#9b

WOODBURY COUNTY BOARD OF SUPERVISORS AGENDA ITEM(S) REQUEST FORM

Date: 11/22/2016 Weekly Agenda Date: 11/29/2016

ELECTED OFFICIAL / DEPARTMENT HEAD / CITIZEN: Kenny Schmitz

WORDING FOR AGENDA ITEM:

Motion to Approve Siouxland District Health Boiler Heating System Engineering drawings and specifications and seek competitive bids for boiler replacement and circulating system improvements.

ACTION REQUIRED:

Approve Ordinance ☐	Approve Resolution ☐	Approve Motion ☑
Give Direction ☐	Other: Informational ☐	Attachments ☑

EXECUTIVE SUMMARY:

Boiler replacement is necessary due to current and past boiler failures. One of three boilers is currently in-operable.
The current system as designed only incorporates heating water return pumps. This design cycles boilers on/off repeatedly contributing to shortened life expectancy. Recommendations include replacement of all boilers, pumps and re-piping configurations.

BACKGROUND:

On October 18, 2016 the Board of Supervisors approved a Resource Consulting Engineers proposal to design drawings and specifications which could be utilized in a bid process for the replacement of boilers at Siouxland District Health.
Drawings and specifications to seek bids have been completed.

FINANCIAL IMPACT:

Financial information will be determined by bids received.

IF THERE IS A CONTRACT INVOLVED IN THE AGENDA ITEM, HAS THE CONTRACT BEEN SUBMITTED AT LEAST ONE WEEK PRIOR AND ANSWERED WITH A REVIEW BY THE COUNTY ATTORNEY'S OFFICE?

Yes ☐ **No** ☑

RECOMMENDATION:

Building Services requests approval to authorize Resource Consulting Engineers to seek competitive bids.

ACTION REQUIRED / PROPOSED MOTION:

Motion to Authorize Resource Consulting Engineers to seek bids for Siouxland Disstrict Health Boiler Replacement and circulation system alterations.

Approved by Board of Supervisors April 5, 2016.

SIOUXLAND DISTRICT HEALTH BOILER REPLACEMENT

BID ISSUE

DATE: 11/18/2016

OWNER INFORMATION:

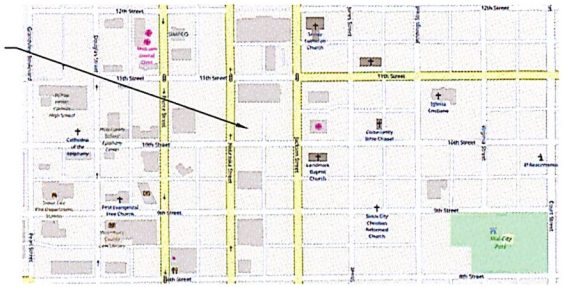
PROJECT ADDRESS:
SIOUXLAND DISTRICT HEALTH
1014 NEBRASKA STREET
SIOUX CITY, IOWA 51105
712-279-6119
800-587-3005
www.siouxlanddistricthealth.org

OWNER:
WOODBURY COUNTY

620 DOUGLAS STREET
SIOUX CITY, IOWA 51105
712-279-6525

www.woodburycountyiowa.org

PROJECT LOCATION



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PROJECT DESIGN TEAM:

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF AVENUE
SUITE 201
AMES, IA 50010
515-292-2500
www.resourcece.com

DRAWING INDEX:

RCE PROJECT NUMBER: 2016.015.00

MECHANICAL:

GENERAL ABBREVIATIONS

ADJ – ADJUSTABLE
AFF – ABOVE FINISHED FLOOR
BAS – BUILDING AUTOMATION SYSTEM
BTUH – BRITISH THERMAL UNIT PER HOUR
CFH – CUBIC FEET PER HOUR
COP – CENTER OF PIPE
CS – CARBON STEEL
CU – COPPER
CV – CONSTANT VOLUME
DB – DRY BULB
DDC – DIRECT DIGITAL CONTROL
DP – DIFFERENTIAL PRESSURE
DT – DIFFERENTIAL TEMPERATURE
EA – EXHAUST AIR
EAT – ENTERING AIR TEMPERATURE
EC – ELECTRICAL CONTRACTOR
EDB – ENTERING DRY BULB TEMPERATURE
EFT – ENTERING FLUID TEMPERATURE
EXST – EXISTING
IN – INCH OR INCHES
KWH – KILOWATT–HOURS
LAT – LEAVING AIR TEMPERATURE
LB – POUND OR POUNDS
LBS – POUNDS
LDB – LEAVING DRY BULB TEMPERATURE
NPS – NOMINAL PIPE SIZE
NPT – NATIONAL PIPE THREAD
NTS – NOT TO SCALE
PSI – PONDS PER SQUARE INCH
PSIA – POUNDS PER SQUARE INCH ABSOLUTE
PSIG – POUNDS PER SQUARE INCH GAUGE
TYP – TYPICAL
W/ – WITH
WMS – WIRE MESH SCREEN
X – EXISTING

EQUIPMENT ABBREVIATIONS

AS – AIR SEPARATOR
B – BOILER
CPF – CHEMICAL POT FEEDER
CV – CONTROL VALVE
DWH – DOMESTIC HOT WATER HEATER
DP – DIFFERENTIAL PRESSURE SENSOR TIP
ET – EXPANSION TANK
H – HUMIDITY SENSOR
P – PUMP (ALSO HWP)
SP – STATIC PRESSURE SENSOR
T – TEMPERATURE SENSOR
VFD – VARIABLE FREQUENCY DRIVE

MECHANICAL SYMBOLS

B 1 EQUIPMENT TAG (BOILER INDICATED)

EQUIPMENT TO BE REMOVED

POINT OF CONNECTION TO EXISTING

PRESSURIZED PIPING SYMBOLS/ABBREVIATIONS

DCW – DOMESTIC COLD WATER
DCW–E – EXISTING DOMESTIC COLD WATER
NG – NATURAL GAS
NG–E – EXISTING NATURAL GAS
HWS – HEATING WATER SUPPLY
HWS–D – HEATING WATER SUPPLY – DEMO
HWS–E – EXISTING HEATING WATER SUPPLY
HWR – HEATING WATER RETURN
HWR–D – HEATING WATER RETURN – DEMO
HWR–E – EXISTING HEATING WATER RETURN

NEW PIPING – REFER TO SYSTEM LABEL FOR TYPE
EXISTING PIPING TO BE REMOVED
EXISTING PIPING TO REMAIN
DOMESTIC COLD WATER PIPING
PIPE ELBOW DOWN
PIPE ELBOW UP
PIPE ELBOW
PIPE BOTTOM TAKE–OFF
PIPING DIRECTIONAL FLOW ARROW
PIPING CONTINUATION MARK
BALL VALVE

SIOUXLAND DISTRICT HEALTH BOILER REPLACEMENT

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712-279-6119
800-587-3005
www.siouxlanddistricthealth.org

REVISION	DATE

ISSUED: 11/18/2016
PROJECT: 2016.015.00

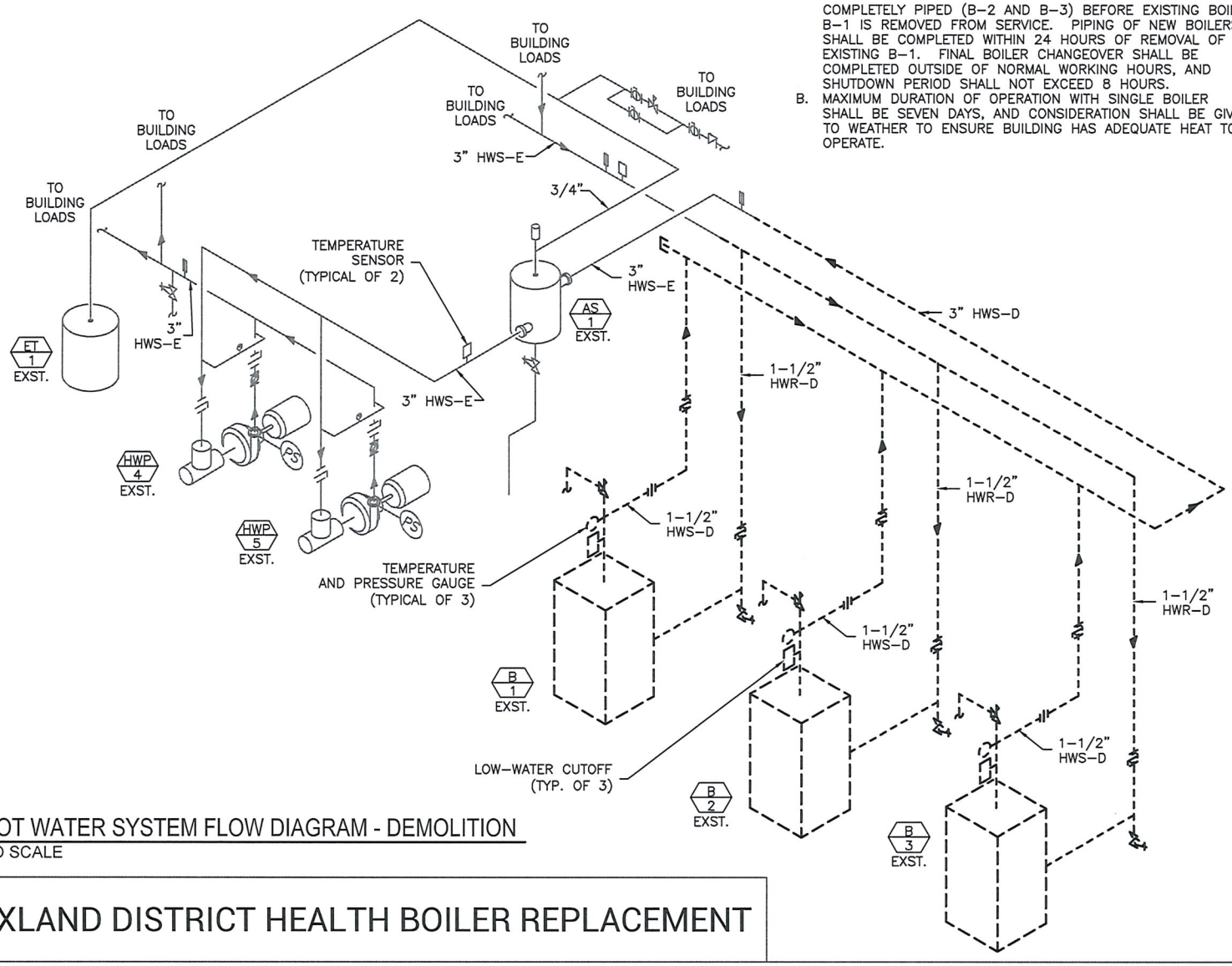
MECHANICAL SYMBOLS

M0

GENERAL NOTES:

A. TWO OF NEW BOILERS SHALL BE SET IN PLACE AND COMPLETELY PIPED (B–2 AND B–3) BEFORE EXISTING BOILER B–1 IS REMOVED FROM SERVICE. PIPING OF NEW BOILERS SHALL BE COMPLETED WITHIN 24 HOURS OF REMOVAL OF EXISTING B–1. FINAL BOILER CHANGEOVER SHALL BE COMPLETED OUTSIDE OF NORMAL WORKING HOURS, AND SHUTDOWN PERIOD SHALL NOT EXCEED 8 HOURS.

B. MAXIMUM DURATION OF OPERATION WITH SINGLE BOILER SHALL BE SEVEN DAYS, AND CONSIDERATION SHALL BE GIVEN TO WEATHER TO ENSURE BUILDING HAS ADEQUATE HEAT TO OPERATE.



1 HOT WATER SYSTEM FLOW DIAGRAM - DEMOLITION
NO SCALE

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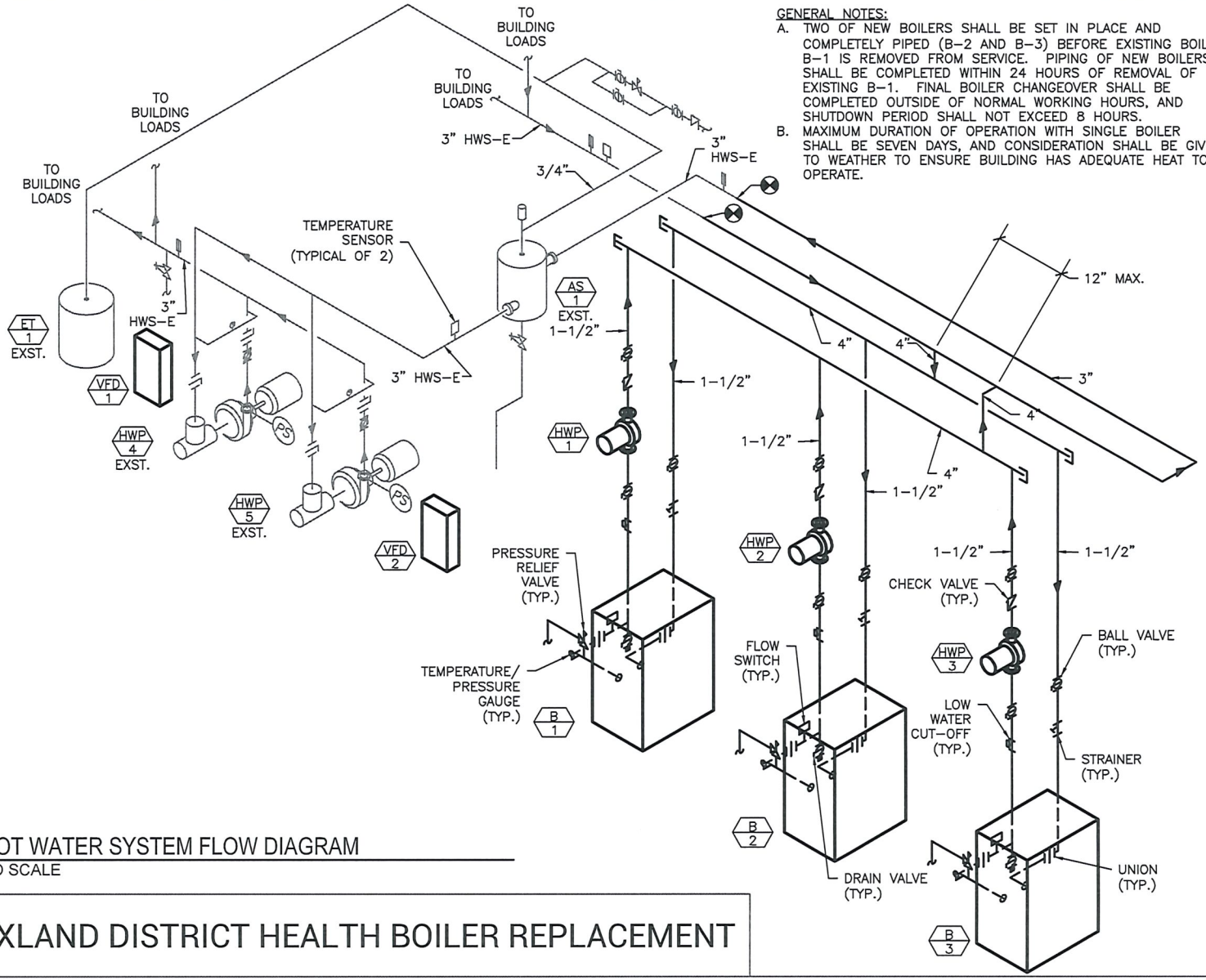
MECHANICAL SYSTEM FLOW DIAGRAM

M600

GENERAL NOTES:

A. TWO OF NEW BOILERS SHALL BE SET IN PLACE AND COMPLETELY PIPED (B–2 AND B–3) BEFORE EXISTING BOILER B–1 IS REMOVED FROM SERVICE. PIPING OF NEW BOILERS SHALL BE COMPLETED WITHIN 24 HOURS OF REMOVAL OF EXISTING B–1. FINAL BOILER CHANGEOVER SHALL BE COMPLETED OUTSIDE OF NORMAL WORKING HOURS, AND SHUTDOWN PERIOD SHALL NOT EXCEED 8 HOURS.

B. MAXIMUM DURATION OF OPERATION WITH SINGLE BOILER SHALL BE SEVEN DAYS, AND CONSIDERATION SHALL BE GIVEN TO WEATHER TO ENSURE BUILDING HAS ADEQUATE HEAT TO OPERATE.



1 HOT WATER SYSTEM FLOW DIAGRAM
NO SCALE

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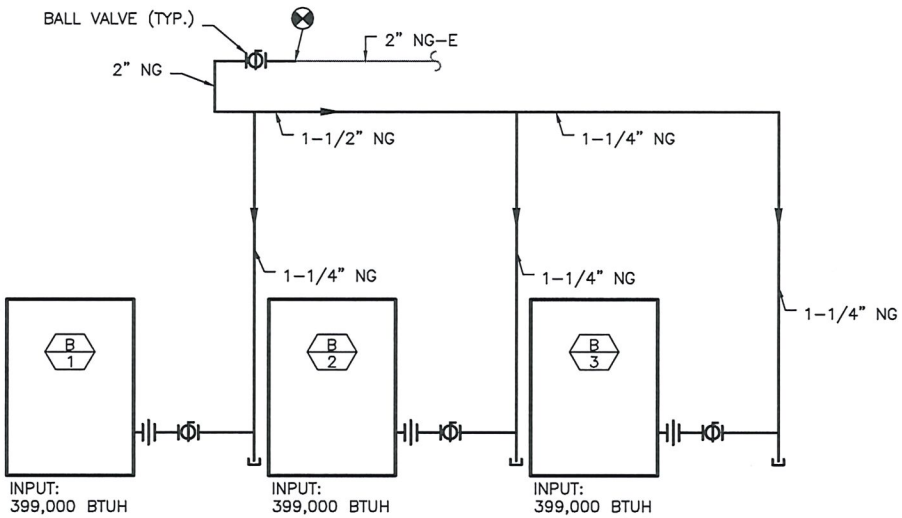
MECHANICAL SYSTEM FLOW DIAGRAM

M601



NATURAL GAS PIPING NOTES:

A. SEE SEPARATE DETAIL FOR INFORMATION ON DIRT LEG AND PIPING CONNECTIONS AT EQUIPMENT.

B. PROVIDE ALL ACCESSORIES RECOMMENDED BY EQUIPMENT MANUFACTURERS AT NATURAL GAS CONNECTIONS.

1 BOILER NATURAL GAS PIPING DIAGRAM
NO SCALE

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MECHANICAL DETAILS

SIOUXLAND DISTRICT HEALTH BOILER REPLACEMENT

M602

BOILER SCHEDULE - PART I									
DESIGNATION	LOCATION	BASIS OF DESIGN		SERVICE	TYPE	COMBUSTION TYPE	PEAK INPUT (BTUH)	PEAK OUTPUT (BTUH)	PEAK EFFICIENCY (%)
		MANUFACTURER	MODEL						
B-1	BOILER ROOM	LOCHINVAR	KBN400	HEATING WATER	COND. FIRE TUBE	SEALED	399,000	376,000	94
B-2	BOILER ROOM	LOCHINVAR	KBN400	HEATING WATER	COND. FIRE TUBE	SEALED	399,000	376,000	94
B-3	BOILER ROOM	LOCHINVAR	KBN400	HEATING WATER	COND. FIRE TUBE	SEALED	399,000	376,000	94

BOILER SCHEDULE - PART II														
DESIGNATION	LOCATION	BASIS OF DESIGN		MIN TURNDOWN RATIO	FLUID TYPE	FLOW (GPM)	ENT. FLUID TEMP. (°F)	LVG. FLUID TEMP. (°F)	FUEL TYPE	GAS INLET PRESS. RANGE (IN. W.C.)	ELECTRICAL DATA			NOTES
		MANUFACTURER	MODEL								VOLTAGE	PHASE	FLA	
B-1	BOILER ROOM	LOCHINVAR	KBN400	5:1	WATER	37	160	180	NG	4 - 13	120	1	12	1-10
B-2	BOILER ROOM	LOCHINVAR	KBN400	5:1	WATER	37	160	180	NG	4 - 13	120	1	12	1-10
B-3	BOILER ROOM	LOCHINVAR	KBN400	5:1	WATER	37	160	180	NG	4 - 13	120	1	12	1-10

NOTES:

1. LISTED FULL FIRE EFFICIENCY ASSUMES A 20 DEGREE F TEMPERATURE RISE THROUGH BOILER, AND IS BASED ON LOWER THAN DESIGN RETURN WATER TEMPERATURE. BOILER SHALL BE CAPABLE OF ACHIEVING PEAK EFFICIENCY LISTED, AND SHALL HAVE MINIMUM EFFICIENCY OF 89 PERCENT AT LISTED WATER TEMPERATURES.
2. UNIT HEAT EXCHANGER(S) SHALL BE CONSTRUCTED OF STAINLESS STEEL.
3. PROVIDE BOILER WITH 4" CPVC COMBUSTION EXHAUST AND INTAKE LINES. LINES SHALL BE ROUTED AND TERMINATED IN ACCORDANCE WITH BOILER MANUFACTURER'S RECOMMENDATIONS.
4. BOILER SHALL BE PROVIDED WITH PRIMARY CIRCULATING PUMP. BOILER SHALL BE CAPABLE OF DIRECTLY CONTROLLING PRIMARY CIRCULATING PUMP.
5. BOILER SHALL BE PROVIDED WITH ACID NEUTRALIZATION SYSTEM, CONNECTED TO CONDENSATE DRAIN PRIOR TO DISCHARGE.
6. BOILER SHALL HAVE CAPABILITY TO INTERFACE WITH BUILDING AUTOMATION SYSTEM THROUGH HARD-WIRED POINTS CALLED OUT ON SEPARATED POINT SCHEDULE AS WELL AS THROUGH BACNET INTERFACE WITH BUILDING AUTOMATION SYSTEM.
7. BOILER SHALL HAVE INTEGRAL CONTROLLER CAPABLE OF OPERATING PRIMARY CIRCULATOR, CONTROLLING NORMAL FUNCTIONS, AND RESETTING SUPPLY WATER TEMPERATURE BASED ON OUTDOOR AIR DRY BULB TEMPERATURE. CONTROLLER SHALL COMMUNICATE WITH CONTROLLER ON OTHER BOILER(S) TO CYCLE LEAD UNIT AND MODULATE SYSTEM CAPACITY. BOILERS SHALL CONTROL FIRING RATE TO MAINTAIN COMMON SUPPLY WATER MEASURED AT TEMPERATURE SENSOR IN PIPING MAIN.
8. WIRE EMERGENCY SHUT-DOWN PUSH BUTTONS TO DISABLE BOILER EITHER AT SAFETY CIRCUIT ON BOILER OR THROUGH SHUNT-TRIP CIRCUIT BREAKER SERVING BOILER.
9. ACCEPTABLE ALTERNATE MANUFACTURERS: LAARS NEOTHERM, THERMAL SOLUTIONS APEX.
10. PROVIDE BREAK-OUT PRICING FOR REMOTE CONNECTIVITY DEVICES SUCH AS A TABLET OR SMART PHONE. CAPABILITIES INCLUDE ALARM NOTIFICATION, DISPLAYING PERFORMANCE DATA, ADJUSTING SETPOINTS, RESET CURVES, AND PUMP CONTROLS WITH THE ABILITY TO ASSIGN LEVELS OF ACCESS TO OTHER USERS SIMILAR TO CON-X-US BY LOCHINVAR.

PUMP SCHEDULE - PART I														
DESIGNATION	LOCATION	BASIS OF DESIGN		SERVICE	TYPE	CAPACITY (GPM)	HEAD (FT)	FLUID TYPE	APPROX. FLUID TEMP. (°F)	MAX NPSHR (FT)	MIN EFFICIENCY (%)	SUCTION SIZE (INCH)	DISCHARGE SIZE (INCH)	IMPELLER SIZE (INCH)
		MANUFACTURER	MODEL											
HWP-1	MECH	BELL & GOSSETT	E-60 E614	B-1	IN-LINE	37	35	WATER	170	5	57	1-1/2"	1-1/2"	6.25
HWP-2	MECH	BELL & GOSSETT	E-60 E614	B-2	IN-LINE	37	35	WATER	170	5	57	1-1/2"	1-1/2"	6.25
HWP-3	MECH	BELL & GOSSETT	E-60 E614	B-3	IN-LINE	37	35	WATER	170	5	57	1-1/2"	1-1/2"	6.25
HWP-4	MECH	BELL & GOSSETT	1510 1-1/2" BC	DISTRIBUTION	BASE	102	60	WATER	180	5	59	1-1/2"	1-1/2"	7.875
HWP-5	MECH	BELL & GOSSETT	1510 1-1/2" BC	DISTRIBUTION	BASE	102	60	WATER	180	5	59	1-1/2"	1-1/2"	7.875

PUMP SCHEDULE - PART II										
DESIGNATION	LOCATION	BASIS OF DESIGN		ELECTRICAL DATA						NOTES
		MANUFACTURER	MODEL	BRAKE HP	MOTOR HP	RPM	VOLTAGE	PHASE	VFD	
HWP-1	MECH	BELL & GOSSETT	SERIES 60	0.69	1	1750	120	1	NO	1
HWP-2	MECH	BELL & GOSSETT	SERIES 60	0.69	1	1750	120	1	NO	1
HWP-3	MECH	BELL & GOSSETT	SERIES 60	0.69	1	1750	120	1	NO	1
HWP-4	MECH	BELL & GOSSETT	1510 1-1/2" BC	2.75	3	1750	120	1	YES	2
HWP-5	MECH	BELL & GOSSETT	1510 1-1/2" BC	2.75	3	1750	120	1	YES	2

NOTES:

1. PUMP SHALL BE PROVIDED WITH PREMIUM EFFICIENCY, NON-OVERLOADING MOTOR.
2. EXISTING PUMP SHOWN FOR REFERENCE. PROVIDE NEW VFD FOR EXISTING PUMP - SEE VFD SCHEDULE.

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MECHANICAL SCHEDULES

M800

VARIABLE FREQUENCY DRIVE SCHEDULE									
DESIGNATION	LOCATION	BASIS OF DESIGN		SERVICE	MAX. HORSEPOWER	BYPASS STARTER	ELECTRICAL DATA		NOTES
		MANUFACTURER	MODEL				VOLTAGE	PHASE	
VFD-1	MECH	ABB	ACH550	HWP-4	3	NO	208	3	1, 2, 3, 4
VFD-2	MECH	ABB	ACH550	HWP-5	3	NO	208	3	1, 2, 3, 4

NOTES:

1. UNIT SHALL BE PROVIDED WITH HAND-OFF-AUTO SWITCH ON FACE, WITH LOCK-OUT CAPABILITY TO SERVE AS DISCONNECT.
2. EXISTING MOTOR STARTERS SHALL BE WIRED THROUGH WITH START/STOP CONTROLS FOR PUMPS WIRED TO NEW VFD'S.
3. UNITS SHALL INITIALLY BE USED FOR BALANCING OF PUMP FLOWS AFTER ALL WORK IS COMPLETED WITH INSTALLATION OF NEW BOILERS. DRIVES SHALL BE PROVIDED WITH INPUTS FOR FUTURE CONNECTION TO BAS.
4. OTHER ACCEPTABLE VFD MANUFACTURER IS SQUARE D.

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MECHANICAL SCHEDULES

SIOUXLAND DISTRICT HEALTH BOILER REPLACEMENT

M801