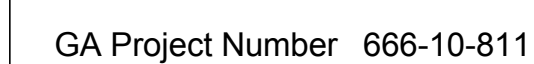
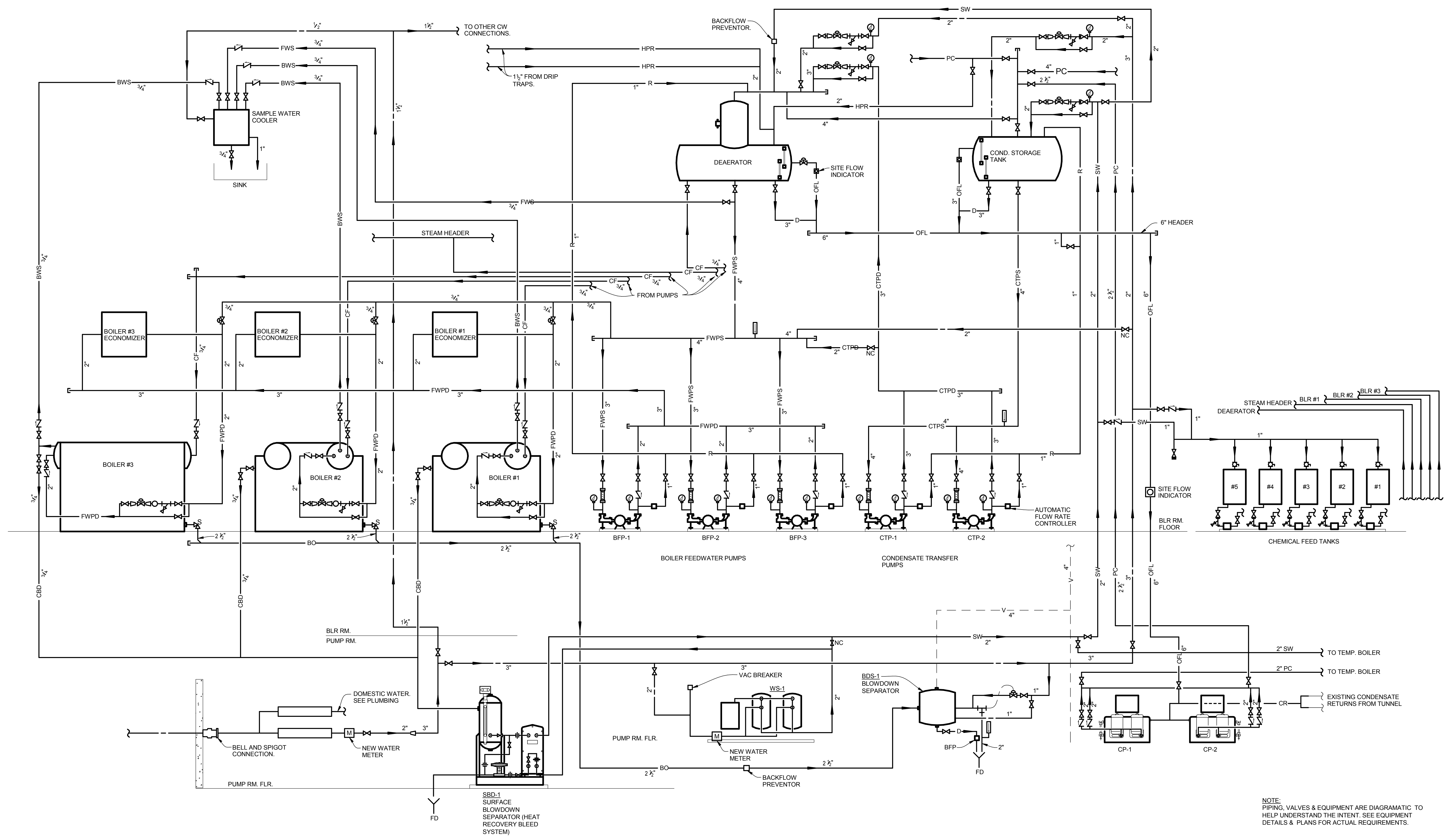


NO SCALE

VA FORM 08-6231

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BOILER FEEDWATER FLOW DIAGRAM
NO SCALE

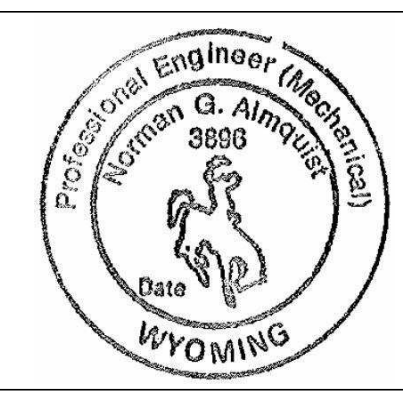
NOTE:
PIPING, VALVES & EQUIPMENT ARE DIAGRAMATIC TO
HELP UNDERSTAND THE INTENT. SEE EQUIPMENT
DETAILS & PLANS FOR ACTUAL REQUIREMENTS.

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GA Project Number 666-10-811

Drawing Title
BOILER FEEDWATER FLOW DIAGRAM

Approved: Project Director
JASON BROWN

Project Title
**-BOILER PLANT
-REPLACEMENT**

Location
- SHERIDAN, WY

Date
12/15/2011
BIDDING & CNSTN

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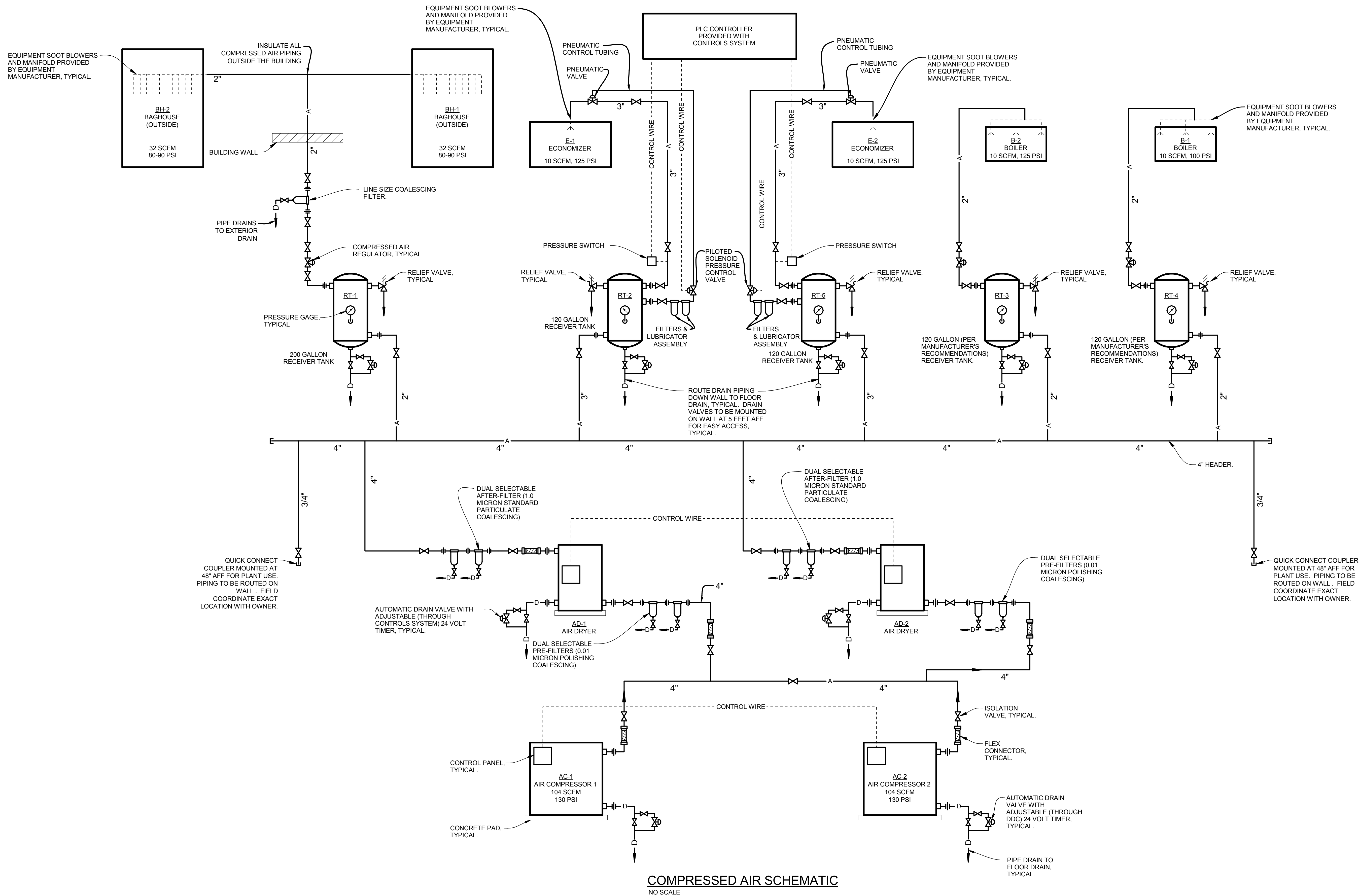
Project Number
- 666-11-101
Building Number
- 90

Drawing Number
M1107
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one-quarter inch = one foot
three-eighths inch = one foot
one-half inch = one foot
three-quarters inch = one foot
one inch = one foot
one and one-half inches = one foot
two inches = one foot
three inches = one foot
four inches = one foot
six inches = one foot
eight inches = one foot
ten inches = one foot
twelve inches = one foot

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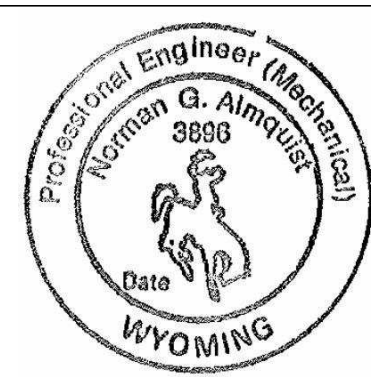


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COMPRESSED AIR SCHEMATIC

Approved: Project Director
JASON BROWN

-BOILER PLANT -REPLACEMENT

Location
- SHERIDAN, WY

Date
12/15/2011
BIDDING & CNSTN

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NGA

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Project Number

- 666-11-101

Building Number

- 90

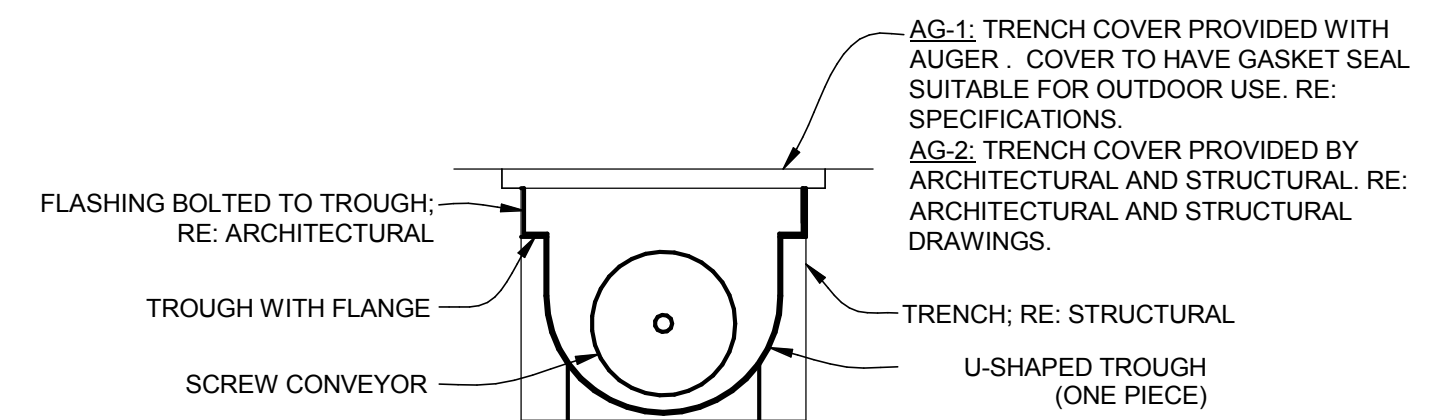
Drawing Number

MI108

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AUGER 1,2 CLEANING METHOD

1. EMPTY AUGER TROUGH OF ALL ASH MATERIAL PRIOR TO HOSING DOWN AUGER SYSTEM.
2. DO NOT UTILIZE AUGER AGAIN UNTIL ALL PARTS OF AUGER ARE COMPLETELY DRY.

CONSTRUCTION DOCUMENTATION SUBMISSION - BIDDING & CONSTRUCTION

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NTS

2

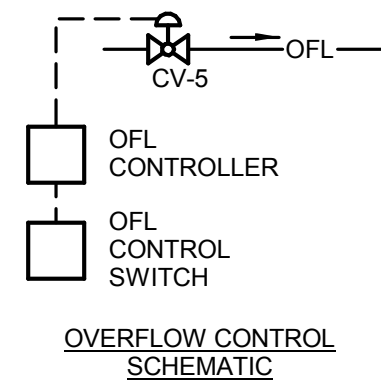
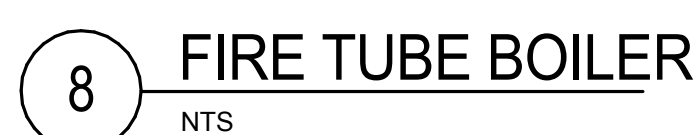
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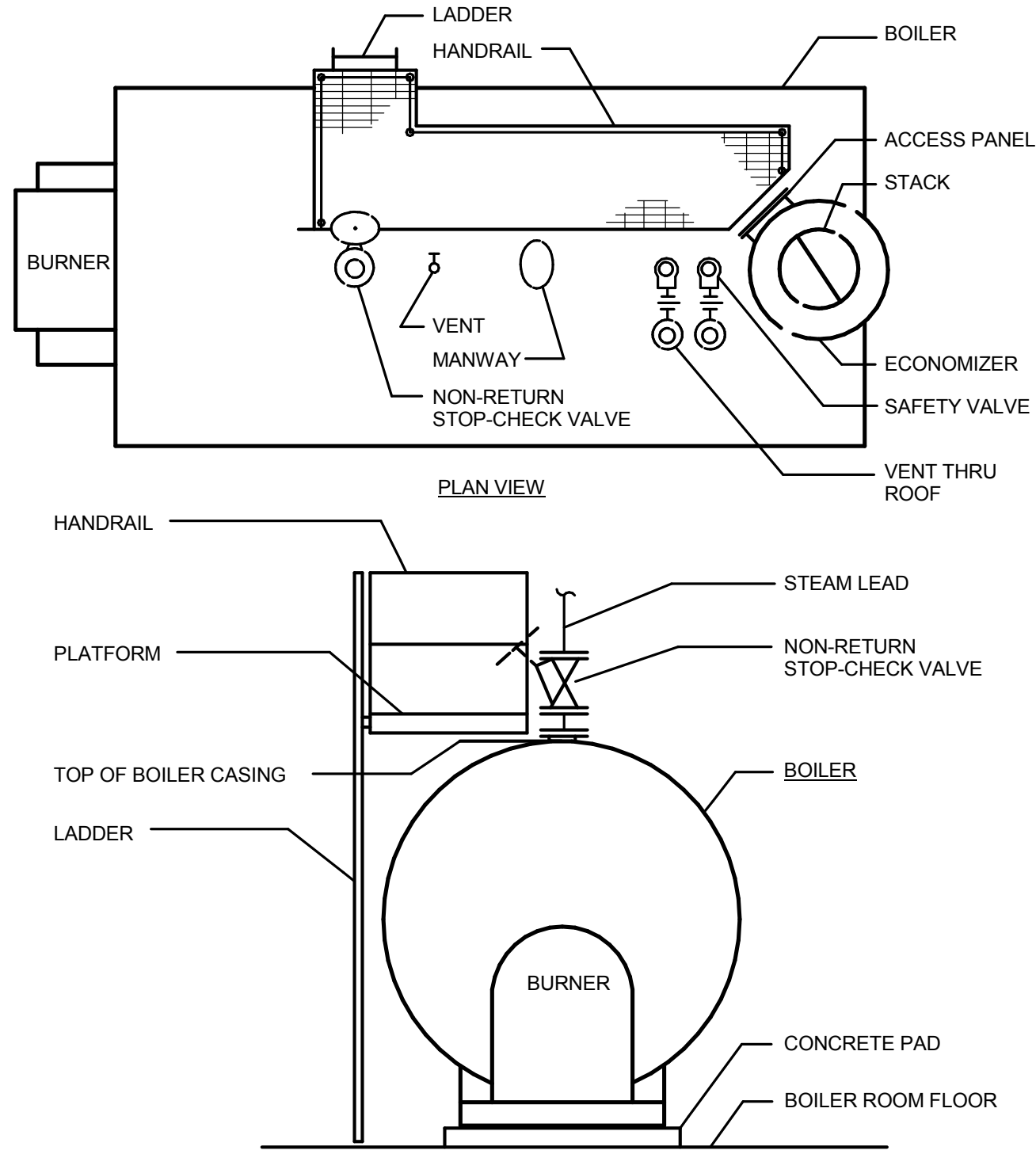
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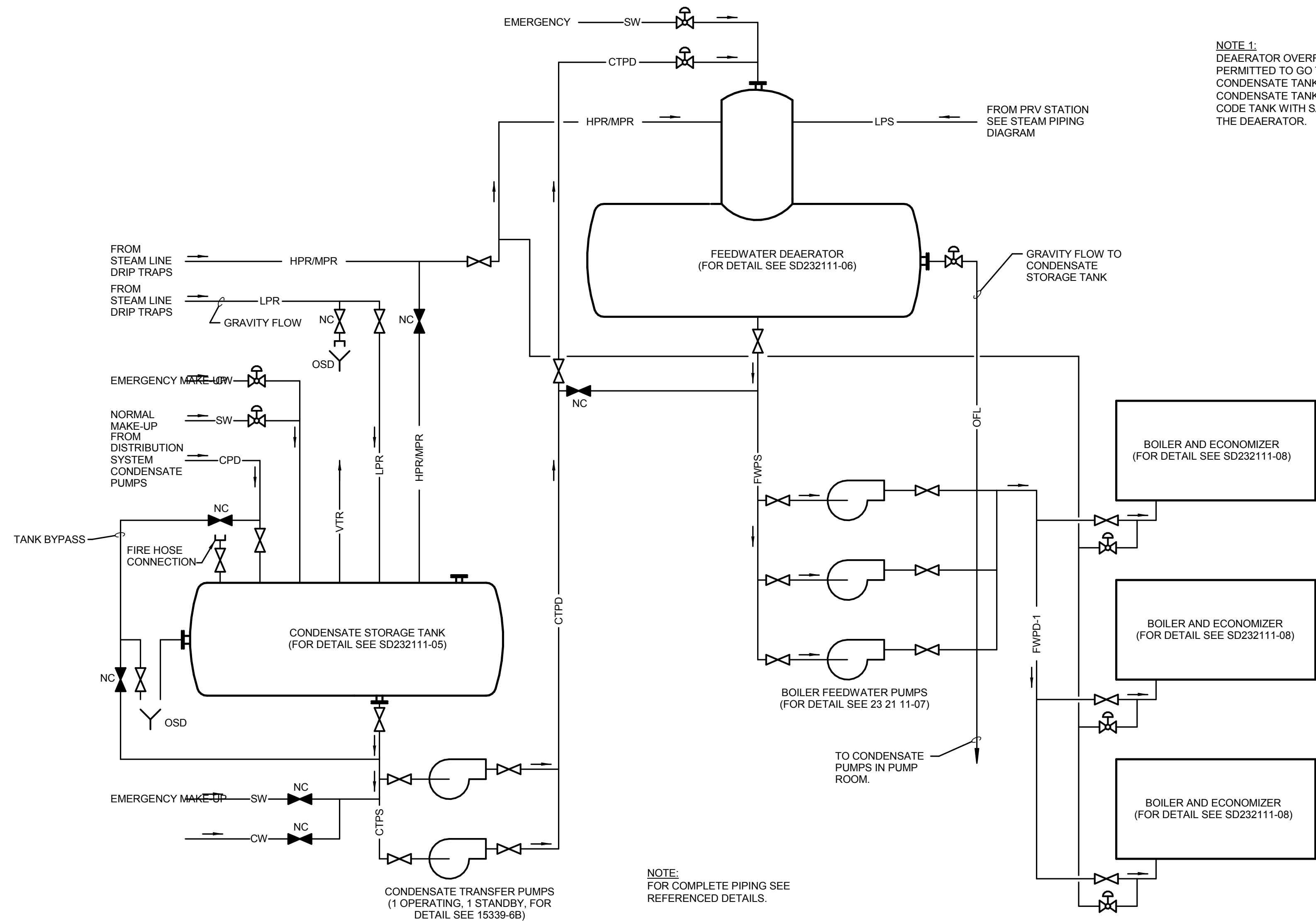


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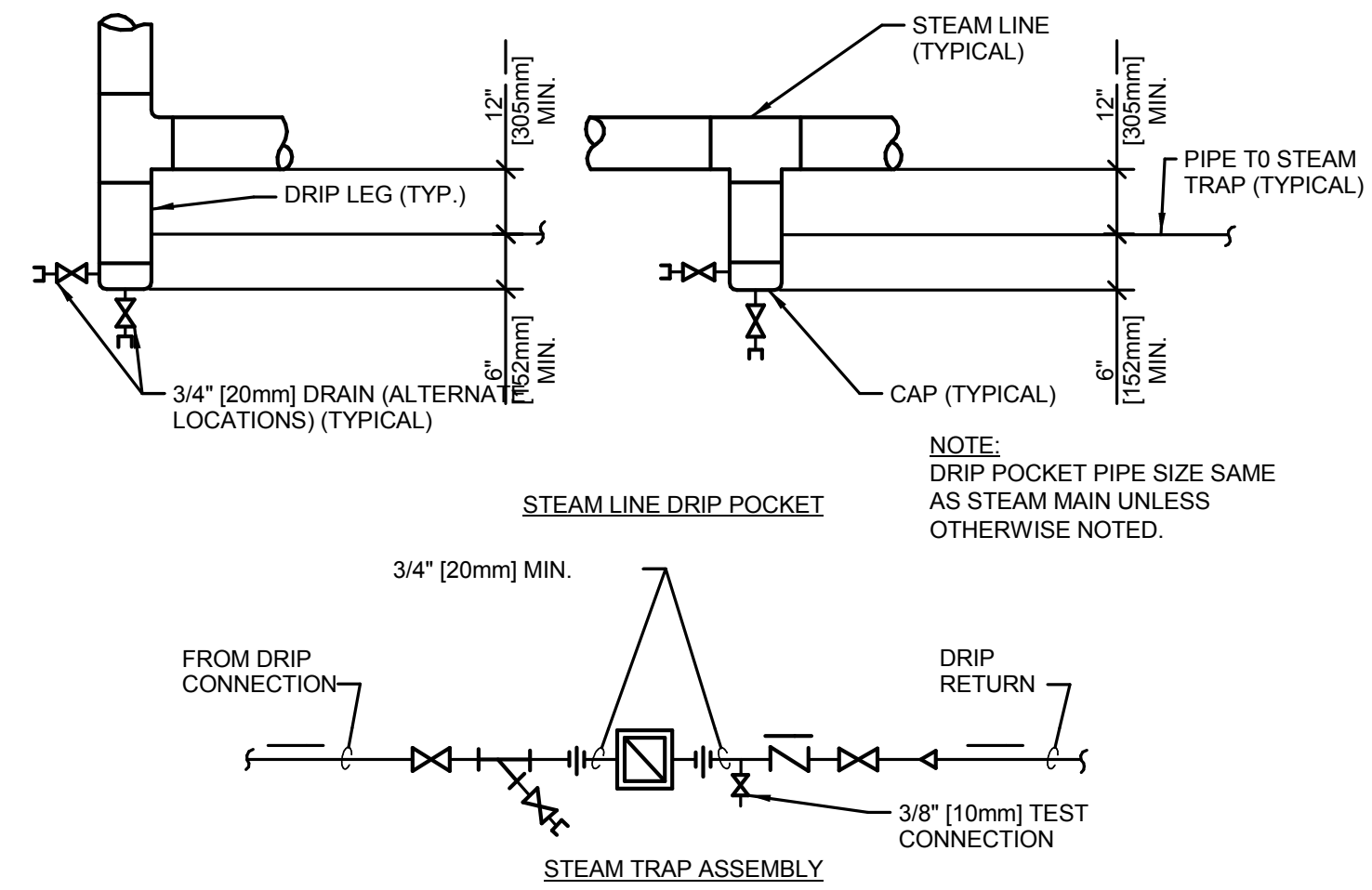
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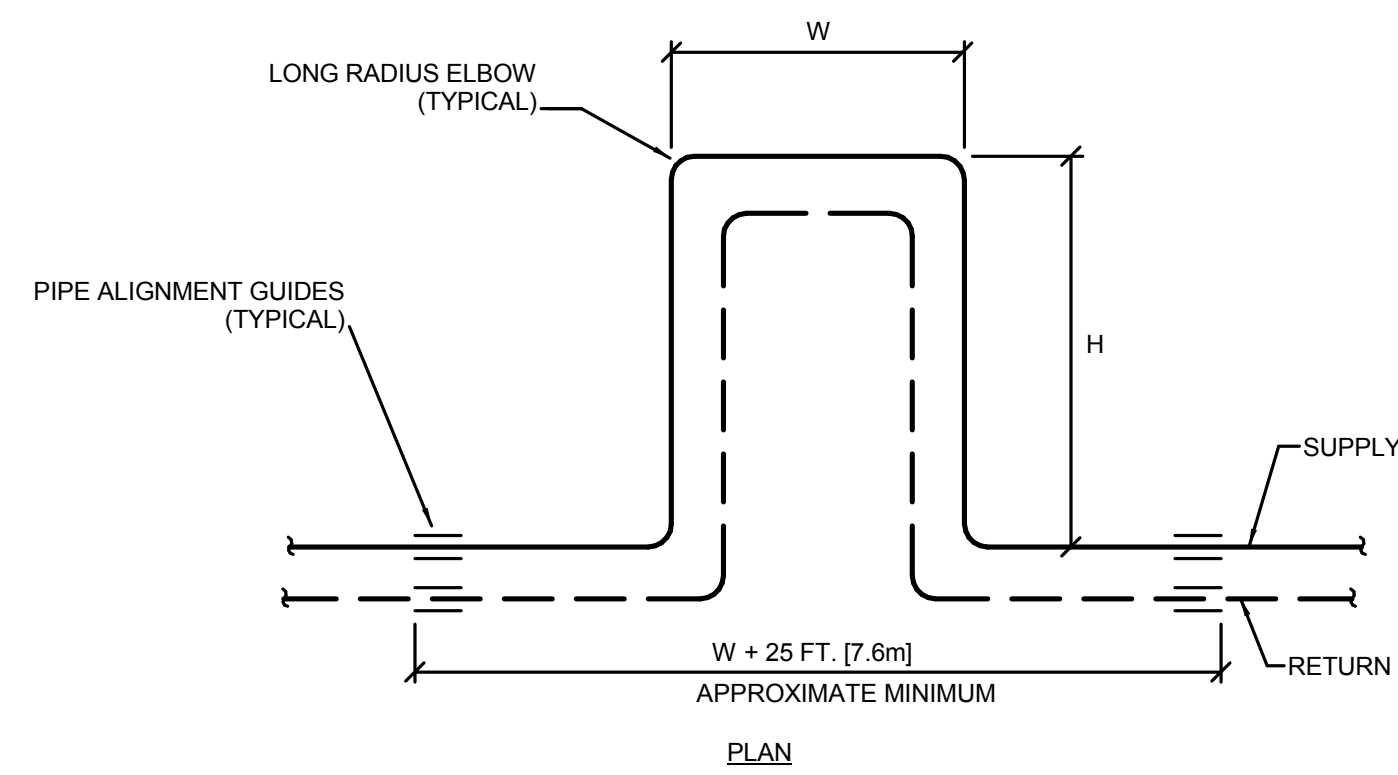
13 ACCESS PLATFORM ARRANGEMENT
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14 BASIC FLOW DIAGRAM - CONDENSATE AND BOILER FEEDWATER
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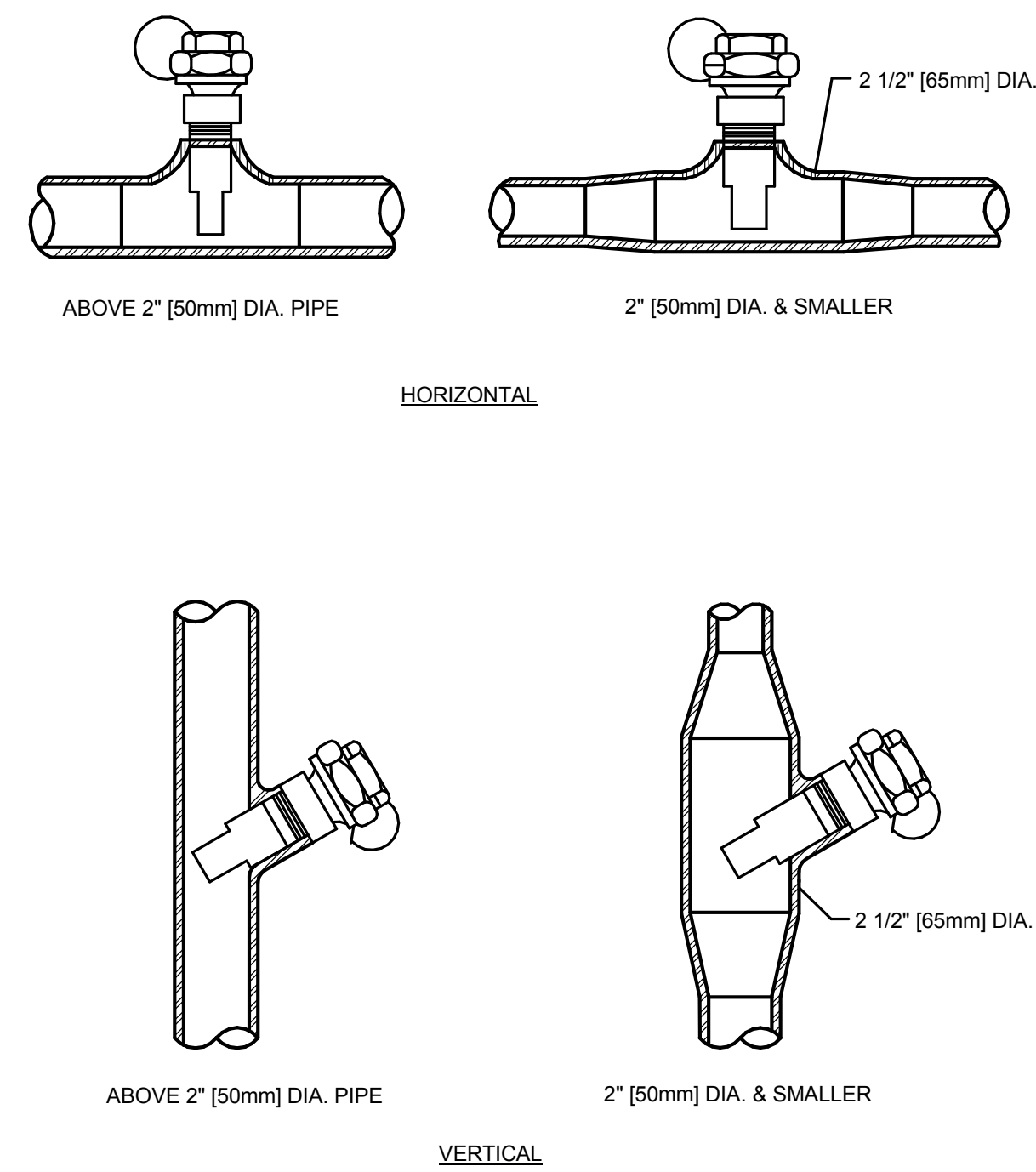


15 STEAM LINE DRIP POCKET
STEAM TRAP ASSEMBLY
NTS

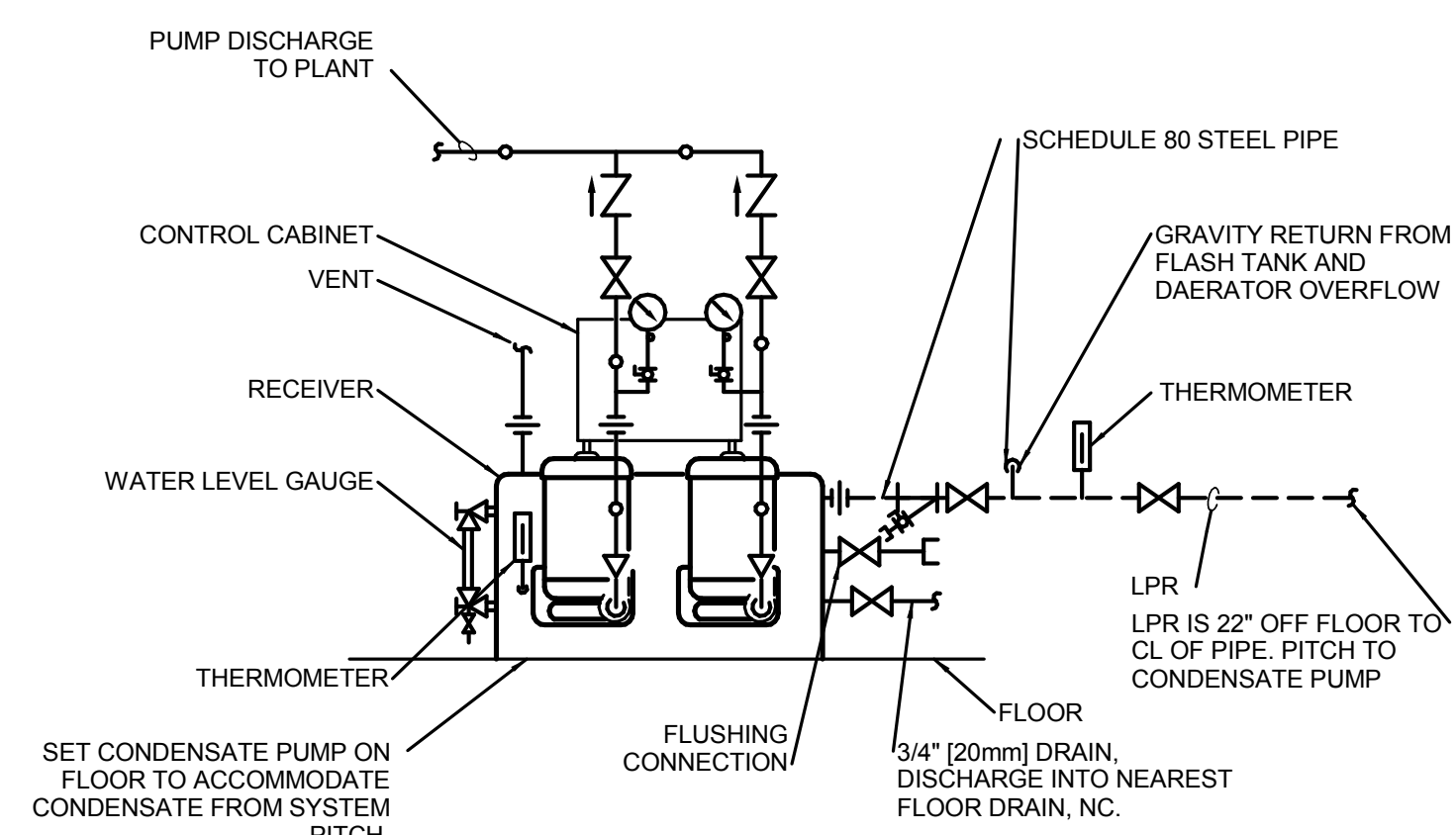


| EXPANSION LOOP | | |
|----------------|----|----|
| LOOP NO. | W | H |
| EL-1 | 4' | 8' |
| EL-2 | 4' | 8' |

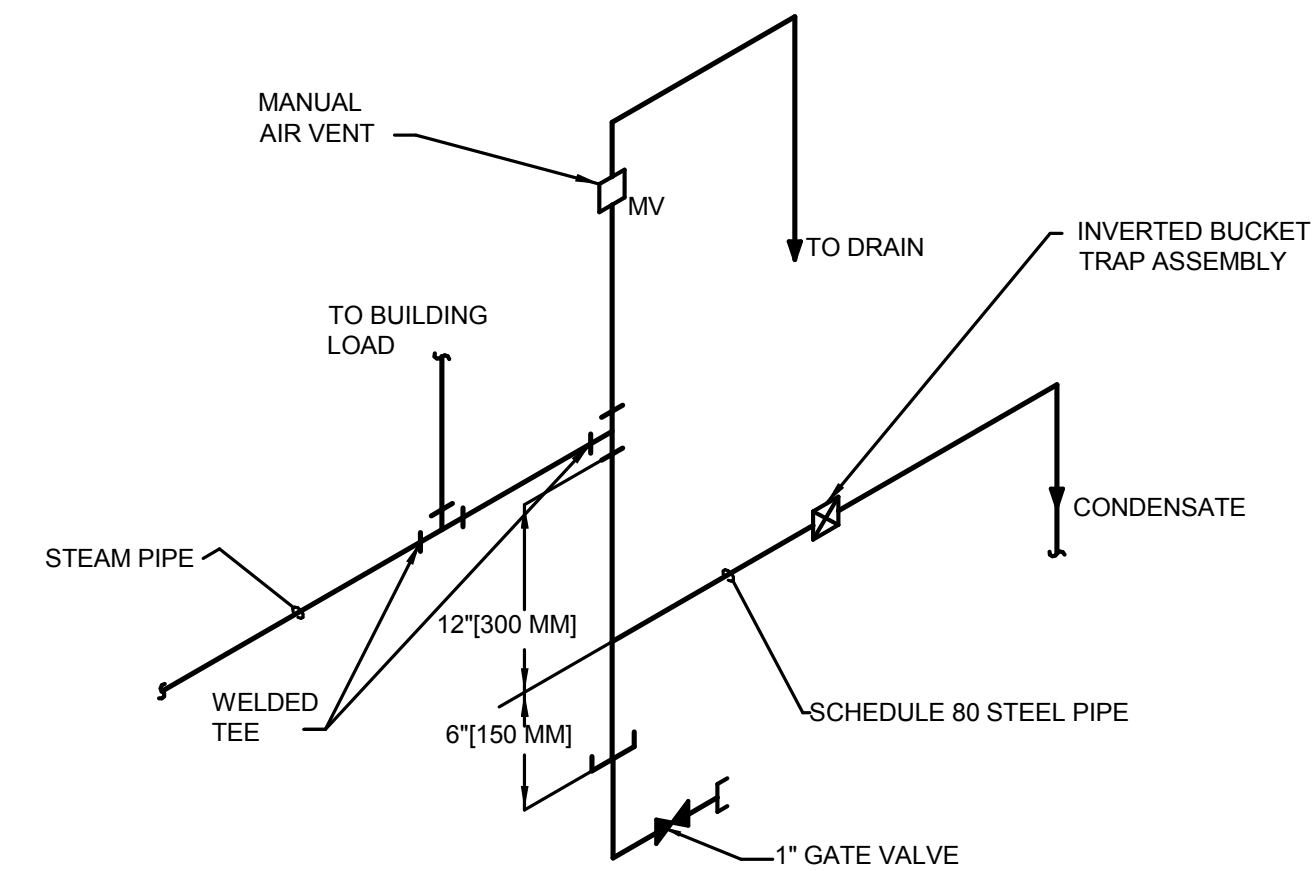
16 EXPANSION LOOP DETAIL
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17 INSTALLATION OF THERMOMETER WELLS
NTS



18 CONDENSATE PUMPS - PIPING CONNECTIONS
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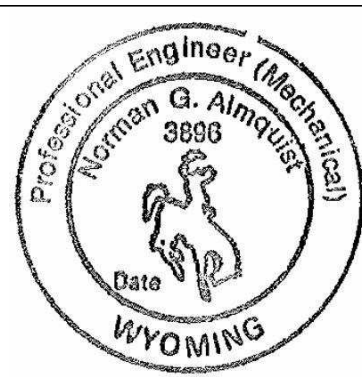
19 END OF STEAM LINE DRIP TRAP
NTS

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GA Project Number 666-10-811

Drawing Title
MECHANICAL DETAILS

Approved: Project Director
JASON BROWN

Project Title
**-BOILER PLANT
-REPLACEMENT**

Location
- SHERIDAN, WY

Date
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BIDDING & CNSTN

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Project Number
- 666-11-101
Building Number
- 90

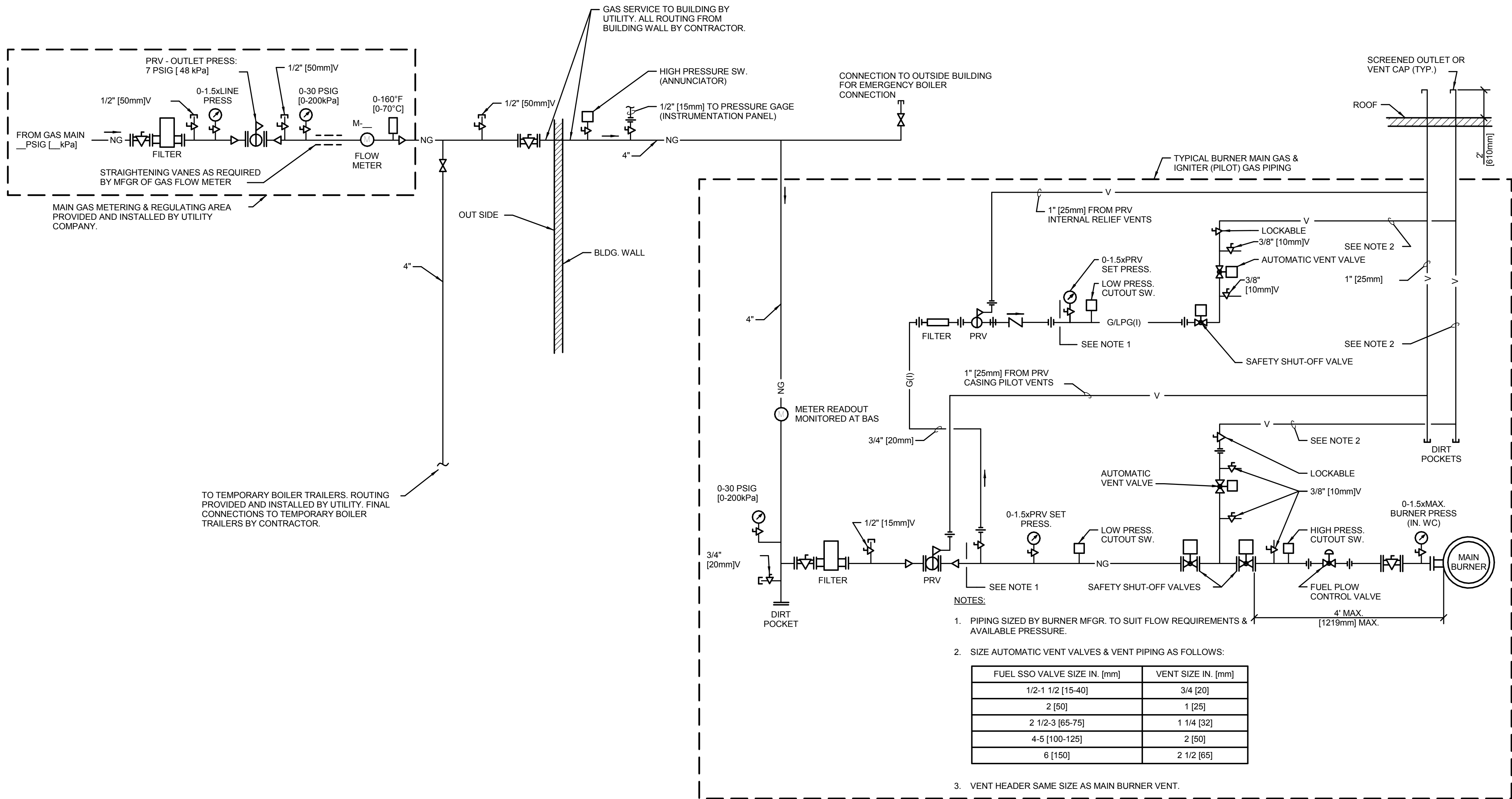
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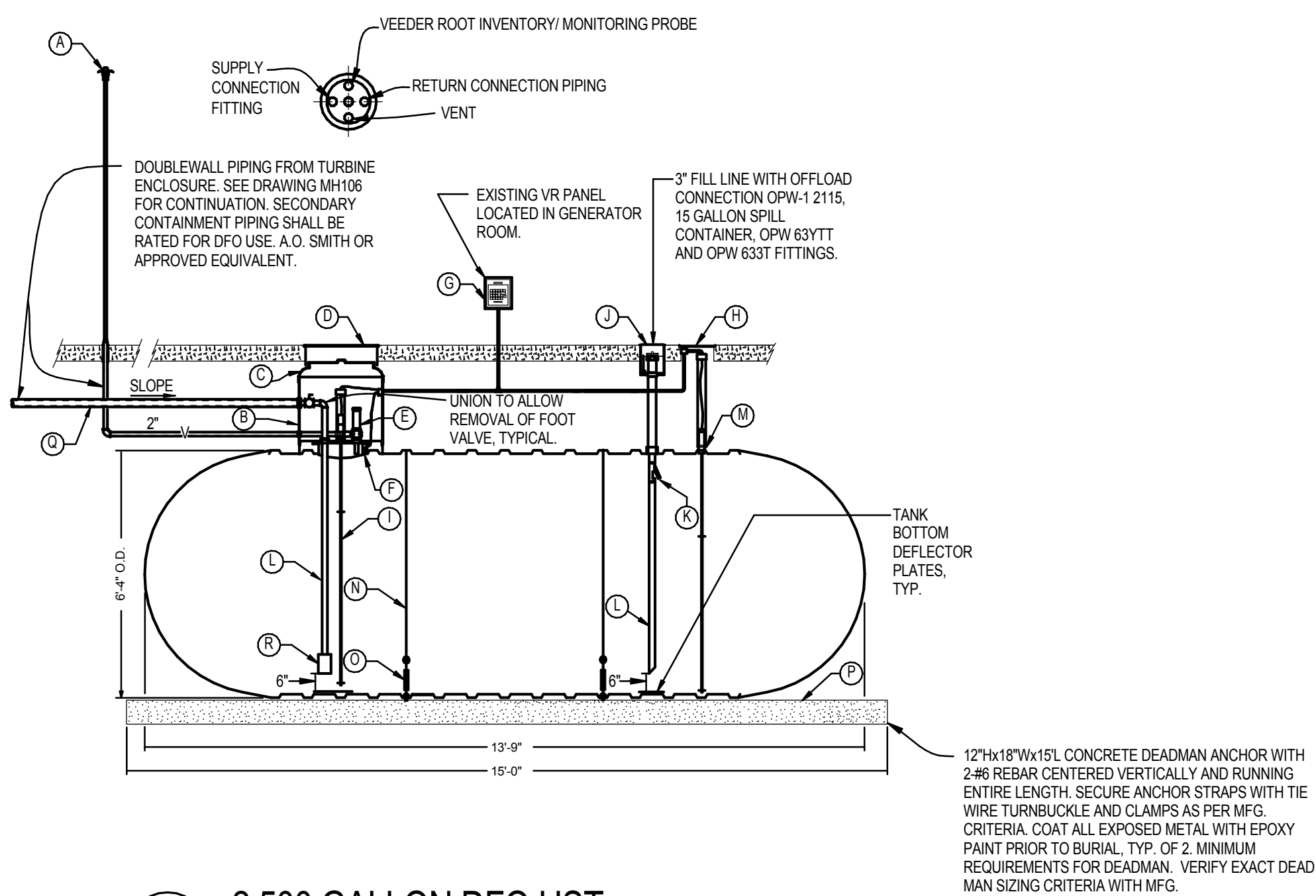
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27 NATURAL GAS - BURNER AND IGNITER FUEL STANDARD PIPING DIAGRAM
NTS



28 2,500 GALLON DFO UST
NTS

| MANHOLE SIZE | | NOTOR OIL LIST EQUIPMENT LISTING | |
|--------------|-------|---|--|
| A | 1 1/2 | OPW 2" VENT CAP THERMATE 1201 MIN. A.F.G. | |
| B | 1 1/2 | CONTAINMENT DOLLAR WISE-SEAL TURBINE ENCLOSURE | |
| C | 1 1/2 | HOPE ENCLOSURE REPAIR ADHESIVE KIT WITH TIE LID | |
| D | 1 1/2 | RAIN TIGHT CONCRETE MANHOLE & FRAME (200 RATING) | |
| E | 1 1/2 | EXTRACTOR HOUSING WITH CAP | |
| F | 1 1/2 | CONTAINMENT DOLLAR SENSOR VEE-DEER ROOT | |
| G | 1 1/2 | INVENTORY & LEAK DETECTION PANEL VEE-DEER ROOT (EXISTING) | |
| H | 1 1/2 | WATER TIGHT MANHOLE | |
| I | 1 1/2 | TANK INVENTORY GAUGE - VEE-DEER ROOT | |
| J | 1 1/2 | SPILL CONTAINMENT MANHOLE W/CAP & ADAPTER | |
| K | 1 1/2 | OVERBELL PRE-CONCRETE VALVE | |
| L | 1 1/2 | DROP TUBE | |
| M | 1 1/2 | INTERSTITIAL SPACE SENSOR VEE-DEER ROOT | |
| N | 1 1/2 | FIBERGLASS HOLD DOWN STRAP TYP. | |
| O | 1 1/2 | GALVANIZED TURBUCKLE (AWN) TYP. | |
| P | 1 1/2 | CONCRETE DEADMAN ANCHOR (SEE NOTE BELOW) | |
| Q | 1 1/2 | DOUBLE WALL PIPING FROM TURBINE ENCLOSURE TO TRANSITION SLUMP | |
| R | 1 1/2 | ROOT VALVE | |

- SHEET NOTES:**
- THIS SECTION IS DIAGRAMMATIC AND IS NOT TO BE SCALED. SEE DRAWING MH105 AND ARCHITECTURAL DRAWINGS FOR ORIENTATION ON SITE. ALSO REFERENCE SPECIFIC MFG. DRAWINGS AND CRITERIA FOR INSTALLATION CRITERIA.
 - ALL DIMENSIONS, INVERTS, ELEVATIONS, ETC. SHALL BE FIELD COORDINATED BEFORE ORDERING.
 - ALL MANWAY AND ACCESS LIDS AND FRAMES SHALL BE RATED FOR H20 LOADING.

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GA Project Number 666-10-811

Drawing Title
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Approved: Project Director
JASON BROWN

Project Title
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-REPLACEMENT
-

Location
- SHERIDAN, WY

Date
12/15/2011
BIDDING & CNSTN

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Project Number
- 666-11-101
Building Number
- 90

Drawing Number
M1114

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| STEAM PRESSURE REDUCING VALVE STATION SCHEDULE | | | | | | | | | |
|--|----------|-------------------|--------|------------|--------|-----------------------|----------------------|--------------|-------|
| STATION NO. | DWG. NO. | TOTAL FLOW LBS/HR | VALVE | | | | | MANUFACTURER | NOTES |
| | | | NO. | SIZE (IN.) | LBS/HR | INITIAL PRESS. (PSIG) | OUTLET PRESS. (PSIG) | | |
| PRV-1 MPS | MH105 | 24,000 | PRV-1A | 6" | 16,000 | 125 | 75 | SPENCE | |
| | | | PRV-1B | 4" | 8,000 | 125 | 75 | SPENCE | |
| | | | | | | | | | |
| PRV-2 LPS | MH105 | 7,500 | PRV-2A | 4" | 5,000 | 75 | 7 | SPENCE | |
| | | | PRV-2B | 3" | 1,500 | 75 | 7 | SPENCE | |
| | | | | | | | | | |

| STEAM VENT SILENCER SCHEDULE | | | | | | | | | | | | | | | |
|------------------------------|----------|----------------|------------------------------|---------------------------|---------|---------|----------|----------|----------|----------|----------|----------|----------|-----------------------------|-------|
| ITEM | DWG. NO. | FLOW LBS/HR | TEMPERATURE/ SET PRESSURE | MINIMUM SOUND ATTENUATION | | | | | | | | | | MANUFACTURER & MODEL NO. | NOTES |
| | | | | 31.5 HZ | 63 HZ | 125 HZ | 250 HZ | 500 HZ | 1.0 KHZ | 2.0 KHZ | 4.0 KHZ | 8.0 KHZ | 16.0 KHZ | | |
| VS-1 | MH105 | 24,000 | 300 DEG F / 14.7 PSIG | 9.2 DBA | 3.6 DBA | 7.6 DBA | 15.2 DBA | 28.0 DBA | 34.6 DBA | 42.2 DBA | 46.2 DBA | 43.1 DBA | 31.3 DBA | PENN SEPARATOR - SP 10-36 | |

| SAMPLE COOLER | | | | | | | | | |
|--|------------------------------|-----------------------------|------------------|-------------------|------------------------|------------------------|-----------------------|-----------------------------|-------|
| ITEM | SHELL PRESS. RATING (PSI) | TUBE PRESS. RATING (PSI) | TUBE MATERIAL | SHELL MATERIAL | WEIGHT WATER LBS | SHELL PRESSURE DROP | TUBE PRESSURE DROP | MANUFACTURER & MODEL NO. | NOTES |
| SC-1 | 250 | 3500 | 316 SS | 316 SS | 10 | 55 PSIG @ 250 LBS/HR | 3 PSIG @ 3 GPM | NEPTUNE - SC-316 | 1 |
| NOTES: 1. PROVIDE WITH MOUNTING PANEL, COOLING WATER INLET AND OUTLET VALVES, SAMPLE INLET METERING VALVE AND ISOLATION VALVE. | | | | | | | | | |

| BLOW DOWN SEPARATOR | | | | | | | | | |
|---|----------|--------------|-------------------------------|---------------------|---------------------|--------------------|------------------|-----------------------------|-------|
| ITEM | TYPE | SERVICE | OPERATING PRESSURE PSIG | VALVE SIZE IN | DRAIN SIZE IN | VENT SIZE IN | OP WGT LBS | MANUFACTURER & MODEL NO. | NOTES |
| BDS-1 | VERTICAL | BOILER PLANT | 125 | 2.0 | 5 | 5 | -- | PENN SEPARATOR - A34B | 1 |
| NOTES: 1. PROVIDE WITH AFTERCOOLER MODEL 18DF-5, 2" SOLENOID VALVE AND STRAINER KIT, AND FLOOR STAND. | | | | | | | | | |

| CONDENSATE PUMPING UNIT SCHEDULE | | | | | | | | | | | | |
|---|----------|--------------|--------------|--------------|----------|------------|-------|-------|----------------|--------------------------|-------|-----------|
| ITEM | DWG. NO. | SERVICE | NO. OF PUMPS | GPM PER PUMP | HEAD PSI | MOTOR DATA | | | TANK CAP. GAL. | MANUFACTURER & MODEL NO. | NOTES | CON-TROLS |
| | | | | | | HP | V-PH | STRTR | | | | |
| CP-1 | MH103 | BOILER PLANT | 2 | 55.0 | 25 | 2@3 | 460/3 | HOA | 120 | SHIPCO - 2DCC14 | | 6 |
| CP-2 | MH103 | BOILER PLANT | 2 | 55.0 | 25 | 2@3 | 460/3 | HOA | 120 | SHIPCO - 2DCC14 | | 6 |
| NOTES: 1. FURNISH WITH UNIT MOUNTED DISCONNECT. | | | | | | | | | | | | |

| PUMP SCHEDULE | | | | | | | | | | | | | | | |
|---------------|----------|----------|--------------|-----|--------|---------------------|---------------|------------|------|-------|-------|--------------|--------------------------|-------|-----------|
| ITEM | DWG. NO. | TYPE | SERVICE | GPM | % GLY. | TOTAL HEAD FT. W.C. | NPSH FT. W.C. | MOTOR DATA | | | | OP. WT. LBS. | MANUFACTURER & MODEL NO. | NOTES | CON-TROLS |
| | | | | | | | | HP | RPM | V-FPH | STRTR | | | | |
| BFP-1 | MH104 | INLINE | BOILER FEED | 40 | 0 | 376 | 12 | 7.5 | 3500 | 460-3 | VFD | 150 | GRUNDFOS - G520 | | 6 |
| BFP-2 | MH104 | INLINE | BOILER FEED | 40 | 0 | 376 | 12 | 7.5 | 3500 | 460-3 | VFD | 150 | GRUNDFOS - G520 | | 6 |
| BFP-3 | MH104 | INLINE | BOILER FEED | 40 | 0 | 376 | 12 | 7.5 | 3500 | 460-3 | VFD | 150 | GRUNDFOS - G520 | | 6 |
| CTP-1 | MH104 | END SUC. | COND. TRANS. | 58 | 0 | 134 | 28.7 | 3.0 | 3500 | 460-3 | HOA | 100 | - | | 6 |
| CTP-2 | MH104 | END SUC. | COND. TRANS. | 58 | 0 | 134 | 28.7 | 3.0 | 3500 | 460-3 | HOA | 100 | - | | 6 |

NOTES:

1. FURNISH DISCONNECT SHIPPED LOOSE FOR INSTALLATION BY DIVISION 28.

2. FURNISH UFD WITH INTEGRAL DISCONNECT SHIPPED LOOSE FOR INSTALLATION BY DIV. 28.

| DEAERATOR SCHEDULE | | | | | | | | |
|---|----------|-----|--------------------------------|------------|-----------------|-----------------------------|----------------------------|---------------|
| ITEM | MAX LOAD | | SYSTEM CAPACITY TO OVERFLOW | ELECTRICAL | OP. WT. LBS. | MANUFACTURER & MODEL NO. | NOTES | CON- TROLS |
| | LBS/HR | HP | | | | | | |
| | | | GALS | MIN | | | | |
| DA-1 | 24000 | 700 | 1024 | - | NOTE 1 | 14000 | BFS INDUSTRIES - 24MSX-155 | 1 |
| NOTES: 1. SEE PUMP SCHEDULE FOR BOILER FEED PUMP ELECTRICAL INFO. 2. FURNISH WITH UNIT MOUNTED DISCONNECT. | | | | | | | | 6 |

| SURGE TANK SCHEDULE | | | | | | | | | |
|---------------------|----------|-----|-----------------------------|-----|------------|--------------------|-------------------------------|-------|----------|
| ITEM | MAX LOAD | | SYSTEM CAPACITY TO OVERFLOW | | ELECTRICAL | OP. WT. LBS. EMPTY | MANUFACTURER & MODEL NO. | NOTES | CONTROLS |
| | LBS/HR | HP | GALS | MIN | | | | | |
| ST-1 | 24000 | 700 | 1000 | - | NOTE 1 | 12,000 | BFS INDUSTRIES - T1 2561BSS-3 | 1 | 6 |

NOTES: 1. SEE PUMP SCHEDULE FOR CONDENSATE TRANSFER PUMP ELECTRICAL INFO
 2. FURNISH WITH UNIT MOUNTED DISCONNECT.

| ECONOMIZER SCHEDULE | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|----------|------------|-------------------|---------------------|-------|-------------------|----------------------|-----------|-----------|------------------|-------------------|-----------|-----------|------------|-------|--------------------|---------------------|----------------|-----------------------------|-------|
| ITEM | DWG. NO. | TYPE | SERVICE | CAPACITY BTU/H·R | CFM | AIR SIDE | | | | | WATER SIDE | | | | | MAX. WIDTH FEET | MAX. LENGTH FEET | OP. WGT LBS | MANUFACTURER & MODEL NO. | NOTES |
| | | | | | | FLOW LBS / H·R | VELOCITY FT / SEC | EAT °F | LAT °F | P.D. IN. W.C. | FLOW LBS / H·R | EWT °F | LWT °F | P.D. FT | | | | | | |
| E-1 | MH105 | HORIZONTAL | BOILER NO. 1 FLUE | 523,500 | 8,000 | 20,800 | 24.5 | 450 | 350 | 0.25 | 25.0 | 295 | 14.0 | 5'-0" | 6,500 | E-TECH | 1.0 | | | |
| E-2 | MH105 | HORIZONTAL | BOILER NO. 2 FLUE | 523,500 | 8,000 | 20,600 | 24.5 | 450 | 350 | 0.25 | 12.075 | 250 | 255 | 14.0 | 5'-0" | 6,500 | E-TECH | 1.0 | | |
| E-3 | MH105 | VERTICAL | BOILER NO. 3 FLUE | 1,186,900 | 6,275 | 27,775 | 28.3 | 475 | 315 | 0.51 | 24.150 | 227 | 275.7 | 10.2 | 5'-0" | 6'-3" | 4,000 | E-TECH | | |
| NOTES: 1. HORIZONTAL HEADERS REQUIRED | | | | | | | | | | | | | | | | | | | | |

| DUST COLLECTOR (SPARK ARRESTOR) SCHEDULE | | | | | | | | | |
|--|----------|----------------------|-------------------|-------------------------------|--------------|-------------------|--|--------------------------------|-------|
| ITEM | DWG. NO. | TYPE | SERVICE | COLLECTION EFFICIENCY | NO. OF TUBES | OPERATING TEMP °F | | MANUFACTURER & MODEL NO. | NOTES |
| DC-1 | MH104 | MULTICLONE COLLECTOR | BOILER NO. 1 FLUE | 85% FOR 15 MICRONS AND LARGER | 8 | 450 | | KING COAL FURNACE - 8STD9CBK15 | 1,2 |
| DC-2 | MH104 | MULTICLONE COLLECTOR | BOILER NO. 2 FLUE | 85% FOR 15 MICRONS AND LARGER | 8 | 450 | | KING COAL FURNACE - 8STD9CBK15 | 1,2 |

NOTES: 1. PROVIDE WITH SQUARE DISCHARGE ROTARY AIR LOCK VALVE TO MATCH OUTLET SIZE.
2. PROVIDE WITH HOPPER DOOR OR BOLTED FLANGES FOR ACCESS.

| BAG HOUSE SCHEDULE | | | | | | | | | | | | |
|--|---------|-----------------------|------------------|------|------------|-----|-------|-------|--------------|---------------------------|-------|----------|
| ITEM | DWG NO. | TYPE | AREA SERVED | CFM | MOTOR DATA | | | | OP. WGT LBS. | MANUFACTURER & MODEL NO. | NOTES | CONTROLS |
| | | | | | H.P. | RPM | V-PH | STRTR | | | | |
| BH-1 | MH104 | WALK-IN PLENUM ACCESS | BOILER NO.1 FLUE | 8000 | 1 | - | 460-3 | - | 16000 | AEROPULSE BEWI-6-132-2073 | 1,2 | A |
| BH-2 | MH104 | WALK-IN PLENUM ACCESS | BOILER NO.2 FLUE | 8000 | 1 | - | 460-3 | - | 16000 | AEROPULSE BEWI-6-132-2073 | 1,2 | A |
| NOTES: | | | | | | | | | | | | |
| 1. PROVIDE WITH 3.86 FPM FILTER VELOCITY. | | | | | | | | | | | | |
| 2. PROVIDE SQUARE DISCHARGE ROTARY AIR LOCK VALVE WITH 1 HP MOTOR TO MATCH BAGHOUSE OUTLET SIZE. | | | | | | | | | | | | |

| FAN SCHEDULE | | | | | | | | | | | | | | | |
|--|---------|--------------|------------------|------|--------------|------------|-------|------------|------|-------|-------|---------------|--------------------------|-------|----------|
| ITEM | DWG NO. | TYPE | AREA SERVED | CFM | ESP IN. W.C. | DRIVE TYPE | SONES | MOTOR DATA | | | | OP. WGT. LBS. | MANUFACTURER & MODEL NO. | NOTES | CONTROLS |
| | | | | | | | | H.P. | RPM | V-PH | STRTR | | | | |
| SF-1 | MH105 | RADIAL BLADE | BOILER NO.1 FLUE | 8000 | 12.00 | VFD | - | 50 | 2750 | 460-3 | VFD | 3000 | CINCINNATI FAN RBE-15 | 1,2,3 | 6 |
| SF-2 | MH105 | RADIAL BLADE | BOILER NO.2 FLUE | 8000 | 12.00 | VFD | - | 50 | 2750 | 460-3 | VFD | 3000 | CINCINNATI FAN RBE-15 | 1,2,3 | 6 |
| NOTES: | | | | | | | | | | | | | | | |
| 1. MECHANICAL CONTRACTOR TO PROVIDE DISCONNECT SWITCH WITH NEMA 3R ENCLOSURE AT UNIT. ADDITIONAL DISCONNECT LOCATED IN THE MOTOR CONTROL CENTER WILL BE PROVIDED BY ELECTRICAL CONTRACTOR. | | | | | | | | | | | | | | | |
| 2. OPERATING TEMPERATURE OF 450 DEG. F. | | | | | | | | | | | | | | | |
| 3. PROVIDE WITH BACKDRAFT DAMPER, VIBRATION ISOLATORS, AND FLEX CONNECTIONS ON INLET AND OUTLET. | | | | | | | | | | | | | | | |

| BOILER SCHEDULE (STEAM) | | | | | | | | | | | | | | |
|--|----------|-----------|---------------|----------------|--------------|---------------|-----------|-------------|-------|-------|--------------|--|---------|-------------|
| ITEM | DWG. NO. | TYPE | CAPACITY | | | OP PRESS PSIG | FUEL TYPE | BLOWER DATA | | | OP. WGT LBS. | MANUFACTURER & MODEL # | NOTES | CONTROLS |
| | | | INPUT MBH @SL | OUTPUT MBH @SL | STEAM LBS/HR | | | HP | V-PH | STRTR | | | | |
| B-1 | MH104 | FIRE BOX | | 12.075 | 11,639 | 125 | COAL | - | 460-3 | VFD | 72,400 | KING COAL - HURST SERIES N-65 | 3.4,5 | WITH BOILER |
| B-2 | MH104 | FIRE BOX | | 12.075 | 11,639 | 125 | COAL | - | 460-3 | VFD | 72,400 | KING COAL - HURST SERIES N-65 | 3.4,5 | WITH BOILER |
| B-3 | MH104 | FIRE-TUBE | 29,300 | 23,430 | 24,000 | 125 | NG | 50 | 460-3 | VFD | 89,000 | SUPERIOR SUPER SEMINOLE X6-5-3500-S150 | 1,2,6,7 | WITH BOILER |
| NOTES: 1. 700 BOILER HORSEPOWER 2. LOW NOX BURNER AT 39 PPM 3. 350 BOILER HORSEPOWER 4. BOILER PROVIDED WITH STAND-ALONE CONTROLS FOR ALL COAL FIRED OPERATION, WHICH WILL COMMUNICATE VIA THE BAS CONTROL PANELS PROVIDE A SINGLE POINT 460V AND 120V CONNECTION AT EACH BOILER FOR CONTROL OF BLOWERS, VFD'S, ETC. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL INFO. 5. BOILER CAPACITY ASSUMES COAL HEATING VALUE OF 9,481 TO 10,018 BTU/LB-WET FUEL. 6. BOILER WITH STAND ALONE CONTROLS FOR ALL BURNER & FANS FOR GAS OPERATION, WHICH COMMUNICATES VIA THE BAS CONTROL PANEL. 7. BOILER PROVIDED WITH INTEGRAL STEAM TO WATER HEAT EXCHANGER WHICH WILL KEEP BOILER WARM WHEN NOT IN SERVICE. | | | | | | | | | | | | | | |

| TEMPORARY BOILER ROOM (STEAM) | | | | | | | | | | | |
|--|----------|-----------|--------------|------------|-------------|-----------------|-----|---------------|-------------------------------------|-------|----------------------------|
| ITEM | DWG. NO. | TYPE | CAPACITY | OP | FUEL | ELECTRICAL DATA | | OP. WGT. LBS. | MANUFACTURER & MODEL # | NOTES | CONTROLS |
| | | | STEAM LBS/HR | PRESS PSIG | TYPE | V-FH | FLA | | | | |
| TB-1 | MH102 | FIRE-TUBE | 21,000 | 150 | NG/ F.O. #2 | 460-3 | 150 | 116,800 | NATIONWIDE BOILER NBI-650-LN-G2-MBR | 1.2,3 | PACKAGED W/ BOILER TRAILER |
| TB-2 | MH102 | FIRE-TUBE | 21,000 | 150 | NG/ F.O. #2 | 460-3 | 150 | 116,800 | NATIONWIDE BOILER NBI-650-LN-G2-MBR | 1.2,3 | PACKAGED W/ BOILER TRAILER |
| NOTES: | | | | | | | | | | | |
| 1. 650 BOILER HORSEPOWER | | | | | | | | | | | |
| 2. LOW NOX BURNER | | | | | | | | | | | |
| 3. BOILER AND ALL ASSOCIATED BOILER ROOM EQUIPMENT SHALL COME FULLY PIPED, WIRED, AND ENCLOSED IN TRAILER. | | | | | | | | | | | |

MECHANICAL/ELECTRICAL EQUIPMENT SCHEDULE

CONTROLS (NOTE A. BELOW) REFERENCES THE "CONTROLS" COLUMN OF THE EQUIPMENT SCHEDULES

NOTES:

A. Controls: (1) From light switch (2) separate wall switch (3) switch with pilot light (4) runs continuously (5) interlock to run with other equipment (6) controlled by Division 23 09 11 (7) cycle from remote thermostat (8) other; see NOTES
* Carries full current. Wiring done by Division 26 for control. See specifications.
Also see "Temperature Control" specifications

B. Magnetic starters to have maintain control unless noted. All starters by Mechanical unless noted to be by Electrical.

C. Motors 1/2 HP and less to be 1750 rpm, 115/60/1, motors 3/4 HP and above to be as noted.


D. Three phase starters on motors 5 HP or greater to have Phase Monitor Control Relay, see specification.

[illegible]

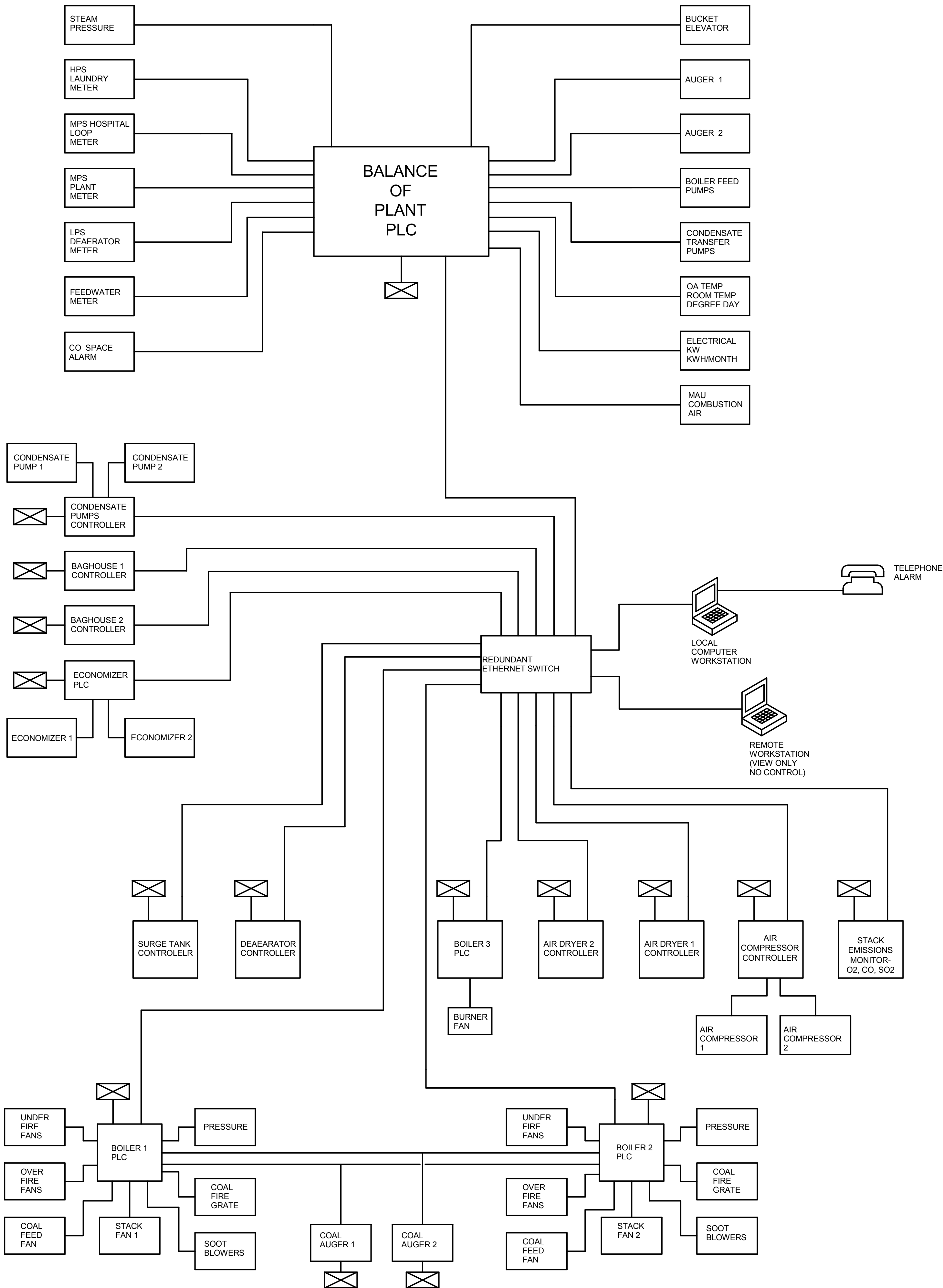
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GA Project Number 666-10-811

| | | | | | | |
|--|--|--|----------------|--|--|---|
| Drawing Title MECHANICAL SCHEDULES | | Project Title -BOILER PLANT -REPLACEMENT - | | Project Number - 666-11-101 | | Office of Construction and Facilities Management |
| | | | | Building Number - 90 | | |
| Approved: Project Director JASON BROWN | | Location - SHERIDAN, WY | | Drawing Number MI201 Dwg. of -- | | |
| | | Date 12/15/2011 BIDDING & CNSTN | Checked NGA | Drawn JTG | |  Department of Veterans Affairs |
| | | | | | | |

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12/15/2011 11:43:23 AM
one-eighth inch = one foot
one-quarter inch = one foot
one-half inch = one foot
three-quarters inch = one foot
one inch = one foot
one and one-half inches = one foot
two inches = one foot
three inches = one foot
four inches = one foot
six inches = one foot
eight inches = one foot
ten inches = one foot
twelve inches = one foot



CONTROL SYSTEM ARCHITECTURE
NO SCALE

☒ HMI - HUMAN MACHINE INTERFACE

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GA Project Number 666-10-811

CONTROL POINTS LIST

| POINT DESCRIPTION | AI | AO | DI | DO | TREND | NOTES |
|---|----|----|----|----|-------|-------|
| GENERAL CONTROL POINTS | | | | | | |
| OUTDOOR AIR TEMPERATURE | | | | | X | 1 |
| DEGREE DAY CALCULATION | X | X | | | X | 1,3 |
| ROOM TEMPERATURE | X | | | | X | 1 |
| CONDENSATE RETURN TEMPERATURE | X | | | | X | 1 |
| HIGH PRESSURE STEAM SUPPLY PRESSURE | X | | | | X | 1 |
| MEDIUM PRESSURE STEAM SUPPLY PRESSURE | X | | | | X | 1 |
| LOW PRESSURE STEAM SUPPLY PRESSURE | X | | | | X | 1 |
| FEED WATER TEMPERATURE | X | | | | X | 1 |
| MAKE UP WATER METER READOUT | X | | | | X | 1 |
| WATER SOFTENER WATER METER READOUT | X | | | | X | 1 |
| BOILER ROOM GAS METER READOUT | X | | | | X | 1 |
| ELECTRIC METER READOUT | X | | | | X | 1,4 |
| HPS LAUNDRY METER READOUT | X | | | | X | 1,3 |
| MPS PLANT METER READOUT | X | | | | X | 1,3 |
| MPS HOSPITAL LOOP METER READOUT | X | | | | X | 1,3 |
| LPS DEAERATOR METER READOUT | X | | | | X | 1,3 |
| BOILER ROOM CO & COMBUSTIBLE GAS HIGH LEVEL ALARM | X | | | | | 1 |
| BOILER FEED PUMPS BFP-1,2,3 | | | | | | 1 |
| BOILER FEED PUMP 1 START/STOP | | | | X | | |
| BOILER FEED PUMP 1 VFD STATUS | | | X | | | |
| BOILER FEED PUMP 1 VFD SPEED | | X | | | X | |
| BOILER FEED PUMP 1 ALARM | | | X | | | |
| BOILER FEED PUMP 2 START/STOP | | | | X | | |
| BOILER FEED PUMP 2 VFD STATUS | | | X | | | |
| BOILER FEED PUMP 2 VFD SPEED | | X | | | X | |
| BOILER FEED PUMP 2 ALARM | | | X | | | |
| BOILER FEED PUMP 3 START/STOP | | | | X | | |
| BOILER FEED PUMP 3 VFD STATUS | | | X | | | |
| BOILER FEED PUMP 3 VFD SPEED | | X | | | X | |
| BOILER FEED PUMP 3 ALARM | | | X | | | |
| CONDENSATE TRANSFER PUMPS CTP-1,2 | | | | | | 1 |
| CONDENSATE TRANSFER PUMP 1 START/STOP | | | | X | | |
| CONDENSATE TRANSFER PUMP 1 STATUS | | | X | | | |
| CONDENSATE TRANSFER PUMP 1 ALARM | | | X | | | |
| CONDENSATE TRANSFER PUMP 2 START/STOP | | | | X | | |
| CONDENSATE TRANSFER PUMP 2 STATUS | | | X | | | |
| CONDENSATE TRANSFER PUMP 2 ALARM | | | X | | | |
| CONDENSATE PUMPS CP-1,2 | | | | | | 2 |
| CONDENSATE PUMP 1A START/STOP | | | | X | | |
| CONDENSATE PUMP 1A STATUS | | | X | | | |
| CONDENSATE PUMP 1A ALARM | | | X | | | |
| CONDENSATE PUMP 1B START/STOP | | | | X | | |
| CONDENSATE PUMP 1B STATUS | | | X | | | |
| CONDENSATE PUMP 1B ALARM | | | X | | | |
| CONDENSATE PUMP 2A START/STOP | | | | X | | |
| CONDENSATE PUMP 2A STATUS | | | X | | | |
| CONDENSATE PUMP 2A ALARM | | | X | | | |
| CONDENSATE PUMP 2B START/STOP | | | | X | | |
| CONDENSATE PUMP 2B STATUS | | | X | | | |
| CONDENSATE PUMP 2B ALARM | | | X | | | |
| SURGE TANK ST-1 | | | | | | 2 |
| MAKE UP VALVE COMMAND | | | | X | | |
| LOW WATER ALARM | | | X | | | |
| HIGH WATER ALARM | | | X | | | |
| DEAERATOR DA-1 | | | | | | 2 |
| MAKE UP VALVE COMMAND | | | | X | | |
| LOW WATER ALARM | | | X | | | |
| HIGH WATER ALARM | | | X | | | |
| OVERFLOW ALARM | | | X | | | |
| COAL BOILER B-1 | | | | | | 5 |
| BOILER 1 FIRING RATE | | X | | | | |
| BOILER 1 STEAM PRESSURE | X | | | | | |
| BOILER 1 GENERAL ALARM | | | X | | | |
| BOILER 1 COMBUSTION CHAMBER TEMPERATURE | X | | | | | |
| DUST COLLECTOR 1 ROTARY AIR LOCK | | | X | | | |
| BOILER 1 COAL FEED FAN | | | | X | | |
| BOILER 1 COAL FIRING GRATES HYDRAULIC PUMPSET | | | X | X | | |
| BOILER 1 UNDERFIRE FANS | | | | X | | |
| BOILER 1 OVERFIRE FANS | | | | X | | |
| STACK FAN 1 START/STOP | | | | X | | |
| STACK FAN VFD SPEED | | X | | | | |
| BOILER 1 CO/SO2 SENSORS | | | X | | | |
| BOILER 1 SOOT BLOWER A | | | X | | | |
| BOILER 1 SOOT BLOWER B | | | X | | | |
| BOILER ASH AUGERS | | | X | | | |
| BOILER 1 BLOW DOWN VALVE COMMAND | | | | X | | |
| BOILER 1 FEEDWATER VALVE COMMAND & PUMP CONTROL | | | X | X | | |
| BOILER 1 LOW WATER ALARM | | | X | | | |
| BOILER 1 LOW WATER CUTOFF | | | | X | | |
| BOILER 1 HIGH WATER CONTROL & ALARM | | | X | X | | |
| COAL BOILER B-2 | | | | | | 5 |
| BOILER 2 FIRING RATE | | X | | | | |
| BOILER 2 STEAM PRESSURE | X | | | | | |
| BOILER 2 GENERAL ALARM | | | X | | | |
| BOILER 2 COMBUSTION CHAMBER TEMPERATURE | X | | | | | |
| DUST COLLECTOR 2 ROTARY AIR LOCK | | | X | | | |
| BOILER 2 COAL FEED FAN | | | | X | | |
| BOILER 2 COAL FIRING GRATES HYDRAULIC PUMPSET | | | X | X | | |
| BOILER 2 UNDERFIRE FANS | | | | X | | |
| BOILER 2 OVERFIRE FANS | | | | X | | |
| STACK FAN 2 START/STOP | | | | X | | |
| STACK FAN 2 VFD SPEED | | X | | | | |
| BOILER 2 CO/SO2 SENSORS | | | X | | | |
| BOILER 2 SOOT BLOWER A | | | X | | | |
| BOILER 2 SOOT BLOWER B | | | X | | | |
| BOILER ASH AUGERS | | | X | | | |
| BOILER 2 BLOW DOWN VALVE COMMAND | | | | X | | |
| BOILER 2 FEEDWATER VALVE COMMAND & PUMP CONTROL | | | X | X | | |
| BOILER 2 LOW WATER ALARM | | | X | | | |
| BOILER 2 LOW WATER CUTOFF | | | | X | | |
| BOILER 2 HIGH WATER CONTROL & ALARM | | | X | X | | |

CONTROL POINTS LIST

| POINT DESCRIPTION | AI | AO | DI | DO | TREND | NOTES |
|--|----|----|----|----|-------|-------|
| GENERAL CONTROL POINTS | | | | | | |
| COAL FEED AUGER 1,2 | | | | | | 7 |
| COAL FEED AUGER 1 START/STOP | | | | X | | |
| COAL FEED AUGER 1 STATUS | | | X | | | |
| COAL FEED AUGER 1 SPEED | X | | | | X | |
| COAL FEED AUGER 1 ALARM | | | X | | | |
| COAL FEED AUGER 2 START/STOP | | | | X | | |
| COAL FEED AUGER 2 STATUS | | | X | | | |
| COAL FEED AUGER 2 SPEED | X | | | | X | |
| COAL FEED AUGER 2 ALARM | | | X | | | |
| COAL WEIGHT CALCULATION AUGER 1 & 2 | | X | | | X | |
| HOPPER MINIMUM | | | X | | | |
| HOPPER MAXIMUM | | | X | | | |
| GAS BOILER B-3 | | | | | | |
| BURNER FAN STATUS | | X | | | | 5 |
| BURNER FAN VFD SPEED | | | | | | |
| FEED WATER VALVE COMMAND | | | | X | | |
| SURFACE BLEED VALVE COMMAND | | | | X | | |
| FLUE STACK TEMPERATURE | X | | | | | |
| STEAM PRESSURE | X | | | | | |
| LOW WATER ALARM | | | X | | | |
| GAS PRESSURE ALARM | | | X | | | |
| BOILER HEAT EXCHANGER STEAM VALVE COMMAND | | | | X | | |
| GENERAL ALARM | | | X | | | |
| BAGHOUSE BG-1,2 | | | | | | |
| BAGHOUSE 1 DIFFERENTIAL PRESSURE | X | | | | X | 2 |
| BAGHOUSE 1 TIMER | | X | | | | |
| BAGHOUSE 1 DIFFERENTIAL PRESSURE ALARM | | | X | | | |
| BAGHOUSE 1 LEAK DETECTION | X | | | | X | |
| BAGHOUSE 2 DIFFERENTIAL PRESSURE | X | | | | X | |
| BAGHOUSE 2 TIMER | | X | | | | |
| BAGHOUSE 2 DIFFERENTIAL PRESSURE ALARM | | | X | | X | |
| BAGHOUSE 2 LEAK DETECTION | X | | | | X | |
| AIR COMPRESSOR AC-1,2 | | | | | | |
| AIR COMPRESSOR 1 STATUS | | | | X | | 2 |
| AIR COMPRESSOR 1 ALARM | | | X | | | |
| AIR COMPRESSOR 2 STATUS | | | X | | | |
| AIR COMPRESSOR 2 ALARM | | | X | | | |
| AIR DRYER AD-1,2 | | | | | | |
| AIR DRYER 1 STATUS | | | | X | | 2 |
| AIR DRYER 1 ALARM | | | X | | | |
| AIR DRYER 2 STATUS | | | X | | | |
| AIR DRYER 2 ALARM | | | X | | | |
| AUGER AG-1,2 | | | | | | |
| AUGER 1 START/STOP | | | | X | | 1 |
| AUGER 1 STATUS | | | X | | | |
| AUGER 1 ALARM | | | X | | | |
| AUGER 2 START/STOP | | | | X | | |
| AUGER 2 STATUS | | | X | | | |
| AUGER 2 ALARM | | | X | | | |
| BUCKET ELEVATOR BE-1 | | | | | | |
| BUCKET ELEVATOR 1 START/STOP | | | | X | | 1 |
| BUCKET ELEVATOR 1 STATUS | | | X | | | |
| BUCKET ELEVATOR 1 ALARM | | | X | | | |
| (E) MAKE-UP AIR UNIT | | | | | | |
| DISCHARGE AIR TEMPERATURE | X | | | | | 1 |
| DISCHARGE AIR LOW TEMPERATURE ALARM | | | X | | | |
| STATUS | | | X | | | |
| STACK EMISSIONS | | | | | | |
| CO LEVEL | X | X | | | X | 6 |
| SO2 LEVEL | X | X | | | X | |
| O2 LEVEL | X | X | | | X | |
| ECONOMIZER E-1,2 | | | | | | |
| ECONOMIZER 1 INLET FLUE GAS TEMPERATURE | X | | | | | 5 |
| ECONOMIZER 1 OUTLET FLUE GAS TEMPERATURE | X | | | | | |
| ECONOMIZER 1 INLET WATER TEMPERATURE | X | | | | | |
| ECONOMIZER 1 OUTLET WATER TEMPERATURE | X | | | | | |
| ECONOMIZER 1 FREEZE PROTECTION VALVE COMMAND | | | | X | | |
| ECONOMIZER 1 PRESSURE SWITCH | | | | X | | |
| ECONOMIZER 1 PRESSURE CONTROL VALVE COMMAND | | | | X | | |
| ECONOMIZER 2 INLET FLUE GAS TEMPERATURE | X | | | | | |
| ECONOMIZER 2 OUTLET FLUE GAS TEMPERATURE | X | | | | | |
| ECONOMIZER 2 INLET WATER TEMPERATURE | X | | | | | |
| ECONOMIZER 2 OUTLET WATER TEMPERATURE | X | | | | | |
| ECONOMIZER 2 FREEZE PROTECTION VALVE COMMAND | | | | X | | |
| ECONOMIZER 2 PRESSURE SWITCH | | | | X | | |
| ECONOMIZER 2 PRESSURE CONTROL VALVE COMMAND | | | | X | | |
| ECONOMIZER 3 INLET FLUE GAS TEMPERATURE | X | | | | | |
| ECONOMIZER 3 OUTLET FLUE GAS TEMPERATURE | X | | | | | |
| ECONOMIZER 3 INLET WATER TEMPERATURE | X | | | | | |
| ECONOMIZER 3 OUTLET WATER TEMPERATURE | X | | | | | |
| ECONOMIZER 3 FREEZE PROTECTION VALVE COMMAND | | | | X | | |

GENERAL NOTES:
A. POINTS LIST IS NOT AN EXHAUSTIVE LIST. CONTROLS CONTRACTOR TO PROVIDE ANY ADDITIONAL POINTS IN ORDER TO COMPLY WITH SPECIFICATIONS, SEQUENCES AND SYSTEM SCHEMATICS.
B. SEE SPECIFICATIONS AND CONTROL SEQUENCE DRAWING FOR CONTROL SEQUENCES OF SYSTEM COMPONENTS.

NOTES:
1. TO BE CONTROLLED/MONITORED BY BALANCE OF PLANT PLC CONTROLLER.
2. PROVIDED WITH MANUFACTURER SUPPLIED CONTROLLER TIED TO THE BAS.
3. DATA SHALL BE OUTPUT REAL TIME AND SHALL ALSO BE TOTALED PER MONTH.
4. SHALL MONITOR KW, KWH, AND KWH/MONTH.
5. CONTROLLED BY INDIVIDUAL PLC CONTROLLER WHICH INTERFACES WITH THE BAS
6. MONITORING ONLY. TIED TO BAS
7. PROVIDED WITH MANUFACTURER SUPPLIED CONTROLLER TIED TO THE BOILER PLC AND TO BAS. CALCULATE VOLUME AND WEIGHT OF COAL CONVEYED.

CONSTRUCTION DOCUMENTATION SUBMISSION - BIDDING & CONTRUCTION

| | | | | | | | | | | | | | |
|--|--|---|--|--|--|--|--|--|--|---|--|---|--|
| <div>Revisions:</div> <div>Date:</div> | | CONSULTANTS: MKK Consulting Engineers, Inc. 7600 East Orchard Road Suite 250S Greenwood Village, CO 80111 Phone: 303.796.6000 Fax: 303.796.6099 Calibre 9090 S Ridgeline Blvd. Suite 105 Highlands Ranch, CO 80129 Phone: 303.399.5154 Fax: 303.730.1130 Structural Consultants Inc. 3400 E Bayaud Ave # 300 Denver, CO 80237 Phone: 303.770.1020 Fax: 303.333.9501 | | <div></div> ARCHITECT/ENGINEERS: GREENFIELD ARCHITECTS 3650 S YOSEMITE ST., STE 402 DENVER, CO 80237 PHONE: 303-770-1020 FAX: 303-770-0922 GA Project Number 666-10-811 | | <div>Drawing Title</div> <div>MECHANICAL CONTROLS</div> <div>Approved: Project Director</div> <div>JASON BROWN</div> | | <div>Project Title</div> <div>-BOILER PLANT -REPLACEMENT -</div> <div>Location</div> <div>- SHERIDAN, WY</div> <div>Date</div> <div>12/15/2011 BIDDING & CNSTN</div> <div>Checked</div> <div>NGA</div> <div>Drawn</div> <div>JTG/ARN</div> | | <div>Project Number</div> <div>- 666-11-101</div> <div>Building Number</div> <div>- 90</div> <div>Drawing Number</div> <div>MI301</div> <div>Dwg. of --</div> | | <div>Office of Construction and Facilities Management</div> <div></div> <div>Department of Veterans Affairs</div> | |
|--|--|---|--|--|--|--|--|--|--|---|--|---|--|