000	648-01032-008	1/2"	Transmitter	NPT	-	Aluminum Connection Head 316L SS Diaphragm	Rosemount	644HAKBJ6M5F6Q4	TRANSMITTER, TEMPERATURE, 4 - 20mA HART, DIN HEADMOUNT, SINGLE SENSOR INPUT, 60 Hz FILTER, W/ LCD  <b>Calibrated for Type K Thermocouple, 0 - 1000°F</b>			
														X		2
TE-	X2600	TE-4555	Economizer Exit Flue Gas Temperature Element	496-00013-000	648-01032-008	1/2"	Element	NPT	-	316SS	Pyromation	K48U-024-SL- 8HN31,WI	K - Single Element Type K Thermocouple 48 - Sheath Diameter: 1/4" U - Measuring Junction: Ungrounded 024 - Stem Length: 24" SL - Element Options: Spring Loaded 8HN - Head Mounting Fittings: 316 SS Fittings, 1/2" x 1/2" Hex Nipple 31 - Head and Sheath Terminations: Aluminum Screw-Cover Head W.I - Options: Epoxy Coating, SS Customer Tag			2
														X		2
TW-	X2600	TW-4555	Economizer Exit Flue Gas Thermowell	937-00868-000	648-01032-008	3/4"	Protection Tube	MNPT	-	316SS	Pyromation	26-88-23-811Z,(Z350)	26 - Built-Up Protection Well 88 - Well Size and Material: OD X ID (0.5 X 0.26"), 316 SS 23 - Well Dimension: 23" 811 - Mounting Bushing Material/Dimensions: 316 SS/ EXT X INT (3/4 X 1/2"), Bushing Dimension = 1"			2
														X		2
TI-	X2605	TI-4532	Economizer Exit Flue Gas Thermometer	937-00982-000	648-01032-008	1/2"	Indicator	NPT	-	304SS	Ashcroft	50EI60E240 (50-550F)	50 - Dial Size: 5" EI - Case Style: EI Series Bimetal Thermometer 60 - Stem Connection: 1/2" NPT E - Stem Location: Everyangle 240 - Stem Length: 24" Range: 50 - 550 F			
														X		
TW-	X2605	TW-4532	Economizer Exit Flue Gas Thermowell	937-00868-000	648-01032-008	3/4"	Protection Tube	MNPT	-	316SS	Pyromation	26-88-23-811Z,(Z350)	26 - Built-Up Protection Well 88 - Well Size and Material: OD X ID (0.5 X 0.26"), 316 SS 23 - Well Dimension: 23" 811 - Mounting Bushing Material/Dimensions: 316 SS/ EXT X INT (3/4 X 1/2"), Bushing Dimension = 1"			
														X		
PIT-	X2610	PIT-4533	Stack Damper Pressure Transmitter	817-04618-000	648-01032-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	2051CG1A02A1AKBS 5M5Q4Q8	TRANSMITTER, COPLANAR GAUGE, W/ NON-B31.1 MANIFOLD, -25 TO 25 inH2O, 4-20mA HART, W/ LCD  <b>Calibrated for -5 to 20 inH2O</b>			
HV-	X2610	HV-X2610	Stack Damper Pressure Transmitter 2-Valve Manifold	Part of Transmitter	648-01032-008	1/2"	Manifold	NPT	-	316SS	Rosemount	0305RC22B11B4	MANIFOLD, COPLANAR, 2 VALVE, FLANGE, 1/2" NPT PROCESS CONNECTIONS			
														X		

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HV-	X2609	HV-X2609	Root Valve for Stack Damper Pressure Transmitter	941-02856-000	648-01032-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8	-	X		B
FCV-FZ-ZSL-	X2620	FCV-4534 FZ-4534 ZSL-4534	Stack Damper	427-85008-000	643-01963-009	-	-	Flanged	-	-	Natcom	-	See NatCom documents for details.		X	B
HV-	X2601	HV-X2601	Stack Drain Valve	941-02419-000	648-01032-008	2"	Gate	NPT	800	SA105	Vogt	12111	-		X	B
S-	X2699	MM-502	Stack	634-01137-000	643-01963-009	-	-	-	-	-	Cheminee Lining	-	Freestanding, 125' height, 76" diameter, 66" diameter at exit. See Cheminee drawings for details			B
<b>FEEDWATER SYSTEM BEFORE CONTROL STATION</b>																
X-6-BFW-30-60C2-H	-	-	Feedwater Piping	-	-	6"	Pipe	RFF	Sch 40	SA106B	by Others	-	pipng by others			
FE-	X3000	FE-4500	Feedwater Orifice Plate	849-05921-000	880-30212-008	6"	Orifice Plate	-	600	316SS	Rosemount	1595P060A6SB065Q8	1595 - CONDITIONING ORIFICE PLATE P - PLATE TYPE: PADDLE, SQUARE EDGE 060 - LINE SIZE: 6-IN. (150MM) A6 - FLANGE RATING: ANSI CLASS 600 RAISED FACE S - MATERIAL TYPE: 316/316L STAINLESS STEEL B - ORIFICE PLATE THICKNESS: 0.250-IN. 065 - BETA RATIO: 0.65 BETA RATIO Q8 - MATERIAL CERTIFICATION PER ISO 10474 3.1-B AND EN 10204 3.1  Orifice bore = 3.942" Beta ratio = 0.65 Permanent pressure loss = 43.32 inH2O @ 252,500 lb/hr			2
	X3000	X3000	Feedwater Orifice Flanges	849-01624-000	880-30212-008	6"	Flange	RFF	600	A105	By CB	-	FLANGE, ORIFICE, 600#, RFWN, 6" { } NPSA 105 STL, SCH 40, 2 FLANGES COMPLETE W/ GASKETS, BOLTS, NUTS, JACK SCREWS, & PIPE PLUGS, PER ANSI/ASME B16.36			2
FIT-	X3000	FIT-4500	Feedwater Flow Transmitter	817-04643-000	880-30212-008	1/2"	Transmitter	NPT	-	316SS Diaphragm with Aluminum Head	Rosemount	2051CD2A02A1AKBS5M5Q4Q8	TRANSMITTER, COPLANAR DIFFERENTIAL, W/ B31.1 MANIFOLD, -250 TO 250 inH2O, 4-20mA HART, W/ LCD  Calibrated for 0 to 117 inH2O for 0 to 310,000 lb/hr			2
HV-	X3000	HV-X3000	Feedwater Flow Transmitter 3-Valve manifold	Part of Transmitter	880-30212-008	1/2"	Manifold	NPT	-	316SS	Rosemount	0305RC82B21B4	MANIFOLD, 3 VALVE, ASME B31.1, FLANGE, 1/2" NPT PROCESS CONNECTIONS			2
HV-	X3001	HV-X3001	Root Valve for Feedwater Flow Transmitter	941-02384-000	880-30212-008	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard	X		2
HV-	X3002	HV-X3002	Root Valve for Feedwater Flow Transmitter	941-02384-000	880-30212-008	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard	X		2
HV-	X3003	HV-X3003	Root Valve for Feedwater Flow Transmitter	941-03113-000	880-30212-008	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard	X		2
HV-	X3004	HV-X3004	Root Valve for Feedwater Flow Transmitter	941-03113-000	880-30212-008	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard	X		2
HV-	X3005	HV-X3005	Drain Vavle for Feedwater Flow Transmitter	941-02856-000	880-30212-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8		X		2
HV-	X3006	HV-X3006	Drain Vavle for Feedwater Flow Transmitter	941-02856-000	880-30212-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8		X		2
HV-	X3007	HV-X3007	Drain Vavle for Feedwater Flow Transmitter	941-02856-000	880-30212-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8		X		2
HV-	X3008	HV-X3008	Drain Vavle for Feedwater Flow Transmitter	941-02856-000	880-30212-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8		X		2
PIT-	X3015	PIT-4501	Feedwater Pressure Transmitter	834-01826-000	880-30212-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	2088G3S22A1M5B4KBQ4Q8S5	TRANSMITTER, IN-LINE GAUGE, W/ B31.1 MANIFOLD, -14.7 TO 800 PSI, 4-20mA HART, W/ LCD  Calibrated 0 to 700 PSIG			2
HV-	X3015	HV-X3015	Feedwater Pressure Transmitter 2-Valve manifold	Part of Transmitter	880-30212-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	0306RT32BA21	ASME B31.1, NPT X NPT, 1/2" NPT PROCESS CONNECTION			2
HV-	X3013	HV-X3013	Root Valve for Feedwater Pressure Transmitter	941-02384-000	880-30212-008	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard			2
HV-	X3014	HV-X3014	Root Valve for Feedwater Pressure Transmitter	941-03113-000	880-30212-008	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard			2

TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
<b>FEEDWATER CONTROL STATION</b>																
X-6-BFW-30-60C2-H	-	-	Feedwater Control Station Piping	900-00488-000	504-14190-007	6"	Pipe	RFF	Sch 40	SA106B	Cleaver-Brooks	-	-			M
XV-X3050	XV-4500 SV-4500A SV-4500B ZSC-4500 ZSO-4500	-	Feedwater Block Valve	228-00172-000	504-14190-008	6"	Butterfly	RFF	600	A216-WCB	Vanessa	MFDC150D2AWA10 0BBN	Vanessa Triple Offset Butterfly valve, ANSI CL600, Full Port, Double Flanged design, Bettis pneumatic actuator, Scotch Yoke, Bettis# RPES1600NU50CWALTNL46LKB00XX, with 2 ASCO Solenoids# 8362A201H181GF0, 120 VAC, CL1 Div 1, Open/Closed TopWorx limit switches DXP-L21GNEB, Explosion proof, includes Fisher 67CFR Filter regulator			
HV-X3038	HV-X3038	-	Drain Valve	941-02384-000	504-14190-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	-	X	X	0
HV-X3039	HV-X3039	-	Drain Valve	941-03113-000	504-14190-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	-	X		
FCV-FZ-ZT-X3000	FCV-4500 FZ-4500 ZT-4500	-	Feedwater Control Valve (FWCV)	230-00868-000	504-14190-008	3"	Control	RFF	600	SA216-WCC	Fisher	ET	Fisher 667 Size 45i actuator, DVC6200-AC positioner, Class IV shutoff, 4-20 mA Input signal.		X	1
HV-X3041	HV-X3041	-	FWCV Isolation	941-02491-000	504-14190-008	6"	Gate	RFF	600	SA216-WCB	Crane	76-XUF	Before FWCV		X	0
HV-X3044	HV-X3044	-	FWCV Piping Drain	941-02384-000	504-14190-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Before FWCV	X	X	
HV-X3046	HV-X3046	-	FWCV Piping Drain	941-03113-000	504-14190-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Before FWCV	X		
HV-X3142	HV-X3142	-	FWCV Isolation	941-02491-000	504-14190-008	6"	Gate	RFF	600	SA216-WCB	Crane	76-XUF	After FWCV		X	1
HV-X3045	HV-X3045	-	FWCV Piping Drain	941-02384-000	504-14190-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	After FWCV		X	
HV-X3047	HV-X3047	-	FWCV Piping Drain	941-03113-000	504-14190-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	After FWCV	X		
HV-X3143	HV-X3143	-	FWCV Bypass	224-00032-000	504-14190-008	3"	Globe	RFF	600	SA216-WCB	Crane	171-XU	-	X		1
<b>FEEDWATER SYSTEM AFTER CONTROL STATION</b>																
X-6-BFW-31-60C2-H	-	-	Feedwater Piping	900-00488-000	504-14190-007	6"	Pipe	RFF	Sch 40	SA106-B	Cleaver-Brooks	-	-			
FV-X3117	FV-X3117	-	Feedwater Check Valve	227-00015-000	504-14190-008	6"	Swing Check	RFF	600	SA216-WCB	Crane	175-XU	-		X	X
HV-X3118	HV-X3118	-	Economizer Inlet Isolation Valve	941-02491-000	504-14190-008	6"	Gate	RFF	600	SA216-WCB	Crane	76-XUF	-			X
TI-X3130	TI-4503	-	Economizer Feedwater Inlet Temperature Gauge	937-00915-000	504-14190-008	1/2"	Indicator	NPT	-	304 SS	Ashcroft	50EI60E060 (50-400F)	50 - Dial Size: 5" EI - Case Style: EI Series Bimetal Thermometer 60 - Stem Connection: 1/2" NPT E - Stem Location: Everyangle 060 - Stem Length: 6" Range: 50 - 400 F		X	
TW-X3130	TW-4503	-	Economizer Feedwater Inlet Temperature Thermowell	096-00119-000 (096-00412-000)	504-14190-007	3/4"	Thermowell	SW	-	304 SS	Pyromation	HW4D0609T1.5S	HW - Type: Heavy-Duty Socket Weld 4 - Bore Size: 0.260" Dia. D - Pipe Size: 3/4" NPS 06 - "S" Length: 6" 09 - Material: 304 SS T1.5 - Lag Length 1.5" Lag S - Well Stamped with Customer Specified Part Number		X	
TIT-X3125	TIT-4502	-	Economizer Feedwater Inlet Temperature Transmitter	817-03469-000	504-14190-008	1/2"	Transmitter	NPT	-	Aluminum Connection Head 316L SS Diaphragm	Rosemount	644HAKBJ6M5F6Q4	TRANSMITTER, TEMPERATURE, 4 - 20mA HART, DIN HEADMOUNT, SINGLE SENSOR INPUT, 60 Hz FILTER, W/LCD  <b>Calibrated for 3-Wire Pt 100 Ohm RTD, 0 to 400 °F</b>		X	X
TE-X3125	TE-4502	-	Economizer Feedwater Inlet Temperature Element	496-00107-000	504-14190-008	1/2"	Element	NPT	-	316 SS	Pyromation	R1T185H483-006-SL-8HN31,WI	RTD, 100 OHM PLATINUM, SINGLE, -328 TO R1T185H - Type: Platinum RTD, Single Element, High Range Wire Wound (-200 to 600C) 48 - Sheath Diameter: 1/4" 3 - Element Connection: 3-Wire Element 006 - Stem Length: 6" SL - Element Options: Spring-Loaded 8HN - Head Mounting Fittings: 316 SS Fittings, 1/2" x 1/2" NPT Hex Nipple 31 - Head and Sheath Terminations: Aluminum Screw-Cover Head W.I - Options: Epoxy Coating, Stainless Steel Tags		X	

TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev	
TW-X3125		TW-4502	Economizer Feedwater Inlet Temperature Thermowell	096-00119-000 (096-00412-000)	504-14190-007	3/4"	Thermowell	SW	-	304 SS	Pyromation	HW4D0609T1.5S	HW - Type: Heavy-Duty Socket Weld 4 - Bore Size: 0.260" Dia. D - Pipe Size: 3/4" NPS 06 - "S" Length: 6" 09 - Material: 304 SS T1.5 - Lag Length 1.5" Lag S - Well Stamped with Customer Specified Part Number				
<b>X-6-BFW-32-60C2-H</b>			Feedwater Piping	900-00488-000	504-14190-007	6"	Pipe	RFF	Sch 40	SA106-B	Cleaver-Brooks	-		X			
HV-X3230		HV-X3230	Economizer Vent Valve	941-02384-000	504-14190-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard		X	B	
HV-X3231		HV-X3231	Economizer Vent Valve	941-03113-000	504-14190-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard		X	1	
HV-X3250A		HV-X3250A	Economizer Drain Valve	941-02384-000	504-14190-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard		X	B	
HV-X3251A		HV-X3251A	Economizer Drain Valve	941-03113-000	504-14190-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard		X	1	
HV-X3250B		HV-X3250B	Economizer Drain Valve	941-02384-000	504-14190-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard		X	B	
HV-X3251B		HV-X3251B	Economizer Drain Valve	941-03113-000	504-14190-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard		X	1	
HV-X3250C		HV-X3250C	Economizer Drain Valve	941-02384-000	504-14190-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard		X	B	
HV-X3251C		HV-X3251C	Economizer Drain Valve	941-03113-000	504-14190-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard		X	1	
HV-X3250D		HV-X3250D	Economizer Drain Valve	941-02384-000	504-14190-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard		X	B	
HV-X3251D		HV-X3251D	Economizer Drain Valve	941-03113-000	504-14190-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard		X	1	
HV-X3250E		HV-X3250E	Economizer Drain Valve	941-02384-000	504-14190-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard		X	B	
HV-X3251E		HV-X3251E	Economizer Drain Valve	941-03113-000	504-14190-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard		X	1	
HV-X3250F		HV-X3250F	Economizer Drain Valve	941-02384-000	504-14190-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard		X	B	
HV-X3251F		HV-X3251F	Economizer Drain Valve	941-03113-000	504-14190-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard		X	1	
ECO-X3299		TS-502	Economizer	611-00550-000	643-01963-009	-	Counterflow	Flanged	-	CS	Eco	-	See economizer manufacturer's documents for details		X	B	
<b>NITROGEN BLANKET</b>																	
<b>X-1-NS-14-60C2-P</b>			Water Column Connection Piping	900-00320-000	504-14190-007	1"	Pipe	RFF	Sch 80	SA106B	Cleaver-Brooks	-	-			B	
HV-X1402		HV-X1402	Nitrogen Purge Isolation Valve	941-02385-000	504-14190-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Inboard		X		
HV-X1401		HV-X1401	Nitrogen Purge Isolation Valve	941-03114-000	504-14190-007	1"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard		X	X	1
<b>FEEDWATER SYSTEM AFTER ECONOMIZER</b>																	
<b>X-6-BFW-33-60C2-H</b>			Feedwater Piping	900-00488-000	504-14190-007	6"	Pipe	RFF	Sch 40	SA106-B	Cleaver-Brooks	-	After Economizer				
TI-X3330		TI-4505	Economizer Feedwater Outlet Temperature Gauge	937-00897-000	504-14190-008	1/2"	Indicator	NPT	-	304 SS	Ashcroft	50EI60E060 50-550F	50 - Dial Size: 5" EI - Case Style: EI Series Bimetal Thermometer 60 - Stem Connection: 1/2" NPT E - Stem Location: Everyangle 060 - Stem Length: 6" Range: 50 - 550 F		X		
TW-X3330		TW-4505	Economizer Feedwater Outlet Temperature Thermowell	096-00119-000 (096-00412-000)	504-14190-007	3/4"	Thermowell	SW	-	304 SS	Pyromation	HW4D0609T1.5S	HW - Type: Heavy-Duty Socket Weld 4 - Bore Size: 0.260" Dia. D - Pipe Size: 3/4" NPS 06 - "S" Length: 6" 09 - Material: 304 SS T1.5 - Lag Length 1.5" Lag S - Well Stamped with Customer Specified Part Number		X		
TIT-X3325		TIT-4504	Economizer Feedwater Outlet Temperature Transmitter	817-03469-000	504-14190-008	1/2"	Transmitter	NPT	-	Aluminum Connection Head 316L SS Diaphragm	Rosemount	644HAKBJ6M5F6Q4	TRANSMITTER, TEMPERATURE, 4 - 20mA HART, DIN HEADMOUNT, SINGLE SENSOR INPUT, 60 Hz FILTER, W/ LCD  <b>Calibrated for 3-Wire Pt 100 Ohm RTD, 0 to 600 °F</b>		X	X	
TE-X3325		TE-4504	Economizer Feedwater Outlet Temperature Element	496-00107-000	504-14190-008	1/2"	Element	NPT	-	316 SS	Pyromation	R1T185H483-006-SL-8HN31,WI	RTD,100 OHM PLATINUM,SINGLE,-328 TO R1T185H - Type: Platinum RTD, Single Element, High Range Wire Wound (-200 to 600C)		X		

TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
TW-X3325		TW-4504	Economizer Feedwater Outlet Temperature Thermowell	096-00119-000 (096-00412-000)	504-14190-007	3/4"	Thermowell	SW	-	304 SS	Pyromation	HW4D0609T1.5S	HW - Type: Heavy-Duty Socket Weld 4 - Bore Size: 0.260" Dia. D - Pipe Size: 3/4" NPS 06 - "S" Length: 6" 09 - Material: 304 SS T1.5 - Lag Length 1.5" Lag S - Well Stamped with Customer Specified Part Number			
HV-X3300		HV-X3300	Feedwater Piping Drain Valve	941-02384-000	504-14190-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	-	X		
HV-X3301		HV-X3301	Feedwater Piping Drain Valve	941-03113-000	504-14190-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	-	X		
<b>DRUM ATTACHMENTS</b>																
PSV-X3480		PSV-X3480	Drum Safety #1	940-07026-000	504-14189-008	3" x 4"	Safety	RFF	600	A216-WCB	Consolidated	1811-MB	Set at 545 psig. Capacity = 93,663 pph. 4"-150# flanged outlet.		X	0
DP-X3480		DP-X3480	Drip Pan Elbow for Drum PSV# 1	847-09171-000	504-14189-008	4"	Drip Pan	RFF	150	Carbon Steel	Keckley	-	-			0
<b>X-8-VNT-46-15C2-P</b>		-	Vent Stack for Drum PSV# 1	900-01007-000	504-14189-007	8"	Pipe	Open	Sch 40	SA106B	Cleaver-Brooks	-	-			0
PSV-X3481		PSV-X3481	Drum Safety #2	940-07028-000	504-14189-008	4" x 6"	Safety	RFF	600	A216-WCB	Consolidated	1811-NB	Set at 550 psig. Capacity = 113,925 pph. 6"-150# flanged outlet.		X	0
DP-X3481		DP-X3481	Drip Pan Elbow for Drum PSV# 2	847-01903-000	504-14189-008	6"	Drip Pan	RFF	150	Carbon Steel	Keckley	-	-			0
<b>X-10-VNT-46-15C2-P</b>		-	Vent Stack for Drum PSV# 2	900-00380-000	504-14189-007	10"	Pipe	Open	Sch 40	SA106B	Cleaver-Brooks	-	-			0
HV-X3482		HV-X3482	Drum Vent Valve	941-02385-000	504-14189-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Inboard		X	
HV-X3483		HV-X3483	Drum Vent Valve	941-03114-000	504-14189-007	1"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard	X	X	1
<b>STEAM DRUM BURNER END</b>																
<b>X-1.5-BLR-34-30C2-P</b>		-	Water Column Connection Piping	900-00292-000	504-14189-007	1-1/2"	Pipe	RFF	Sch 80	SA106B	Cleaver-Brooks	-	-			
HV-X3407		HV-X3407	Upper Water Column Isolation Valve	941-02387-000	504-14189-007	1-1/2"	Gate	SW	800	SA105	Vogt	SW12111	Lock Open, Inboard		X	
HV-X3409		HV-X3409	Upper Water Column Isolation Valve	941-02387-000	504-14189-007	1-1/2"	Gate	SW	800	SA105	Vogt	SW12111	Lock Open, Outboard			X
HV-X3408		HV-X3408	Lower Water Column Isolation Valve	941-02387-000	504-14189-007	1-1/2"	Gate	SW	800	SA105	Vogt	SW12111	Lock Open, Inboard			X
HV-X3410		HV-X3410	Lower Water Column Isolation Valve	941-02387-000	504-14189-007	1-1/2"	Gate	SW	800	SA105	Vogt	SW12111	Lock Open, Outboard		X	
LE-X3400		LE-4506	Water Column	100-01043-000	504-14189-007	1-1/2"	Water Column	RFF	300	CS	Cleaver-Brooks	-	10" Alarm variation, 1-1/2" SW Steam and Water Connections on 21" centers. With two(2) sets of 3/4" NPT Gage Glass connections on 26" centers. 3/4" SW Drain connection.		X	
LSC-LSLL-LSL-LSH-LSHH-X3400		LSC-4506 LSLL-4506 LSL-4506 LSH-4506 LSHH-4506	Water Column Probes	289-03927-000	100-01043-000	-	Probes	-	400	-	Clark Reliance	-	From Drum Centerline: -2" HWCO, -3" HWA, -8" NWL, -13" LWA, -14.5" LWCO and Common probes.			X
LG-X3400A		LG-4506A	Gage Glass	851-00395-000	504-14189-008	3/4"	Indicator	-	900	Glass	Clark Reliance	FG966	Vertical, Flat Glass, 15" visibility.		X	X
HV-X3401A		HV-X3401A	Gage Glass Isolation Valve	825-00383-000	504-14189-007	3/4"	Globe	NPT	800	A105	Clark Reliance	SG855	Includes chain (with open/close indication) for floor level operation	X	X	
HV-X3402A		HV-X3402A	Gage Glass Isolation Valve	(Valve set)	504-14189-007	3/4"	Globe	NPT	800	A105	Clark Reliance	SG855	Includes chain (with open/close indication) for floor level operation	X	X	
HV-X3403A		HV-X3403A	Gage Glass Drain Valve	941-02384-000	504-14189-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard	X	X	1
HV-X3404A		HV-X3404A	Gage Glass Drain Valve	224-00170-000	504-14189-007	3/4"	Globe	SW / NPT	800	SA105	Vogt	TSW12141	Outboard	X	X	1
LG-X3400B		LG-4506B	Gage Glass	851-00395-000	504-14189-008	3/4"	Indicator	-	900	Glass	Clark Reliance	FG966	Vertical, Flat Glass, 15" visibility.		X	X
HV-X3401B		HV-X3401B	Gage Glass Isolation Valve	825-00383-000	504-14189-007	3/4"	Globe	NPT	800	A105	Clark Reliance	SG855	Includes chain (with open/close indication) for floor level operation	X	X	
HV-X3402B		HV-X3402B	Gage Glass Isolation Valve	(Valve set)	504-14189-007	3/4"	Globe	NPT	800	A105	Clark Reliance	SG855	Includes chain (with open/close indication) for floor level operation	X	X	
HV-X3403B		HV-X3403B	Gage Glass Drain Valve	941-02384-000	504-14189-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard	X	X	1
HV-X3404B		HV-X3404B	Gage Glass Drain Valve	224-00170-000	504-14189-007	3/4"	Globe	SW / NPT	800	SA105	Vogt	TSW12141	Outboard	X	X	1
HV-X3405		HV-X3405	Water Column Drain Valve	941-02384-000	504-14189-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard	X	X	1

TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
HV-	X3406	HV-X3406	Water Column Drain Valve	224-00170-000	504-14189-007	3/4"	Globe	SW / NPT	800	SA105	Vogt	TSW12141	Outboard	X	X	1
<b>X-1-BLR-34-30C2-P</b>			Aux. LWCO Piping	900-00320-000	504-14189-007	1"	Pipe	PE	Sch80	SA106B	Cleaver-Brooks	-	-			
HV-	X3413	HV-X3413	Upper Aux. LWCO Isolation Valve	941-02385-000	504-14189-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Lock Open, Inboard	X		
HV-	X3415	HV-X3415	Upper Aux. LWCO Isolation Valve	941-02385-000	504-14189-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Lock Open, Outboard		X	
HV-	X3414	HV-X3414	Lower Aux. LWCO Isolation Valve	941-02385-000	504-14189-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Lock Open, Inboard			X
HV-	X3416	HV-X3416	Lower Aux. LWCO Isolation Valve	941-02385-000	504-14189-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Lock Open, Outboard	X		
LSLL-	X3410	LSLL-4507	Aux Low-Water Cut-Out (ALWCO)	817-04943-000	504-14189-007	1"	Switch	SW	750	A216-WCB	Magnetrol	B35-PB30-CKA	Float type,	X	X	3
HV-	X3411	HV-X3411	ALWCO Drain Valve	941-02384-000	504-14189-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard	X		
HV-	X3412	HV-X3412	ALWCO Drain Valve	224-00170-000	504-14189-007	3/4"	Globe	SW / NPT	800	SA105	Vogt	TSW12141	Outboard	X	X	1
HS-LGT-	X3415	HS-4508 LGT-4508	Low Water Cut-Off Shunt Pushbutton	880-06442-000	504-14189-007	-	Switch	-	-	-	Allen Bradley	800H-AR2A 800H-QRH2R 800H-2HZ4	KIT, PUSH-BUTTON (BLACK, FLUSH MOUNT, BOOTLESS, NEMA 4X), PILOT LIGHT (12-130V AC/DC, RED LED, NEMA 4X), 304 SS NEMA4X ENCLOSURE	X		
<b>X-1-BLR-34-30C2-P</b>			Drum Level Transmitter Piping	900-00320-000	504-14189-007	1"	Pipe	PE	Sch80	SA106B	Cleaver-Brooks	-	-			
HV-	X3421A	HV-X3421A	Drum Level Transmitter Isolation Valve	941-02385-000	504-14189-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Inboard, Steam Leg	X		
HV-	X3422A	HV-X3422A	Drum Level Transmitter Isolation Valve	941-02385-000	504-14189-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Inboard, Water Leg	X		
HV-	X3423A	HV-X3423A	Drum Level Transmitter Isolation Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8	at Transmitter Rack	X		
HV-	X3424A	HV-X3424A	Drum Level Transmitter Isolation Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8	at Transmitter Rack	X		
LIT-	X3420A	LT-4509A	Drum Level Transmitter	817-04643-000	504-14189-007	1/2"	Transmitter	NPT	-	316SS	Rosemount	2051CD2A02A1AKBS 5M5Q4Q8	TRANSMITTER, COPLANAR DIFFERENTIAL, W/ B31.1 MANIFOLD, -250 TO 250 inH2O, 4-20mA HART, W/ LCD  Calibrated -28 to 0 inH2O for -10 to +18 Level Indication	X		
HV-	X3420A	HV-X3420A	Drum Level Transmitter 3-Valve manifold	Part of Transmitter	504-14189-007	1/2"	Manifold	NPT	-	316SS	Rosemount	0305RC82B21B4	MANIFOLD, 3 VALVE, ASME B31.1, FLANGE, 1/2" NPT PROCESS CONNECTIONS	X		
HV-	X3425A	HV-X3425A	Drum Level Transmitter Drain Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8		X		
HV-	X3426A	HV-X3426A	Drum Level Transmitter Drain Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8		X		
HV-	X3427A	HV-X3427A	Drum Level Transmitter Drain Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8				
HV-	X3428A	HV-X3428A	Drum Level Transmitter Drain Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8				
<b>X-1-BLR-34-30C2-P</b>			Drum Level Transmitter Piping	900-00320-000	504-14189-007	1"	Pipe	PE	Sch80	SA106B	Cleaver-Brooks	-	-			
HV-	X3421B	HV-X3421B	Drum Level Transmitter Isolation Valve	941-02385-000	504-14189-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Inboard, Steam Leg	X		B
HV-	X3422B	HV-X3422B	Drum Level Transmitter Isolation Valve	941-02385-000	504-14189-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Inboard, Water Leg	X		B
HV-	X3423B	HV-X3423B	Drum Level Transmitter Isolation Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8	at Transmitter Rack	X		B
HV-	X3424B	HV-X3424B	Drum Level Transmitter Isolation Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8	at Transmitter Rack	X		B
LIT-	X3420B	LT-4509B	Drum Level Transmitter, B	817-04643-000	504-14189-007	1/2"	Transmitter	NPT	-	316SS	Rosemount	2051CD2A02A1AKBS 5M5Q4Q8	TRANSMITTER, COPLANAR DIFFERENTIAL, W/ B31.1 MANIFOLD, -250 TO 250 inH2O, 4-20mA HART, W/ LCD  Calibrated -28 to 0 inH2O for -10 to +18 Level Indication	X		B
HV-	X3420B	HV-X3420B	Drum Level Transmitter 3-Valve manifold	Part of Transmitter	504-14189-007	1/2"	Manifold	NPT	-	316SS	Rosemount	0305RC82B21B4	MANIFOLD, 3 VALVE, ASME B31.1, FLANGE, 1/2" NPT PROCESS CONNECTIONS	X		B
HV-	X3425B	HV-X3425B	Drum Level Transmitter Drain Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8		X		B
HV-	X3426B	HV-X3426B	Drum Level Transmitter Drain Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8		X		B
HV-	X3427B	HV-X3427B	Drum Level Transmitter Drain Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8				B
HV-	X3428B	HV-X3428B	Drum Level Transmitter Drain Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8				B
HV-	X3449	HV-X3449	Steam Drum Pressure Transmitter Root Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8	-			B

TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
PIT-X3450		PIT-4510	Steam Drum Pressure Transmitter	834-01826-000	504-14189-007	1/2"	Transmitter	NPT	-	316SS	Rosemount	2088G3S22A1M5B4K BQ4Q8S5	TRANSMITTER, IN-LINE GAUGE, W/ B31.1 MANIFOLD, 14.7 TO 800 PSI, 4-20mA HART, W/ LCD  <b>Calibrated 0 to 700 PSIG</b>			
HV-X3450		HV-X3450	Steam Drum Pressure Transmitter 2-Valve manifold	Part of Transmitter	504-14189-007	1/2"	Transmitter	NPT	-	316SS	Rosemount	0306RT32BA21	ASME B31.1, NPT X NPT, 1/2" NPT PROCESS CONNECTION			
PI-X3460		PI-4511	Drum Pressure Gage	850-02250-000	504-14189-008	1/2"	Indicator	NPT	-	-	Ashcroft	85-1010-S-04L 0/800 PSI	85 - Size: 8-1/2" 1010 - Type S - System (Tube & Socket): 316L SST 04L - Connection Location: 1/2" MNPT Lower Range: 0-800 PSIG	X		
HV-X3460		HV-X3460	Drum Pressure Gage 2-Valve Manifold	330-00954-000	504-14189-007	1/2"	Manifold	NPT	-	316SS	ANDERSON, GREENWOOD & CO	M25HPS-44F-XP	M25HP - 3/16" In-Line 2-Valve Manifold S - Body Material: 316 SS 44F - Connection (Inlet/Outlet): 1/2" FNPT x 1/2" MNPT XP - B31.1			
HV-X3459		HV-X3459	Pressure Gauge Isolation Valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8	<b>Lock Open</b>			
HV-X3462		HV-X3462	Drum Pressure Instruments Isolation Valve	941-03113-000	504-14189-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	<b>Lock Open</b>			B
HV-X3463		HV-X3463	Steam Drum Pressure - test valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8				1
HV-X3464		HV-X3464	Steam Drum Pressure - test valve	941-02856-000	504-14189-007	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8				
<b>CONTINUOUS BLOWDOWN</b>																
X-1-BBS-35-30C2-P		-	Continuous Blowdown Piping	900-00320-000	504-14189-007	1"	Pipe	PE	Sch 80	SA106B	Cleaver-Brooks	-	-			
HV-X3500		HV-X3500	Continuous Blowdown Stop Valve	941-02619-000	504-14189-007	1"	Globe	SW	800	SA105	Vogt	SW12141	-	X	X	0
HV-X3501		HV-X3501	Continuous Blowdown Metering Valve	941-02393-000	504-14189-007	1"	Globe Needle	SW	800	SA105	Vogt	SW12443	-	X	X	
<b>BOTTOM BLOW OFF</b>																
X-2-BBS-65-60C2-P		-	Bottom Blowoff Piping	900-00952-000	504-14189-007	2"	Pipe	PE	Sch80	SA106B	-	-	-			
HV-X6510		HV-X6510	Bottom Blowoff Valve	941-02946-000	504-14189-007	2"	Globe	SW	600	SA105	Edward	1641Y	Target End, Inboard.	X	X	1
HV-X6511		HV-X6511	Bottom Blowoff Valve	941-02946-000	504-14189-007	2"	Globe	SW	600	SA105	Edward	1641Y	Target End, Outboard.			1
HV-X6520		HV-X6520	Bottom Blowoff Valve	941-02946-000	504-14189-007	2"	Globe	SW	600	SA105	Edward	1641Y	Burner End, Inboard.			1
HV-X6521		HV-X6521	Bottom Blowoff Valve	941-02946-000	504-14189-007	2"	Globe	SW	600	SA105	Edward	1641Y	Burner End, Outboard.	X	X	1
<b>SATURATED STEAM PIPING</b>																
X-12-SHP-37-30C2-H		-	Steam Drum Outlet Saturated Piping	900-01039-000	504-14191-007	12"	Pipe	BW	Sch 40	SA106-B	Cleaver-Brooks	-	-			
HV-X3701		HV-X3701	Saturated Steam Piping Vent Valve	941-02384-000	504-14191-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	-	X	X	
HV-X3702		HV-X3702	Saturated Steam Piping Vent Valve	941-03113-000	504-14191-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	-	X	X	1
AX-X3704		AX-X3704	Isokinetic Steam Sample Nozzle	277-05026-000	504-14191-007	-	Nozzle	-	-	-	Jonas	-	Weld-In Isokinetic Steam Sampling Nozzle w/ 2 Isolation valves. Per ASTM D1066 requirements.	X		B
HV-X3705		HV-X3705	Isokinetic Steam Sample Stop Valve	included with nozzle	504-14191-007	1/2"	Needle	TSW	800	316SS	Parker	8W-U12LR-G-SS-HT-QC311	See Jonas docs for details	X		0
HV-X3706		HV-X3706	Isokinetic Steam Sample Stop Valve	included with nozzle	504-14191-007	1/2"	Needle	TSW	800	316SS	Parker	8W-U12LR-G-SS-HT-QC311	See Jonas docs for details	X		0
HV-X3707		HV-X3707	Saturated Steam Piping Drain Valve	941-02384-000	504-14191-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	-	X		
HV-X3708		HV-X3708	Saturated Steam Piping Drain Valve	941-03113-000	504-14191-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	-	X		1
HV-X3709		HV-X3709	Saturated Steam Piping Drain Valve	941-02384-000	504-14191-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	-	X		
<b>SUPERHEATER</b>																



TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev	
	X3800	TS-503	Superheater Assembly	401-00137-000	642-01493-000	-	SH Assembly	-	-	-	Cleaver-Brooks	-					
<b>MAIN STEAM OUTLET PIPING (SUPERHEATED)</b>																	
	X-10-SHP-43-60C2-H	-	Main Steam Piping	900-00380-000	504-14192-007	10"	Pipe	BW	Sch 40	SA106-B	Cleaver-Brooks	-					
	PSV-X4306	PSV-X4306	Superheater Safety Valve	940-07026-000	504-14192-008	3" x 4"	Safety	RFF	600	A216-WCB	Consolidated	1811-MB	Set at 465 psig. Capacity = 71,034 pph. 4"-150# flanged outlet.		X	0	
	DP-X4306	DP-X4306	Drip Pan Elbow for SH PSV	847-09171-000	504-14192-008	4"	Drip Pan	RFF	150	Carbon Steel	Keckley	-				0	
	X-8-VNT-46-15C2-P	-	Vent Stack for SH PSV	900-01007-000	504-14192-007	8"	Pipe	Open	Sch 40	SA106B	Cleaver-Brooks	-				0	
	HV-X4322	HV-X4322	Main Steam Piping Drain Valve	941-02385-000	504-14192-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Inboard		X		
	HV-X4323	HV-X4323	Main Steam Piping Drain Valve	941-03114-000	504-14192-007	1"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard		X	1	
	HV-X4324	HV-X4324	Main Steam Piping Drain Valve	941-02385-000	504-14192-007	1"	Gate	SW	800	SA105	Vogt	SW12111			X		
	PIT-X4320	PIT-4517	Superheater Steam Outlet Pressure Transmitter	834-01826-000	504-14192-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	2088G3S22A1M5B4K BQ4Q8S5	TRANSMITTER, IN-LINE GAUGE, W/ B31.1 MANIFOLD, -14.7 TO 800 PSI, 4-20mA HART, W/ LCD  Calibrated 0 to 700 PSIG				B
	HV-X4320	HV-X4320	Steam Header Pressure Transmitter 2-Valve Manifold	Part of Transmitter	504-14192-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	0306RT32BA21	ASME B31.1, NPT X NPT, 1/2" NPT PROCESS CONNECTION				B
	HV-X4318	HV-X4318	Superheater Steam Outlet Pressure Transmitter High High Trip Isolation Valve	941-02384-000	504-14192-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Lock Open, Inboard		X	1	
	HV-X4319	HV-X4319	Superheater Steam Outlet Pressure Transmitter High High Trip Isolation Valve	941-03113-000	504-14192-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Lock Open, Outboard		X	1	
	TW-X4320A	TW-4517A	Superheater Outlet Temperature Transmitter Thermowell	096-00124-000 (096-00138-000)	504-14192-007	1-1/4"	Thermowell	SW	-	304 SS	Pyromation	HW4F0909T3"S	HW - Well Type: Heavy-Duty Socket-weld 4 - Bore Size: 0.260" Diameter F - Pipe Size: 1 1/4" NPS 09 - "S" Length (Stem Length): 9" 09 -Material: 304 SS T3 - Lag Length: 3" S - Options: Well Stamped with Customer Specified Tag Number		X		
	TE-X4320A	TE-4517A	Superheater Outlet Temperature Transmitter RTD	496-00017-000	504-14192-008	1/2"	Element	NPT	-	316 SS	Pyromation	R1T185H483-009-SL-8HN31,WI	R1T185H - 100 Ohm Platinum RTD Element, Single Element, High Range Wire Wound (-328 to 1112 F) 48 - Sheath Diameter: 1/4" 3 - Element Connection: 3-Wire 009 - Stem Length: 9" SL - Element Options: Spring Loaded Element 8HN - Head Mounting Fittings: 316SS 1/2" x 1/2" NPT Hex Nipple 31 - Head and Sheath Terminations: Aluminum Screw-Cover Head W.I - Options: Epoxy Coating, SS Tag		X		
	TIT-X4320A	TIT-4517A	Superheater Outlet Temperature Transmitter	817-03469-000	504-14192-008	1/2"	Transmitter	NPT	-	Aluminum Connection Head	Rosemount	644HAKBJ6M5F6Q4	TRANSMITTER, TEMPERATURE, 4 - 20mA HART, DIN HEADMOUNT, SINGLE SENSOR INPUT, 60 Hz FILTER, W/ LCD  Calibrated for 3-Wire Pt 100Ω RTD, 0 to 900 Deg F		X		
	TW-X4321	TW-4518	Superheater Outlet Temperature Transmitter Thermowell	096-00124-000 (096-00138-000)	504-14192-007	1-1/4"	Thermowell	SW	-	304 SS	Pyromation	HW4F0909T3"S	HW - Well Type: Heavy-Duty Socket-weld 4 - Bore Size: 0.260" Diameter F - Pipe Size: 1 1/4" NPS 09 - "S" Length (Stem Length): 9" 09 -Material: 304 SS T3 - Lag Length: 3" S - Options: Well Stamped with Customer Specified Tag Number		X		

TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
TE-	X4321	TE-4518	Superheater Outlet Temperature Transmitter RTD	496-00017-000	504-14192-008	1/2"	Element	NPT	-	316 SS	Pyromation	R1T185H483-009-SL-8HN31,WI	R1T185H - 100 Ohm Platinum RTD Element, Single Element, High Range Wire Wound (-328 to 1112 F) 48 - Sheath Diameter: 1/4" 3 - Element Connection: 3-Wire 009 - Stem Length: 9" SL - Element Options: Spring Loaded Element 8HN - Head Mounting Fittings: 316SS 1/2" x 1/2" NPT Hex Nipple 31 - Head and Sheath Terminations: Aluminum Screw-Cover Head W.I - Options: Epoxy Coating, SS Tag	X		
TIT-	X4321	TIT-4518	Superheater Outlet Temperature Transmitter	817-03469-000	504-14192-008	1/2"	Transmitter	NPT	-	Aluminum Connection Head	Rosemount	644HAKBJ6M5F6Q4	TRANSMITTER, TEMPERATURE, 4 - 20mA HART, DIN HEADMOUNT, SINGLE SENSOR INPUT, 60 HZ FILTER, W/LCD  <b>Calibrated for 3-Wire Pt 100Ω RTD, 0 to 900 Deg F</b>	X		
TW-	X4307	TW-4516	Superheater Outlet Temperature Thermowell	096-00124-000 (096-00138-000)	504-14192-007	1-1/4"	Thermowell	SW	-	304 SS	Pyromation	HW4F0909T3"S	HW - Well Type: Heavy-Duty Socket-weld 4 - Bore Size: 0.260" Diameter F - Pipe Size: 1 1/4" NPS 09 - "S" Length (Stem Length): 9" 09 -Material: 304 SS T3 - Lag Length: 3" S - Options: Well Stamped with Customer Specified Tag Number	X		
TI-	X4307	TI-4516	Superheater Outlet Temperature Gauge	937-00904-000	504-14192-008	1/2"	Indicator	NPT	-	304 SS	Ashcroft	50EI60E090 200-1000F	50 - Dial Size: 5" EI - Case Style: EI Series Bimetal Thermometer 60 - Stem Connection: 1/2" NPT E - Stem Location: Everyangle 090 - Stem Length: 9" Range: 200 - 1000 F			
HV-	X4328A	HV-X4328A	Steam Header Pressure Transmitter Root Valve	941-02384-000	504-14192-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard	X		1
HV-	X4329A	HV-X4329A	Steam Header Pressure Transmitter Root Valve	941-03113-000	504-14192-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard	X		1
PIT	X4330A	PIT-4519A	Steam Header Pressure Transmitter	834-01826-000	504-14192-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	2088G3S22A1M5B4K BQ4Q8S5	TRANSMITTER, IN-LINE GAUGE, W/ B31.1 MANIFOLD, -14.7 TO 800 PSI, 4-20mA HART, W/ LCD  <b>Calibrated 0 to 700 PSIG</b>			
HV-	X4330A	HV-X4330A	Steam Header Pressure Transmitter 2-Valve Manifold	Part of Transmitter	504-14192-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	0306RT32BA21	ASME B31.1, NPT X NPT, 1/2" NPT PROCESS CONNECTION			
HV-	X4338	HV-X4338	Steam Header Pressure Transmitter Root Valve	941-02384-000	504-14192-007	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard	X		1
HV-	X4339	HV-X4339	Steam Header Pressure Transmitter Root Valve	941-03113-000	504-14192-007	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard	X		1
PI-	X4340	PI-4520	Steam Header Pressure Gauge	850-02250-000	504-14192-008	1/2"	Indicator	NPT	-	-	Ashcroft	85-1010-S-04L 0/800 PSI	85 - Size: 8-1/2" 1010 - Type S - System (Tube & Socket): 316L SST 04L - Connection Location: 1/2" MNPT Lower Range: 0-800 PSIG	X		
HV-	X4340	HV-X4340	Steam Header Pressure Gauge 2-Valve Manifold	330-00954-000	504-14192-008	1/2"	Manifold	NPT	-	316SS	ANDERSON, GREENWOOD & CO	M25HPS-44F-XP	M25HP - 3/16" In-Line 2-Valve Manifold S - Body Material: 316 SS 44F - Connection (Inlet/Outlet): 1/2" FNPT x 1/2" MNPT XP - B31.1			
<b>X-4-SHP-43-60C2-H</b>			Main Steam Piping - Start-up Vent	900-00652-000	504-14192-007	4"	Pipe	BW	Sch 40	SA106-B	Cleaver-Brooks	-	-			3
HV- ZSC- ZSO-	X4350	XV-4521 ZSC-4521 ZSO-4521	Start-Up Vent Isolation Valve	223-00628-000	504-14192-008	4"	Ball	BW	600	A105	Flowtek	M1	Flowtek model S98 pneumatic actuator, Spring Return, Fail Closed, Bray model# 50 Open/Closed Limit switches, Bray# 63 Solenoid, filter-regulator	X	X	2
HV-	X4354	HV-X4354	Start-up Vent Drain Valve	941-03114-000	504-14192-007	1"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	-			1
FCV- FZ- ZT-	X4351	FCV-4513 FY-4513 ZT-4513	Start-up Vent Control Valve	230-00869-000	504-14192-008	4"	Control	RFF	600	SA216-WCB	Fisher	ED	Fisher 667 Size 45i actuator, DVC6200-HC positioner, Class IV shutoff, 4-20 mA Input signal.			
SIL-	X4352	SIL-X4352	Start-up Vent Silencer	154-01246-000	504-14192-008	-	Silencer	RFF	600	CS	Aarding	-	Sized for 50,000 lb/hr steam, 135 psi pressure drop. See Aarding documents for details	X		B
<b>X-10-SHP-43-60C2-H</b>			Main Steam Piping	900-00380-000	504-14192-007	10"	Pipe	BW	Sch 40	SA106-B	Cleaver-Brooks	-	-			B

TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
FV-	X4300	FV-X4300	Main Steam Non-Return Valve	940-07309-000	504-14192-008	8"	Stop-Check	BW	600	A216-WCB	Edward	B602Y	10:1 Turndown, dP=6 psig			
HV-	X4302	HV-X4302	Main Steam Spool Piece Drain Valve	941-02385-000	504-14192-007	1"	Gate	SW	800	SA105	Vogt	SW12111	Inboard	X	X	0
HV-	X4303	HV-X4303	Main Steam Spool Piece Drain Valve	941-03114-000	504-14192-007	1"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard	X	X	1
HV-	X4304	HV-X4304	Main Steam Spool Piece Drain Valve	941-02385-000	504-14192-007	1"	Gate	SW	800	SA105	Vogt	SW12111	-			B
HV-	X4301	HV-X4301	Main Steam Stop Valve	225-00790-000	504-14192-007	10"	Gate	BW	600	SA216-WCB	Crane	76-1/2XUF	ends bored to match Sch 40		X	
HV-	X4305	HV-X4305	Main Steam Warmup Valve	941-02385-000	504-14192-007	1"	Gate	SW	800	SA105	Vogt	SW12111	-			
HV-	X4306	HV-X4306	Vent Valve	941-03114-000	880-30196-008	1"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	-	X	X	1
TW-	X4320B	TW-4517B	Superheater Outlet Temperature Transmitter Thermowell	096-00124-000 (096-00138-000)	880-30212-008	1-1/4"	Thermowell	SW	-	304 SS	Pyromation	HW4F0909T3"S	HW - Well Type: Heavy-Duty Socket-weld 4 - Bore Size: 0.260" Diameter F - Pipe Size: 1 1/4" NPS 09 - "S" Length (Stem Length): 9" 09 -Material: 304 SS T3 - Lag Length: 3" S - Options: Well Stamped with Customer Specified Tag Number	X		2
TE-	X4320B	TE-4517B	Superheater Outlet Temperature Transmitter RTD	496-00017-000	880-30212-008	1/2"	Element	NPT	-	316 SS	Pyromation	R1T185H483-009-SL-8HN31,WI	R1T185H - 100 Ohm Platinum RTD Element, Single Element, High Range Wire Wound (-328 to 1112 F) 48 - Sheath Diameter: 1/4" 3 - Element Connection: 3-Wire 009 - Stem Length: 9" SL - Element Options: Spring Loaded Element 8HN - Head Mounting Fittings: 316SS 1/2" x 1/2" NPT Hex Nipple 31 - Head and Sheath Terminations: Aluminum Screw-Cover Head W,I - Options: Epoxy Coating, SS Tag	X		2
TIT-	X4320B	TIT-4517B	Superheater Outlet Temperature Transmitter	817-03469-000	880-30212-008	1/2"	Transmitter	NPT	-	Aluminum Connection Head	Rosemount	644HAKBJ6M5F6Q4	TRANSMITTER, TEMPERATURE, 4 - 20mA HART, DIN HEADMOUNT, SINGLE SENSOR INPUT, 60 Hz FILTER, W/ LCD  <b>Calibrated for 3-Wire Pt 100Q RTD, 0 to 900 Deg F</b>			2
FE-	X4300	FE-4515	Superheated Steam Flow Element	048-01049-000	880-30212-008	12"	V-Cone	BW	-	-	McCrometer	VB12FE01N	v cone See initial sizing sheet 12" Sch 40 pipe, A106-B Cone: 316/L Stainless Steel Ends: BW Includes hydrostatic testing per ASME B31.3,	X		2
FIT-	X4300	FIT-4515	Superheated Steam Flow Transmitter	817-04644-000	880-30212-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	2051CD3A02A1AKBS5M5Q4Q8/0305RC82B21B4	TRANSMITTER, COPLANAR DIFFERENTIAL, W/ B31.1 MANIFOLD, -1000 TO 1000 inH2O, 4-20mA HART, W/ LCD, ROSEMOUNT #2051CD3A02A1AKBS5M5Q4Q8/0305RC82B21B4 2051C - Coplanar Pressure Transmitter D - Measurement Type: Differential 3 - Pressure Range: -1000 to 1000 inH2O A - Transmitter Output: 4-20mA HART Protocol 0 - Materials of Construction: Alternate Process Connection 2 - Isolating Diaphragm: Standard 316L SS A - O-Ring: Glass Filled PTFE 1 - Sensor Fill Fluid: Silicone A - Housing Material and Conduit: Aluminum 1/2-14 NPT KB - Product Certs: FM and CSA Explosion-proof, Dust Ignition Proof, Intrinsically Safe, and Division 2 S5 - Manifold Assembly: Assemble to Rosemount 305 Integral Manifold M5 - Display and Interface Options: LCD Q4,Q8 - Product Certs: Calibration Certificate, MTR Certificate ROSEMOUNT #2051CD3A02A1AKBS5M5Q4Q8/0305RC82B21B4	X		2
HV-	X4300	HV-X4300	Superheated Steam Flow Transmitter 3-Valve manifold	Part of Transmitter	880-30212-008	1/2"	Manifold	NPT	-	316SS	Rosemount	0305RC82B21B4	MANIFOLD, 3 VALVE, ASME B31.1, FLANGE, 1/2" NPT PROCESS CONNECTIONS	X		2
HV-	X4311	HV-X4311	Root Valve for Superheated Steam Flow Transmitter	941-02384-000	880-30212-008	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard	X		2

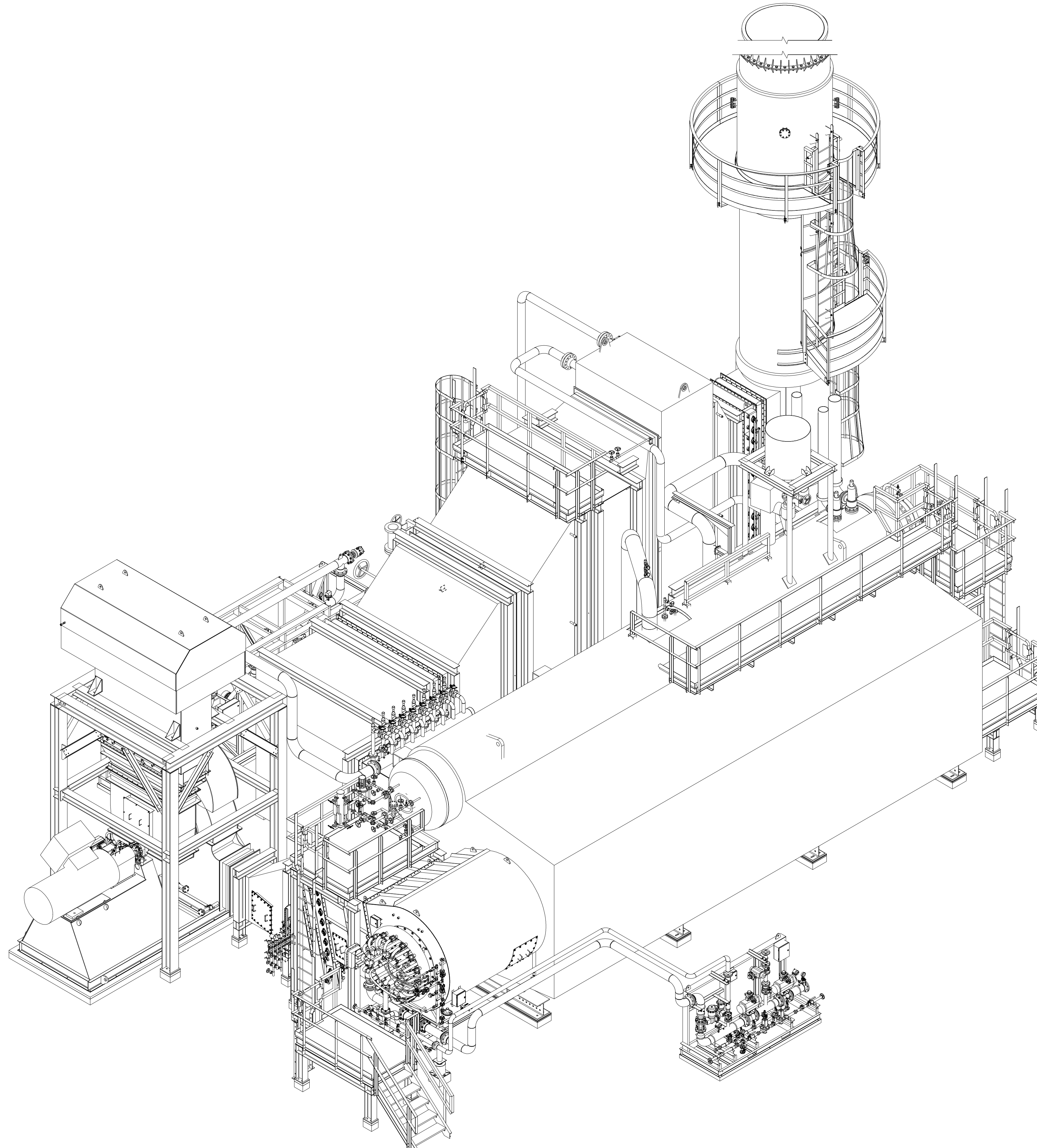
TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
HV-X4312		HV-X4312	Root Valve for Superheated Steam Flow Transmitter	941-02384-000	880-30212-008	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard			
														X		2
HV-X4313		HV-X4313	Root Valve for Superheated Steam Flow Transmitter	941-03113-000	880-30212-008	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard			
														X		2
HV-X4314		HV-X4314	Root Valve for Superheated Steam Flow Transmitter	941-03113-000	880-30212-008	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard			
														X		2
HV-X4315		HV-X4315	Drain Vavle for Superheated Steam Flow Transmitter	941-02856-000	880-30212-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8				
														X		2
HV-X4316		HV-X4316	Drain Vavle for Superheated Steam Flow Transmitter	941-02856-000	880-30212-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8				
														X		2
HV-X4317		HV-X4317	Drain Vavle for Superheated Steam Flow Transmitter	941-02856-000	880-30212-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8				
														X		2
HV-X4318		HV-X4318	Drain Vavle for Superheated Steam Flow Transmitter	941-02856-000	880-30212-008	1/2"	Needle	Tube	2500	316SS	Swagelok	SS-6DBS8				
														X		2
HV-X4328B		HV-X4328B	Steam Header Pressure Transmitter Root Valve	941-02384-000	880-30212-008	3/4"	Gate	SW	800	SA105	Vogt	SW12111	Inboard			
														X		2
HV-X4329B		HV-X4329B	Steam Header Pressure Transmitter Root Valve	941-03113-000	880-30212-008	3/4"	Gate	SW / NPT	800	SA105	Vogt	TSW12111	Outboard			
														X		2
PIT X4330B		PIT-4519B	Steam Header Pressure Transmitter	834-01826-000	880-30212-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	2088G3S22A1M5B4K BQ4Q8S5	TRANSMITTER, IN-LINE GAUGE, W/ B31.1 MANIFOLD, -14.7 TO 800 PSI, 4-20mA HART, W/ LCD  <b>Calibrated 0 to 700 PSIG</b>			
																2
HV-X4330B		HV-X4330B	Steam Header Pressure Transmitter 2-Valve Manifold	Part of Transmitter	880-30212-008	1/2"	Transmitter	NPT	-	316SS	Rosemount	0306RT32BA21	ASME B31.1, NPT X NPT, 1/2" NPT PROCESS CONNECTION			
																2
<b>CHEMICAL FEED</b>																
X-1-CEM-56-30C2-P			Boiler Chemical Feed Piping	900-00320-000	504-14189-007	1"	Pipe	PE	Sch 80	SA106B	Cleaver-Brooks	-	-			
HV-X5601		HV-X5601	Chemical Feed Stop Valve	941-02619-000	504-14189-007	1"	Globe	SW	800	SA105	Vogt	SW12141	-		X	0
FV-X5600		FV-X5600	Chemical Feed Check Valve	227-00444-000	504-14189-007	1"	Check	SW	800	SA105	Vogt	SWS701	-		X	0
<b>MACHINE MONITORING</b>																
VEX-X6110		VEX-X6110	Vibration Probe, Fan Bearing, Non-Drive End, X	Part of Fan	-	-	-	-	-	-	-	-	See Howden documents for details		X	0
VEY-X6111		VEY-X6111	Vibration Probe, Fan Bearing, Non-Drive End, Y	Part of Fan	-	-	-	-	-	-	-	-	See Howden documents for details		X	0
VEK-X6112		VEK-X6112	Keyphasor	Part of Fan	-	-	-	-	-	-	-	-	See Howden documents for details		X	0
VEX-X6113		VEX-X6113	Vibration Probe, Fan Bearing, Drive End, X	Part of Fan	-	-	-	-	-	-	-	-	See Howden documents for details		X	0
VEY-X6114		VEY-X6114	Vibration Probe, Fan Bearing, Drive End, Y	Part of Fan	-	-	-	-	-	-	-	-	See Howden documents for details		X	0
TE-X6120A		TE-X6120A	Fan Bearing RTD, Non-Drive end	Part of Fan	-	-	-	-	-	-	-	-	See Howden documents for details		X	0
TE-X6120B		TE-X6120B	Fan Bearing RTD, Non-Drive end	Part of Fan	-	-	-	-	-	-	-	-	See Howden documents for details		X	0
TE-X6121A		TE-X6121A	Fan Bearing RTD, Drive end	Part of Fan	-	-	-	-	-	-	-	-	See Howden documents for details		X	0
TE-X6121B		TE-X6121B	Fan Bearing RTD, Drive end	Part of Fan	-	-	-	-	-	-	-	-	See Howden documents for details		X	0
VEX-X6130		VEX-X6130	Vibration Probe, Motor Bearing, Drive End, X	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details		X	0
VEY-X6131		VEY-X6131	Vibration Probe, Motor Bearing, Drive End, Y	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details		X	0
VEX-X6132		VEX-X6132	Vibration Probe, Motor Bearing, Non-Drive End, X	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details		X	0
VEY-X6133		VEY-X6133	Vibration Probe, Motor Bearing, Non-Drive End, Y	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details		X	0
TE-X6140A		TE-X6140A	Motor Bearing RTD, Drive end	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details		X	0
TE-X6140B		TE-X6140B	Motor Bearing RTD, Drive end	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details		X	0

TAG	NUMBER	CUSTOMER TAG#	FUNCTION / EQUIPMENT	PART NUMBER	PRODUCT STRUCTURE NUMBER	SIZE	TYPE	ENDS	CLASS	MATERIAL	MANUF.	MODEL #	ADDITIONAL NOTES	SP	RSP	Rev
TE-X6141A	TE-X6141A	TE-X6141A	Motor Bearing RTD, Non-Drive end	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details	X		0
TE-X6141B	TE-X6141B	TE-X6141B	Motor Bearing RTD, Non-Drive end	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details	X		0
TE-X6142A	TE-X6142A	TE-X6142A	Motor Stator RTD	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details	X		0
TE-X6142B	TE-X6142B	TE-X6142B	Motor Stator RTD	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details	X		0
TE-X6143A	TE-X6143A	TE-X6143A	Motor Stator RTD	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details	X		0
TE-X6143B	TE-X6143B	TE-X6143B	Motor Stator RTD	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details	X		0
TE-X6144A	TE-X6144A	TE-X6144A	Motor Stator RTD	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details	X		0
TE-X6144B	TE-X6144B	TE-X6144B	Motor Stator RTD	Part of Fan	-	-	-	-	-	-	-	-	See WEG documents for details	X		0
<b>START-UP SPARES &amp; MISC.</b>																
			Manway Gaskets	853-09208-000	880-30192-008	14" x 18"	-	-	-	-	Topog-E	Series 2000	Three sets (6 pieces). For spare.	X		B
			24" Flanged Manway gaskets	880-06799-000	880-30192-008	24"	Spiral Wound Gasket	-	300	-	Flexitallic	CGI	Three sets (6 pieces). For spare.			1
			Gage Glass, Tubular Type	851-00393-000	880-30192-008	3/4"	Indicator	-	250	Glass	Clark Reliance	-	Two. Spares for boil-out. 22 3/4" length	X		
			Tubular Gauge Glass Packing	789-01075-000	880-30192-008	3/4"	Packing	-	250	Rubber	Clark Reliance	BG-403R-8	two (2) sets (4 total) For use with tubular Gage glasses.	X		
			Furnace Observation Port Lens	851-00879-000	880-30192-008	1-1/2"	Lens	-	-	Glass	Sip, Inc.	-	Three. For spare.	X		
			Furnace Observation Port Lens gaskets	853-01218-000	880-30192-008	1-1/2"	Gasket	-	-	-	Garlock	9850	Qty: 6	X		

**TRIM LIST REVISION LOG**

<b>REV. #</b>	<b>DESCRIPTION OF CHANGE</b>	<b>RFEC #</b>	<b>PE</b>	<b>CE</b>	<b>PEM</b>	<b>DATE ISSUED</b>
A	Initial Release	-	DEC	JD		15-Feb-19
B	Update per customer comments		DEC	KB	MSV	18-Apr-19
0	Released for Construction		DEC			16-May-19
1	Corrected Thermal movement ( $\delta x$ ) of boiler nozzles, Corrected pressure class of Bottom Blowdown valves, change root valves to 3/4". Change outboard drain valve to SW/NPT	L4581-014	DEC	KB	MV	16-Jul-19
2	Updated Product Structure	L4581-029	DEC			17-Sep-19
3	Updated LSLL	L4581-044	DEC	TIB		11-Jun-20
4	Add FGR components	L4581-048	DEC			27-May-21
5	Updated tags	L4581-051	DEC			18-Jun-21

DO NOT SCALE USE DIMENSIONS ONLY		*NF* INDICATES NOT FURNISHED BY CLEAVER-BROOKS						
DO NOT USE FOR CONSTRUCTION UNLESS APPROVED BELOW								
THIS DRAWING IS THE PROPERTY OF CLEAVER-BROOKS AND IS LOANED ON CONDITION THAT IT SHALL NOT BE COPIED OR REPRODUCED IN WHOLE OR IN PART OR DISCLOSED TO ANY THIRD PARTY OR USED IN ANY WAY WITHOUT THE WRITTEN CONSENT OF CLEAVER-BROOKS. ANY EQUIPMENT OR MATERIAL SHOWN, BUT NOT FURNISHED BY CLEAVER-BROOKS, IS FOR ILLUSTRATING THE APPLICATION, AND CLEAVER-BROOKS ACCEPTS NO RESPONSIBILITY AS TO THE INSTALLATION OR OPERATION OF SUCH EQUIPMENT OR MATERIALS								
REV	DATE	DESCRIPTION	CNF	DWN	CKD	CKD DATE	APP	APP DATE
A	4/17/19	INITIAL RELEASE OF DRAWING		BLB	AA	4/17/19	DEC	4/17/19
B	5/29/19	UPDATE PER CUSTOMER COMMENTS		BLB	DEC	5/29/19	MSV	5/29/19
0	7/12/19	UPDATE PER CUSTOMER COMMENTS		BLB	DEC	7/16/19	MSV	7/16/19
1	9/5/19	UPDATE PER CUSTOMER COMMENTS	L4581-020	BLB	DEC	9/6/19	MSV	9/6/19



**NOTES:**

**GENERAL ARRANGEMENT**

1. REFER TO PDS/PTL-4581-83 FOR DESIGN DATA, PAINT NOTES AND COMPLETE DESCRIPTION OF EQUIPMENT & COMPONENTS.
2. FIELD WELDS WILL BE REQUIRED TO ASSEMBLE THIS EQUIPMENT. AT THE TIME THIS DRAWING IS MADE, THE LOCATION OF ALL FIELD WELDS MAY NOT BE KNOWN. PLEASE REFER TO DETAILED ASSEMBLY AND PIPING DRAWINGS, ISSUED IN 'AS BUILT' REVISION FOR THE LOCATION OF ALL FIELD WELDS.
3. DRAWING IS USED FOR GENERAL LAYOUT PURPOSES.
4. ALL VENTS AND DRAINS SHALL BE PIPED TO A SAFE AND VISIBLE LOCATION BY OTHERS.

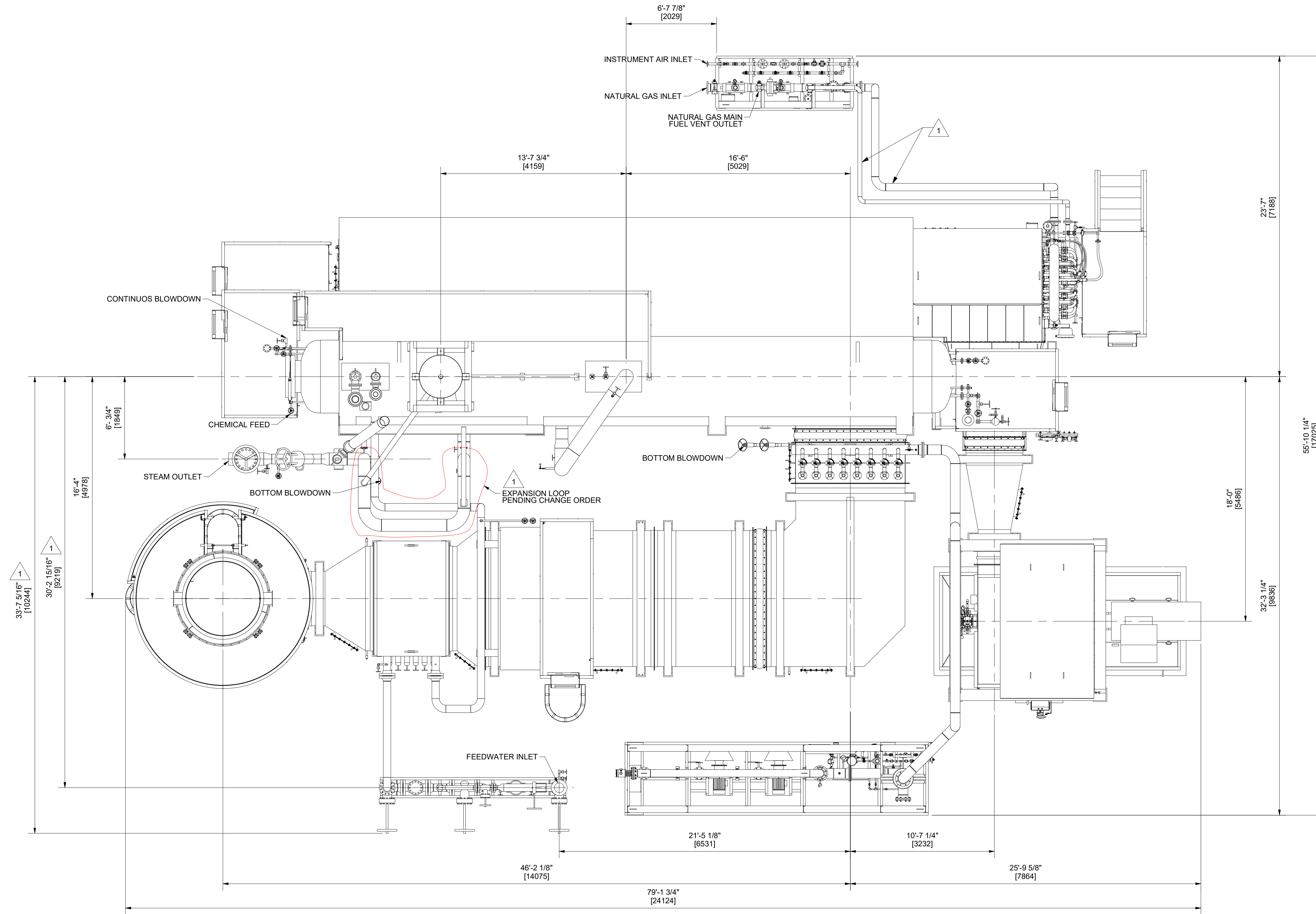
**BASE LOADING**

1. ALL DIMENSIONS ARE SHOWN IN COLD POSITION.
2. ALL CONCRETE WORK, REINFORCEMENT RODS, ANCHOR BOLTS, NUTS, WASHERS, ETC., ARE NOT DESIGNED NOR SUPPLIED BY CB-NEBRASKA.

NO ATTACHMENTS TO CLEAVER-BROOKS SUPPLIED  
EQUIPMENT WITHOUT PRIOR WRITTEN AUTHORIZATION

<b>CleaverBrooks®</b>			
ENGINEERED BOILER SYSTEMS			
NEBRASKA BOILER, CLEAVER-BROOKS, AND ENERGY RECOVERY INTERNATIONAL			
WITH NATCOM BURNER SYSTEMS			
GENERAL ARRANGEMENT			
SERIES: CP-NB-801D-125-550-AL-LH			
1			
SCALE: N/A	JOB NO.: CP-4581-83	SERIAL NO.: CP-4581-83	1 REV
HAND: LEFT HAND	DRAWING NO.: 122-08668		



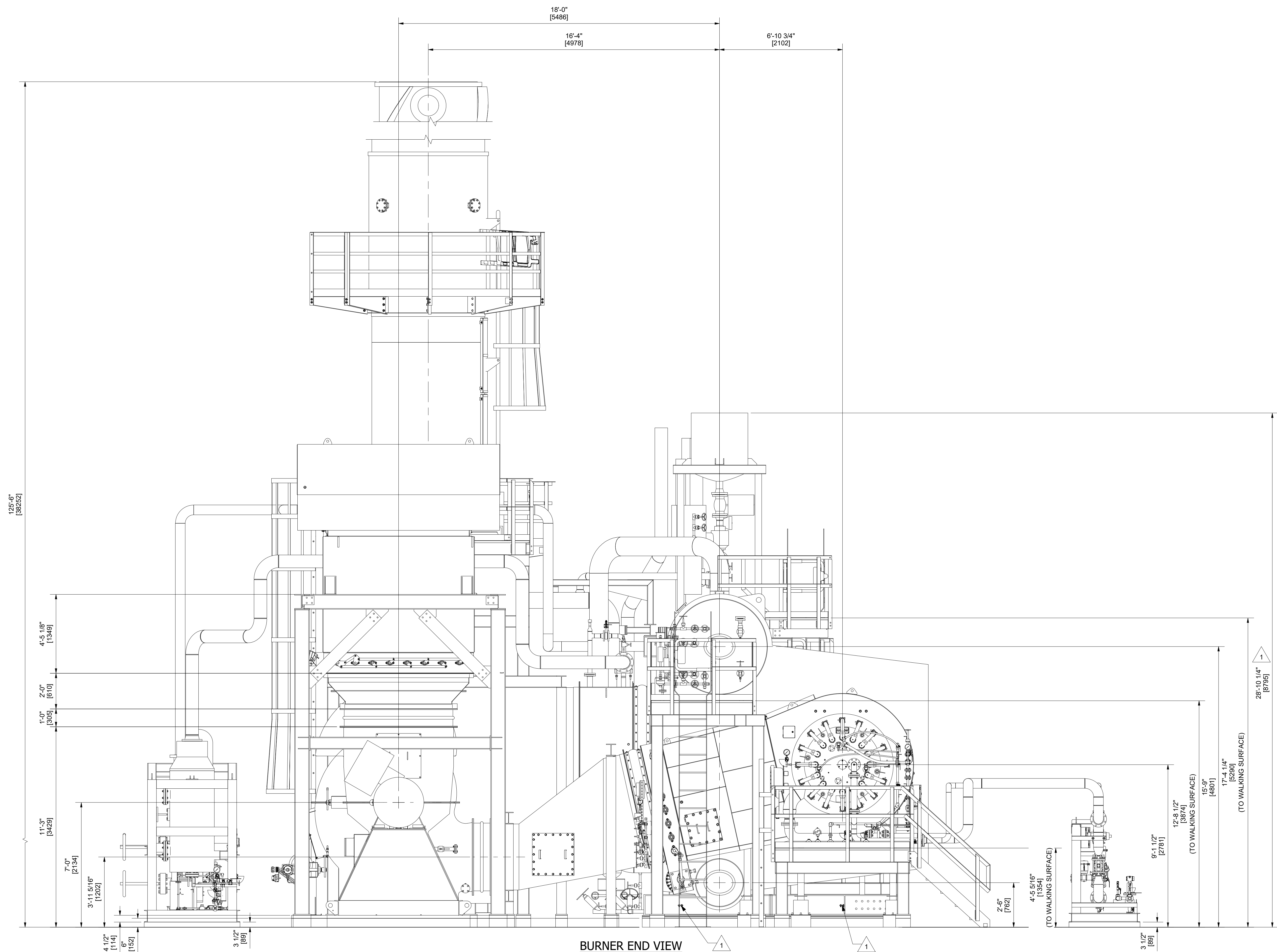


PLAN VIEW

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GENERAL ARRANGEMENT  
SERIES: CP-NB-801D-125-550-AL-LH

SCALE: N/A	SERIAL NO: CP-4581-83	1 REV
JOB NO: CP-4581-83	DRAWING NO: 2 OF 2	
HAND: LEFT HAND	722-08668	

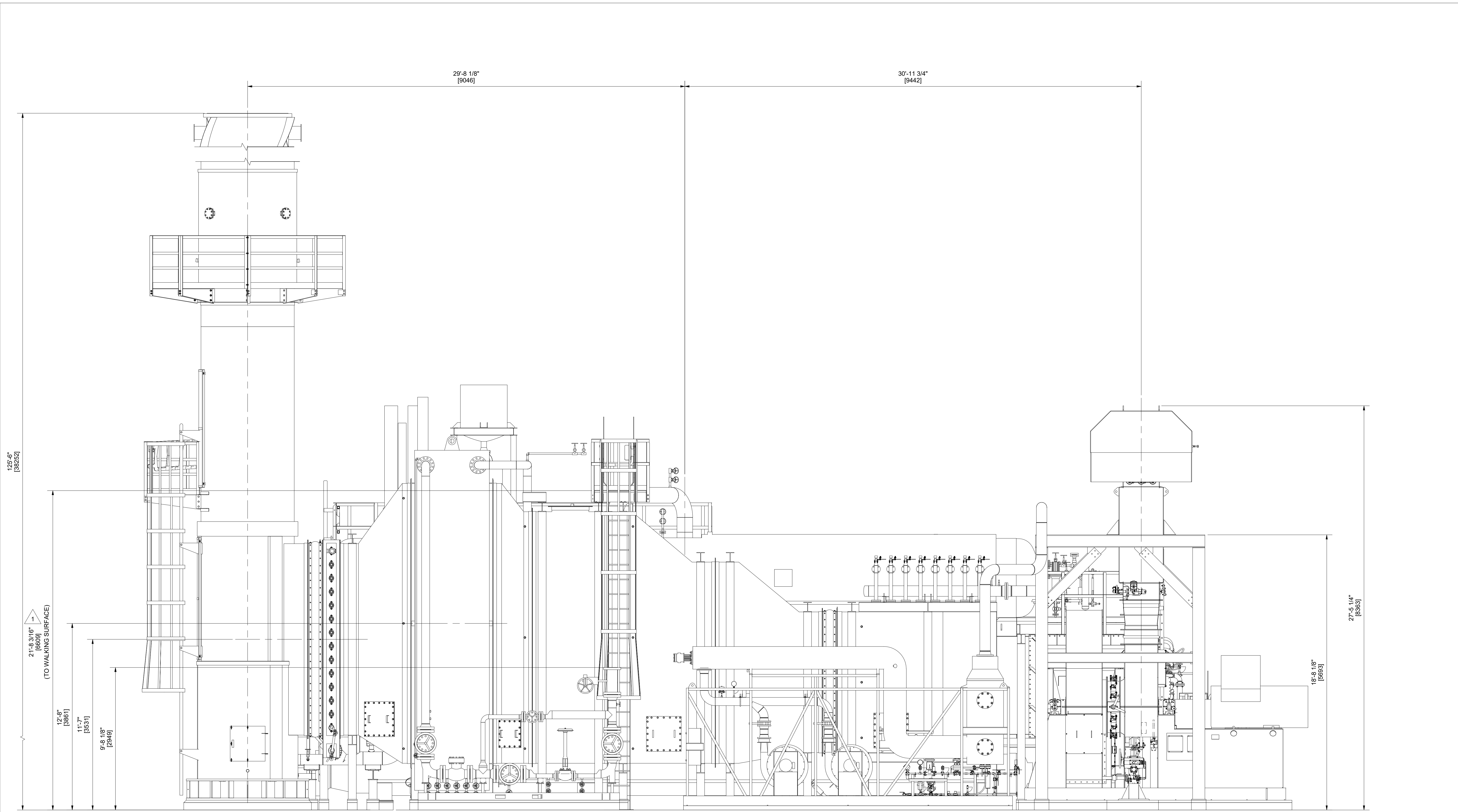




BURNER END VIEW

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 GENERAL ARRANGEMENT  
 SERIES: CP-NB-801D-125-550-AL-LH

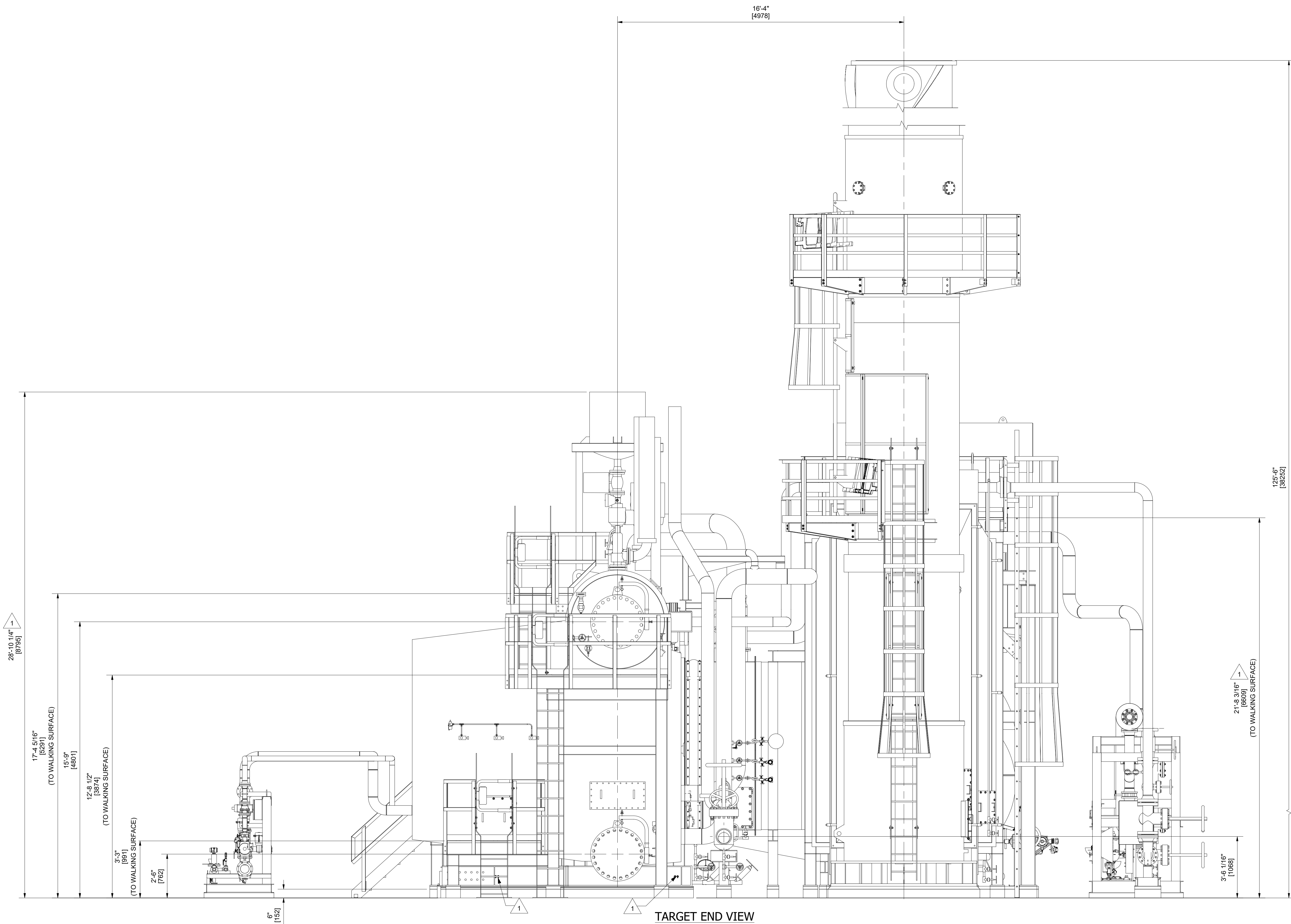
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JOB NO: CP-4581-83	DRAWING NO: 722-08668	
HAND: LEFT HAND		



CONVECTION SIDE VIEW

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 GENERAL ARRANGEMENT  
 SERIES: CP-NB-801D-125-550-AL-LH

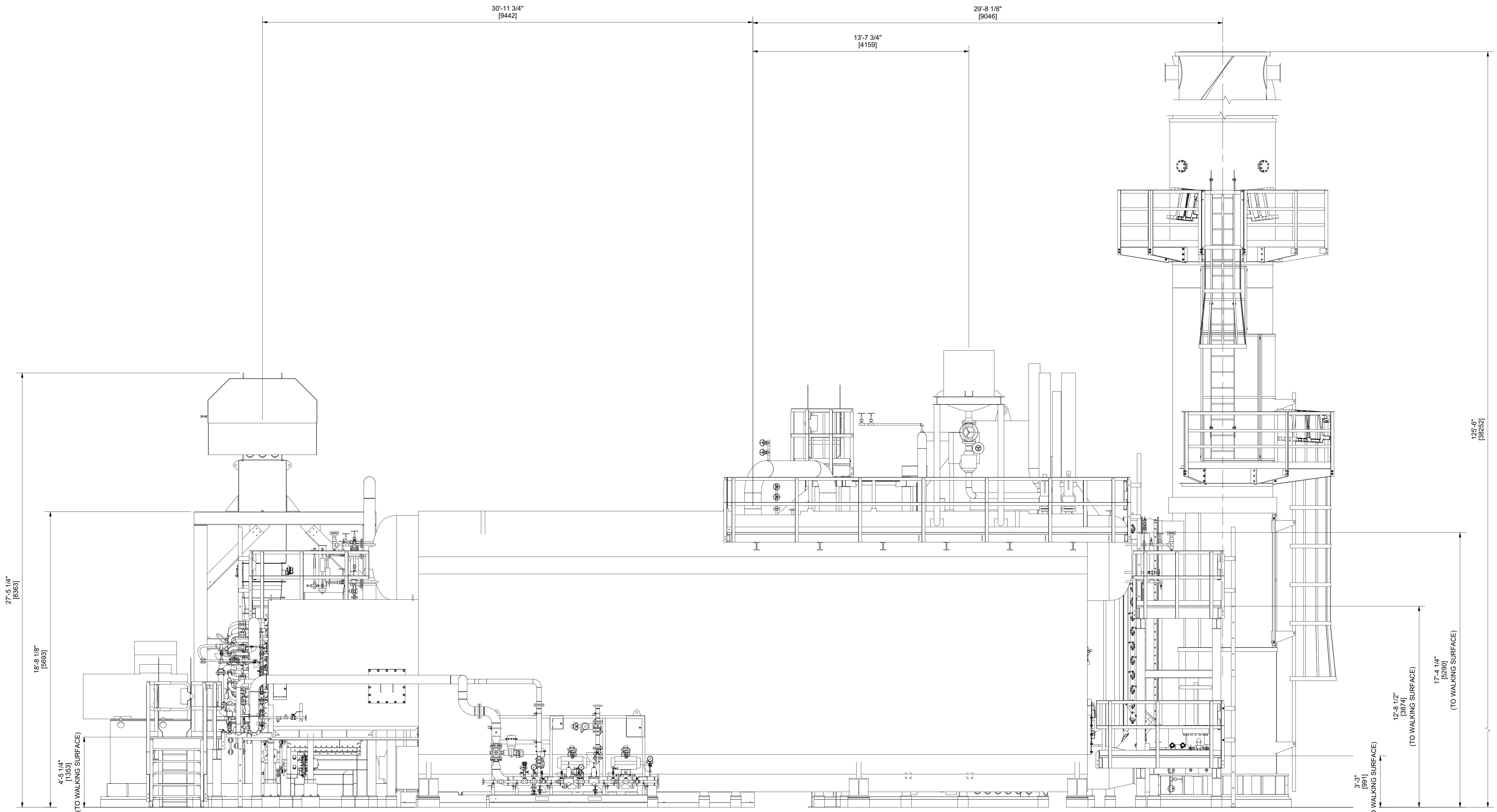
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JOB NO: CP-4581-83	DRAWING NO: 722-08668	
HAND: LEFT HAND		



TARGET END VIEW

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 GENERAL ARRANGEMENT  
 SERIES: CP-NB-801D-125-550-AL-LH

SCALE: N/A	SERIAL NO: CP-4581-83	1 REV
JOB NO: CP-4581-83	DRAWING NO: 3 OF 3	
HAND: LEFT HAND	722-08668	



FURNACE SIDE VIEW

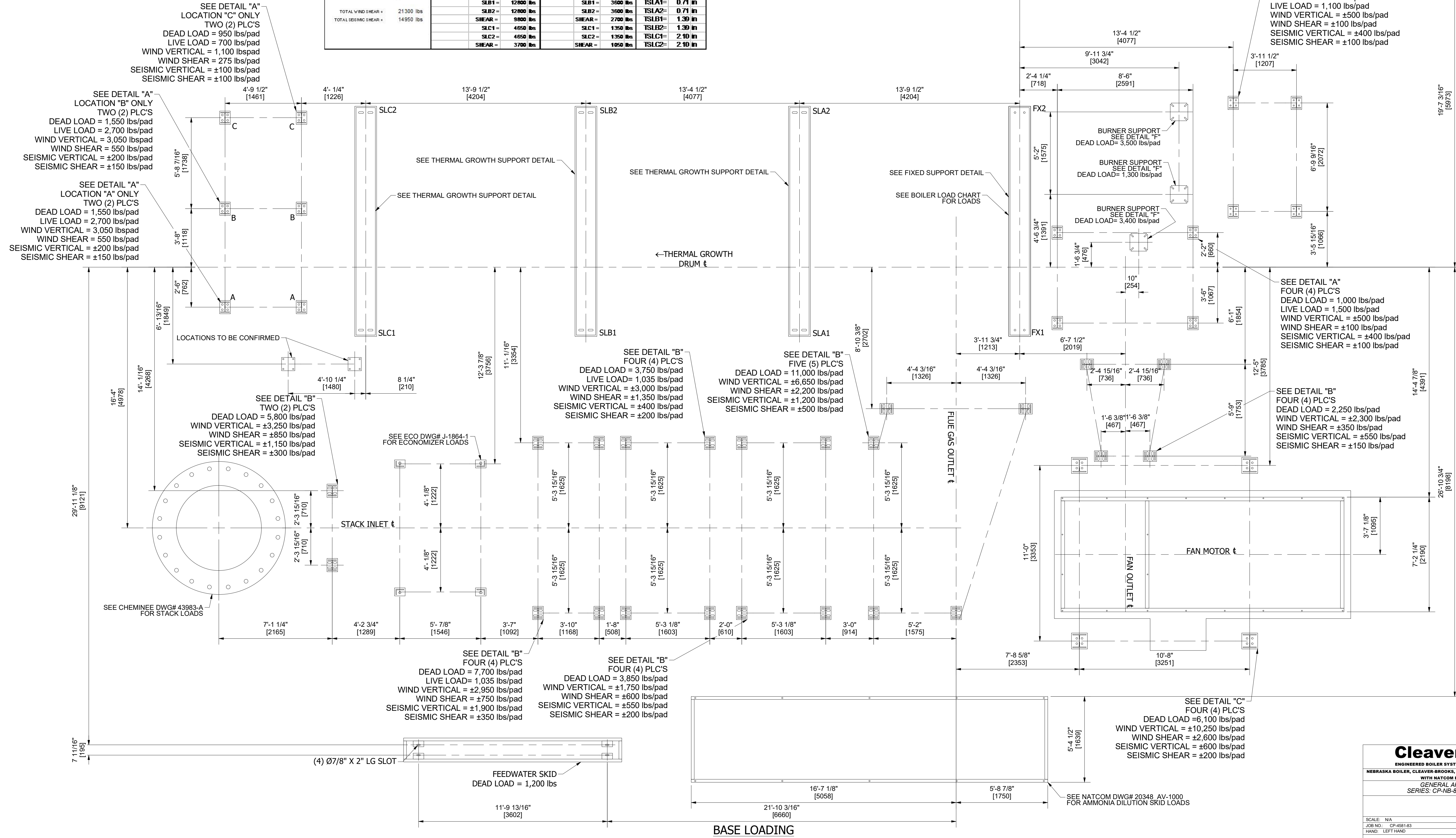
**CleaverBrooks®**  
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 WITH NATCOM BURNER SYSTEMS  
 GENERAL ARRANGEMENT  
 SERIES: CP-NB-801D-125-550-AL-LH

SCALE: N/A	SERIAL NO: CP-4581-83	<b>1</b> REV
JOB NO: CP-4581-83	DRAWING NO: 722-08668	
HAND: LEFT HAND	DRAWING NO: 722-08668	



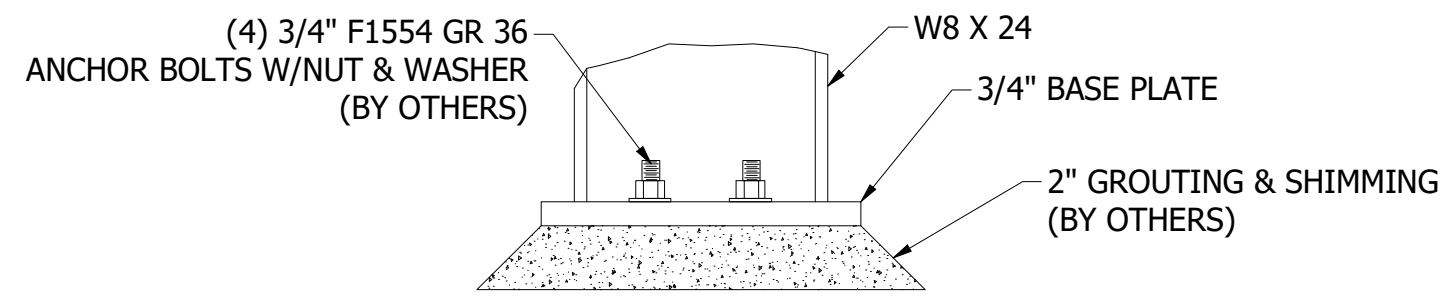
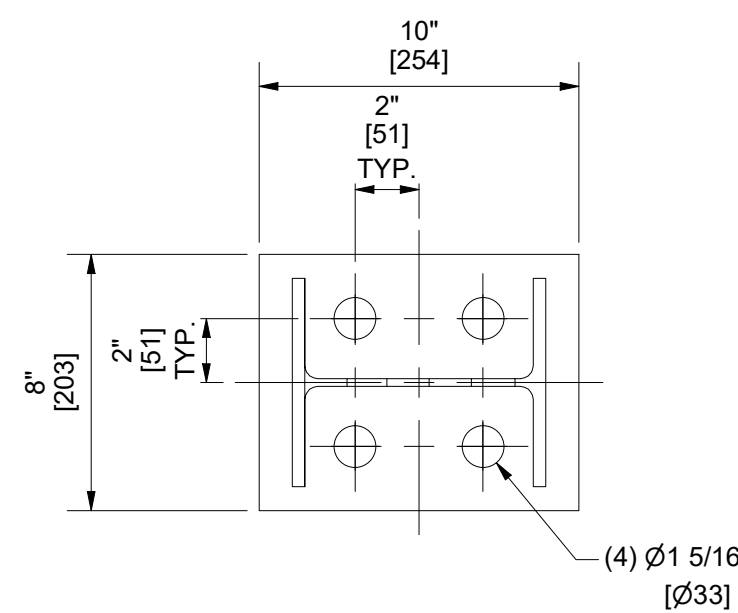


DISTRIBUTED BOILER LOADS CHART		
LOADS FOR DRY WEIGHT	LOADS FOR OPERATING WEIGHT	LOADS FOR FLOODED WEIGHT
DRY WEIGHT = 232500 lbs	OPERATING WEIGHT = 282100 lbs	FLOODED WEIGHT = 316400 lbs
FX1 = 19850 lbs	FX1 = 24000 lbs	FX1 = 26800 lbs
FX2 = 12500 lbs	FX2 = 15050 lbs	FX2 = 16850 lbs
SLA1 = 51950 lbs	SLA1 = 62900 lbs	SLA1 = 70450 lbs
SLA2 = 32600 lbs	SLA2 = 39500 lbs	SLA2 = 44250 lbs
SLB1 = 51350 lbs	SLB1 = 62300 lbs	SLB1 = 69850 lbs
SLB2 = 32200 lbs	SLB2 = 39100 lbs	SLB2 = 43850 lbs
SLC1 = 19250 lbs	SLC1 = 23400 lbs	SLC1 = 26200 lbs
SLC2 = 12100 lbs	SLC2 = 14650 lbs	SLC2 = 16450 lbs
TOTAL WIND SHEAR = 54450 lbs	TOTAL SEISMIC SHEAR = 14950 lbs	
TOTAL WIND SHEAR = 21300 lbs	TOTAL SEISMIC SHEAR = 14950 lbs	
	WIND (X and Y Direction)	SEISMIC (X and Y Direction)
	FX1 = 4650 lbs	FX1 = 1350 lbs
	FX2 = 4650 lbs	FX2 = 1350 lbs
	SHEAR = 10650 lbs	SHEAR = 7500 lbs
	SLA1 = 12800 lbs	SLA1 = 3600 lbs
	SLA2 = 12800 lbs	SLA2 = 3600 lbs
	SHEAR = 9800 lbs	SHEAR = 2700 lbs
	SLB1 = 12800 lbs	SLB1 = 3600 lbs
	SLB2 = 12800 lbs	SLB2 = 3600 lbs
	SHEAR = 9800 lbs	SHEAR = 2700 lbs
	SLC1 = 4650 lbs	SLC1 = 1350 lbs
	SLC2 = 4650 lbs	SLC2 = 1350 lbs
	SHEAR = 3700 lbs	SHEAR = 1050 lbs
		Thermal Growth
		TSLA1 = 0.71 in
		TSLA2 = 0.71 in
		TSLB1 = 1.30 in
		TSLB2 = 1.30 in
		TSLC1 = 2.10 in
		TSLC2 = 2.10 in

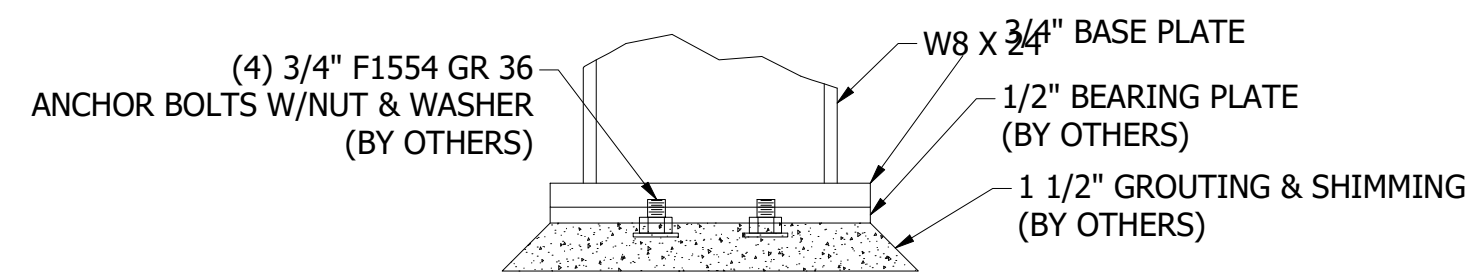
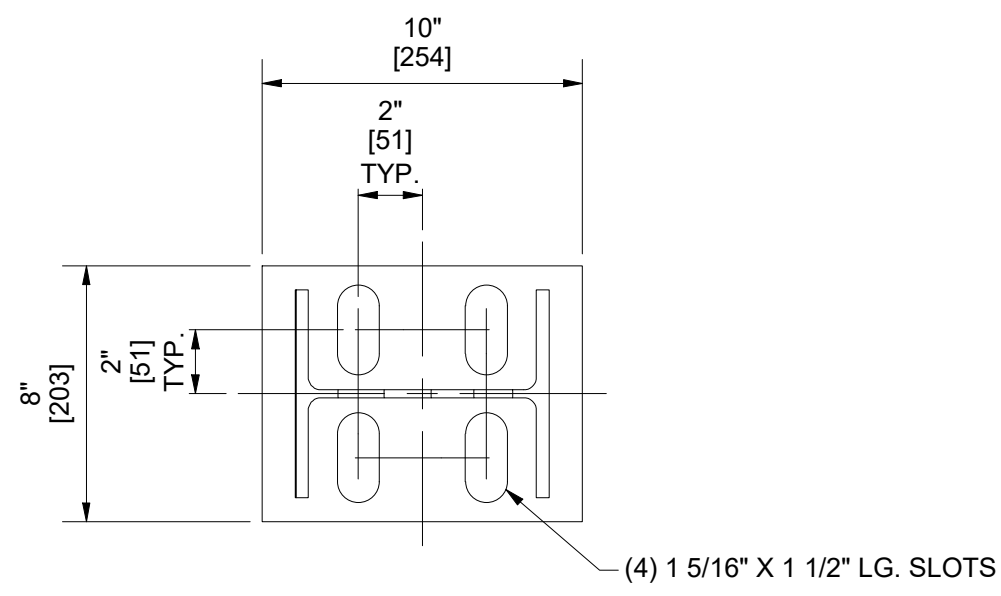


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ENGINEERED BOILER SYSTEMS  
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GENERAL ARRANGEMENT  
SERIES: CP-NB-801D-125-550-AL-LH

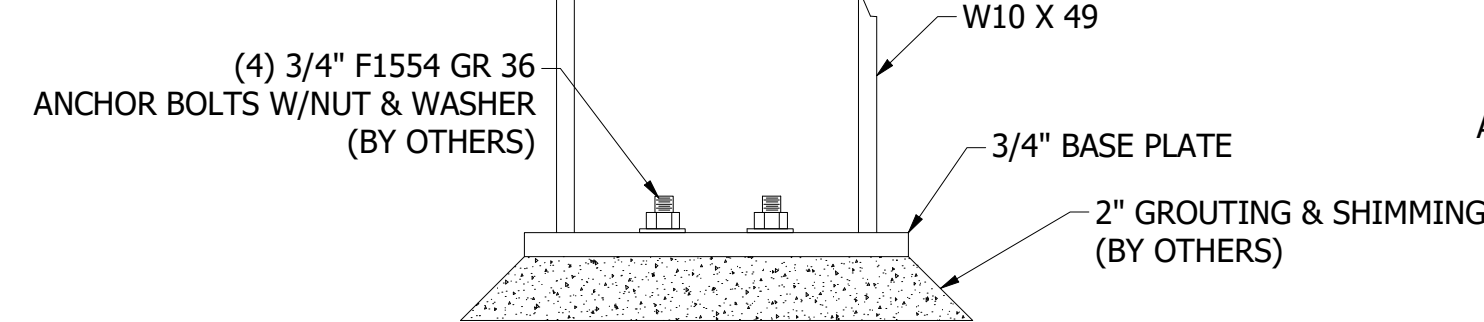
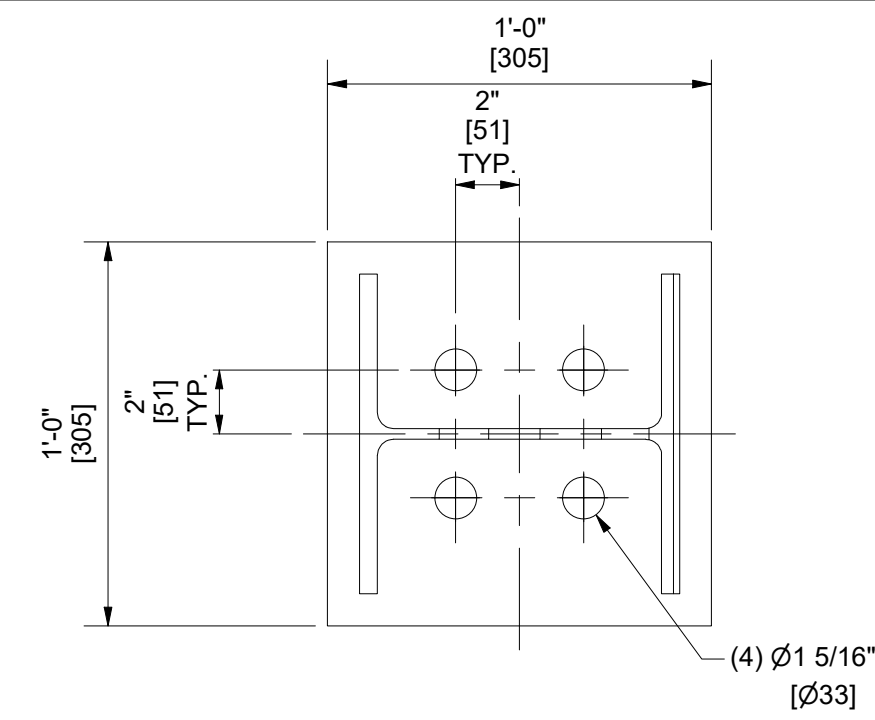
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JOB NO: CP-4581-83	DRAWING NO: 122-08668	
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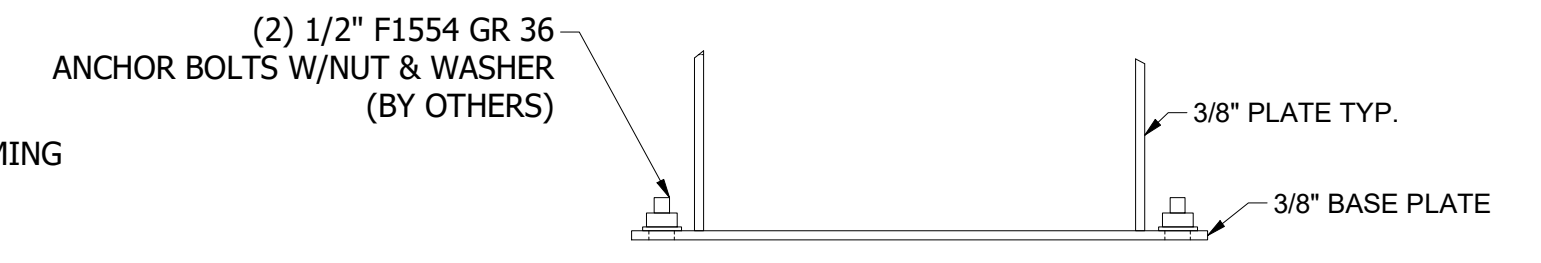
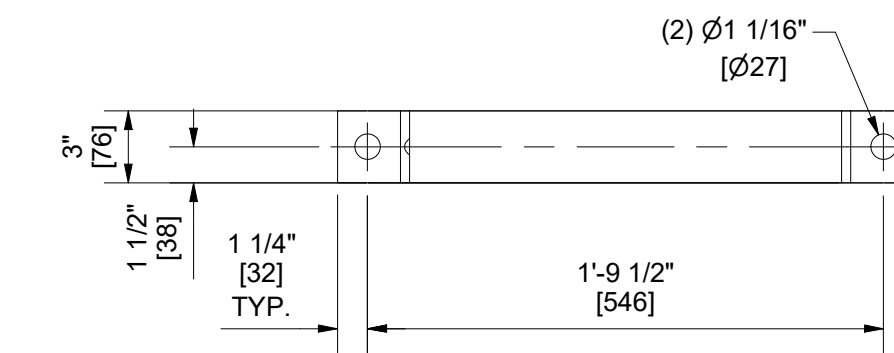
**DETAIL "A"**  
FOURTEEN (14) REQUIRED



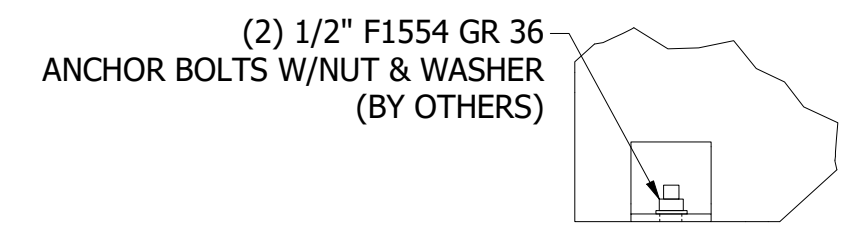
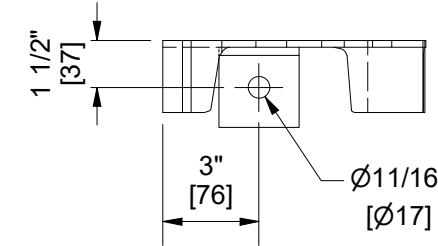
**DETAIL "B"**  
TWENTY THREE (23) REQUIRED



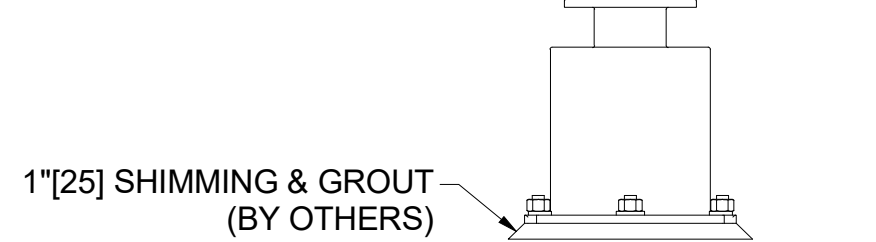
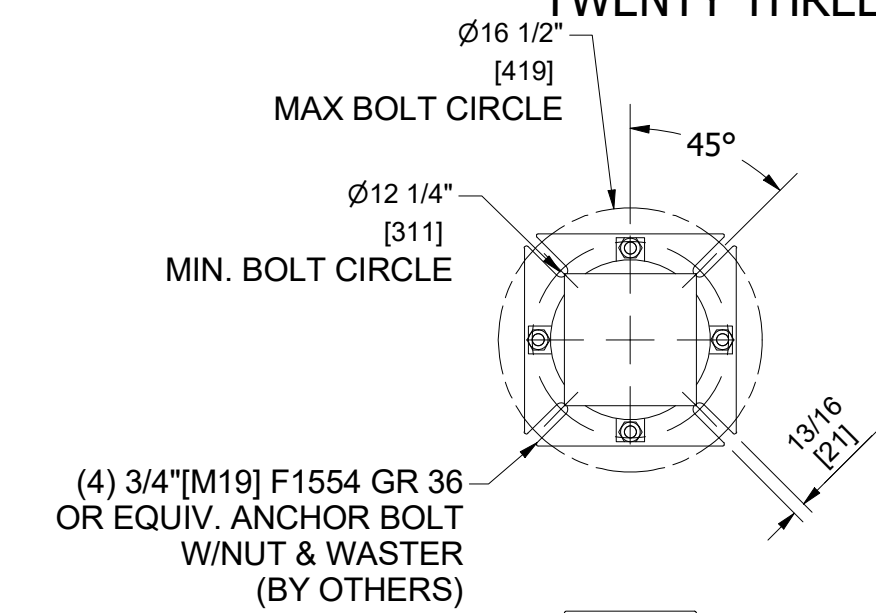
**DETAIL "C"**  
FOUR (4) REQUIRED



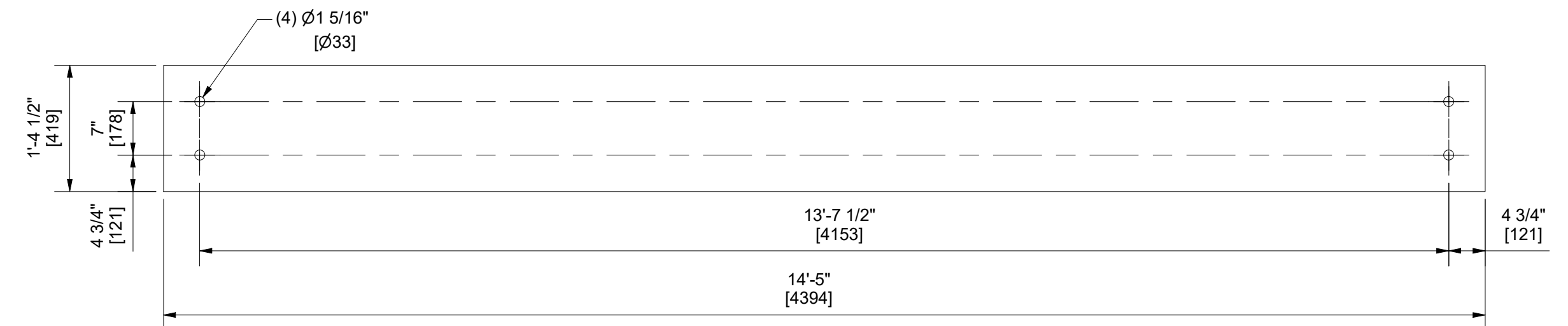
**DETAIL "D"**  
PLATFORM LADDER MOUNTING DETAIL  
FIVE (5) REQUIRED



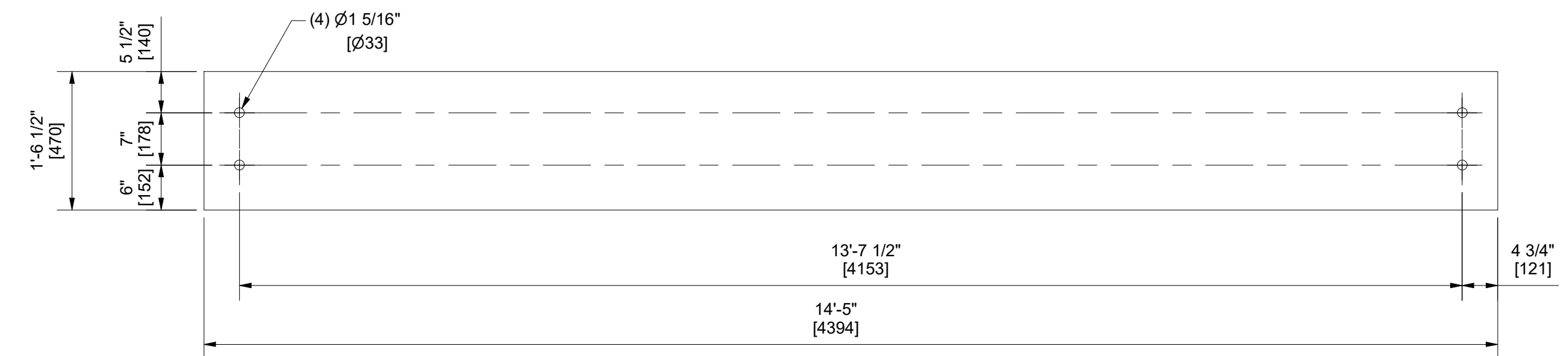
**DETAIL "E"**  
STAIR MOUNTING DETAIL  
TWO (2) REQUIRED



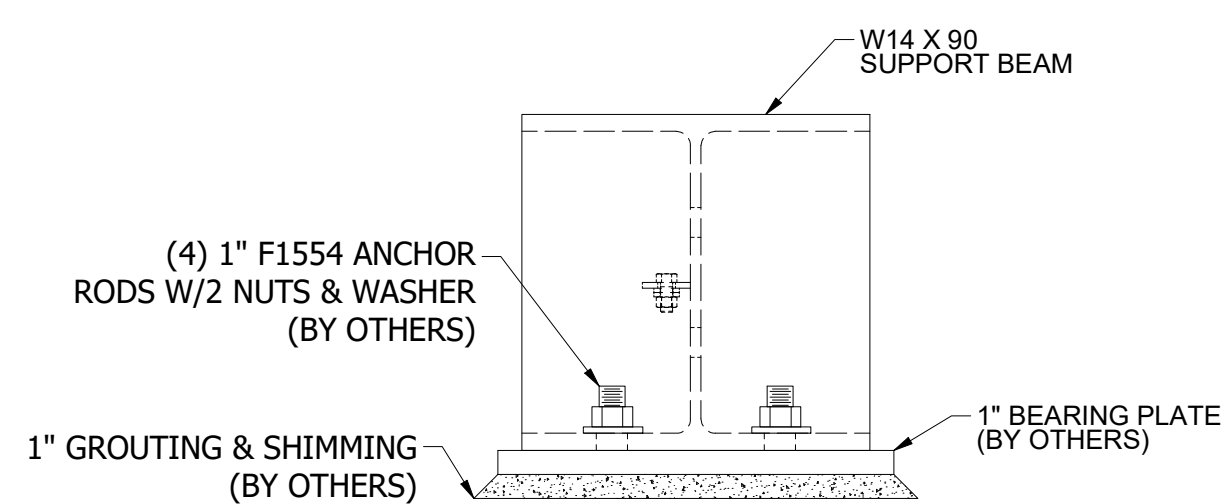
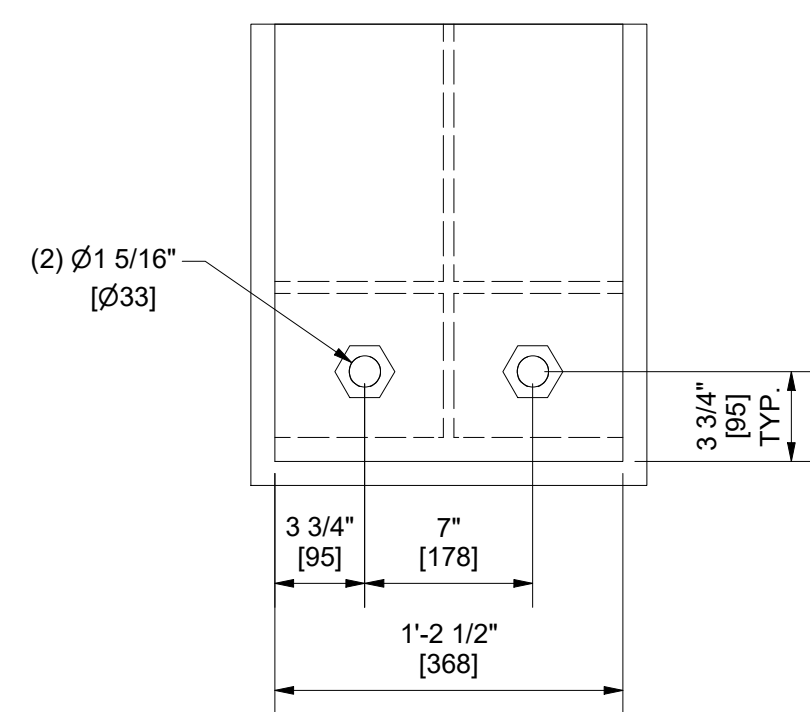
**DETAIL "F"**  
THREE (3) REQUIRED



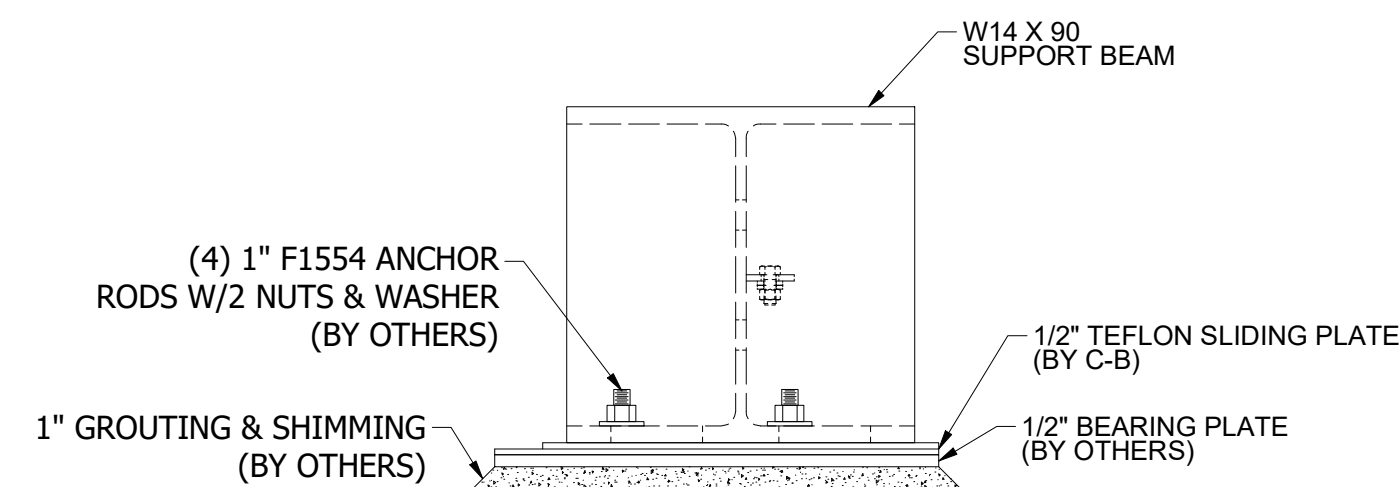
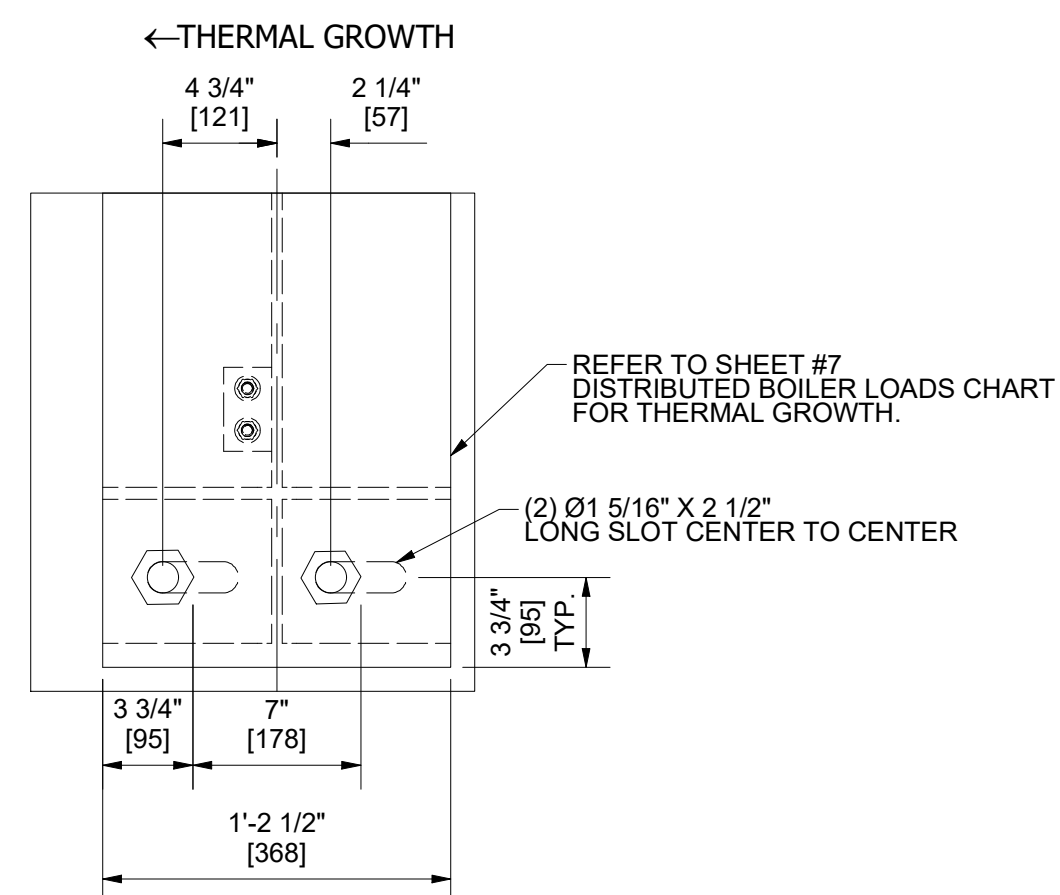
**FIXED SUPPORT BEARING PLATE DETAIL**  
TWO (2) REQUIRED (FX1 & FX2)  
1" THICK PLATE  
(BY OTHERS)



**THERMAL GROWTH SUPPORT BEARING PLATE DETAIL**  
SIX (6) REQUIRED (SLA1 & SLA2, SLB1 & SLB2, SLC1 & SLC2)  
1/2" THICK PLATE  
(BY OTHERS)



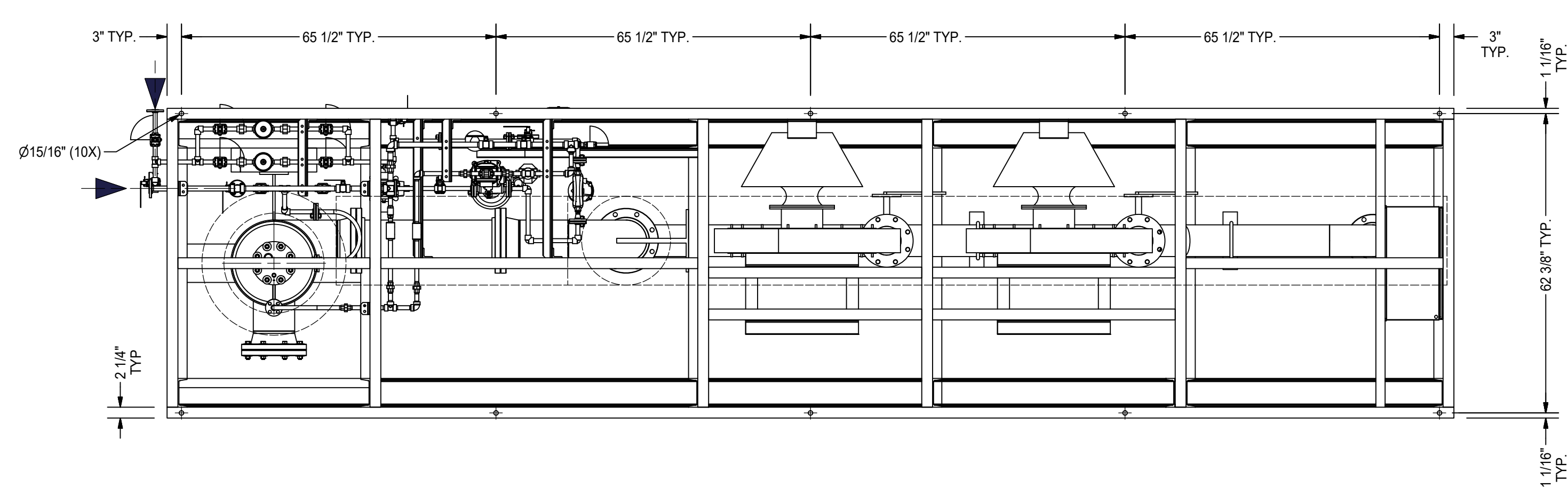
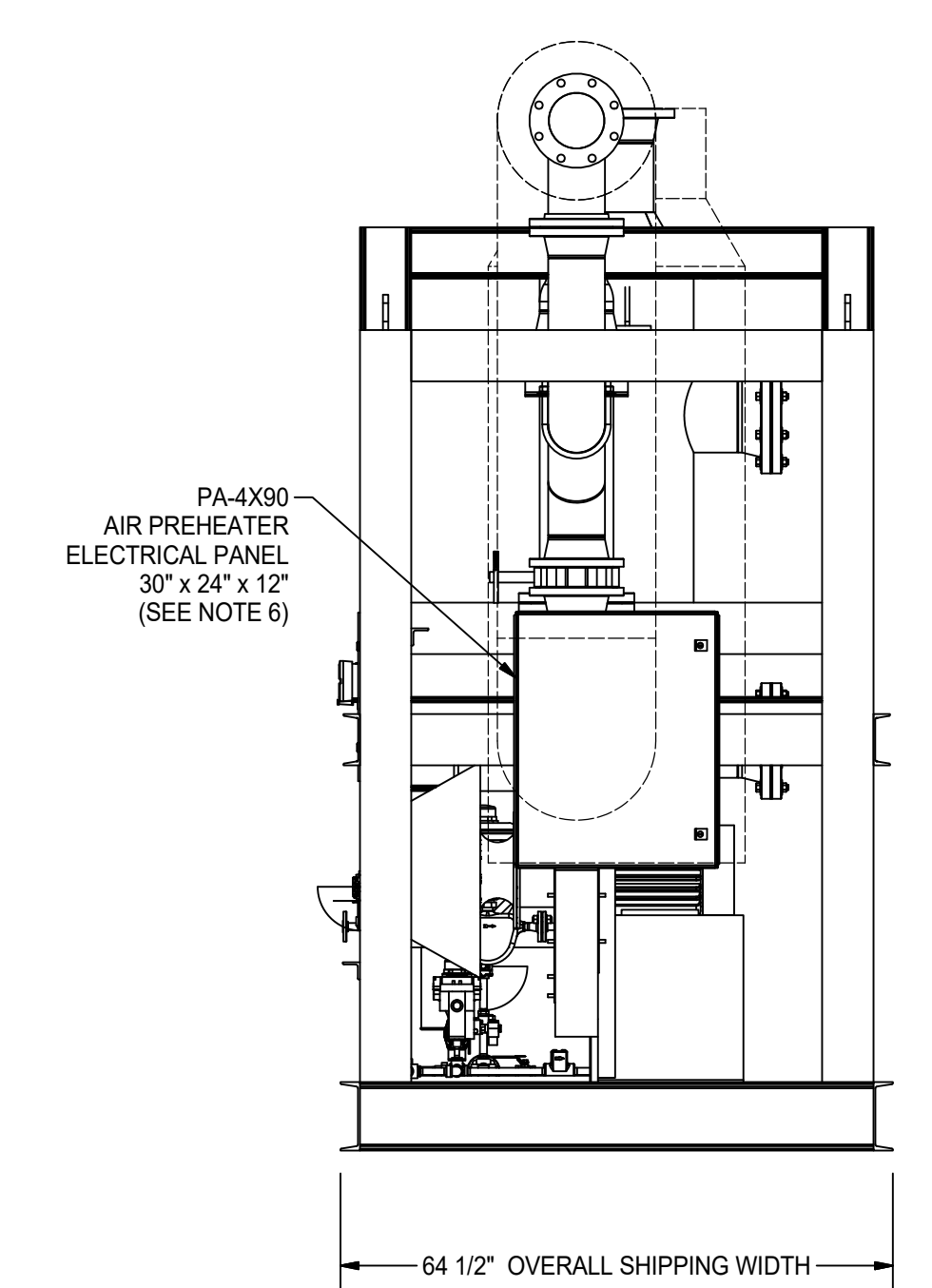
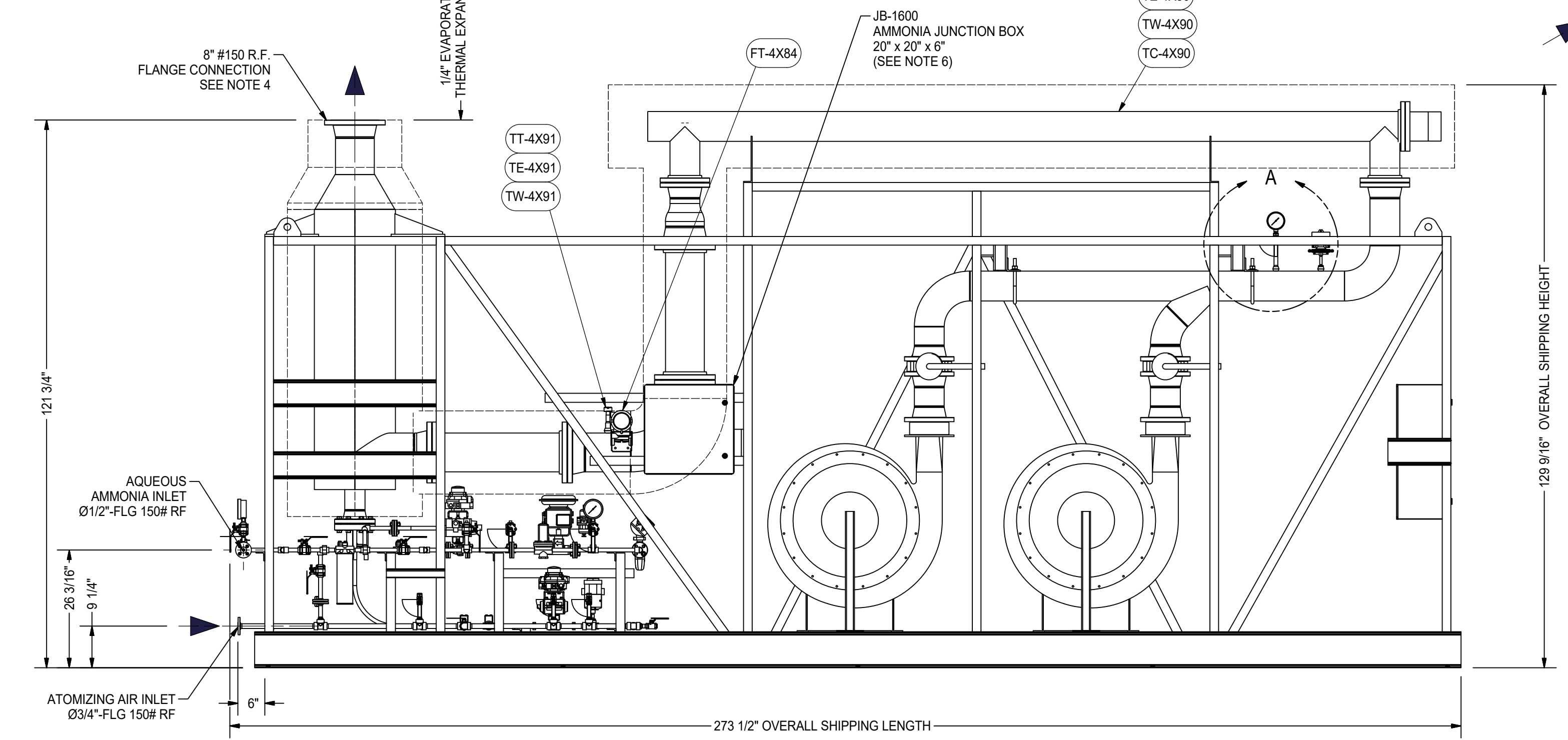
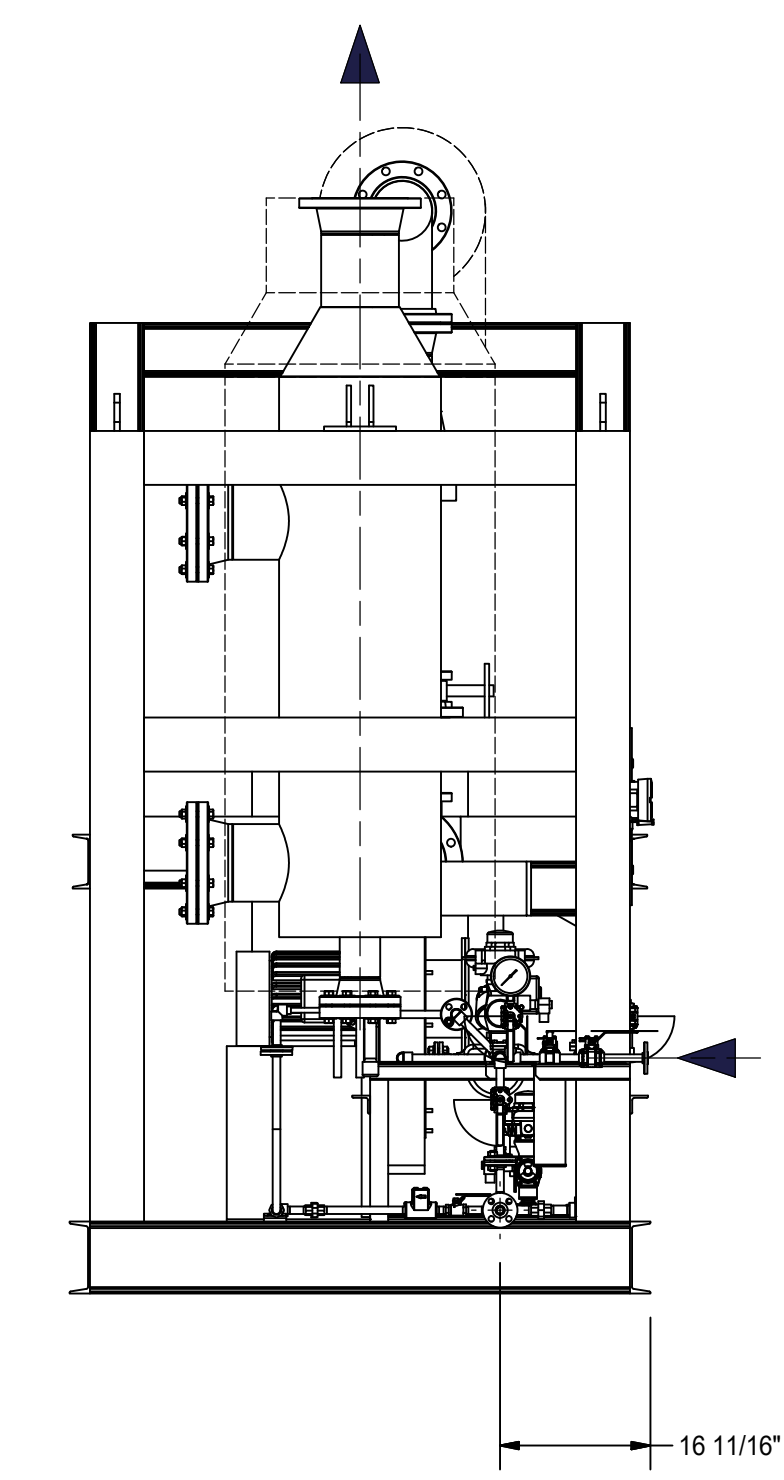
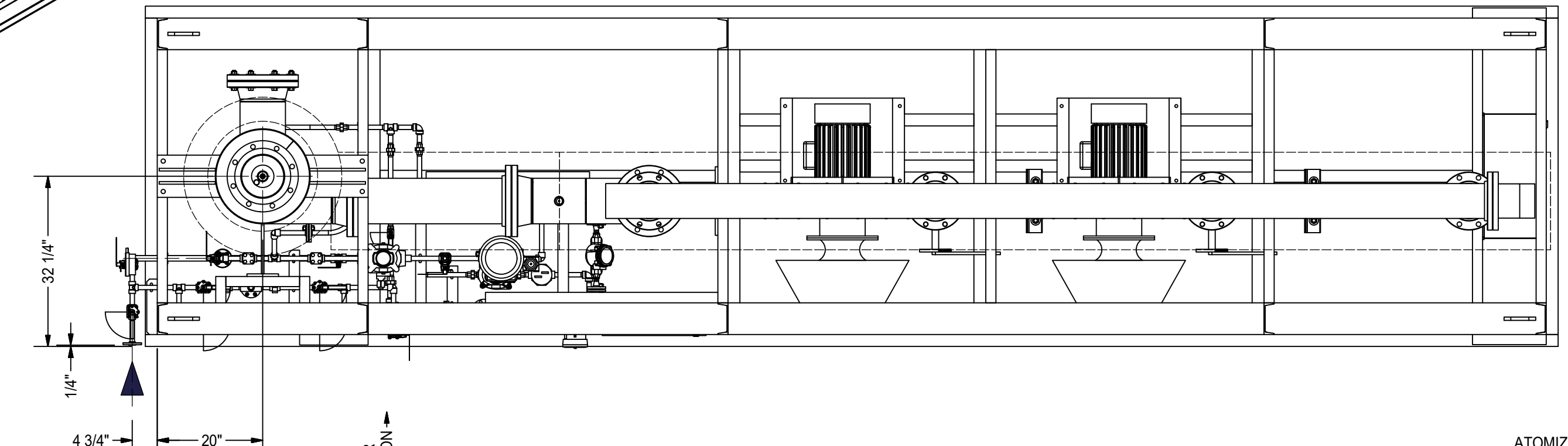
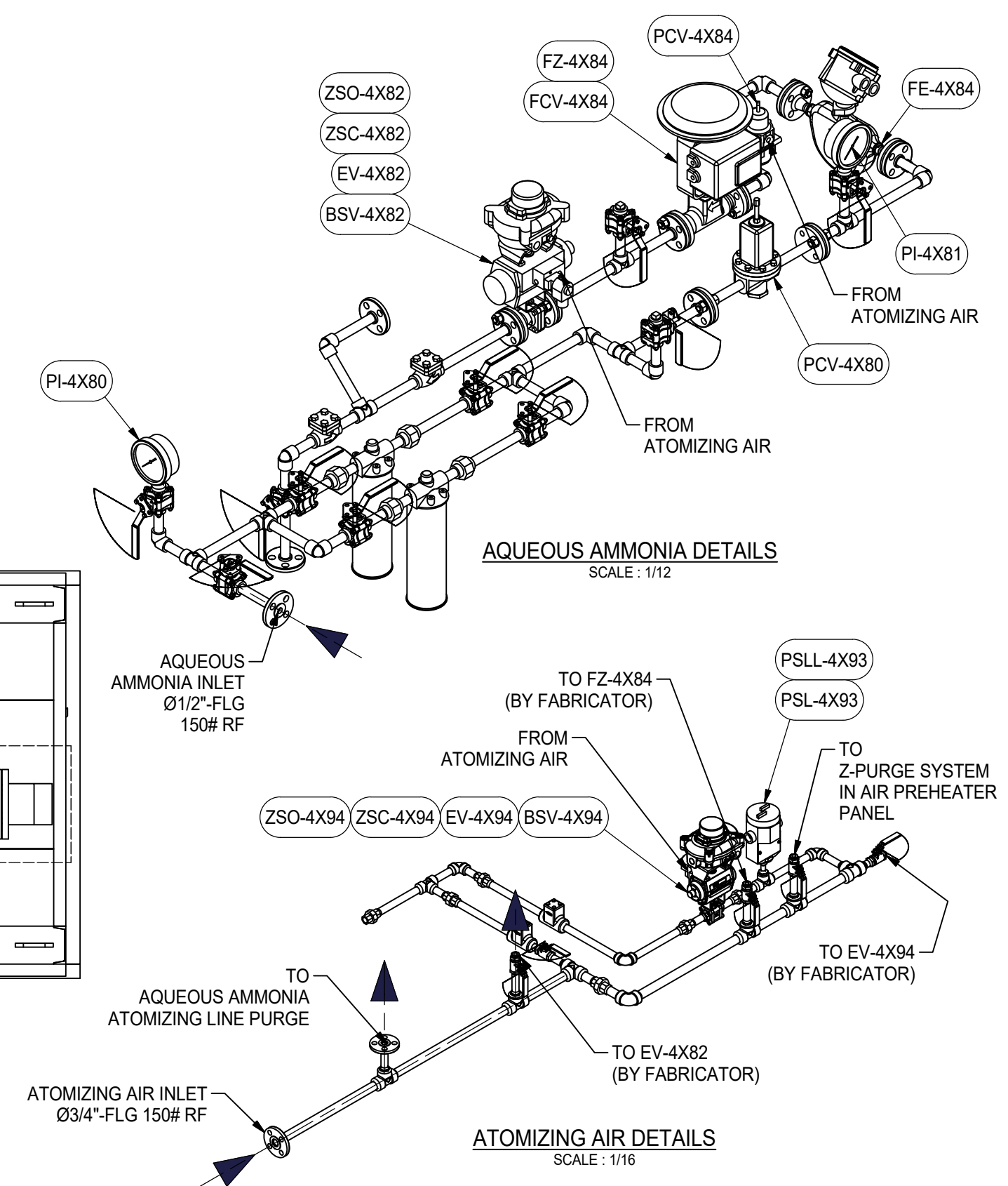
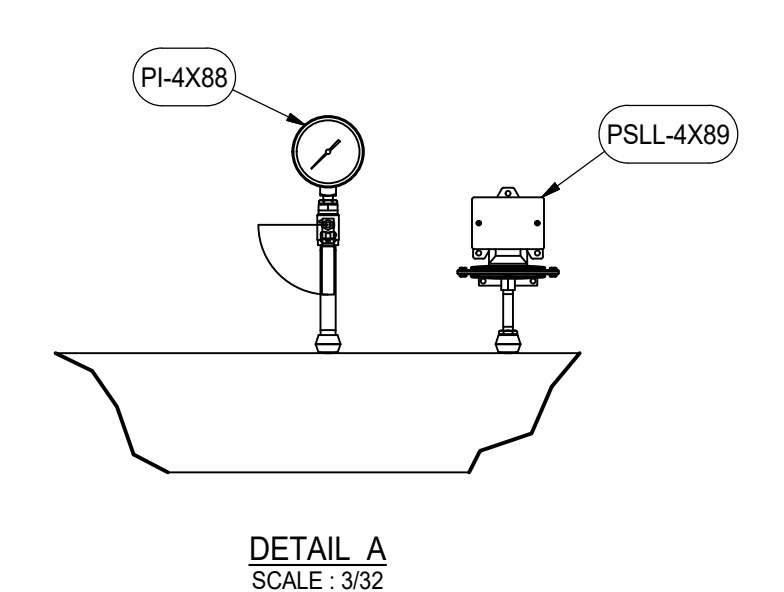
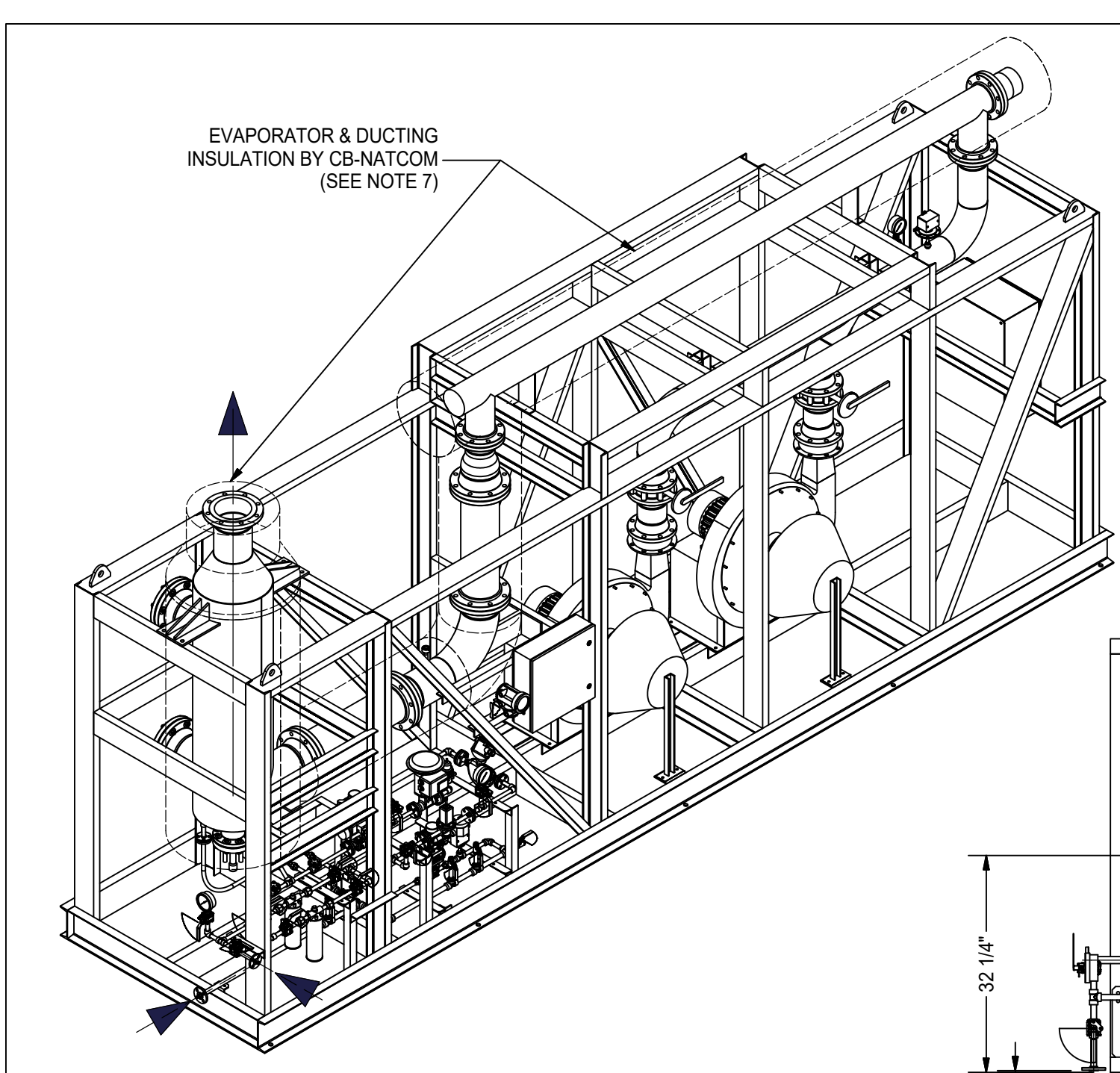
**FIXED SUPPORT ANCHOR DETAIL**  
TWO (2) REQUIRED (FX1 & FX2)



**THERMAL GROWTH SUPPORT DETAIL**  
SIX (6) REQUIRED (SLA1 & SLA2, SLB1 & SLB2, SLC1 & SLC2)

DOCUMENTS USED		
ITEM	DOCUMENT	REVISION
PTL	PTL - 4581-83	2
P&ID	627-02424	3
ECONOMIZER	J-1864-1	4
AIG	20348_AIG-1000	1
AMMONIA DILUTION SKID	20348_AV-1000	2
BURNER	20348_FT-1001	1
FUEL TRAIN	20348_FT-1005	1
AIR HANDLING	20348_GA-1500	1
STACK DAMPER	20348_SD-1000	2
FD FAN	6088-100-1	3
STACK	43983-A	5





LISTE DE MATÉRIAUX - BILL OF MATERIALS					
No	QTY	DESCRIPTION	MATERIAL	DRAWING #	WT (LB)
1	1	MOUNTING AND MISCELLANEOUS		20348-1000-M00	15615

- NOTES:
- NATCOM DOCUMENT REFERENCES:  
20348\_BE-1000: ELECTRICAL BILL OF MATERIAL  
20348\_BM-1000: MECHANICAL BILL OF MATERIAL  
20348\_PI-1000: PROCESS & INSTRUMENTATION DIAGRAM  
20348\_PS-1000: PAINTING/SURFACE FINISH SPECIFICATION
  - THE BOILER TAG SERIES NUMBERS WILL BE GIVEN AS SHOWN BELOW. NOTE THAT THE "X" WITHIN THE TAGS WILL BE REPLACED WITH THE FIRST DIGIT OF THE CORRESPONDING INDIVIDUAL BOILER TAG SERIES.  
BOILER #5 TAG SERIES 45XX  
BOILER #6 TAG SERIES 46XX  
BOILER #7 TAG SERIES 47XX
  - ESTIMATED UNIT OVERALL WEIGHT: 17 170 lbs
  - THE PIPES OR DUCTS ARE NOT DESIGNED TO WITHSTAND ADDITIONAL STATIC OR DYNAMIC LOADS. MINIMAL EXTERNAL LOADS MAY BE TRANSFERRED TO THE EQUIPMENT.
  - UNLESS OTHERWISE SPECIFIED ON THIS DRAWING, ALL HEAT TRACING AND INSULATION IS TO BE SUPPLIED AND INSTALLED BY OTHERS (NOT BY CB). ENSURE A MINIMUM OF 3" CLEARANCE AROUND ALL HOT PIPES OR DUCTS.
  - JUNCTION BOX MAINTENANCE AND SERVICE CLEARANCE:  
6.1 A CLEARANCE OF 3 FEET SHALL BE MAINTAINED IN FRONT OF ALL JUNCTION BOXES CONTAINING VOLTAGES OF 150 VAC OR LESS. (NFPA 79 ELECTRICAL STANDARD FOR ELECTRICAL MACHINERY, 2015 EDITION)
  - INSULATION 6" PROROX SL 40 OR EQUIVALENT

FOR CLIENT APPROVAL

By: \_\_\_\_\_

Date: \_\_\_\_\_

**APPROVED**  
By F.M. at 11:49 am, Feb 14, 2019

**APPROVED**  
By R.Brousseau at 11:41 am, Feb 14, 2019

REV	DESCRIPTION	M.L. / J.F.A.	DATE
A	ISSUED FOR CLIENT APPROVAL		2019-02-14

**CleaverBrooks®**  
545, Fernand-Poiras, Terrebonne (Québec) J6Y 1Y5, CANADA  
Tel.: (514) 326-2571 Fax: (514) 326-9347

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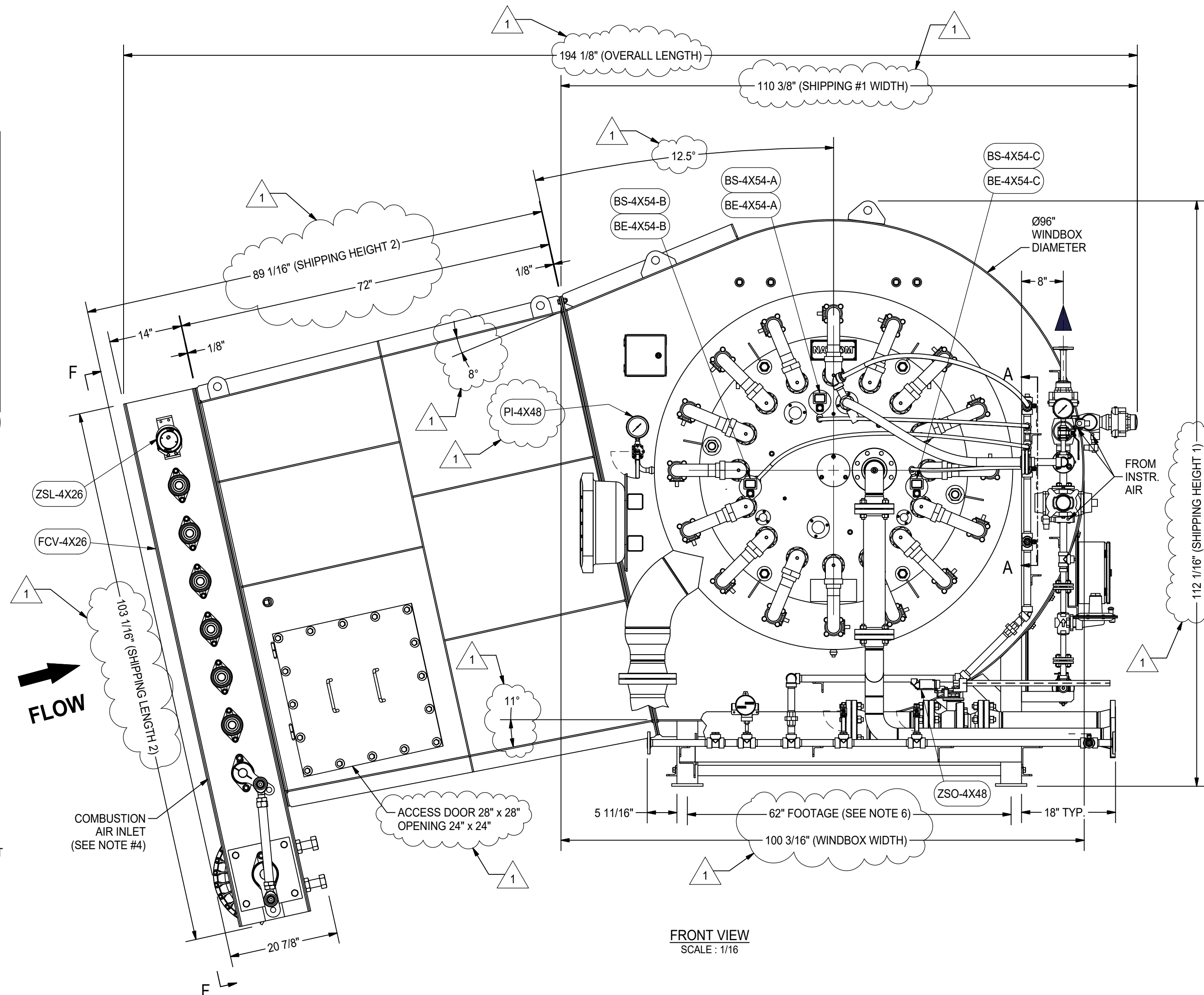
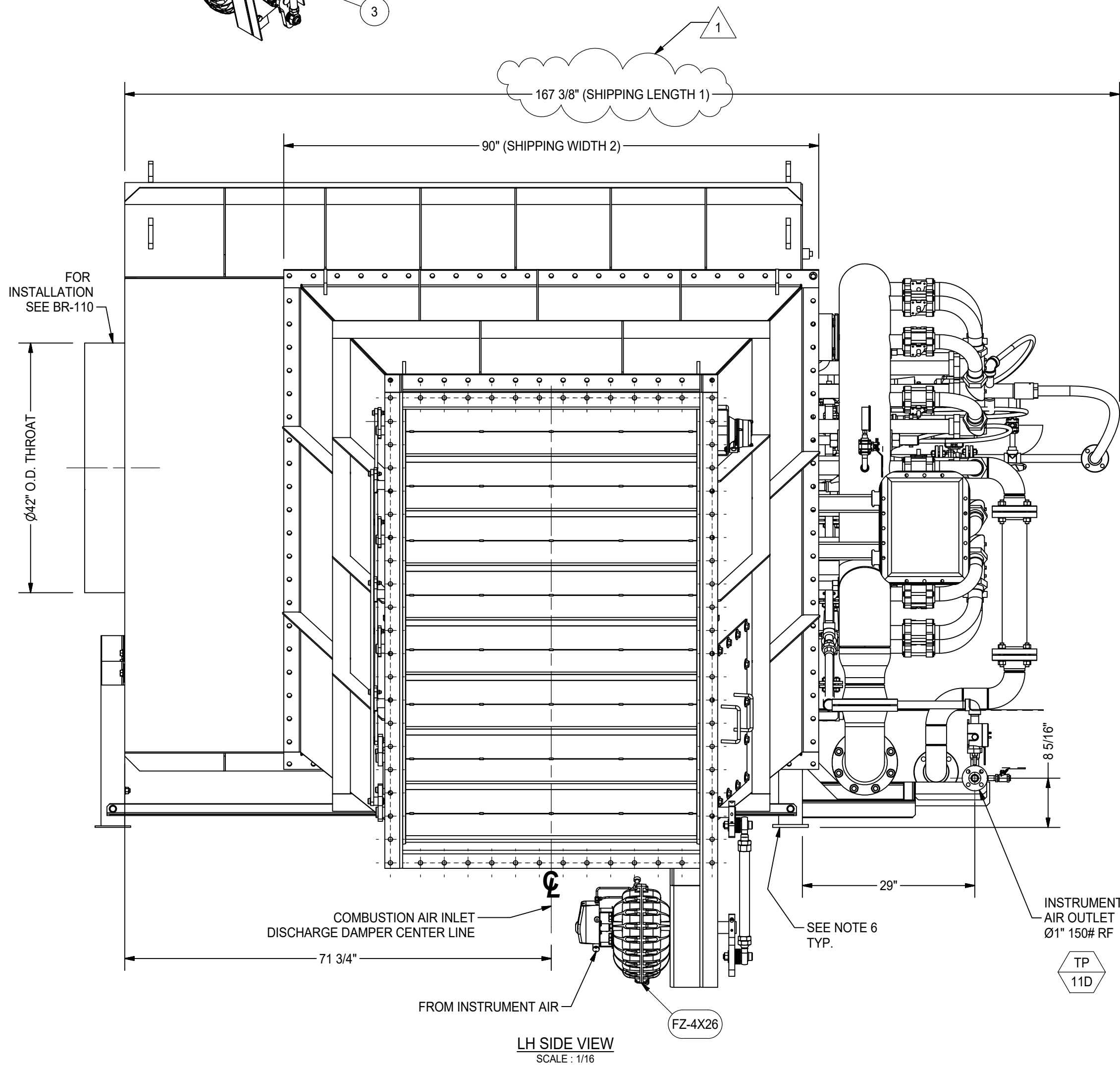
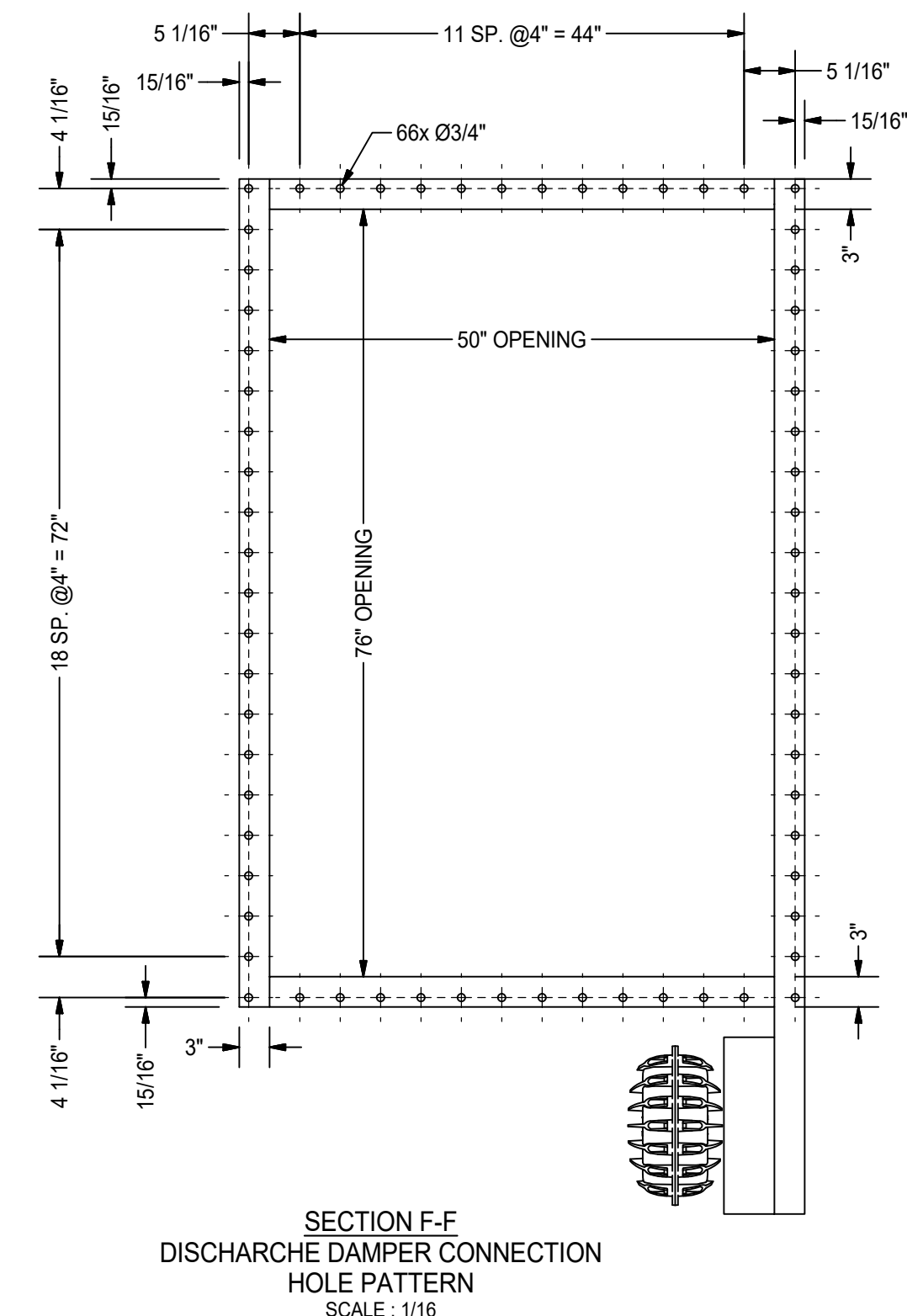
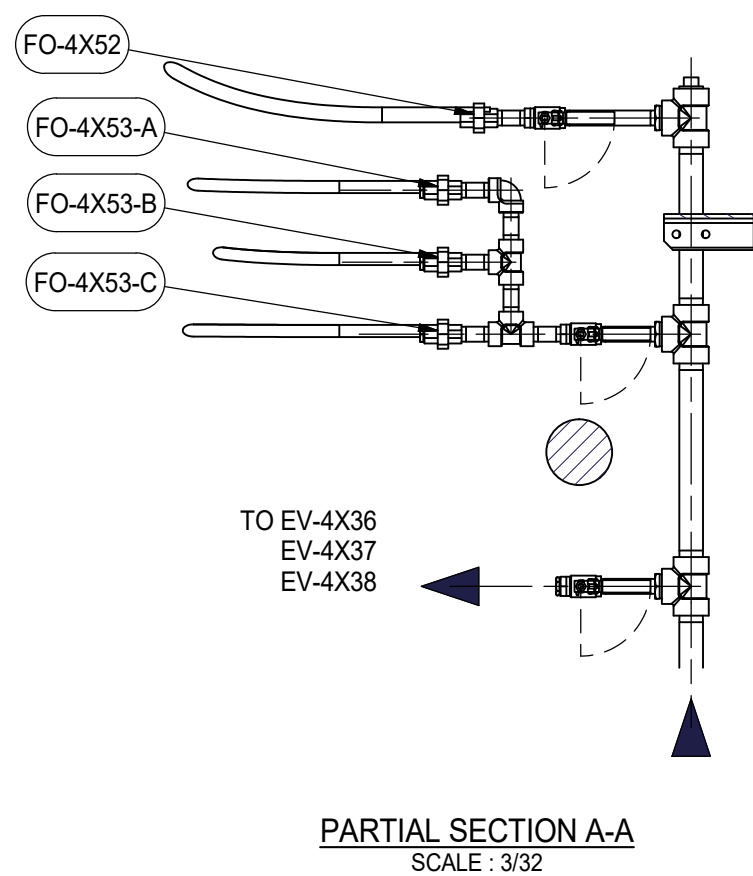
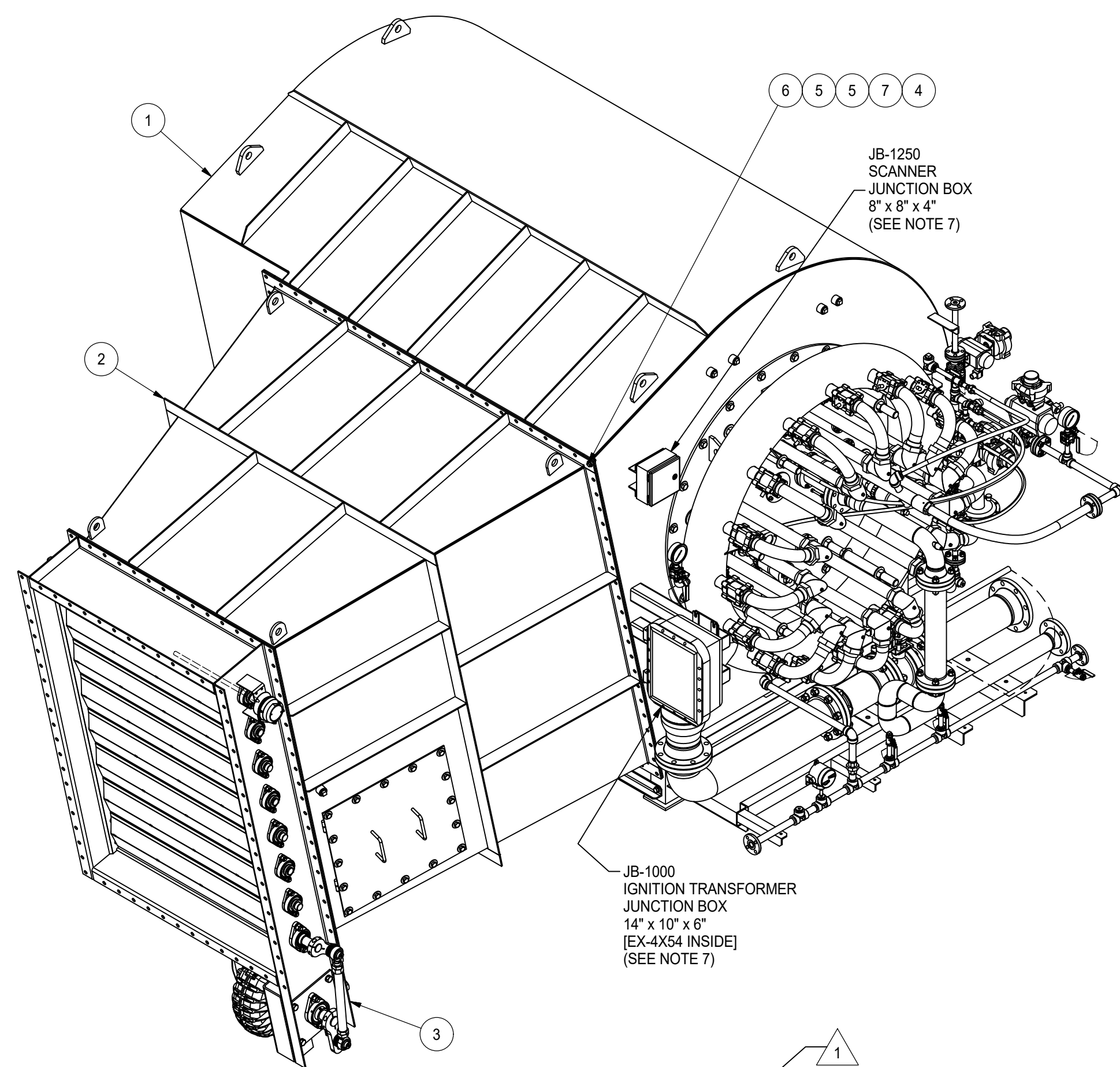
ECHELLE / SCALE	CONCEPTION / DESIGN	DESSIN / DRAWN	TOLERANCES	SAUF INDICATIONS CONTRAIRES / UNLESS OTHERWISE SPECIFIED
3/64"=1"	M.L. 2019-02-14	M.L. / J.F.A. 2019-02-14	XXX + 0.05 XX + 0.10 XX + 0.15 Ang + 1°	TOUS LES DIMENSIONS SONT EN POUCES

PRÉLIMINAIRE PAS POUR CONSTRUCTION  
PRELIMINARY NOT FOR CONSTRUCTION

TITRE - TITLE	
NATCOM SCR	
AMMONIA DILUTION SKID - GENERAL ARRANGEMENT	
PROJET - PROJECT	
BOILER MODEL # NB-801D-125	
REFERENCE CLIENT REFERENCE	CP-4581/82/83
REFERENCE NATCOM REFERENCE	20348
CLIENT	CB-LINCOLN BOILER COMPANY
DESSIN No. / DRAWING No.	AV-1000
REV	1/1

Z:\Workpace\Projects\Job Number\20348\N20348-AV-1000 (AMMONIA VAPORIZER SKID ASSEMBLY)20348\_AV-1000.dwg





LISTE DE MATÉRIAUX - BILL OF MATERIALS						
No	QTY	DESCRIPTION	LG. (")	MATERIAL	DRAWING #	REV. WT. (LB)
1	1	WINDBOX - MOUNTING & MISCELLANEOUS			20348-1100-M00	8728
2	1	TRANSITION DUCT S110-2-HR			20348-1000-426	0 1696
3	1	DISCHARGE DAMPER ASS'Y			20348-2000-991	0 1294
4	1	FLAT GASKET 1/8" THK x 3" X 30 FT.		ROBCO		
5	172	FLAT WASHER REGULAR, Ø1/2", TYPE B		STEEL ZP		0
6	86	HEX HD BOLT, Ø1/2"-13 UNC X 1 1/2" LG		STEEL ZP		0
7	86	HEX NUT, Ø1/2"-13 UNC		STEEL ZP		0

- NOTES:
- NATCOM DOCUMENT REFERENCES:  
20348\_BE-1000: ELECTRICAL BILL OF MATERIAL  
20348\_BM-1000: MECHANICAL BILL OF MATERIAL  
20348\_PI-1000: PROCESS & INSTRUMENTATION DIAGRAM  
20348\_PS-1000: PAINTING/SURFACE FINISH SPECIFICATION
  - THE BOILER TAG SERIES NUMBERS WILL BE GIVEN AS SHOWN BELOW. NOTE THAT THE "X" WITHIN THE TAGS WILL BE REPLACED WITH THE FIRST DIGIT OF THE CORRESPONDING INDIVIDUAL BOILER TAG SERIES.  
  
BOILER #5 TAG SERIES 45XX  
BOILER #6 TAG SERIES 46XX  
BOILER #7 TAG SERIES 47XX
  - ESTIMATED UNIT OVERALL WEIGHT: SHIPPING #1 : 9300 lbs  
SHIPPING #2 : 3300 lbs
  - THE PIPES OR DUCTS ARE NOT DESIGNED TO WITHSTAND ADDITIONAL STATIC OR DYNAMIC LOADS. MINIMAL EXTERNAL LOADS MAY BE TRANSFERRED TO THE EQUIPMENT.
  - 4.1 FOR ALLOWABLE LOADS AND MOMENTS, REFER TO THE TERMINAL POINT LIST
  - VENT LINE: VENT TO SAFE LOCATION PER LOCAL CODE REQUIREMENTS.
  - WINDBOX SPRING LEGS (2 REQ'D) BY CB-LINCOLN
  - JUNCTION BOX MAINTENANCE AND SERVICE CLEARANCE:  
7.1 A CLEARANCE OF 3 FEET SHALL BE MAINTAINED IN FRONT OF ALL JUNCTION BOXES CONTAINING VOLTAGES OF 150 VAC OR LESS. (NFPA 79 ELECTRICAL STANDARD FOR ELECTRICAL MACHINERY, 2015 EDITION)  
7.2 A CLEARANCE OF 6 FEET SHALL BE MAINTAINED IN FRONT OF ALL IGNITION TRANSFORMER JUNCTION BOXES. (NFPA 70 NATIONAL ELECTRICAL CODE, 2014 EDITION)
  - BOLTS AND NUTS PROVIDED BY OTHERS

REV	DESCRIPTION	DESSIN DRAWN	DATE
1	WINDBOX STRUCTURE & DIMENSION CHANGED / GENERAL RE-ARRANGEMENT / ISSUED FOR CONSTRUCTION	JSD	2019-05-24
A	ISSUED FOR CLIENT APPROVAL	JSD/YV	2019-02-13

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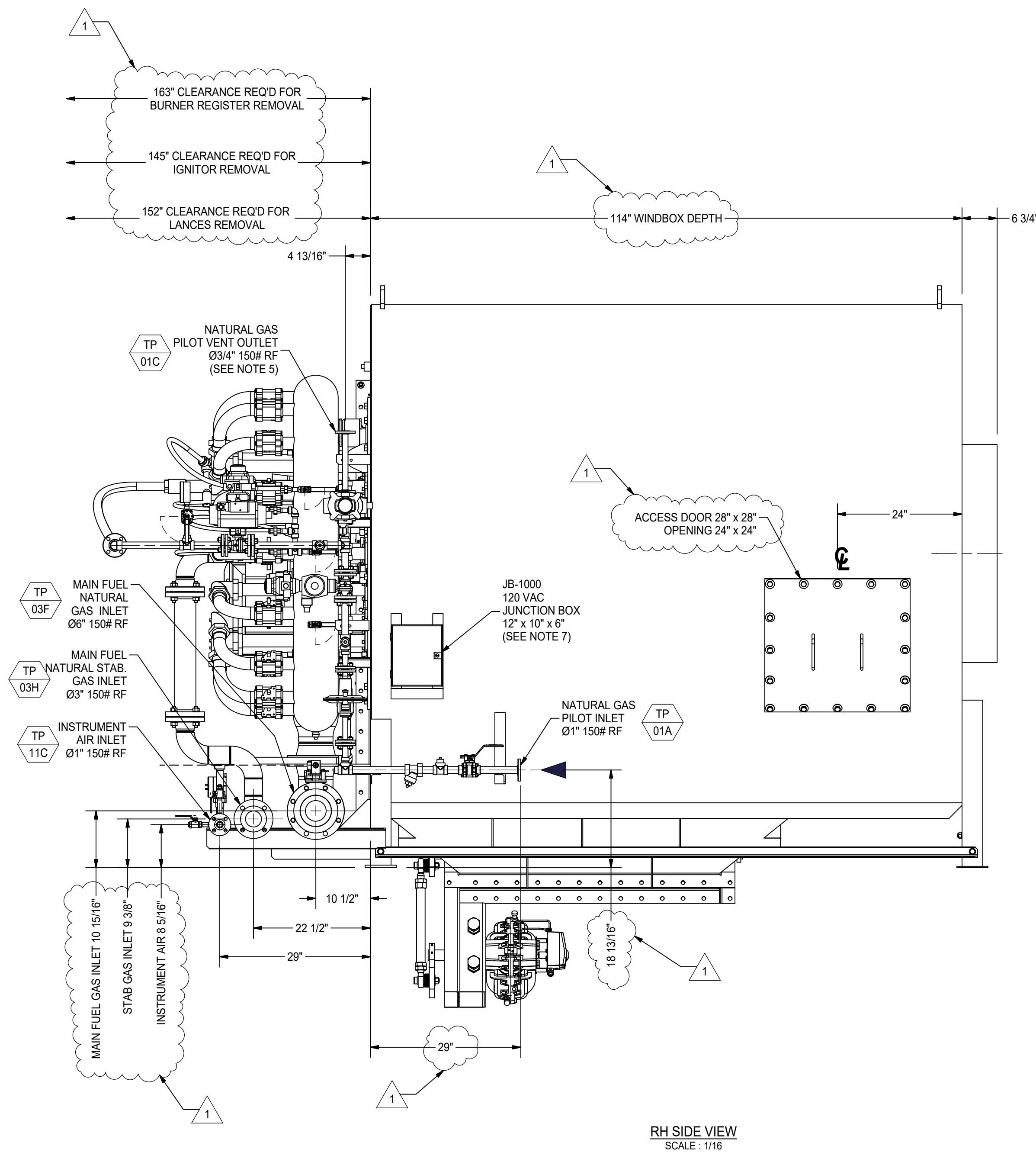
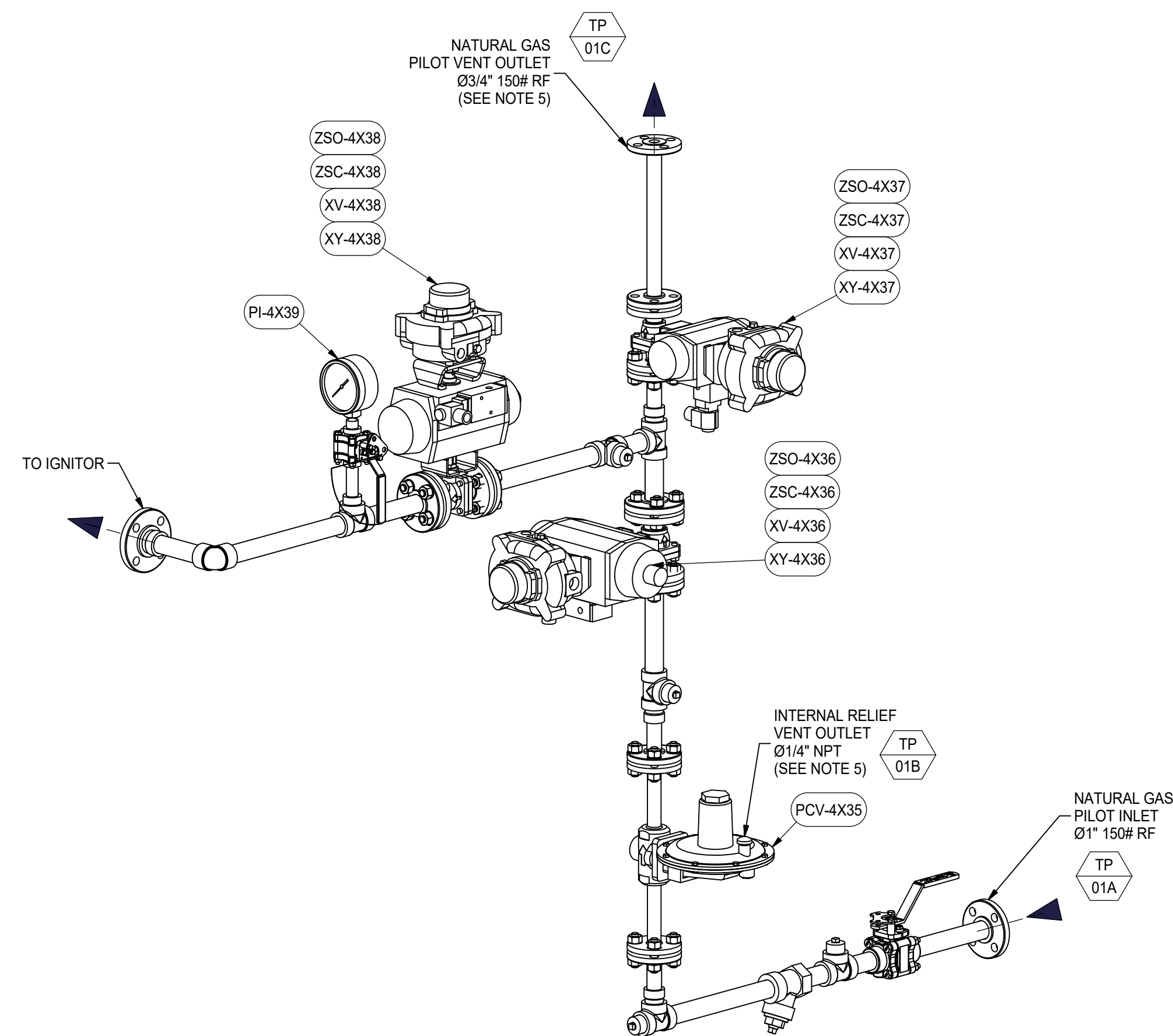
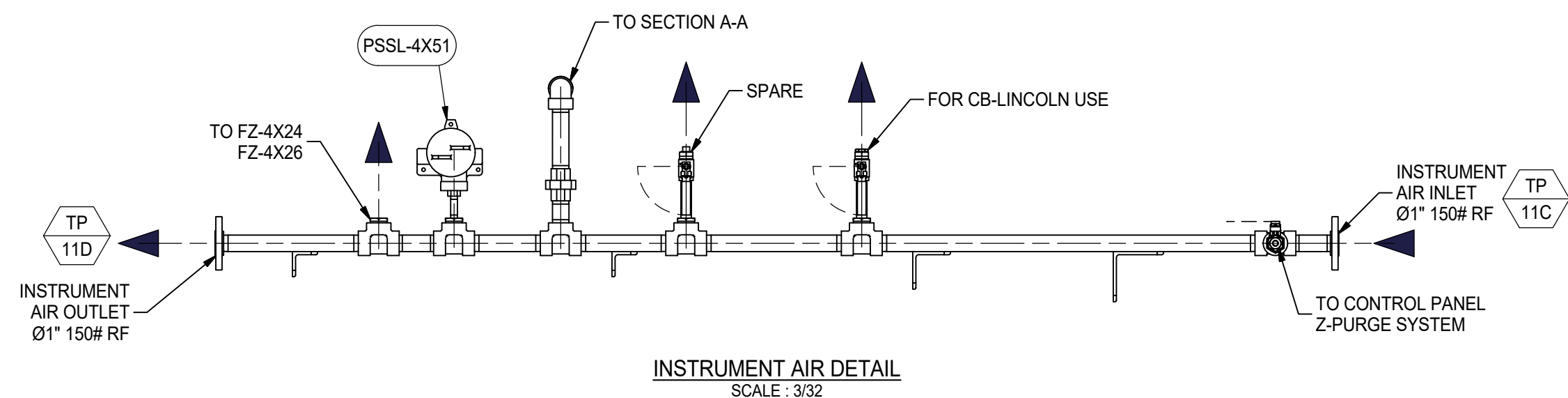
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ECHELLE SCALE	CONCEPTION DESIGN	DESSIN DRAWN	TOLERANCES	UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.
1/16"=1"	JSD/YV 2019-02-13	JSD/YV 2019-02-13	XXX ± 0.05 XX ± 0.10 X ± 0.15 Frac. ± 1/8" Ang. ± 1°	SAUF INDICATIONS CONTRAIRES, TOUS LES DIMENSIONS SONT EN POUCE.

**POUR CONSTRUCTION FOR CONSTRUCTION**

TITRE - TITLE			
NATCOM BURNER			
WINDBOX PIPING ASSEMBLY			
PROJET - PROJECT			
BOILER MODEL # NB-801D-125			
REFERENCE CLIENT REFERENCE	CP-4581/82/83	CLIENT:	CB-LINCOLN BOILER COMPANY
REFERENCE NATCOM REFERENCE	20348	DESSIN DRAWING No.	FT-1001
QTY BY CONTRACT:	3	REV	1/2





1	WINDBOX STRUCTURE & DIMENSION CHANGED / GENERAL RE-ARRANGEMENT / ISSUED FOR CONSTRUCTION	JSD	2019-05-24
A	ISSUED FOR CLIENT APPROVAL	JSD/YV	2019-02-13
REV	DESCRIPTION	DESSIN DRAWN	DATE

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ECHELLE SCALE	1/16"=1"	TOLERANCES	XXX + 0.05 XX + 0.10 XX + 0.15 Frac. + 1/8" Ang. + 1°
CONCEPTION DESIGN	JSD/YV 2019-02-13	<p><b>POUR CONSTRUCTION FOR CONSTRUCTION</b></p>	
DESSIN DRAWN	JSD/YV 2019-02-13		

TITRE - TITLE  
**NATCOM BURNER**

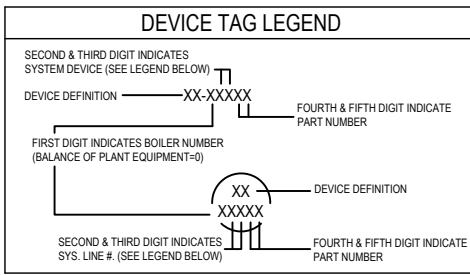
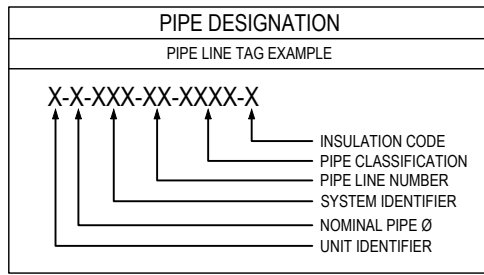
WINDBOX PIPING ASSEMBLY

PROJET - PROJECT

BOILER MODEL # NB-801D-125			
REFERENCE CLIENT REFERENCE	CP-4581/82/83	CLIENT:	CB-LINCOLN BOILER COMPANY
REFERENCE NATCOM REFERENCE	20348	DESSIN DRAWING No.	FT-1001
			REV 2/2

QTY BY CONTRACT: 3

Z:\WorkSpace\Projects\Job Number\20348\20348-FT-1001 (BURNER OR DUCT BURNER GENERAL ARRANGEMENT)20348\_FT-1001.dwg



### FLOW ELEMENTS

	ORIFICE PLATE		V-CONE METER		FLOW NOZZLE		CORIOLIS FLOWMETER
	VENTURI TUBE		ULTRASONIC FLOW METER		THERMAL MASS FLOWMETER		STANDARD PITOT TUBE
	VORTEX SHEDDING FLOWMETER		TOTAL FLOW INDICATOR		MASS FLOW CONTROLLER		AVERAGING PITOT TUBE

UNIT IDENTIFIER	DESCRIPTION
0	BALANCE OF PLANT
1, 2, 3, 4...	BOILER 1, 2, 3, 4, ETC

### SIGNAL LINETYPES

---	BY OTHERS
	CAPILLARY TUBE / CONNECTION
	COMMUNICATION LINK
	ELECTRICAL SIGNAL / HIDDEN LINE
	ELECTROMAGNETIC SIGNAL (GUIDED)
	ELECTROMAGNETIC SIGNAL (UNGUIDED)
	HYDRAULIC LINE
	INSTRUMENT AIR SUPPLY LINE
	MECHANICAL LINK
	PNEUMATIC LINE
	PROCESS SUPPLY LINE
	HEAT (COOL) TRACED LINE
	-[E] ELECTRICAL
	-[ST] STEAM
	-[CW] CHILLED WATER
	DRAWING TO DRAWING SIGNAL CONNECTOR

### VALVES

NORMALLY OPENED		NORMALLY CLOSED			
AUTOMATIC	MANUAL				
				THREE-WAY VALVE - ARROW INDICATES DE-ENERGIZED FLOW PATH	
				FOUR-WAY VALVE - ARROWS INDICATES DE-ENERGIZED FLOW PATH	
				ANGLE VALVE	
				ANGLE GLOBE VALVE	
				BUTTERFLY VALVE	
				BALL VALVE	
				CHECK VALVE	
				GATE VALVE	
				NEEDLE VALVE	
				PLUG VALVE	
				AUTOMATIC RECIRCULATION VALVE	
				STOP CHECK VALVE	
				ANGLE STOP CHECK VALVE	
				LINEAR PISTON ACTUATOR (VERTICAL) LINEAR PISTON ACTUATOR (HORIZONTAL)	

### SYSTEM IDENTIFIER

SYSTEM IDENTIFIER	DESCRIPTION
BLR	BOILER TRIM PIPING
BBS	BOILER BLOWDOWN
BFW	BOILER FEEDWATER
CEM	CHEMICAL FEED
CNS	CONDENSATE SYSTEM
CWR	COOLING WATER RETURN
CWS	COOLING WATER SUPPLY
DMN	DEMINERALIZED WATER
DRN	DRAIN
FCA	FRESH COMBUSTION AIR
FGA	FLUE GAS AIR
FGS	FUEL GAS SUPPLY
FOS	FUEL OIL SUPPLY
GEN	GENERAL
GLR	GLYCOL RETURN
GLS	GLYCOL SUPPLY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
IAS	INSTRUMENT AIR SUPPLY
MXA	MIXED COMBUSTION AIR
NGS	NATURAL GAS SUPPLY
NS	NITROGEN SUPPLY
OXS	OXYGEN SUPPLY
PAS	PLANT AIR SUPPLY
SAS	SERVICE AIR SUPPLY
SDN	STEAM DRAINS
SHP	STEAM HIGH PRESSURE
SMP	STEAM MEDIUM PRESSURE
SLP	STEAM LOW PRESSURE
SWS	SERVICE WATER
VNT	VENT

### PIPE CLASSIFICATION

PIPE SPEC.	CLASS	MATERIAL
15C1	150	A 106 Gr. B
15C2	150	A 106 Gr. B
30C1	300	A 106 Gr. B
30C2	300	A 106 Gr. B
60C1	600	A 106 Gr. B
60C2	600	A 106 Gr. B
60C3	600	A 106 Gr. B
90C1	900	A 106 Gr. B
90C2	900	A 106 Gr. B
90C3	900	A 106 Gr. B
30A1	300	A 335 Gr. P11
30A2	300	A 335 Gr. P22
30A3	300	A 335 Gr. P91
60A1	600	A 335 Gr. P11
60A2	600	A 335 Gr. P22
60A3	600	A 335 Gr. P91
90A1	900	A 335 Gr. P11
90A2	900	A 335 Gr. P22
90A3	900	A 335 Gr. P91
30S1	300	A 312 TP304 or 316*
30S2	300	A 312 TP304 or 316*
60S1	600	A 312 TP304 or 316*
60S2	600	A 312 TP304 or 316*
90S1	900	A 312 TP304 or 316*
90S2	900	A 312 TP304 or 316*
150S1	1500	A 312 TP304 or 316*

### INSULATION CODE

A = ANTI-SWEAT	P = PERSONAL PROTECTION
F = FREEZE PROTECTION	T = HEAT TRACED
H = HEAT CONSERVATION	N = NONE

### DEVICE STATUS

FC	FAIL CLOSED
FO	FAIL OPEN
CSC	CAR SEAL CLOSED
CSO	CAR SEAL OPEN
LC	LOCKED CLOSED
LO	LOCKED OPENED
FL	FAIL LAST
FI	FAIL INDETERMINATE

### LINE NO. LINE DESCRIPTION

1	NATURAL GAS PILOT LINE
2	ALTERNATIVE FUEL PILOT LINE
3	NATURAL GAS MAIN FUEL LINE
4	ALTERNATE GAS MAIN FUEL LINE
5	#2 OIL MAIN FUEL LINE
6	#6 OIL MAIN FUEL LINE
7	ALTERNATE OIL MAIN FUEL LINE
8	FUEL OIL ATOMIZING STEAM
9	FUEL OIL ATOMIZING AIR
10	SPARE
11	INSTRUMENT AIR LINE
12	PLANT AIR
13	BURNER MISCELLANEOUS
14	NITROGEN
15	STEAMLINE FOR AIR PREHEATER
16	STEAMLINE FOR OIL HEATER
17	TURBINE GASES
18	AMMONIA
19	DILUTED AMMONIA
20	FRESH COMBUSTION AIR
21	FLUE GAS RECIRCULATION
22	MIXED AIR/FGR
23	WINDBOX
24	FURNACE
25	BOILER TO ECONOMIZER
26	ECONOMIZER OUTLET/STACK
27	AMMONIA DILUTION MEDIUM
28	AMMONIA ATOMIZING MEDIUM
29	CONDENSATE
30	F.W. PUMP DISCHARGE TO FCV STATION
31	FCV STATION TO STOP VALVE
32	ECONOMIZER & ATTACHMENTS
33	ECONOMIZER TO BOILER
34	BOILER PRESSURE VESSEL ATTACHMENTS
35	CONTINUOUS BLOWDOWN
36	LOWER DRUM HEATING COIL
37	SATURATED STEAM PIPING
38	SUPERHEATER 1
39	SUPERHEATED STEAM PIPING
40	DE-SUPERHEATED SPRAY WATER
41	DE-SUPERHEATED STEAM PIPING
42	SUPERHEATER 2
43	MAIN STEAM LINE
44	SOOTBLOWER
45	MISCELLANEOUS DRAINS
46	MISCELLANEOUS VENTS
47	EXTERNAL BLOWDOWN PIPING
48	MEDIUM PRESSURE SUPERHEATED STEAM
49	MEDIUM PRESSURE SATURATED STEAM
50	MAKE-UP WATER TO DEAERATOR
51	DEAERATOR PRESSURE VESSEL ATTACHMENTS
52	FEEDWATER TO PUMP SUCTION
53	SPARE
54	LOW PRESSURE SATURATED STEAM
55	STEAM PIPING TO DEAERATOR
56	CHEMICAL FEED
57	BLOWDOWN TANK & ATTACHMENTS
58	UTILITY WATER
59	MAIN STEAM LINE / TURBINE
60	EXHAUST STEAM LINE / TURBINE
61	FAN MONITOR
62	SPARE
63	SPARE
64	SPARE
65	INTERMITTENT BLOWDOWN
66	SAMPLE STATION
67	SPARE
68	SPARE
69	SPARE
70	SPARE
71	SPARE

### INSTRUMENTATION DEVICE & FUNCTION SYMBOLS

	FIELD MOUNTING	PRIMARY LOCATION (ACCESSIBLE PANEL)	PRIMARY LOCATION (INACCESSIBLE PANEL)	SECONDARY LOCATION (ACCESSIBLE PANEL)	SECONDARY LOCATION (INACCESSIBLE PANEL)
DISCRETE INSTRUMENT					
PROCESS LOGIC CONTROL					
OTHER LOGIC CONTROL					
SAFETY LOGIC CONTROL					

DO NOT SCALE USE DIMENSIONS ONLY

"NF" INDICATES NOT FURNISHED BY CLEAVER-BROOKS

DO NOT USE FOR CONSTRUCTION UNLESS APPROVED BELOW

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A	02/13/2019	INITIAL RELEASE OF DRAWING	-	RH	KB	02/15/2019	DEC	02/15/2019
B	04/12/2019	CHANGES PER CUST/ENG COMMENTS	-	RH	KB	04/17/2019	DEC	04/17/2019
0	05/14/2019	CHANGES PER CUST/ENG COMMENTS	-	RH	KB	05/16/2019	DEC	05/16/2019
1	05/14/2019	CHANGES PER CUST/ENG COMMENTS	L4581-004	RH	KB	05/23/2019	DEC	05/23/2019
2	07/08/2019	CHANGES PER CUST/ENG COMMENTS	L4581-011	RH	KB	07/11/2019	DEC	07/11/2019
3	07/31/2019	CHANGES PER CUST/ENG COMMENTS	L4581-016	RH	KB	08/07/2019	DEC	08/07/2019

### SIGNAL PROCESSING FUNCTION BLOCK SYMBOLS

BLOCK SYMBOL	FUNCTION	BLOCK SYMBOL	FUNCTION	BLOCK SYMBOL	FUNCTION	BLOCK SYMBOL	FUNCTION
	ANALOG SIGNAL GENERATOR		DIVISION		LOW LIMITING		PROPORTION
	AVERAGE		EXPONENTIAL		LOW SELECTING		REVERSE PROPORTION
	BIAS		GAIN		LOW SIGNAL MONITORING		ROOT EXTRACTION
	BINARY SIGNAL GENERATOR		HIGH LIMITING		MIDDLE SIGNAL SELECT		SIGNAL TRANSFER
	BOOST		HIGH SELECTING		MONITORING		SUMMATION
	CHARACTERIZE		HIGH SIGNAL MONITOR		MULTIPLYING		TIME FUNCTION
	CONVERSION		HIGH/LOW SIGNAL MONITOR		NEGATIVE BIAS		VELOCITY BIAS
	DERIVATIVE		INTEGRAL		ON-OFF		
	DIFFERENCE		INVERSE DERIVATIVE		POSITIVE BIAS		

# CleaverBrooks

ENGINEERED BOILER SYSTEMS

NEBRASKA BOILER, CLEAVER-BROOKS, AND ENERGY RECOVERY INTERNATIONAL  
WITH NATCOM BURNER SYSTEMS

P&ID  
SERIES: CP-NB-801D-125-550-AL

SCALE: -- HAND: --

JOB NO: CP-4581 SHEET NO: 01 OF 06

SERIAL NO: CP-4581 DRAWING NO: 627-02424

3

DEVICE IDENTIFICATION LETTERS				
FIRST LETTERS		SUCCEEDING LETTERS		
COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5
MEASURED OR INITIATING VARIABLE	VARIABLE MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT OR ACTIVE FUNCTION	FUNCTION MODIFIER
A	ANALYSIS			ALARM
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE		CONTROL	CLOSE
D	USER'S CHOICE	DIFFERENCE, DIFFERENTIAL		DEVIATION
E	VOLTAGE		SENSOR, PRIMARY ELEMENT	
F	FLOW, FLOW RATE	RATIO		
G	USER'S CHOICE		GLASS, GAUGE, VIEWING DEVICE	
H	HAND			HIGH
I	CURRENT		INDICATE	
J	POWER		SCAN	
K	TIME, SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION
L	LEVEL		LIGHT	LOW
M	USER'S CHOICE			MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION	
P	PRESSURE		POINT (TEST CONNECTION)	
Q	QUANTITY	INTEGRATE, TOTALIZE		
R	RADIATION		RECORD	RUN
S	SPEED, FREQUENCY	SAFETY		SWITCH
T	TEMPERATURE			TRANSMIT
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER
W	WEIGHT, FORCE		WELL, PROBE	
X	UNCLASSIFIED	X-AXIS	ACCESSORY DEVICES, UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, PRESENCE	Y-AXIS		AUXILIARY DEVICES
Z	POSITION, DIMENSION	Z-AXIS, SAFETY INSTRUMENTED SYSTEM		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT

MISCELLANEOUS INSTRUMENTS											
	SCOPE BREAK (SUPPLIED/CUSTOMER)		CONDUCTIVITY ANALYSIS		FLANGED INSTRUMENT CONNECTION TO PROCESS LINE OR EQUIPMENT		WHISPER DISK		CONCENTRIC REDUCER		ECCENTRIC REDUCER
	LINE BREAK DESCRIPTOR		PH ANALYSIS		WELDED INSTRUMENT CONNECTION TO PROCESS LINE OR EQUIPMENT		INTERLOCK		FLANGED CONNECTION		
	DRIP PAN ELBOW (TWO DRAINS NOT SHOWN)		FLEXIBLE HOSE		SOCKET WELDED INSTRUMENT CONNECTION TO PROCESS LINE OR EQUIPMENT		FILTER		BASKET STRAINER		
	VENT / DRAIN		Y-TYPE STRAINER		THREADED INSTRUMENT CONNECTION TO PROCESS LINE OR EQUIPMENT		CONDENSATE POT		FILTER REGULATOR		
	GENERIC INSTRUMENT & EQUIPMENT CONNECTION TO PROCESS LINE		GENERIC MOISTURE TRAP (FT): FLOAT & THERMOSTATIC (IB): INVERTED BUCKET (TS): THERMOSTATIC		GAUGE GLASS		DESUPERHEATER		SPECTACLE FLANGE (OPENED)		
	BUTTERFLY DAMPER		TWO-VALVE MANIFOLD		MAGNETIC LEVEL GAUGE WITH TRANSMITTER		DIAPHRAGM SEAL		SPECTACLE FLANGE (CLOSED)		
	OPPOSING BLADE DAMPER		THREE-VALVE MANIFOLD		RESTRICTION ORIFICE		SIPHON				
	PARALLEL BLADE DAMPER		FIVE-VALVE MANIFOLD		SAMPLE CONDITIONER WITH PROBE AND TRANSMITTER		END CAP				
	WATER COLUMN		EYE-HYE		TEMPERATURE TRANSMITTER WITH ELEMENT (SHOW TYPE WHEN RTD)						

EQUIPMENT SYMBOLS			
	SILENCER		
	BLOWER, FAN		
	PUMP		
	STEAM TURBINE		
	HEAT EXCHANGER - FINNED TUBE		
	RAIN HOOD		
	HEAT EXCHANGER		
	SAMPLE COOLER		
	MOTOR		

**NOTES:**

1. PIPING, EQUIPMENT, AND TRIM COMPONENTS THAT MAY CONTAIN WATER (IN ANY PHASE), AND THAT MAY BE EXPOSED TO TEMPERATURES NEAR, OR BELOW FREEZING, SHALL BE PROTECTED FROM FREEZING. SUCH PROTECTION IS TO BE DESIGNED AND INSTALLED BY OTHERS.
2. PIPING, DUCTING, EQUIPMENT, AND TRIM COMPONENTS THAT MAY CAUSE PERSONNEL HARM IF CONTACTED SHALL BE INSULATED FOR PERSONAL PROTECTION. PIPING, DUCTING, EQUIPMENT, AND TRIM COMPONENTS THAT TRANSPORT A PROCESS FLUID ABOVE AMBIENT AIR TEMPERATURE SHALL BE INSULATED FOR HEAT CONSERVATION. IN BOTH OF THESE CASES, ADDITIONAL PROTECTION OR INSULATION IS TO BE DESIGNED AND INSTALLED BY OTHERS.
3. PIPING AND INSTRUMENT IMPULSE LINES OUTSIDE CLEAVER BROOKS SCOPE, AS INDICATED BY EITHER A SCOPE BREAK SYMBOL OR THE LINE STYLE, SHALL BE PROVIDED AND ROUTED BY OTHERS.
4. LOW POINTS IN PIPING INDICATED BY "NOTE 4" THAT WOULD ALLOW UNDESIRABLE ACCUMULATION OF WATER, OR PREVENT THE COMPLETE EVACUATION OF WATER FROM THE SYSTEM SHALL BE DESIGNED WITH A MEANS TO DRAIN THE LINE. SUCH DRAINAGE TO BE PROVIDED BY OTHERS.
5. EQUIPMENT AND TRIM COMPONENTS TAGGED WITH A TAG NUMBER AND LOCATED IN PIPING INDICATED BY "NOTE 5" WILL BE SHIPPED LOOSE, AND INSTALLED BY OTHERS.
6. WHEN FLOW METERS ARE LOCATED IN PIPING OR DUCTING INDICATED BY "NOTE 6", OTHERS ARE RESPONSIBLE FOR ENSURING THAT UPSTREAM AND DOWNSTREAM PIPE DIAMETER STRAIGHT PIPE LENGTH REQUIREMENTS ARE MET. FOR FURTHER DETAILS SEE DRAWING 656-10270.
7. VENTS AND DRAINS INCLUDING, BUT NOT LIMITED TO PRESSURE SAFETY VALVE OUTLETS AND BLOWDOWN VALVE OUTLETS SHALL BE ROUTED TO A SAFE AND VISIBLE LOCATION BY OTHERS AND IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.
8. PIPE ROUTING, EQUIPMENT AND TRIM LOCATIONS AS INDICATED IN THIS DRAWING ARE NOT INTENDED TO BE A PROPORTIONALLY ACCURATE REPRESENTATION OF THE FINAL INSTALLED PRODUCT. THIS DOCUMENT IS NOT TO BE USED FOR MANUFACTURING.
9. "\*" AND "-" RESPECTIVELY INDICATE THE INSTRUMENTS HIGH SIDE AND LOW SIDE PROCESS CONNECTIONS.
10. INSTRUMENT IMPULSE LINES FOR STEAM PIPING REQUIRE A CONDENSATE SEAL TO PROTECT THE INSTRUMENT FROM THE PROCESS TEMPERATURE. INSTRUMENT IMPULSE LINES FOR ALL OTHER INSTRUMENTS SHALL BE OF SUFFICIENT LENGTH TO PROTECT THE INSTRUMENT FROM PROCESS TEMPERATURES.
11. FOR SAFETY REASONS, ISOLATION VALVES MUST NOT BE INSTALLED IN THE PIPING BETWEEN THE INSTRUMENT AIR HEADER AND ACTUATORS/POSITIONERS. ALL MAINTENANCE ON THE EQUIPMENT MUST BE PERFORMED BY CLOSING THE HEADER SUPPLY ISOLATION VALVE.
12. VALVE TO BE USED FOR LEAKAGE TEST (MUST BE SUPPLIED WITH PLUG).
13. THIS VALVE IS USED FOR LEAKAGE TEST ONLY AND MUST BE LOCKED IN THE OPEN POSITION DURING NORMAL OPERATION.
14. CLEAVER-BROOKS RECOMMENDS THE USE OF REFERENCE AIR WITH THE OXYGEN ANALYZER. REFERENCE GASES, BOTTLES AND REGULATORS BY OTHERS. FOR FURTHER DETAILS SEE DRAWING 656-10441.
15. THE EQUIVALENT LENGTH OF INTERCONNECTING PIPE BETWEEN THE FUEL RACK AND THE BURNER SHALL NOT EXCEED 40 FT.
16. PRESSURE REGULATOR TO BE INSTALLED AS CLOSE AS POSSIBLE TO THE FUEL RACK BUT NOT MORE THAN 40' EQUIVALENT LENGTH.
17. MAXIMUM FRESH AIR TEMPERATURE OF 100 F. HIGHER TEMPERATURES WILL CAUSE THE FAN TO OPERATE WITHIN ITS TEST BLOCK MARGIN.
18. MINIMUM FRESH AIR OPERATING TEMPERATURE OF 50 F. LOWER TEMPERATURES MAY REQUIRE THE INSTALLATION OF INLET AIR HEATER (SUPPLIED BY OTHERS).
19. NOTE REMOVED.



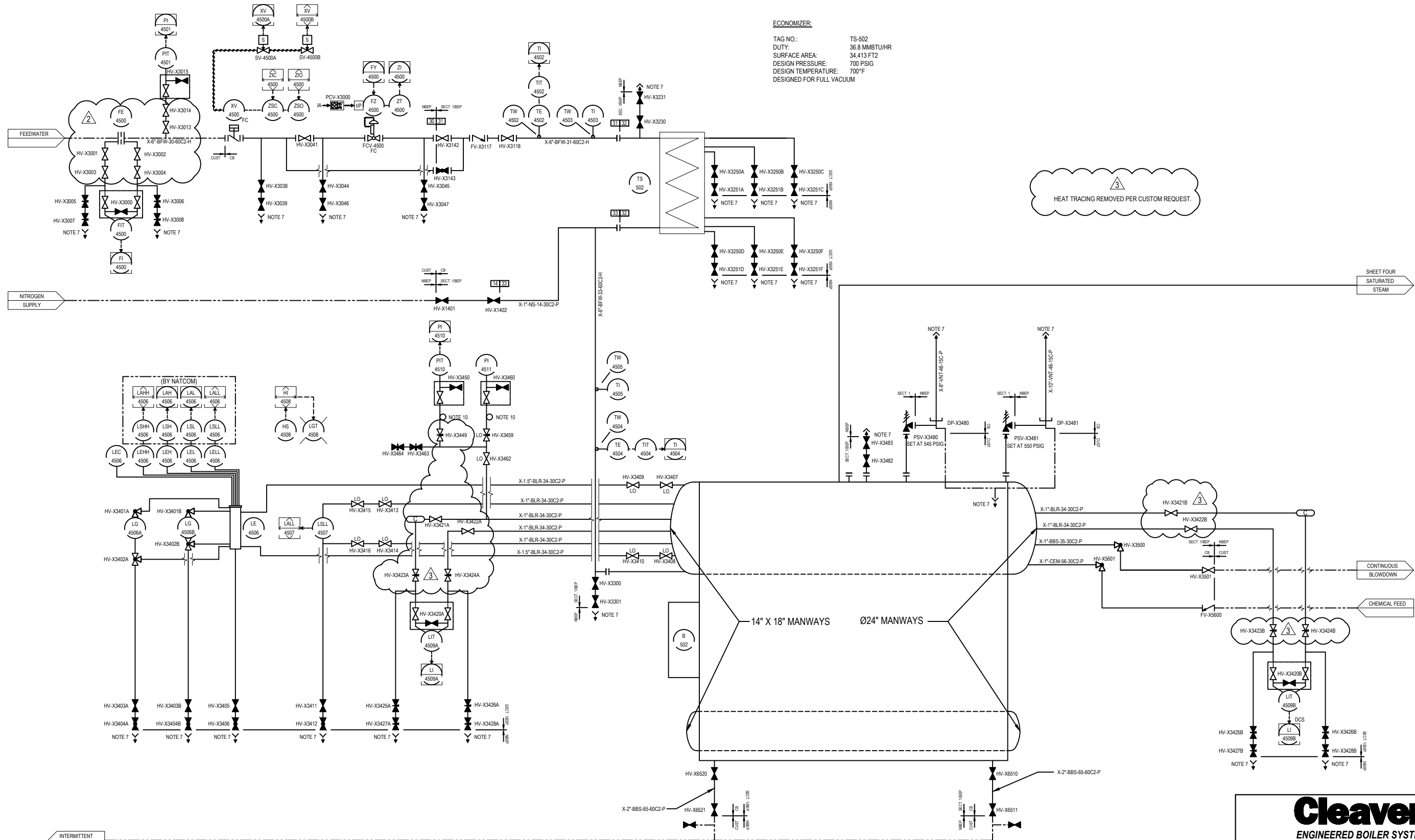
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WITH NATCOM BURNER SYSTEMS

**P&ID**  
**SERIES: CP-NB-801D-125-550-AL**

SCALE: —	HAND: —	<b>3</b>
JOB NO: CP-4581	SHEET NO: 02 OF 06	
SERIAL NO: CP-4581	DRAWING NO: 627-02424	



**ECONOMIZER:**  
 TAG NO.: TS-502  
 DUTY: 36.8 MMBTU/HR  
 SURFACE AREA: 34,413 FT<sup>2</sup>  
 DESIGN PRESSURE: 700 PSIG  
 DESIGN TEMPERATURE: 700°F  
 DESIGNED FOR FULL VACUUM

HEAT TRACING REMOVED PER CUSTOM REQUEST.

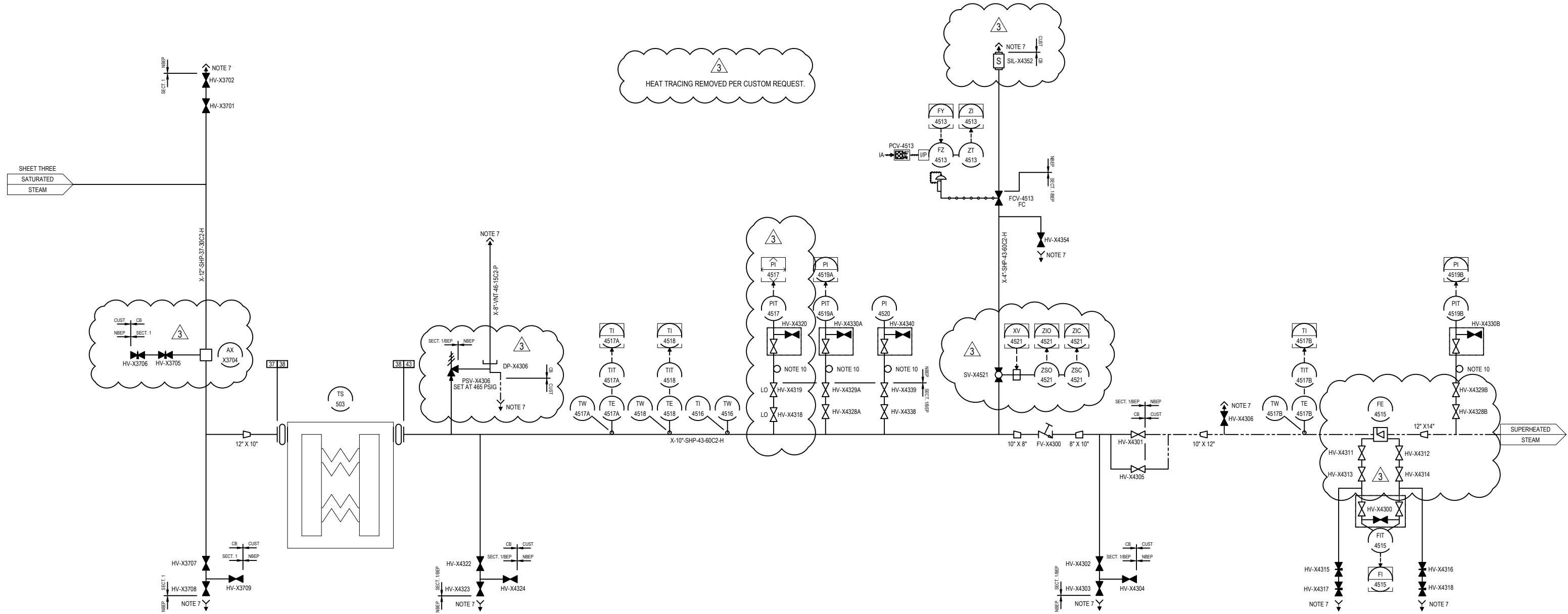
**HP STEAM DRUM:**  
 TAG NO.: MS-502  
 CAPACITY: 250,000 LB/HR  
 DESIGN PRESSURE: 550 PSIG  
 DESIGN TEMPERATURE: 650°F  
 STEAM OUTPUT DUTY: 281 MMBTU/HR  
 DESIGNED FOR FULL VACUUM

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**SUPERHEATER:**  
 TAG NO.: TS-503  
 DUTY: 34.2 MMBTU/HR  
 SURFACE AREA: 975 FT<sup>2</sup>  
 DESIGN PRESSURE: 550 PSIG  
 DESIGN TEMPERATURE: 825 F



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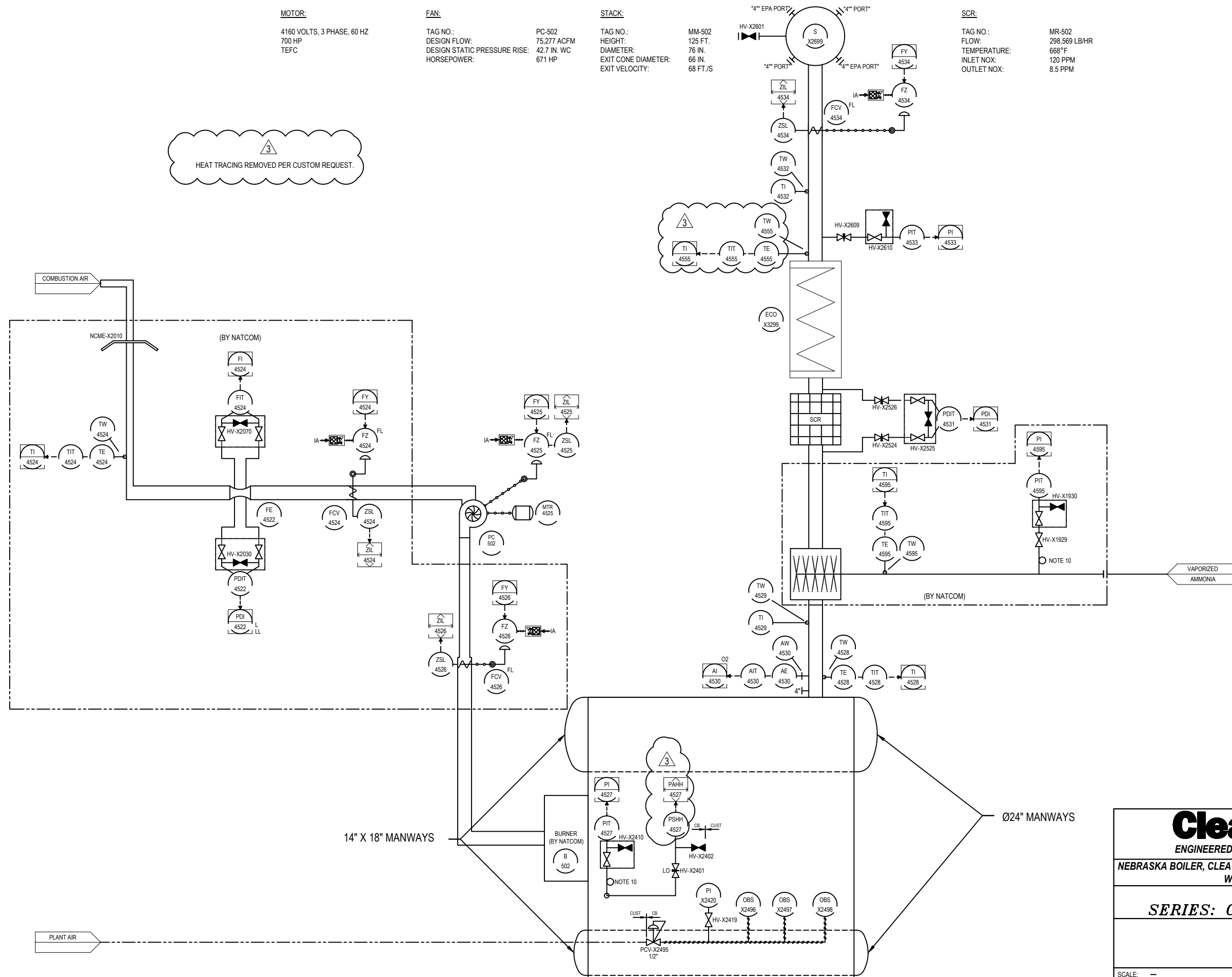
**MOTOR:**  
 4160 VOLTS, 3 PHASE, 60 HZ  
 700 HP  
 TEFC

**FAN:**  
 TAG NO.: PC-502  
 DESIGN FLOW: 75,277 ACFM  
 DESIGN STATIC PRESSURE RISE: 42.7 IN. WC  
 HORSEPOWER: 671 HP

**STACK:**  
 TAG NO.: MM-502  
 HEIGHT: 125 FT.  
 DIAMETER: 76 IN.  
 EXIT CONE DIAMETER: 66 IN.  
 EXIT VELOCITY: 68 FT./S

**SCR:**  
 TAG NO.: MR-502  
 FLOW: 298,569 LB/HR  
 TEMPERATURE: 668°F  
 INLET NOX: 120 PPM  
 OUTLET NOX: 8.5 PPM

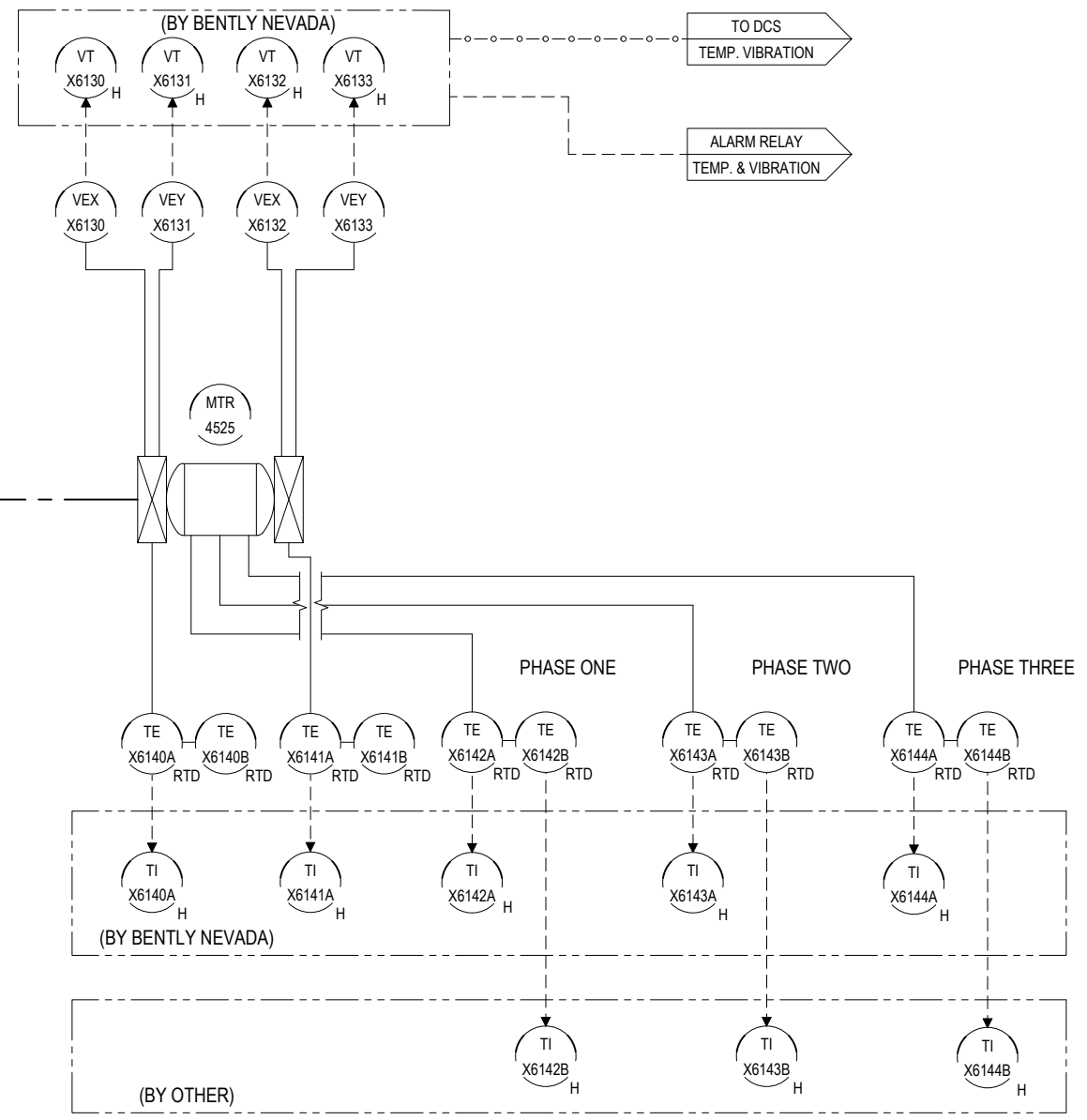
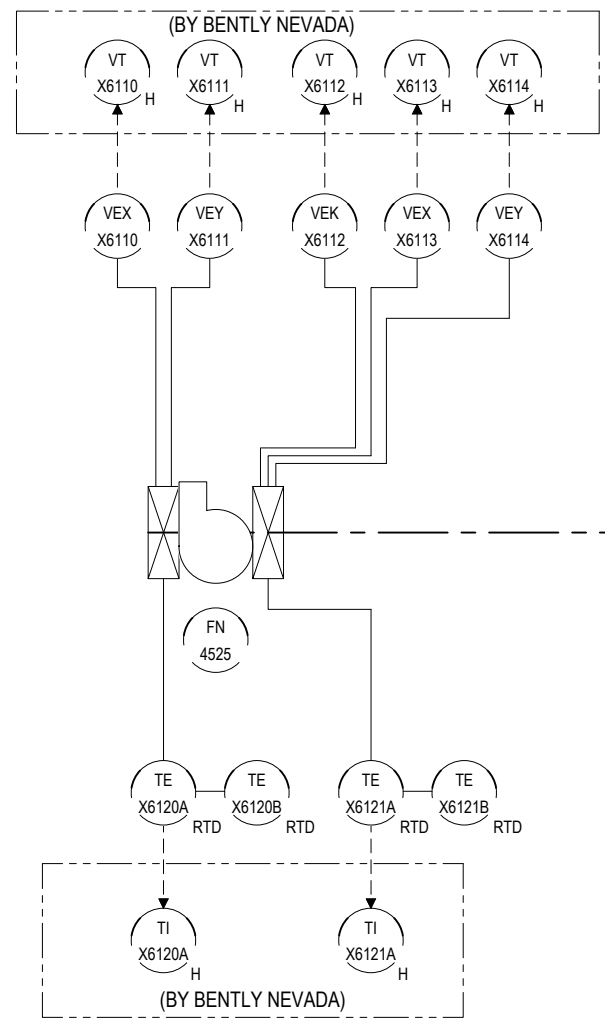
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