

CONVECTION SIDE VIEW
(SEE SHEET 4 FOR FEEDWATER AND DA TANK PIPING DETAIL)

CleaverBrooks
ENGINEERED BOILER SYSTEMS
NEBRASKA BOILER, CLEAVER-BROOKS, AND ENERGY RECOVERY INTERNATIONAL
WITH NATCOM BURNER SYSTEMS
GENERAL ARRANGEMENT (SUBMITTAL 2)
SERIES: NB-501D-125-450-HC-RH
MISSISSIPPI POWER CO.
KEMPER COUNTY, MS
(SOUTHERN CO. SERVICES)

SCALE: 1/4"=1'-0"
JOB NO.: CP-4143
HAND: RIGHT HAND

SERIAL NO.: CP-4143
DRAWING NO.: 722-5344
SHEET 5 OF 4



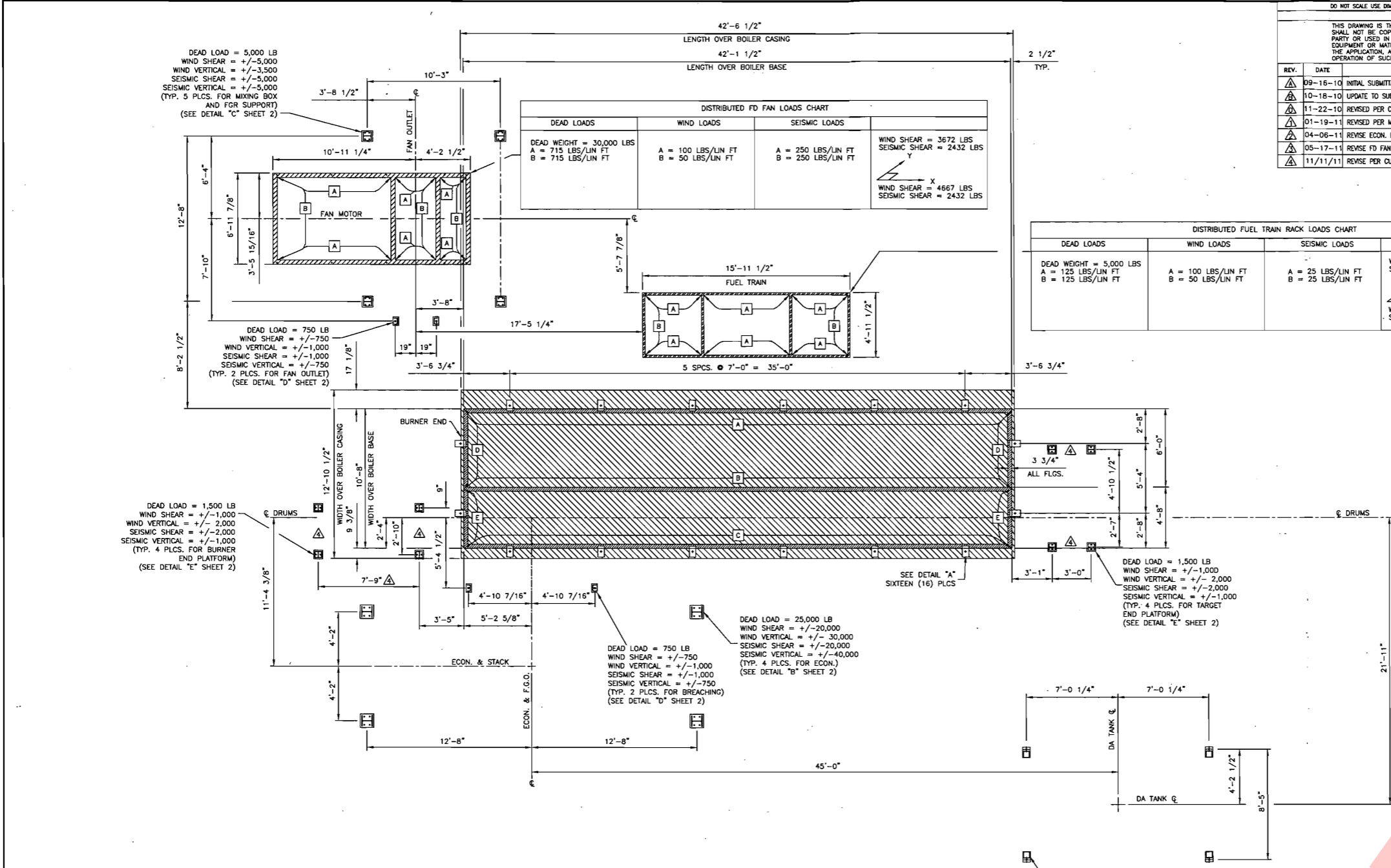
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REV.	DATE	DESCRIPTION	CH #	DWN	CKD	CKD DATE	APP	APP DATE
△	09-16-10	INITIAL SUBMITTAL		DH	JAF	09-17-10	AZ	09-17-10
△	10-18-10	UPDATE TO SUBMITTAL 2		DH	AZ	10/18/10	MSV	10/18/10
△	11-22-10	REVISED PER CUSTOMER COMMENTS		DH	AZ	11/23/10	DCF	11/24/10
△	01-19-11	REVISED PER MARKUP	E11-032	DH	AZ	1/19/11	DCF	1/19/11
△	04-06-11	REVISE ECON. BASE	E11-140	DH	JAF	4/6/11	MSV	4/6/11
△	05-17-11	REVISE FD FAN FOUNDATION AND DA BASE	E11-203	DH	JAF	5/17/11	MSV	5/17/11
△	11/11/11	REVISE PER CUSTOMER COMMENTS	E11-505	BDF	DCF	11/22/11	MSV	11/21/11



NOTES:

- SHADED AREA REPRESENTS LOAD BEARING SURFACE.
- BOILER OUTLINE.
- LOADS GIVEN IN DISTRIBUTED LOADS CHARTS ARE BASED ON BEAM EQUATIONS, NOT ON THE SUMMATION OF LINE LOADS.

DISTRIBUTED BOILER LOADS CHART		
DEAD LOADS FOR DRY WEIGHT	DEAD LOADS FOR OPERATING WEIGHT	DEAD LOADS FOR FLOODED WEIGHT
DRY WEIGHT = 156,320 LBS A = 742 LBS/LIN FT B = 1,113 LBS/LIN FT C = 1,113 LBS/LIN FT D = 5,360 LBS/LIN FT E = 10,040 LBS/LIN FT	OPERATING WEIGHT = 200,280 LBS A = 950 LBS/LIN FT B = 1,430 LBS/LIN FT C = 1,430 LBS/LIN FT D = 6,870 LBS/LIN FT E = 12,866 LBS/LIN FT	FLOODED WEIGHT = 228,230 LBS A = 1,080 LBS/LIN FT B = 1,630 LBS/LIN FT C = 1,630 LBS/LIN FT D = 7,830 LBS/LIN FT E = 14,660 LBS/LIN FT
WIND SHEAR = 18,290 LBS SEISMIC SHEAR = 18,810 LBS	WIND + DEAD LOADS FOR OPERATING WEIGHT A = 450 LBS/LIN FT B = 230 LBS/LIN FT C = 230 LBS/LIN FT D = 110 LBS/LIN FT E = 110 LBS/LIN FT	SEISMIC + DEAD LOADS FOR OPERATING WEIGHT A = 470 LBS/LIN FT B = 230 LBS/LIN FT C = 230 LBS/LIN FT D = 360 LBS/LIN FT E = 360 LBS/LIN FT

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

CleaverBrooks
ENGINEERED BOILER SYSTEMS

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

BASE LOADING
SERIES: NB-501D-125-450-HC-RH
MISSISSIPPI POWER CO.
KEMPER COUNTY, MS
(SOUTHERN CO. SERVICES)

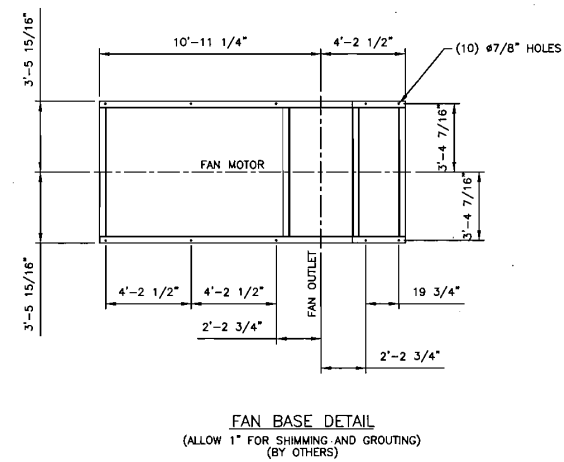
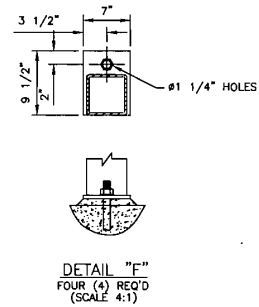
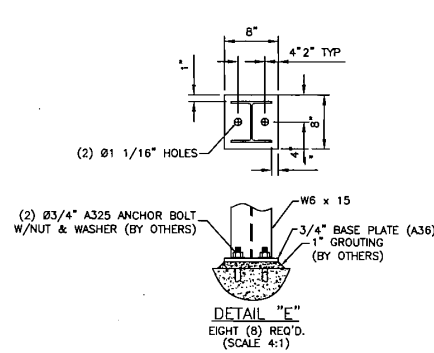
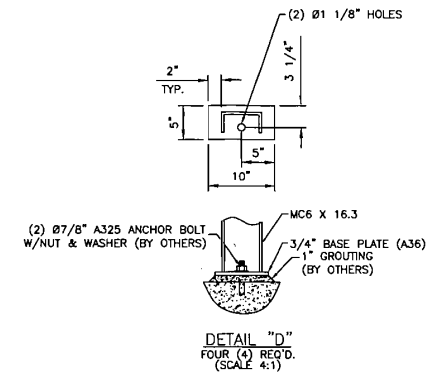
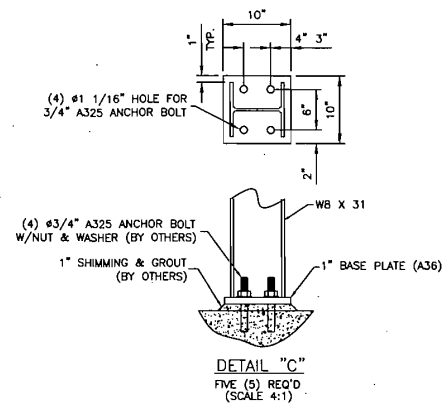
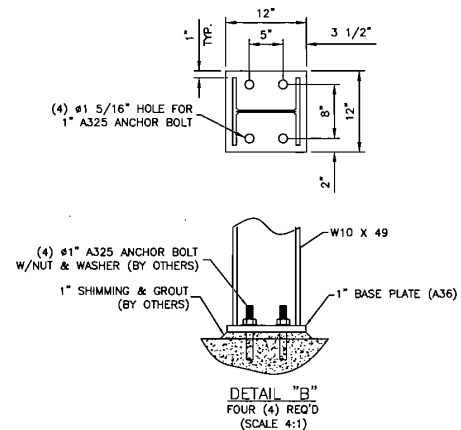
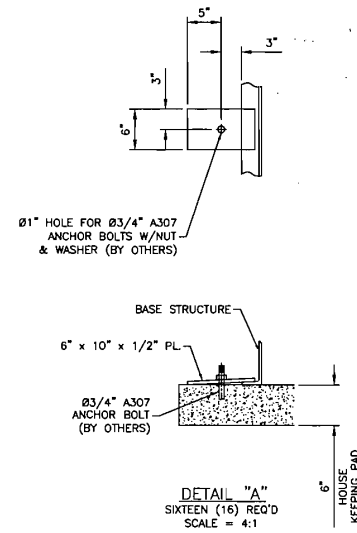
SCALE: 1/4" = 1'-0"

JOB NO.: CP-4143
DRAWING NO.: 722-5341

SHEET 1 OF 2

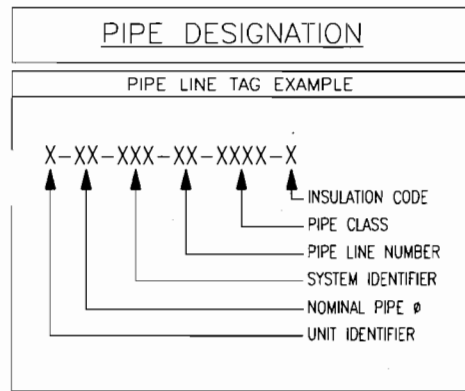


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CleaverBrooks ENGINEERED BOILER SYSTEMS	
NEBRASKA BOILER, CLEAVER-BROOKS, AND ENERGY RECOVERY INTERNATIONAL WITH MATCOM BURNER SYSTEMS	
BASE LOADING SERIES: NB-501D-125-450-HC-RH	
MISSISSIPPI POWER CO. KEMPER COUNTY, MS (SOUTHERN CO. SERVICES)	
SCALE: 1/4" = 1'-0"	SERIAL NO.: CP-4143
JOB NO.: CP-4143	DRAWING NO.: 722-5341
HAND-RIGHT HAND	SHEET 3 OF 2
	4 REV





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

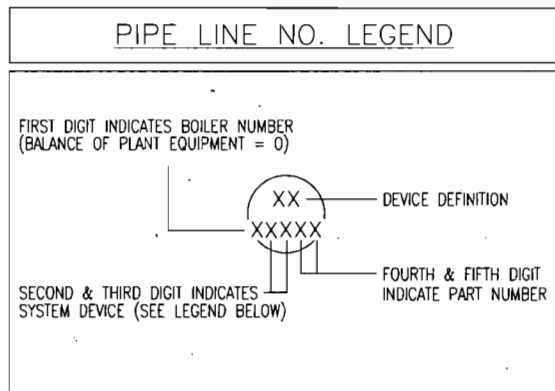
SYSTEM IDENTIFIER	DESCRIPTION
BLR	BOILER TRIM PIPING
BBS	BOILER BLOWDOWN
BFW	BOILER FEEDWATER
CEM	CHEMICAL FEED
CNS	CONDENSATE SYSTEM
CWR	COOLING WATER RETURN
CWS	COOLING WATER SUPPLY
DMN	DEMINERALIZED WATER
DRN	DRAIN
FGS	FUEL GAS SUPPLY
FOS	FUEL OIL SUPPLY
GEN	GENERAL
GLR	GLYCOL RETURN
GLS	GLYCOL SUPPLY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
IAS	INSTRUMENT AIR SUPPLY
NGS	NATURAL GAS SUPPLY
NS	NITROGEN SUPPLY
OXG	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 SPECIFICATION	FLANGE CLASS	MATERIAL
15C1	150	A106 Gr B
15C2	150	A106 Gr B
30C1	300	A106 Gr B
30C2	300	A106 Gr B
60C1	600	A106 Gr B
60C2	600	A106 Gr B
60C3	600	A106 Gr B
90C1	900	A106 Gr B
90C2	900	A106 Gr B
90C3	900	A106 Gr B
30A1	300	A335 Gr P11
30A2	300	A335 Gr P22
30A3	300	A335 Gr P91
60A1	600	A335 Gr P11
60A2	600	A335 Gr P22
60A3	600	A335 Gr P91
90A1	900	A335 Gr P11
90A2	900	A335 Gr P22
90A3	900	A335 Gr P91
15S1	150	A312 TP304/316
30S1	300	A312 TP304/316
30S2	300	A312 TP304/316
60S1	600	A312 TP304/316
60S2	600	A312 TP304/316
90S1	900	A312 TP304/316
90S2	900	A312 TP304/316
150S1	1500	A312 TP304/316

INSULATION CODE

A	= ANTI-SWEAT
F	= FREEZE PROTECTION
H	= HEAT CONSERVATION
N	= NONE



LINE NO.	LINE DESCRIPTION
01	NATURAL GAS PILOT LINE
02	ALTERNATIVE FUEL PILOT LINE
03	NATURAL GAS MAIN FUEL LINE
04	ALTERNATE GAS MAIN FUEL LINE
05	#2 OIL MAIN FUEL LINE
06	#6 OIL MAIN FUEL LINE
07	ALTERNATE OIL MAIN FUEL LINE
08	ATOMIZING STEAM
09	ATOMIZING AIR
10	HYPERMIX STEAM
11	INSTRUMENT AIR LINE
12	PLANT AIR
13	BURNER MISCELLANEOUS
14	SPARE
15	STEAMLINE FOR AIR PREHEATER
16	STEAMLINE FOR OIL HEATER
17	TURBINE GASES
18	SPARE
19	SPARE
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	SPARE
28	SPARE
29	CONDENSATE
30	F.W. PUMP DISCHARGE TO FCV STATION
31	FCV STATION TO STOP VALVE
32	ECONOMIZER & ATTACHMENTS
33	STOP VALVE TO BOILER
34	BOILER PRESSURE VESSEL ATTACHMENTS
35	INTERMITTENT/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	FEEDWATER PUMP TO FLOW CONTROL VALVE
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	SPARE
61	SPARE
62	SPARE
63	SPARE
64	SPARE
65	SPARE
66	SAMPLE STATION
67	SPARE
68	SPARE
69	SPARE
70	SPARE
71	SPARE

ISA PIPING LINETYPES

	PROCESS SUPPLY LINE
	CAPILLARY TUBE / CONNECTION
	ELECTRICAL SIGNAL / HIDDEN LINE
	HYDRAULIC LINE
	MECHANICAL LINK
	PNEUMATIC LINE
	SOFTWARE / COMMUNICATION LINK
	SONIC (GUIDED)
	INSTRUMENT AIR SUPPLY LINE
	4-20 mA SIGNAL
	BY OTHERS
	PROCESS START / TERMINATION FLAG
	SCOPE BREAK (SUPPLIED/CUSTOMER)
	LINE BREAK DESCRIPTOR

ISA VALVE SYMBOLS

	GATE VALVE
	3-WAY VALVE
	GLOBE VALVE
	NEEDLE VALVE
	CHECK VALVE
	BALL VALVE
	BUTTERFLY VALVE
	ANGLE VALVE
	RELIEF OR SAFETY VALVE
	CONTROL VALVE
	PRESSURE REDUCING VALVE
	PRESSURE REGULATING VALVE (EXTERNAL)
	PRESSURE REGULATING VALVE (SELF)

ISA VALVE OPERATOR SYM.

	CYLINDER
	DIAPHRAGM (PNEUMATIC)
	SOLENOID
	MOTOR
	RELIEF
	HAND ACTUATOR

ISA FLOW ELEMENT SYMBOLS

	FLOW ORIFICE
	VORTEX SENSOR
	ULTRASONIC
	VENTURI
	FLOW NOZZLE

ISA TANK SYMBOLS

	DRIP PAN ELBOW
	VENT
	DRAIN

ISA INLINE PIPING SYMBOLS

	FILTER
	FILTER REGULATOR
	FLEXIBLE HOSE
	EXPANSION JOINT
	ECCENTRIC / CONCENTRIC REDUCER
	STRAINER
	TRAP
	CONDENSATE POT
	DESUPERHEATER

ISA MISCELLANEOUS SYMBOLS

	DIAPHRAGM SEAL
	ILLUMINATOR, LIGHT
	CURRENT TO PNEUMATIC CONVERTER
	INTERLOCK LOGIC: B - BMS (BURNER MANAGEMENT SYSTEM) C - CCS (COMBUSTION CONTROL SYSTEM) T - TURBINE J - JUNCTION BOX

ISA EQUIPMENT SYMBOLS

	SILENCER
	BLOWER, FAN
	CENTRIFUGAL PUMP
	HEAT EXCHANGER; SHELL
	RAIN HOOD
	DAMPER
	HEAT EXCHANGER; FINNED TUBE

ISA FUNCTION SYMBOLS

	FIELD MOUNTING	PRIMARY LOCATION (LOCAL PANEL)	AUXILIARY LOCATION (LOCAL PANEL)
DISCRETE INSTRUMENTS			
DCS SHARED DISPLAY/SHARED CONTROL			
BMS PROGRAMMABLE LOGIC CONTROL			
PLC PROGRAMMABLE LOGIC CONTROL			

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REV.	DATE	DESCRIPTION	CN#	DWN	CKD	CKD DATE	APP	APP DATE
△	10/18/10	INITIAL SUBMITTAL OF DRAWING		JJJ	PS	10/18/10	AZ	10/18/10
△	05/06/11	RELEASE FOR CONSTRUCTION		MMP	PS	5/6/11	MSV	5/6/11
△	06/01/11	MOVED TE, TT-X2170 TO ECON-OMIZER OUTLET LINE	E11-241	JJJ	MMP	6/2/11	PS	6/2/11
△	07/13/11	UPDATE CUST. TAG NO.S, DAMPER ACTUATORS, & FUNC. SYMBOLS	E11-277	MMP	PS	7/13/11	MSV	7/13/11
△	07/26/11	UPDATE CUST. TAG NO AND MOTORIZED ACTUATORS SYMBOLS	E11-323	MMP	JJJ	8/1/11	PS	8/11/11
△	01/30/12	UPDATED TAG NUMBER FOR MAIN STEAM OUTLET TEST CONNECTION	E12-042	JJJ	MMP	1/30/12	PS	1/30/12

ISA DEVICE IDENTIFICATION LETTERS

FIRST-LETTER	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION				
C	CONDUCTIVITY			CONTROL	CLOSED
D	SILENCER	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW	RATIO (FRACTION)			
G	SIPHON		GLASS, VIEWING DEVICE		
H	HAND		HOSE		HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RAT OF CHG.		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	TRAP	MOMENTARY			MIDDLE, INTERMEDIATE
N	STRAINER, FILTER				
O			ORIFICE, RESTRICTION POINT (TEST) CONN.		OPEN
P	PRESSURE, VACUUM				
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	VIB., MECH. ANALYSIS		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	MULTIVARIABLE	VENT		VALVE, DAMPER LOUVER	
W	WEIGHT, FORCE		WELL		
X	MISC., DUCTING, STRUCT.	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED CONTROL ELEMENT	

CleaverBrooks®
ENGINEERED BOILER SYSTEMS

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

P & ID
SERIES: NB-501D-125-450-HC

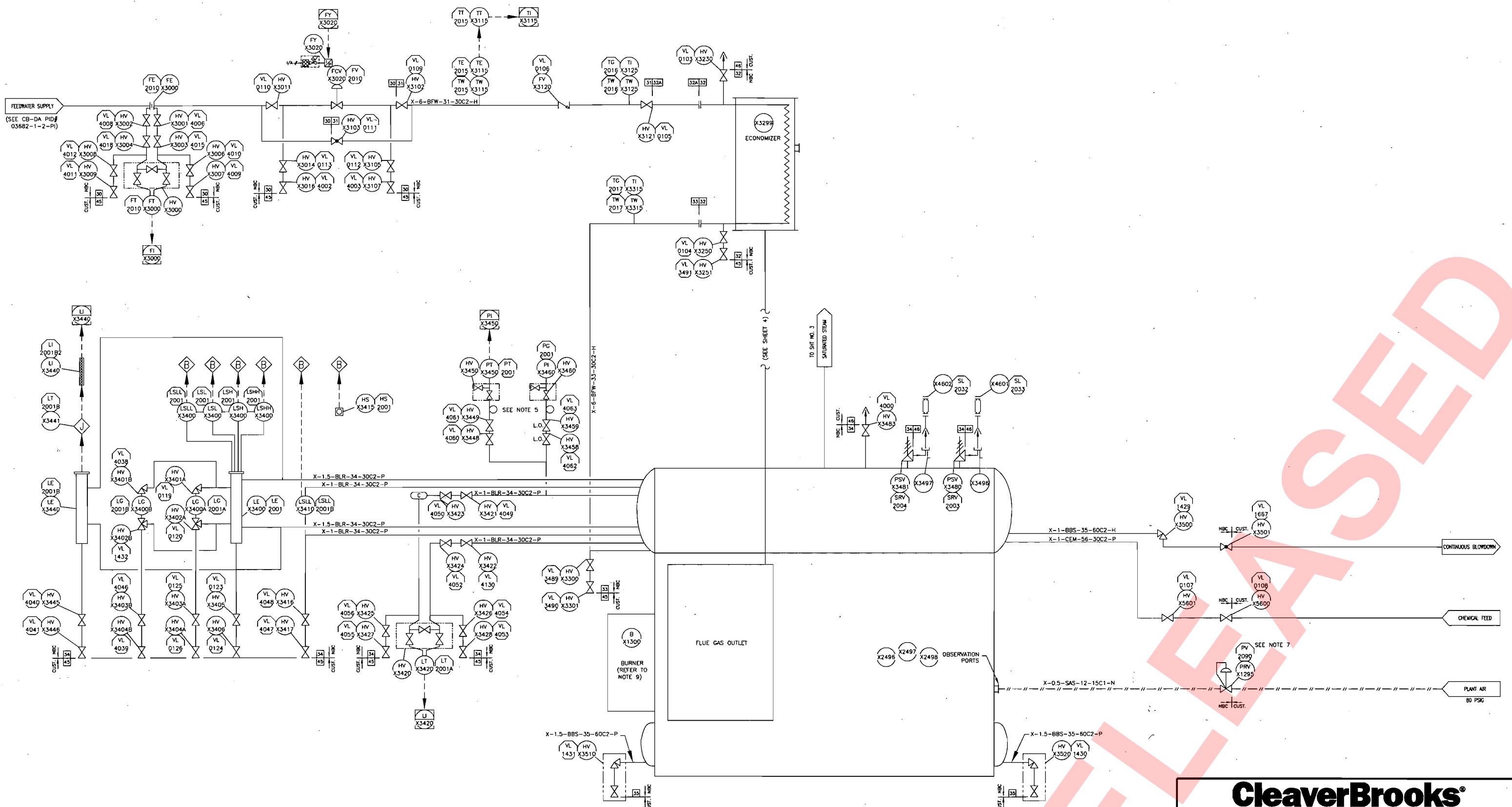
MISSISSIPPI POWER CO.
KEMPER COUNTY, MS
(SOUTHERN CO. SERVICES)

SCALE: -
JOB NO.: CP-4143
HAND: -

SERIAL NO.: CP-4143
DRAWING NO. SHEET 1 OF 4
627-00999

4 REV

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- NOTES:**
- FOR STANDARD LEGEND, REFER TO SHEET 1.
 - REFER TO PROJECT TRIM LIST FOR COMPLETE DESCRIPTION OF COMPONENTS.
 - ALL VENTS (INCLUDING SAFETY RELIEF VALVES) AND DRAINS (PROCESS AND INSTRUMENT) SHALL BE PIPED TO A SAFE AND VISIBLE LOCATION BY OTHERS.
 - THIS DOCUMENT IS NOT TO BE USED FOR MANUFACTURING. LOCATIONS OF PIPING/EQUIPMENT ON THIS DRAWING MAY NOT REFLECT ACTUAL INSTALLATION.
 - INSTRUMENTS REQUIRE LOOP SEAL TEMPERATURE PROTECTION.

- THE CUSTOMER TAG (REPRESENTED BY AN OCTAGON) SHOULD BE PRECEDED BY 01C-QC- IN ALL CASES UNLESS SPECIFICALLY CALLED OUT ON P&ID.
- THIS CUSTOMER TAG NUMBER SHOULD BE PRECEDED BY 01C-SB-.
- COMPONENTS AFTER THE SCOPE BREAK SYMBOL ARE INCLUDED IN THE SCOPE, IF THEY ARE MARKED WITH A CLEAVER BROOKS TAG NUMBER.
- COMPONENTS SUPPLIED BY NATCOM REFER TO NATCOM P&ID (20008_PI-1000) AND NATCOM BILL OF MATERIALS (20008_BM-1000) FOR A COMPLETE DESCRIPTION OF COMPONENTS.



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ENGINEERED BOILER SYSTEMS

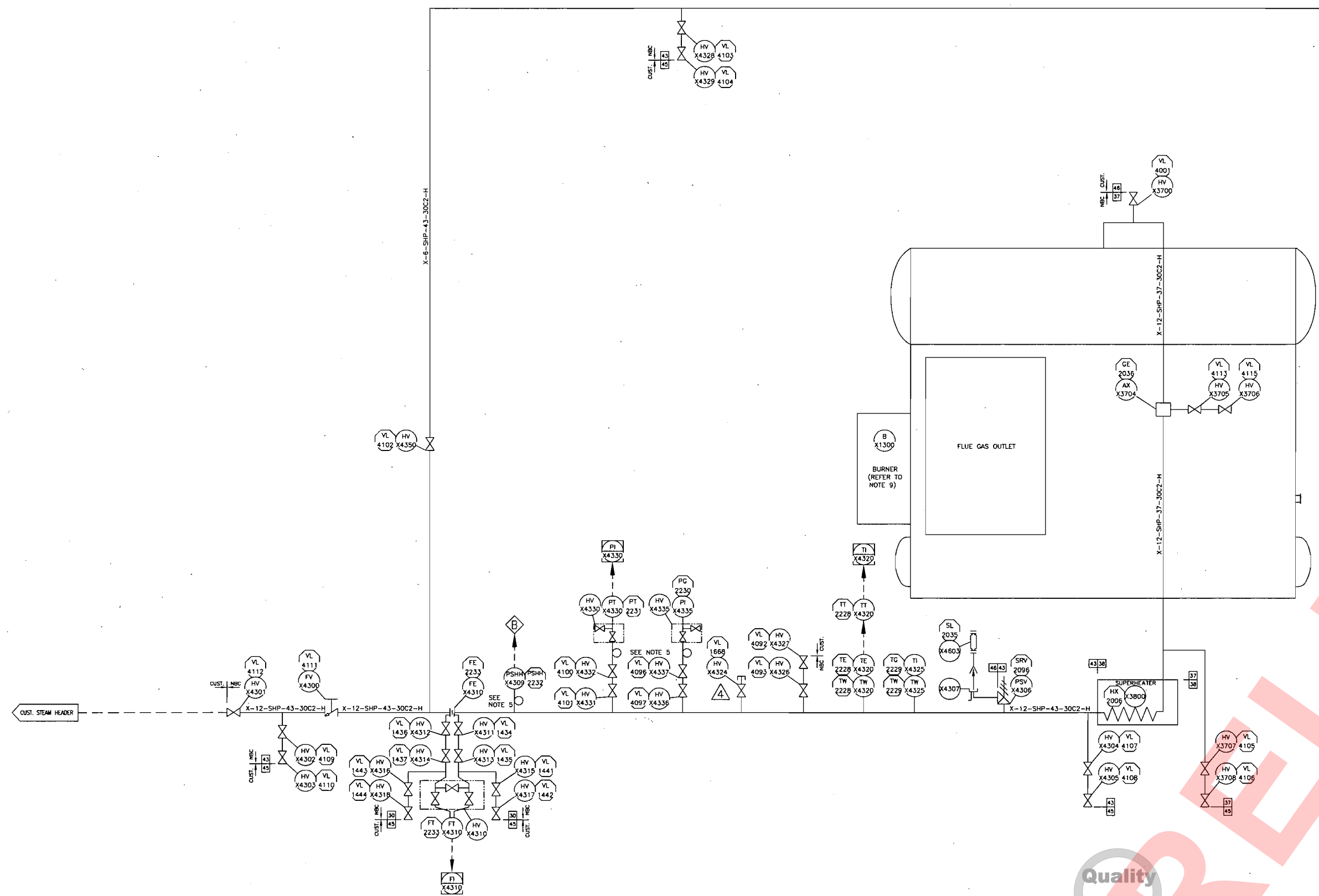
NEBRASKA BOILER, CLEAVER-BROOKS, AND ENERGY RECOVERY INTERNATIONAL
WITH NATCOM BURNER SYSTEMS

P & ID
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MISSISSIPPI POWER CO.
KEMPER COUNTY, MS
(SOUTHERN CO. SERVICES)

SCALE: -	SERIAL NO.: CP-4143	4 REV
JOB NO.: CP-4143	DRAWING NO. SHEET 2 OF 4	
HAND: -	627-00999	

APPROVED

PEERING STEAM
(SEE CB-DA PID#
03682-1-2-PI)



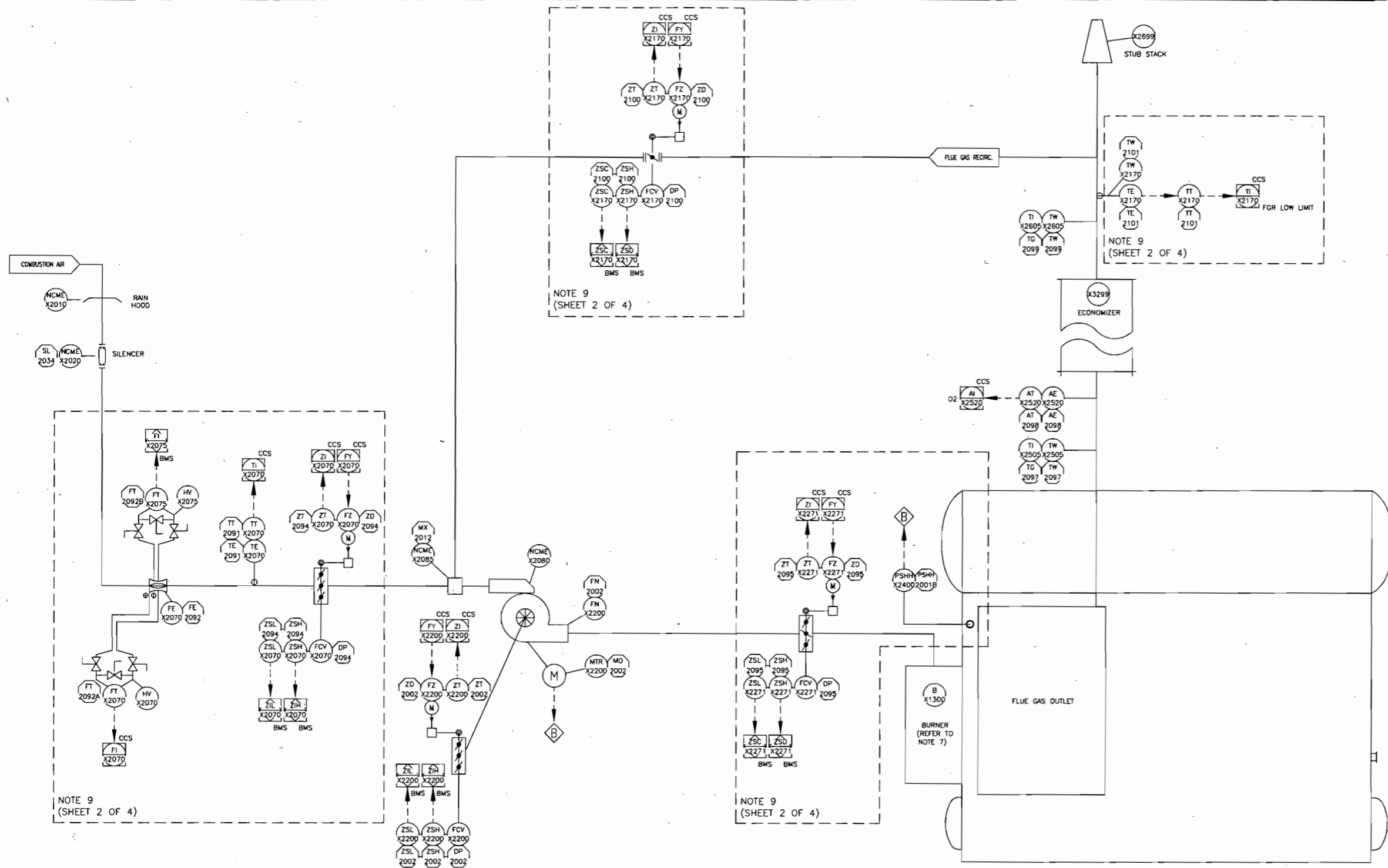
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MISSISSIPPI POWER CO.
KEMPER COUNTY, MS
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SCALE: -	SERIAL NO.: CP-4143	4 REV
JOB NO.: CP-4143	DRAWING NO. SHEET 3 OF 4	
HAND: -	627-00999	



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NOTE 9
(SHEET 2 OF 4)

NOTE 9
(SHEET 2 OF 4)

NOTE 9
(SHEET 2 OF 4)

NOTE 9
(SHEET 2 OF 4)

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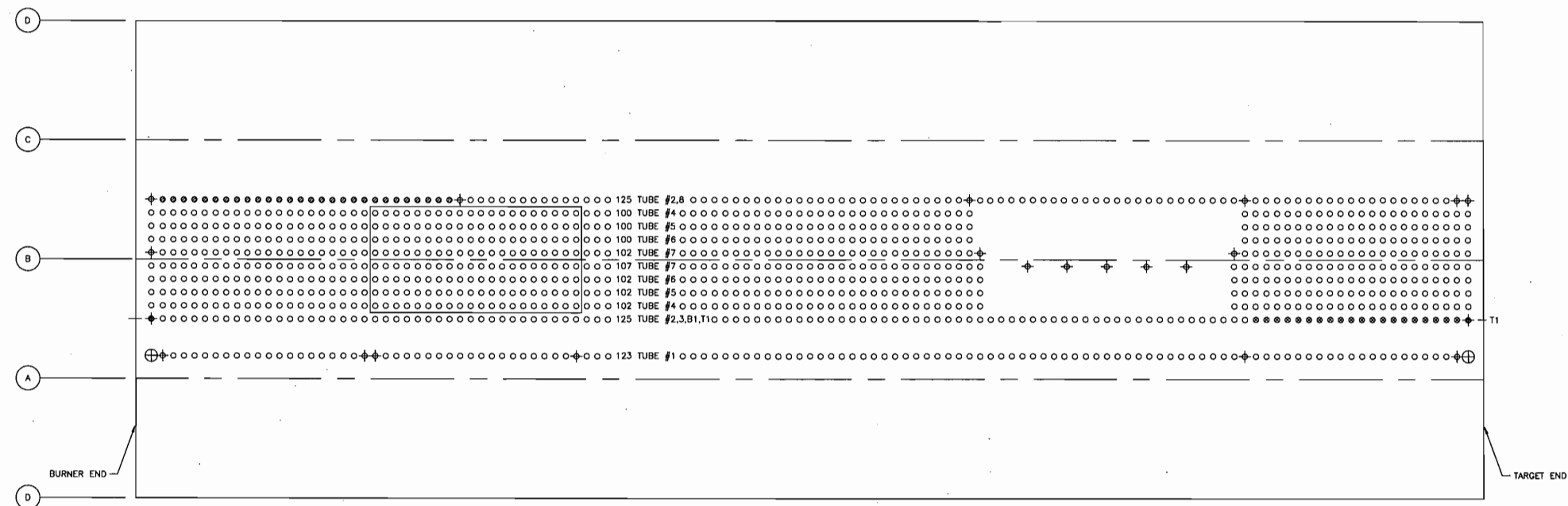
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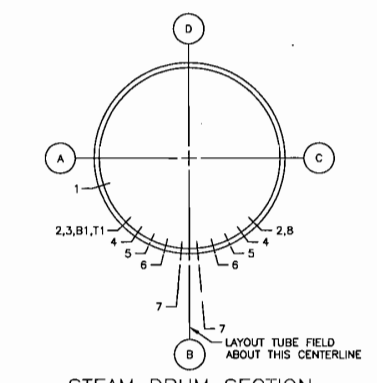


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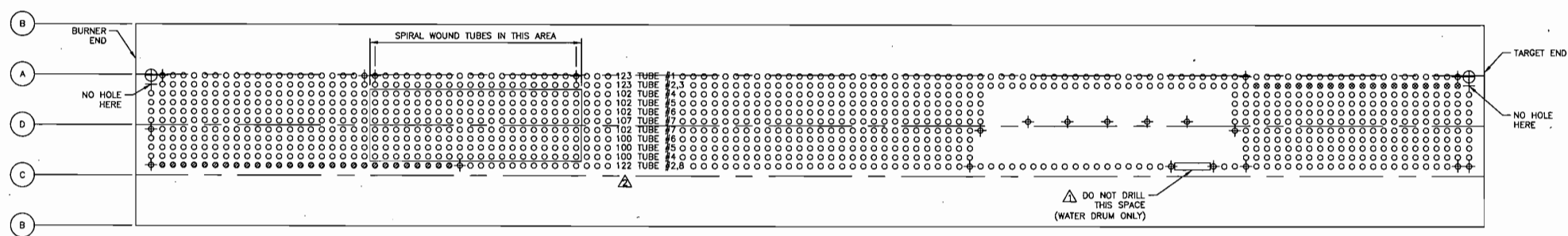
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REV.	DATE	DESCRIPTION	CN #	DWN	CKD	CKD DATE	APP	APP DATE
△	06/08/11	INITIAL RELEASE OF DRAWING		CRR	JAF	6/23/11	CD	6/23/11
△	7/28/11	REMOVED 3 HOLES ON WATER DRUM	E11-323	KVN	MSV	7/28/11	CD	7/28/11
△	08/10/11	CHG. QTY OF HOLE ROW #2 & 8, WAS 125	E11-354	KVN	CD	8/10/11	CD	8/10/11



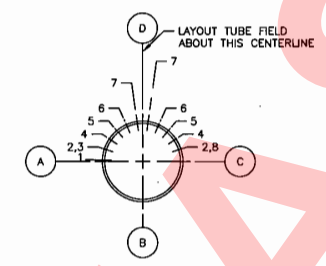
STEAM DRUM DEVELOPED OUTSIDE SURFACE



STEAM DRUM SECTION AS VIEWED FROM BURNER END



WATER DRUM DEVELOPED OUTSIDE SURFACE



WATER DRUM SECTION AS VIEWED FROM BURNER END

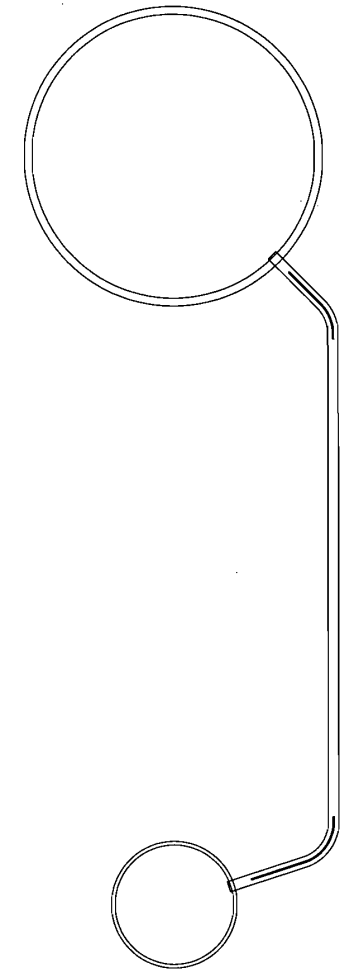
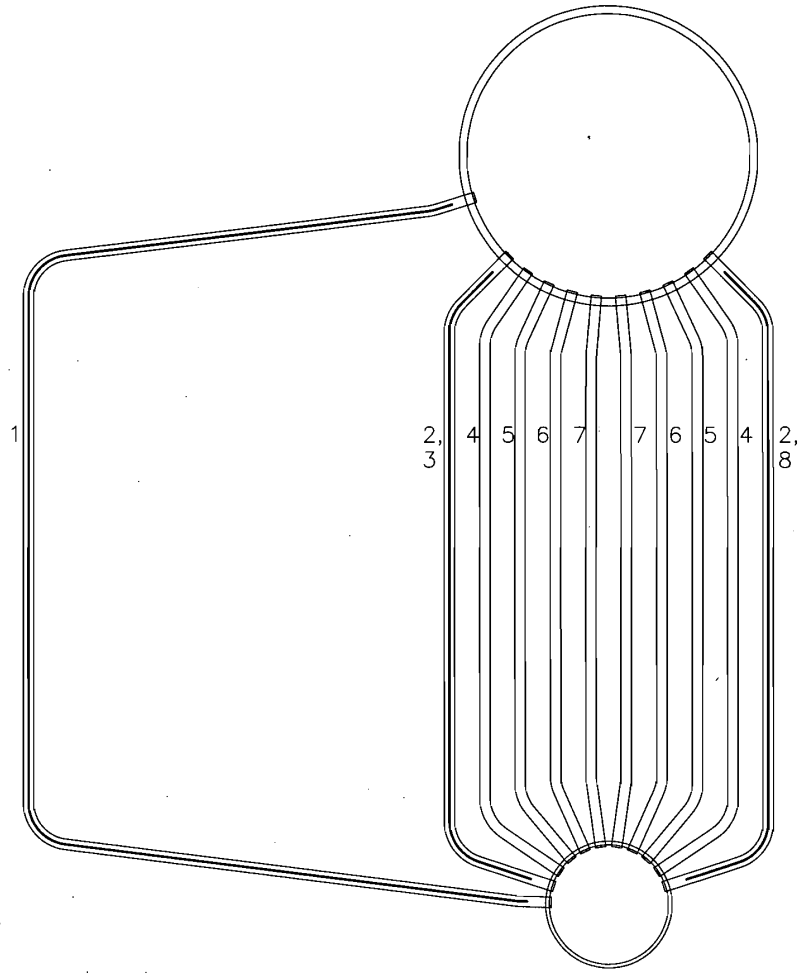
CleaverBrooks
 ENGINEERED BOILER SYSTEMS
 NEBRASKA BOILER, CLEAVER-BROOKS, AND ENERGY RECOVERY INTERNATIONAL
 WITH MATCOM BURNER SYSTEMS
 DRILLING, DRUM
 SERIES: NB-501D-125-450-HC-RH
 MISSISSIPPI POWER CO.
 KEMPER COUNTY, MS
 (SOUTHERN CO. SERVICES)

SCALE: 1/2" = 1'-0"
 JOB NO.: CP-4143 SERIAL NO.: CP-4143
 HAND: RIGHT HAND DRAWING NO.: 190-1580



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DO NOT USE FOR CONSTRUCTION UNLESS APPROVED BELOW								
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REV.	DATE	DESCRIPTION	CN#	DWN	CKD	CKD DATE	APP	APP DATE
0	12/06/10	INITIAL RELEASE OF DRAWING		NP	JDD	12/9/10	AZ	12/10/10



FIN DETAIL TUBE #8
FLUE GAS OUTLET TUBE

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

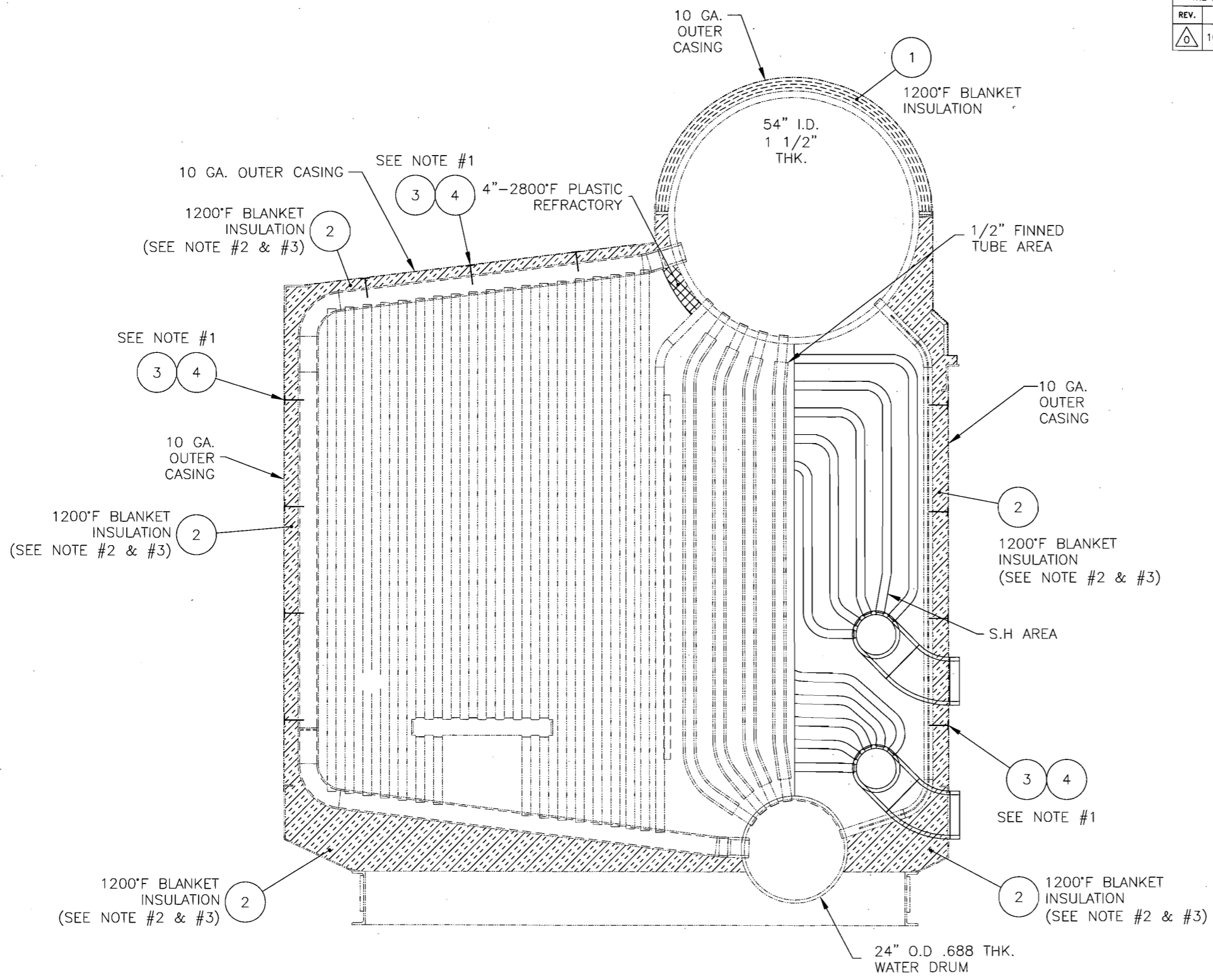
CONV & FURN, TUBE BEND
SERIES: NB-501D-125-450-HC-RH
MISSISSIPPI POWER CO.
KEMPER COUNTY, MS
(SOUTHERN CO. SERVICES)

SCALE: 3/8"=1'-0"	SERIAL NO.: CP-4143	0 REV
JOB NO.: CP-4143	DRAWING NO.	
HAND: RIGHT	093-10144	



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REV.	DATE	DESCRIPTION	CN#	DWN	CKD	CKD DATE	APP	APP DATE
0	10/28/11	INITIAL RELEASE OF DRAWING		VHN	JAF	11/7/11	CD	11/10/11



SECTION "A-A"
VIEWED FROM BURNER END

NOTES:

1. ATTACH PINS, ITEM #3, TO FIN TUBE OR INNER CASING AS APPLICABLE ON 24" CENTER APPROX.
2. 1200°F BLANKET INSULATION TO CONFORM TO FEDERAL HH-1-558.
3. USE 2 LAYERS OF ITEM #2 WITH OVERLAPPING SEAMS.

CleaverBrooks®
ENGINEERED BOILER SYSTEMS

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

DETAIL, INSULATION & REFRACTORY
SERIES: NB-501D-125-450-HC-RH-SH
MISSISSIPPI POWER CO.
KEMPER COUNTY, MS
(SOUTHERN CO. SERVICES)

SCALE: 1/2"=1'-0"	SERIAL NO.: CP-4143	0 REV
JOB NO.: CP-4143	DRAWING NO. SHEET 1 OF 3	
HAND: RIGHT	094-09455	



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