

MECHANICAL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	DRAIN		SAFETY RELIEF VALVE
	COMPRESSED AIR		UNION
	DOMESTIC COLD WATER		MOTORIZED T.C. VALVE / 2-WAY
	DOMESTIC HOT WATER		MOTORIZED T.C. VALVE / 3-WAY
	DOMESTIC HOT WATER CIRC.		TEE UP
	HEATING WATER SUPPLY		TEE DOWN
	HEATING WATER RETURN		ELBOW UP
	GLYCOL SUPPLY		ELBOW DOWN
	GLYCOL RETURN		PIPE SIZE CHANGE
	EXPANSION TANK		MANUAL FLOW BALANCING VALVE (CIRCUIT SETTER)
	LIQUID PETROLEUM GAS (PROPANE)		PRESSURE / TEMP. TEST PLUG
	PUMPED CONDENSATE		DIAL THERMOMETER
	GATE VALVE		THERMOSTAT/TEMPERATURE SENSOR
	BALL VALVE		CONNECT NEW WORK TO EXISTING
	BUTTERFLY VALVE		PRESSURE GAUGE W/ SNUBBER
	SWING CHECK VALVE	C	COMMON
	STRAINER	(E)	EXISTING
	FLEX CONNECTOR		
	HOSE END DRAIN VALVE		
	PRESSURE REDUCING VALVE		

HVAC ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	LF	LINEAR FEET
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	MAX	MAXIMUM
AMP	AMPERE (AMP, AMPS)	MC	MECHANICAL CONTRACTOR
APPROX	APPROXIMATE	MIN	MINIMUM
BHP	BRAKE HORSEPOWER, BOILER HORSEPOWER	NO	NORMALLY OPEN
BTU	BRITISH THERMAL UNIT	NC	NORMALLY CLOSED
MBH	BTU PER HOUR (THOUSAND)	N/A	NOT APPLICABLE
C	COMMON	NIC	NOT IN CONTRACT
CIRC.	CIRCULATION	NTS	NOT TO SCALE
DIA	DIAMETER	NO	NUMBER
ID	DIAMETER, INSIDE	%	PERCENT
OD	DIAMETER, OUTER	PH	PHASE (ELECTRICAL)
DBT	DRY-BULB TEMPERATURE	LBS	POUNDS
DN	DOWN	PSI	POUNDS PER SQUARE INCH
DOM.	DOMESTIC	PSIA	PSI ABSOLUTE
EAT	ENTERING AIR TEMPERATURE	PD	PRESSURE DROP
EC	ELECTRICAL CONTRACTOR	PSIG	PSI GAUGE
EXP	EXPANSION	R/O	RUN OUT
EWT	ENTERING WATER TEMPERATURE	RPM	REVOLUTIONS PER MINUTE
F	FAHRENHEIT	SH	SENSIBLE HEAT
FA	FROM ABOVE	SPEC	SPECIFICATION
FD	FLOOR DRAIN	SP VOL	SPECIFIC VOLUME
FBM	FEET PER MINUTE	STD	STANDARD
FPS	FEET PER SECOND	SP	STATIC PRESSURE
FT	FOOT OR FEET	SUCT	SUCTION
HZ	FREQUENCY	TEMP	TEMPERATURE
GA	GAGE OR GAUGE	TD	TEMPERATURE DIFFERENCE
GAL	GALLONS	T STAT	THERMOSTAT
G.C.	GENERAL CONTRACTOR	TC	TEMPERATURE CONTROL
GPH	GALLONS PER HOUR	UEF	UNIFORM ENERGY FACTOR
GPM	GALLONS PER MINUTE	VEL	VELOCITY
GPD	GALLONS PER DAY	V	VOLT
HD	HEAD	VOL	VOLUME
HGT	HEIGHT	VFD	VARIABLE FREQUENCY DRIVE
HP	HORSEPOWER	WC	WATER COLUMN
KW	KILOWATT	WPD	WATER PRESSURE DROP
KWH	KILOWATT HOUR	W	WITH
LWT	LEAVING WATER TEMPERATURE		

BIOMASS BOILER SCHEDULE

PLAN CODE	MFGR	MODEL	BURN RATE (KW) / (MBH) NOTE 1	BOILER WATER CONTENT (GAL)	FLUE SIZE	POWER CONSUMPTION (W)	POWER (V/PH/Hz)	DIMENSIONS W x H x L (IN x IN x IN)	REMARKS
B-3	TWIN HEAT	CS 150i	140 / 478	198	9"	340	208/3/60	50 x 67 x 150	NOTES 1,2,3

NOTES:
 1 - BURN RATE WITH WOOD CHIPS AT 25% MC.
 2 - PROVIDE WITH HYDRAULIC FLOOR SCRAPER SYSTEM, COLLECTION AUGERS, LIFT AUGER, METERING BIN, CONTROLS, AND ALL OTHER COMPONENTS REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM
 3 - SEE SPECIFICATION 236250 FOR ADDITIONAL ACCESSORIES AND FEATURES.

EXPANSION TANK SCHEDULE

PLAN CODE	MFGR	MODEL	TYPE	WORKING FLUID	PHYSICAL			PRECHARGE PRESSURE (PSIG)	MAXIMUM SYSTEM PRESSURE (PSIG)	MIN. TEMP (°F)	MAX. TEMP (°F)	EST. SYSTEM VOLUME (GAL)	REMARKS
					TANK VOL. (GAL)	ACCEPTANCE VOL. (GAL)	DIA. / HEIGHT (INxIN)						
ET-1	TACO	CBX-130	BLADDER	40% PROP. GLYCOL	34	19	20 x 38	12	40	50	200	300	NOTES 1,2

NOTES:
 1 - PROVIDE ASME RATED TANK.

PUMP SCHEDULE

PLAN CODE	MFGR	MODEL	TYPE	SERVICE	FLUID			MINIMUM PUMP EFF.	MOTOR IMPELLAR DIA	MOTOR			REMARKS
					FLOW (GPM)	HEAD (FT)	WORKING FLUID			MIN HP	RPM	POWER (V/PH/Hz)	
P-14	TACO	1915	INLINE	BOILER, B-3	40	21	TREATED WATER	52%	5.3	0.5	1750	120/1/60	NOTE 1,2
P-15	TACO	1919	INLINE	SYSTEM, GLYCOL LOOP	42	42	40% PROP. GLYCOL	51%	6.8	1	1750	208/3/60	NOTE 1
P-16	TACO	1919	INLINE	SYSTEM, GLYCOL LOOP	42	42	40% PROP. GLYCOL	51%	6.8	1	1750	208/3/60	NOTE 1
P-17	TACO	0013	CARTRIDGE CIRCULATOR	SHOP BUILDING	9	13	TREATED WATER	-	-	0.167	3250	120/1/60	NOTE 1
P-18	TACO	1911	INLINE	SCHOOL HEAT INJECTION	42	15	40% PROP. GLYCOL	55%	4.5	0.33	1750	120/1/60	NOTE 1,2

NOTES:
 1. PROVIDE WITH SEALS COMPATIBLE WITH WORKING FLUID.
 2. PROVIDE MOTOR WITH INTEGRAL THERMAL OVERLOAD PROTECTION.

BRAZED PLATE HEAT EXCHANGER SCHEDULE

PLAN CODE	MFGR	MODEL NO.	PLATES	CAPACITY (MBH)	HOT SIDE DATA				COLD SIDE DATA				FOULING FACTOR	REMARKS		
					FLUID	FLOW (GPM)	EWT (°F)	LWT (°F)	WPD (PSI)	FLUID	FLOW (GPM)	EWT (°F)			LWT (°F)	WPD (PSI)
HTX-1	KELVION	FG10X20-60 (2" MPT)	60	487.4	WATER	40	190	165	2	40% PROP. GLYCOL	42	155	180	2.3	0.00010	-
HTX-2	KELVION	FG10X20-90 (2 1/2" MPT)	90	488.3	40% PROP. GLYCOL	42	180	155	1.2	40% PROP. GLYCOL	42	145	170	1.2	0.00010	-

AIR SEPARATOR SCHEDULE

PLAN CODE	MFGR	MODEL	SIZE	FLUID			WEIGHT (LB)	REMARKS
				FLOW RATE (GPM)	WORKING FLUID	HEAD LOSS (FT)		
AS-2	TACO	436	3"	42	WATER	5	40	ASME RATED

UNIT HEATER SCHEDULE

PLAN CODE	SERVICE	MFGR	MODEL	MBH	GPM	CFM	WPD (FT)	RPM	HP	POWER (V/PH/Hz)	PIPING R/O SIZE
UH-1	BOILER ROOM	REZNOR	WS	33	3	500	0.04	1,600	0.055	115/1/60	3/4"
UH-2	WOOD SHOP	REZNOR	WS	33	3	500	0.04	1,600	0.055	115/1/60	3/4"
UH-3	WOOD SHOP	REZNOR	WS	33	3	500	0.04	1,600	0.055	115/1/60	3/4"

WALL LOUVER SCHEDULE

PLAN CODE	MFGR	MODEL NO.	SERVICE	FRAME TYPE	WIDTH x HEIGHT (IN x IN)	FREE AREA (SQ. FT.)	MAX APD (IN W.C.)	MATERIAL	REMARKS
L-1	RUSKIN	ELF375	BOILER ROOM	FLANGE MTD	36x48	6.11	0.05	ALUMINUM	NOTES 1,2

NOTES:
 1 - PROVIDE BAKED ENAMEL FINISH, COLOR BY ARCHITECTURAL.
 2 - PROVIDE BIRDSCREEN.

GLYCOL FEEDER UNIT SCHEDULE

PLAN CODE	MFGR	MODEL	DUTY	TANK VOL. (GAL)	PUMP FLOW GPM	CUT IN (PSI)	PUMP HP	POWER (V/PH/Hz)	REMARKS
GFU-1	GENERAL TREATMENT PRODUCTS	GRE 15-E7-5-ALM	HEATING WATER	15	0.8	20-80	1/100	120/1/60	PROVIDE POLYETHYLENE TANK.

BUFFER TANK SCHEDULE

PLAN CODE	MFGR	MODEL NO.	FLUID	DIAMETER (IN)	HEIGHT (IN)	TANK VOL. (GAL)	EMPTY WEIGHT (LBS)	FULL WEIGHT (LBS)	CONNECTION SIZES (IN)	REMARKS
BT-1	TACO	BTH0100F25-125N	WATER	24	61	100	280	1114	2.5	-

RADIANT HEATER SCHEDULE

PLAN CODE	MFGR	MODEL NO.	POWER V / PH / Hz	CURRENT RATING (A)	HEATING CAPACITY (MBH)	WEIGHT (LBS)	REMARKS
RH-1	DETROIT RADIANT	LS3-15-30	120 / 1 / 60	4.8	30	85	24 V CONTROL
RH-2	DETROIT RADIANT	LS3-15-30	120 / 1 / 60	4.8	30	85	24 V CONTROL

REVISIONS:
 REV 1: ADD R3 - 02-26-2021

Craig City School District
 Biomass Project

STATUS:

Construction Documents

DRAWN BY: HERBST
 CHECKED BY: RATZ
 DATE: 1.22.21
 PROJECT #: 182361

R&M
R&M ENGINEERING-KETCHIKAN, INC.
 7180 REVILLA ROAD, SUITE 300
 KETCHIKAN, ALASKA 99901
 PH: 907.225.7187
 www.ketchikanengineer.com



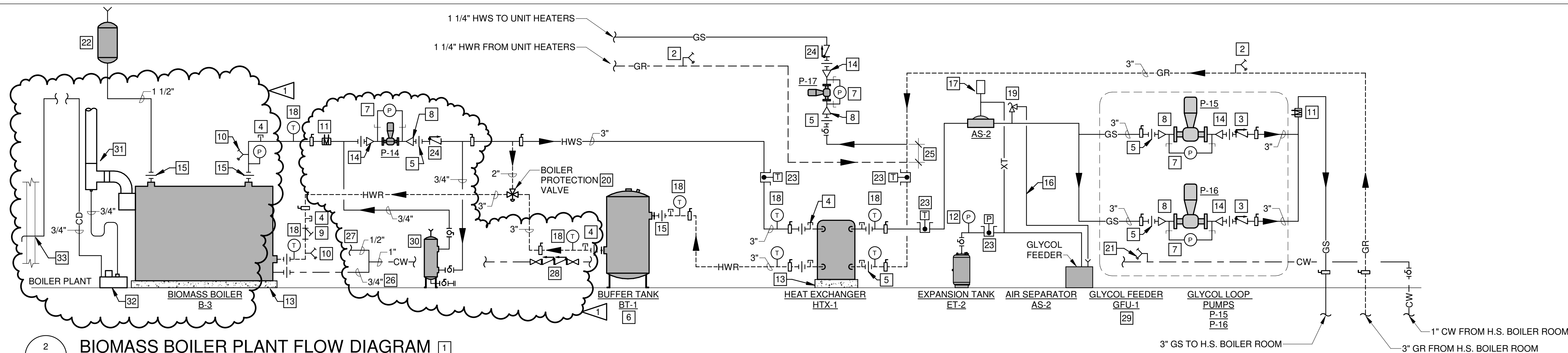
Cushing Terrell

cushingterrell.com
 800.757.9522

SHEET DESCRIPTION:
 MECHANICAL SCHEDULES & LEGEND

M1.0

SHEET:



Ⓢ SHEET NOTES

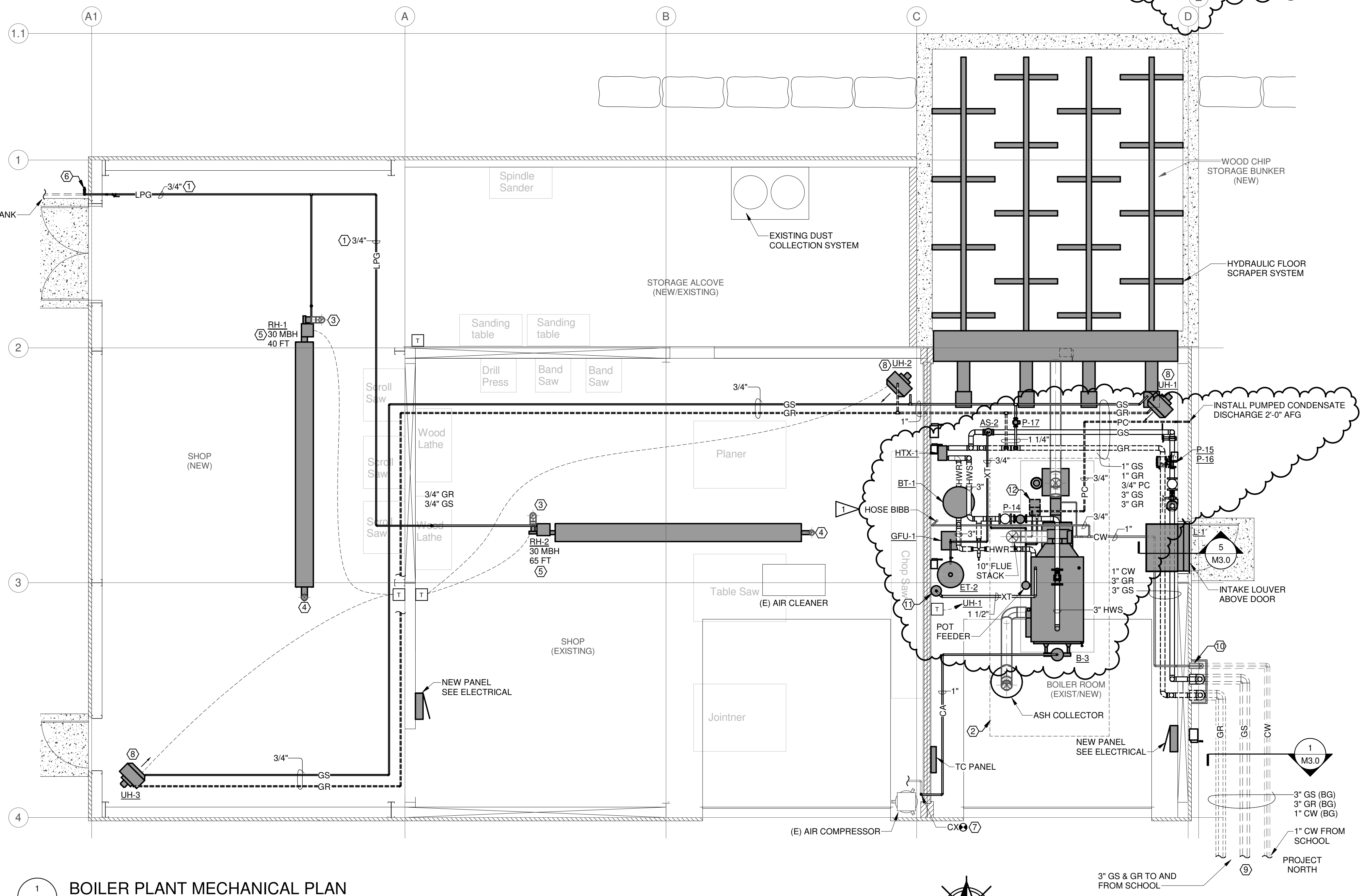
1. ROUTE LPG PIPING AS HIGH AS POSSIBLE.
2. DASHED AREAS ARE ACCESS AREAS, KEEP CLEAR.
3. 4" COMBUSTION AIR VENT UP THRU ROOF. TERMINATE WITH MANUFACTURERS APPROVED INLET CAP.
4. 4" EXHAUST VENT UP THRU ROOF. TERMINATE WITH MANUFACTURERS APPROVED VENT CAP.
5. INSTALL RADIANT HEATER PER MANUFACTURER'S RECOMMENDATIONS INCLUDING CLEARANCE FROM STRUCTURE.
6. PROPANE TANK, MEDIUM PRESSURE PIPING, AND SECONDARY REGULATOR WITH 11" W.C. OUTLET PRESSURE BY OTHERS. CONTRACTOR SHALL CONNECT TO PRV AND INSTALL LPG PIPING TO RADIANT HEATERS.
7. CONNECT NEW 1" COMPRESSED AIR PIPE INTO (E) COMPRESSED AIR RISER.
8. MOUNT BOTTOM OF UNIT HEATER 8'-0" AFF.
9. SEE CIVIL DRAWINGS FOR UNDERGROUND UTILITY TRENCH AND ROUTING.
10. SEE 4/M3.0 FOR BOILER PLANT PIPE PENETRATION DETAIL.
11. INSTALL OPEN EXPANSION TANK PROVIDED BY BOILER MANUFACTURER TO WALL AS HIGH AS POSSIBLE AT HIGH POINT OF ROOF. LEAVE MANUFACTURER RECOMMENDED CLEARANCE AT TOP.
12. CONDENSATE NEUTRALIZATION TANK WITH PUMP FOR STACK DRAIN. EXTEND PUMPED CONDENSATE PIPING TO DISCHARGE TO EXTERIOR. SEE ALSO FLOW DIAGRAM.

2 BIOMASS BOILER PLANT FLOW DIAGRAM

NOT TO SCALE

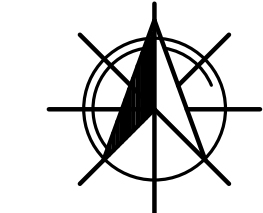
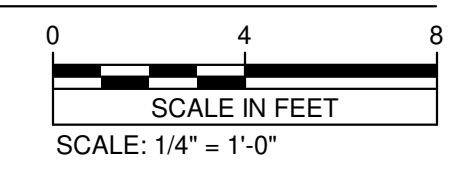
Ⓢ FLOW DIAGRAM NOTES

1. THIS DIAGRAM SHALL TAKE PRECEDENCE OVER PLAN VIEWS FOR ACTUAL PIPING ARRANGEMENTS AND COMPONENTS REQUIRED.
2. HOSE END DRAIN VALVE FOR MANUAL AIR VENT, AT ALL HIGH POINTS IN HEATING WATER SYSTEM.
3. NON SLAM, GLOBE STYLE CHECK VALVE, INSTALL WITH A MINIMUM OF 5 PIPE DIAMETERS OF STRAIGHT PIPE BETWEEN PUMP DISCHARGE AND CHECK VALVE.
4. P/T TEST PLUG, TYPICAL.
5. UNION, TYPICAL.
6. ATMOSPHERIC BUFFER TANK PROVIDED AND INSTALLED BY MC.
7. LIQUID FILLED PRESSURE GAUGE WITH SNUBBER, 1/4" BALL VALVE GAUGE COCKS AND 1/4" COPPER TUBING OR THREADED STEEL PIPE FROM PUMP SUCTION AND PUMP DISCHARGE.
8. CONCENTRIC REDUCER AS REQUIRED, TYPICAL.
9. STRAINER.
10. PROVIDE A 3/4" DRAIN W/HOSE FITTING AND CAP.
11. VENTURI STYLE MANUAL BALANCE VALVE. INSTALL WITH MANUFACTURER RECOMMENDED STRAIGHT PIPE UPSTREAM AND DOWNSTREAM OF VALVE.
12. PRESSURE GAUGE, TYPICAL.
13. 4" CONCRETE HOUSEKEEPING PADS SHALL EXTEND 8" BEYOND FOOTPRINT OF EQUIPMENT ON ALL SIDES.
14. INSTALL CONCENTRIC INCREASER ON DISCHARGE OF PUMP, TYPICAL.
15. INSTALL FLANGE OR UNION AT EQUIPMENT CONNECTION. INSTALL CONCENTRIC REDUCER AS REQUIRED.
16. PIPE FULL SIZE TO GLYCOL FEEDER.
17. AUTOMATIC AIR VENT WITH MINIMUM 3/8" DRAIN LINE.
18. TEMPERATURE GAUGE, TYPICAL.
19. INSTALL RELIEF VALVE, BELL & GOSSETT MODEL 790-45, 45 PSIG SETTING. DRAIN DISCHARGE FULL SIZE TO TOP OF GLYCOL FEEDER.
20. THREE WAY BOILER PROTECTION VALVE. PROVIDE LOCHINVAR MODEL LTV, 2" SIZE OR APPROVED EQUAL. PROVIDE REDUCERS AT VALVE. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
21. PROVIDE HOSE BIBB WOODFORD MODEL 26 OR APPROVED EQUAL NEAR GLYCOL FEEDER.
22. INSTALL OPEN EXPANSION TANK PROVIDED BY BOILER MANUFACTURER TO WALL AS HIGH AS POSSIBLE. CONNECT TO BOILER PER MANUFACTURER RECOMMENDATIONS.
23. DDC TEMPERATURE OR PRESSURE SENSOR BY T.C. CONTRACTOR. WELLS BY PLUMBING CONTRACTOR.
24. CHECK VALVE, TYPICAL.
25. PRIMARY-SECONDARY PIPING CONNECTION. INSTALL TEES CLOSE TOGETHER, 12" MAXIMUM.
26. 3/4" CW TO SAFETY QUENCH COIL ON BURNER.
27. 1/2" CW TO SAFETY BACKBURN SPRINKLER IN METERING BIN.
28. 1" REDUCED PRESSURE BACKFLOW PREVENTER, WILKINS MODEL 975XL OR APPROVED EQUAL.
29. CONTRACTOR SHALL ADD A 40% SOLUTION OF PROPYLENE GLYCOL TO THE ENTIRE NEW HEATING SYSTEM AS FOLLOWS:
 A. DRAIN SYSTEM AFTER CLEANING AND FLUSHING.
 B. FILL SYSTEM WITH CLEAR WATER USING A WATER METER TO MEASURE VOLUME.
 C. DRAIN SYSTEM TOTALLY DOWN.
 D. PROVIDE TAG AT GLYCOL FEEDER WITH ACTUAL TOTAL SYSTEM VOLUME LISTED.
30. 2 GALLON POT FEEDER WITH FEET, J.L. WINGERT, MODEL DB-2-HD OR EQUAL. INSTALL NEXT TO BOILER. COORDINATE WITH BOILER MANUFACTURER.
31. ALL FUEL STACK. SEE SPECIFICATION. PROVIDE WITH DRAIN TAP AT BOTTOM OF STACK. PIPE DRAIN TO CONDENSATE NEUTRALIZATION TANK.
32. CONDENSATE NEUTRALIZATION TANK WITH PUMP, AXIOM MODEL NT1-P OR EQUAL WITH 120 V POWER PLUG. PUMPED CONDENSATE PIPING SHALL BE TYPE L COPPER.
33. DISCHARGE PUMPED CONDENSATE TO EXTERIOR 24" ABOVE FINISHED GRADE. SEAL PENETRATION WATER TIGHT.



1 BOILER PLANT MECHANICAL PLAN

1/4" = 1'-0"



REVISIONS:
REV 1: ADD #3 02.26.2021

Craig City School District
Biomass Project

STATUS:
Construction Documents

DRAWN BY: HERBST
CHECKED BY: RATZ
DATE: 1.22.21
PROJECT #: 182361

R&M
R&M ENGINEERING-KETCHIKAN, INC.
7180 REVILLA ROAD, SUITE 300
KETCHIKAN, ALASKA 99901
PH: 907.225.7187
www.ketchikanengineer.com



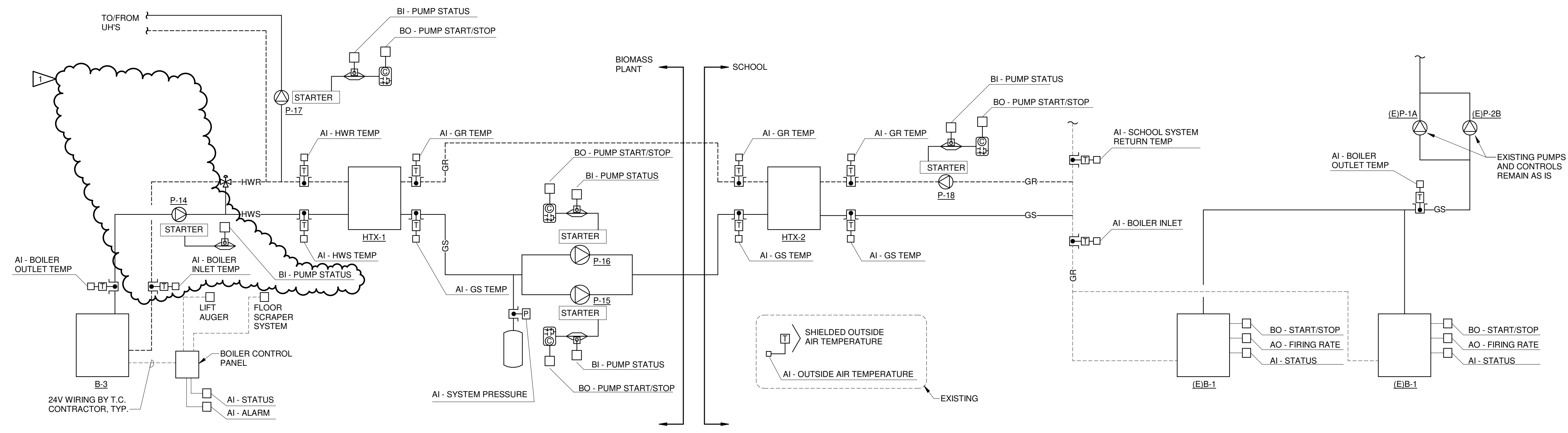
Cushing Terrell.

cushingterrell.com
800.757.9522

SHEET DESCRIPTION:
BOILER PLANT HVAC
PLAN, SCHEMATIC &
DETAILS

M2.1

SHEET:



1 HEATING WATER PLANT CONTROL SCHEMATIC
M4.0 NOT TO SCALE

SEQUENCES OF OPERATION

BIOMASS BOILER PLANT

BOILER PUMP P-14
THIS PUMP IS MANUALLY STARTED WHEN THE BIOMASS BOILER IS READY TO FIRE. PROVIDE CURRENT SENSING RELAY TO MONITOR THE STATUS OF THE PUMP.

BIOMASS BOILER, B-3
THE BIOMASS BOILER IS MANUALLY STARTED. PROVIDE INPUTS TO MONITOR STATUS (ON/OFF) AND ALARM FROM THE THE BOILER CONTROL PANEL. THE INTENT IS FOR THIS BOILER TO ACT AS THE FIRST STAGE OF HEAT FOR THE SCHOOL AND THE SHOP BUILDING. PROVIDE TEMPERATURE SENSORS TO MONITOR BOILER INLET AND OUTLET TEMPERATURES.

GLYCOL HEATING WATER PUMPS, P-15 AND P-16
WHEN THE SCHOOL HEATING SYSTEM IS ENABLED, THE DDC SYSTEM SHALL ENABLE THE LEAD GLYCOL HEATING SYSTEM PUMP. PROVIDE CURRENT SENSING RELAYS TO MONITOR THE STATUS OF EACH PUMP. THE DDC SYSTEM SHALL OPERATE THE PUMPS IN A LEAD/LAG STRATEGY. UPON FAILURE OF THE LEAD HEATING WATER PUMP, THE DDC SYSTEM SHALL GENERATE AN ALARM AND ENABLE THE LAG PUMP. THE LEAD PUMP MUST BE COMPLETELY SHUT DOWN BEFORE THE LAG PUMP STARTS. THE LEAD PUMP WILL ALTERNATE BASED ON AN OWNER SUPPLIED SCHEDULE.

GLYCOL SYSTEM PRESSURE
A PRESSURE SENSOR LOCATED IN THE EXPANSION TANK LEG SHALL MONITOR SYSTEM PRESSURE. IF THE SYSTEM PRESSURE DROPS 3 PSI BELOW THE NORMAL OPERATING PRESSURE, THE DDC SYSTEM SHALL GENERATE AN ALARM.

HEAT EXCHANGER, HTX-1
HEAT EXCHANGER HTX-1 IS USED TO TRANSFER HEAT FROM THE BIOMASS BOILER TO THE GLYCOL LOOP. MONITOR HEATING WATER INLET AND OUTLET TEMPERATURES AND GLYCOL WATER INLET AND OUTLET TEMPERATURES.

SHOP HEATING PUMP, P-17
P-17 PROVIDES HEATING FLOW TO THE UNIT HEATERS IN THE SHOP. IF ANY UH-1, UH-2, OR UH-3 CALLS FOR HEAT, THE DDC SYSTEM SHALL ENABLE THE PUMP. PROVIDE A CURRENT SENSING RELAY TO MONITOR THE STATUS OF THE PUMP. UPON FAILURE OF THE PUMP, THE DDC SYSTEM SHALL GENERATE AN ALARM.

BOILER ROOM UNIT HEATER, UH-1
PROVIDE TEMPERATURE SENSOR TO MONITOR SPACE TEMPERATURE. ON A CALL FOR HEAT, ENABLE PUMP P-17 AND CYCLE ON THE UNIT HEATER FAN. IF SPACE TEMPERATURE DROPS BELOW 40F, THE DDC SYSTEM SHALL GENERATE AN ALARM, AND SHALL ENABLE PUMP P-17, THE LEAD GLYCOL PUMP (P-15 OR P-16) AND THE SCHOOL INJECTION HEAT PUMP, P-18 REGARDLESS IF BOILER B-3 IS OPERATING.

WOOD SHOP UNIT HEATERS AND RADIANT HEATERS, UH-2/RH-1 AND UH-3/RH-2
PROVIDE TEMPERATURE SENSORS TO MONITOR SPACE TEMPERATURE. ON A CALL FOR HEAT, ENABLE PUMP P-17 AND CYCLE ON THE RESPECTIVE UNIT HEATER FAN. IF HOT WATER HEAT IS NOT AVAILABLE, LOCK OUT PUMP P-17, AND ENABLE RESPECTIVE RADIANT HEATER. LIMIT TEMPERATURE SENSOR TO MAXIMUM OF 65F (ADJUSTABLE). IF SPACE TEMPERATURE DROPS BELOW 40F, THE DDC SYSTEM SHALL GENERATE AN ALARM. PROVIDE PROGRAMMING TO ALLOW A TOGGLE SWITCH TO ALLOW RADIANT HEAT ONLY (SUMMER OPERATION).

SEQUENCES OF OPERATION

SCHOOL BOILER PLANT

MONITOR OUTSIDE AIR TEMPERATURE. WHEN OUTSIDE AIR TEMPERATURE IS 75 DEG F AND ABOVE (ADJUSTABLE), LOCK OUT THE HEATING SYSTEMS. WHEN THE OUTSIDE AIR TEMPERATURE IS 65 DEG F OR BELOW ENABLE THE HEATING SYSTEM.

HEAT EXCHANGER, HTX-2
HEAT EXCHANGER HTX-2 IS USED TO TRANSFER HEAT FROM THE GLYCOL LOOP TO THE SCHOOL HEATING SYSTEM LOOP. MONITOR HEATING WATER INLET AND OUTLET TEMPERATURE AND GLYCOL WATER INLET AND OUTLET TEMPERATURE.

SCHOOL HEATING SYSTEM INJECTION PUMP P-18
THIS PUMP INJECTS HEAT FROM THE BIOMASS PLANT INTO SCHOOL HEATING LOOP VIA THE GLYCOL LOOP. THE INTENT IS FOR THIS TO BE THE FIRST STAGE OF HEAT FOR THE SCHOOL. WHEN THE SCHOOL HEATING SYSTEM IS ENABLED, THE DDC SYSTEM SHALL ENABLE THE INJECTION PUMP. PROVIDE A CURRENT SENSING RELAY TO MONITOR THE STATUS OF THE PUMP. UPON FAILURE OF THE PUMP, THE DDC SYSTEM SHALL GENERATE AN ALARM.

BOILERS, B-1 AND B-2 (EXISTING - ADD NEW CONTROLLER TO CONTROL BOILERS)
WHEN THE HEATING SYSTEM IS ENABLED, AND THE PRIMARY HEATING WATER PUMP HAS PROVED OPERATION, AND HTX-2 ADN P-18 CANNONT MAINTAIN THE SYSTEM SETPOINT, THE DDC SYSTEM SHALL ENABLE THE LEAD BOILER. THE BOILER SHALL MODULATE TO MAINTAIN THE SYSTEM MAIN HEATING WATER SETPOINT OF 170 DEG F (ADJUSTABLE). IF THE BOILER CANNOT MAINTAIN THE SETPOINT, ENABLE THE LAG BOILER. THE DDC SYSTEM SHALL OPERATE THE BOILERS IN A LEAD/LAG STRATEGY. UPON FAILURE OF THE LEAD BOILER, THE DDC SYSTEM SHALL GENERATE AN ALARM AND ENABLE THE LAG BOILER. THE LEAD BOILER WILL ALTERNATE BASED ON AN OWNER SUPPLIED SCHEDULE. PROVIDE TEMPERATURE SENSORS TO MONITOR BOILER INLET AND OUTLET TEMPERATURES AND THE SYSTEM RETURN TEMPERATURE JUST UPSTREAM OF THE HTX-2 INJECTION POINT.

NOTE

THE TEMPERATURE CONTROL SYSTEM SHALL BE AN EXTENSION OF THE EXISTING JOHNSON CONTROL, INC DIGITAL CONTROL SYSTEM.

TEMPERATURE CONTROL SYSTEM GENERAL NOTES

A. ALL CONTROL POINTS LISTED IN THE SEQUENCE OF OPERATION AND POINTS LIST SHALL BE ADJUSTABLE BY THE SYSTEM OPERATOR.

B. THE TEMPERATURE CONTROLS CONTRACTOR AND EQUIPMENT MANUFACTURERS SHALL COORDINATE ALL FACTORY FURNISHED CONTROL DEVICES. THE TEMPERATURE CONTROLS CONTRACTOR IS RESPONSIBLE FOR A COMPLETELY OPERATIONAL SYSTEM.

DDC TEMPERATURE CONTROL LEGEND

SD-1		SMOKE DETECTOR
D-1		CONTROL DAMPER (NORMALLY CLOSED DAMPER INDICATED)
DA-1		CONTROL ACTUATOR
CD-1		CARBON DIOXIDE SENSOR
R-1		CONTROL RELAY
CS-1		CURRENT-SENSING STATUS SWITCH
V		MOTORIZED T.C. VALVE/2-WAY
V-1		3-WAY CONTROL VALVE (NORMALLY OPEN, NORMALLY CLOSED & COMMON PORTS INDICATED)
TE-1		AVERAGING TEMPERATURE SENSOR
TE-1		ROOM TEMPERATURE SENSOR
TE-1		WELL-MOUNTED INSERTION SENSOR
TE-1		DUCT-MOUNTED INSERTION SENSOR
TLL-1		LOW LIMIT TEMPERATURE SWITCH
PS-1		WELL-MOUNTED PRESSURE SENSOR
TS-1		WELL-MOUNTED TEMPERATURE SWITCH
TS-1		DUCT-MOUNTED TEMPERATURE SWITCH
DP-1		DIFFERENTIAL PRESSURE SENSOR
AI		ANALOG INPUT
AO		ANALOG OUTPUT
BI		BINARY INPUT
BO		BINARY OUTPUT
EA		EXHAUST AIR
RA		RETURN AIR
OA		OUTDOOR AIR
NC		NORMALLY CLOSED VALVE OR DAMPER
NO		NORMALLY OPEN VALVE OR DAMPER

REVISIONS:

REV 1:	ADD #3 - 02.26.2021
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Craig City School District
Biomass Project

STATUS:
Construction Documents

DRAWN BY: HERBST
CHECKED BY: RATZ
DATE: 1.22.21
PROJECT #: 182361

R&M ENGINEERING-KETCHIKAN, INC.
7180 REVILLA ROAD, SUITE 300
KETCHIKAN, ALASKA 99901
PH: 907.225.7187
www.ketchikanengineer.com



Cushing Terrell.

cushingterrell.com
800.757.9522

SHEET DESCRIPTION:
TEMPERATURE CONTROLS

M4.0

SHEET: