BID NOTES:

- THE AWARDED CONTRACTOR WILL BE RESPONSIBLE FOR THE ENTIRE SCOPE OF THIS PROJECT WHICH INCLUDES MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION, AND PROTECTION OF THE EXISTING BUILDING INTERIOR, EXTERIOR, AND SITE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS AND ASSOCIATED FEES REQUIRED TO PERFORM THE SCOPE OF WORK.
- THE CONTRACTOR SHALL WORK DIRECTLY WITH THE OWNER TO COORDINATE SCHEDULE, SITE ACCESS, SYSTEM SHUTDOWNS, TEMPORARY HEAT, AND CONTRACT TERMS.
- THE CONTRACTOR SHALL ENSURE THE BUILDING IS PROTECTED FROM FREEZING CONDITIONS DURING CONSTRUCTION AND SHALL PROVIDE TEMPORARY HEAT IF REQUIRED.
- THE OWNER SHALL BE RESPONSIBLE FOR REMOVING NON-MECHANICAL AND NON-ELECTRICAL ITEMS FROM MECHANICAL ROOMS PRIOR TO CONSTRUCTION. NOTIFY OWNER 7 DAYS IN ADVANCE OF WHEN ITEMS MUST BE REMOVED.

DEMOLITION DEFINITIONS:

- REMOVE: DETACH ITEMS FROM EXISTING CONSTRUCTION AND LEGALLY DISPOSE OF THEM OFF-SITE UNLESS INDICATED TO BE REMOVED AND SALVAGED OR REMOVED AND REINSTALLED.
- REMOVE AND SALVAGE: CAREFULLY DETACH FROM EXISTING CONSTRUCTION, IN A MANNER TO PREVENT DAMAGE, AND DELIVER TO OWNER.
- REMOVE AND REINSTALL: DETACH FROM EXISTING CONSTRUCTION, PREPARE FOR REUSE, AND REINSTALL WHERE INDICATED
- EXISTING TO REMAIN: EXISTING ITEMS OF CONSTRUCTION THAT ARE NOT TO BE PERMANENTLY REMOVED AND THAT ARE NOT OTHERWISE INDICATED TO BE REMOVED, REMOVED AND SALVAGED, OR REMOVED AND REINSTALL.

ABBREVIATIONS:

ADJ	ADJUSTABLE
BAS	BUILDING AUTOMATION SYSTEM
BLDG	BUILDING
CFM	CUBIC FEET PER MINUTE
CHW	CHILLED WATER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CW	DOMESTIC COLD WATER
DOM	DOMESTIC
EXIST	EXISTING
HHW	HEATING HOT WATER
HHWR	HEATING HOT WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
TEMP	TEMPORARY
TYP	TYPICAL
VFD	VARIABLE FREQUENCY DRIVE

PROJECT LOCATION
TULSA HOUSING AUTHORITY
ROXIE WEBER PLAZA
807 S LOWRY STREET
STILLWATER, OK 74074

PROJECT SCOPE OVERVIEW:
THE SCOPE OF THIS PROJECT IS TO REPLACE THE BOILER PLANT AND CHILLER PLANT AND TO REPLACE VERTICAL CABINET-STYLE FAN-COIL UNITS INSIDE THE BUILDING.

CHILLER PLANT MECHANICAL SCOPE OVERVIEW AND PHASING NOTES:

1. CHILLER REPLACEMENT WORK TO BE COMPLETED BETWEEN OCTOBER 31ST AND MARCH 31ST. IF WORK CANNOT BE COMPLETED IN THIS TIMEFRAME, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AT 100-TON TEMPORARY CHILLER SYSTEM TO ENSURE THE BUILDING IS NOT WITHOUT CHILLED WATER OUTSIDE THIS WINDOW.
2. REMOVE EXISTING 100-TON AIR-COOLED CHILLER, PUMPS, AND PIPING OUTDOORS AND WITHIN THE MECHANICAL ROOM.
3. EXTEND EXISTING OUTDOOR CHILLER PAD TO ACCOMMODATE NEW CHILLERS.
4. PROVIDE NEW CONCRETE PADS FOR CHILLED WATER PUMPS
5. PROVIDE TWO NEW 60-TON CHILLERS PIPED IN SERIES TO PROVIDE 120-TON TONS OF CHILLED WATER.
6. PROVIDE TWO NEW CHILLED WATER PUMPS (N+1) TO OPERATE IN DUTY/STANDBY.
7. PROVIDE NEW CHILLER PIPING, VALVES, AND HYDRONIC SPECIALTIES AND CONNECT NEW CHILLERS AND CHILLED WATER PUMPS TO EXISTING PIPING SERVING THE BUILDING.
8. DRAIN EXISTING CHILLED WATER SYSTEM PIPING IN THE APARTMENT BUILDING AND FILL BUILDING AND NEW CHILLED WATER SYSTEM WITH NEW WATER AND TREAT NEW WATER TO ENSURE PROPER CHEMISTRY FOR PIPING AND CHILLER.
9. PROVIDE NEW CONTROLS FOR CHILLED WATER SYSTEM.
10. PROVIDE STARTUP AND VERIFY PROPER CONTROL OPERATION FOR NEW CHILLED WATER SYSTEM.

BOILER PLANT MECHANICAL SCOPE OVERVIEW AND PHASING NOTES:

1. BOILER REPLACEMENT WORK TO BE COMPLETED BETWEEN APRIL 30TH AND SEPTEMBER 30TH. IF WORK CANNOT BE COMPLETED IN THIS TIMEFRAME, THE CONTRACTOR SHALLD BE RESPONSIBLE FOR PROVIDING A 1,000,000 BTUH TEMPORARY BOILER SYSTEM TO ENSURE THE BUILDIGN IS NOT WITHOUT HEATING HOT WATER OUTSIDE THIS WINDOW.
2. REMOVE EXISTING 1,000,000 BTUH BOILER, PUMPS, PIPING, AND FLUE WITHIN THE EXISTING MECHANICAL ROOM.
3. PROVIDE TWO NEW 500,000 BTUH NATURAL GAS HEATING HOT WATER BOILERS WITH BOILER CIRCULATOR PUMPS ON THE EXISTING BOILER PAD.
4. PROVIDE NEW FLUES FOR NEW BOILERS AND SEAL ROOF PENETRATIONS TO ENSURE THEY ARE WATER-TIGHT.
5. CONNECT NEW BOILERS TO EXISTING GAS LINE.
6. PROVIDE NEW CONCRETE PADS FOR NEW HEATING HOT WATER PUMPS.
7. PROVIDE TWO NEW HEATING HOT WATER PUMPS (N+1) TO OPERATE IN DUTY/STANDBY.
8. PROVIDE NEW HEATING HOT WATER PIPING, VALVES, AND HYDRONIC SPECIALTIES AND CONNECT NEW BOILERS, BOILER CIRCULATOR PUMPS, AND HEATING HOT WATER PUMPS TO THE EXISTING PIPING SERVING THE BUILDING.
9. DRAIN EXISTING HEATING HOT WATER SYSTEM PIPING IN THE APARTMENT BUILDING AND FILL EXISTING BUILDING PIPING AND NEW BOILER SYSTEM WITH NEW WATER AND TREAT NEW WATER TO ENSURE PROPER CHEMISTRY FOR PIPING AND BOILER.
10. PROVIDE NEW CONTROLS FOR BOILER PLANT.
11. PROVIDE STARTUP AND VERIFY PROPER CONTROL SYSTEM OPERATION FOR HEATING HOT WATER SYSTEM.

FAN-COIL UNIT MECHANICAL SCOPE OVERVIEW:

1. REMOVE EXISTING FAN-COIL UNITS INDICATED ON THE PLANS AND REPLACE WITH NEW FAN COIL UNITS. PROVIDE NEW VALVES AND PIPING TO CONNECT TO EXISTING CHILLED WATER AND HEATING HOT WATER LINES. TRAP CONDENSATE AND CONNECT TO EXISTING CONDENSATE LINES.
2. PROVIDE NEW STAND-ALONE CONTROLS FOR FAN-COIL UNITS.

CONTROLS SCOPE OVERVIEW:

1. PROVIDE NEW CONTROL SYSTEM TO CONTROL NEW BOILER AND CHILLER PLANT EQUIPMENT. REFERENCE CONTROL NOTES ON M-6 FOR MORE DETAIL.

ELECTRICAL SCOPE OVERVIEW:

1. REFERENCE ELECTRICAL SCOPE NOTES ON E-0

GENERAL MECHANICAL NOTES:

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE THE DRAWINGS, AND AS REQUIRED BY CODE.
2. DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
3. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATION, AND APPLICABLE CODES AND REGULATIONS.
4. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
5. TESTING, ADJUSTING, AND BALANCING IS REQUIRED FOR ALL NEW SYSTEMS. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL. ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH AABC STANDARDS.
6. CONTRACTOR TO COMPLY WITH ALL LOCAL CODES AND REQUIREMENTS.
7. ALL OUTSIDE AIR INTAKES TO BE A MINIMUM OF 10' FROM ANY MECHANICAL EXHAUST, FLUES, OR PLUMBING VENTS.
8. SUPPORTS FOR MECHANICAL SYSTEM PIPING MUST MEET THE HORIZONTAL AND VERTICAL SPACING PROVISIONS IN RESPECTIVE MECHANICAL CODE.
9. THESE DRAWINGS REFLECT A SYSTEM DESIGNED AROUND SPECIFIED REFERENCE PRODUCTS, THE SELECTION OF WHICH HAS INFLUENCED THE DESIGNS OF OTHER TRADES. IF SUBSTITUTE MANUFACTURERS, SIZES, OR MODEL NUMBERS ARE BID OR SUBMITTED, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL DIFFERENCES PRIOR TO BID, ALL COSTS OF ALL TRADES ASSOCIATED WITH THE SUBSTITUTION SHALL BE INCLUDED IN THE BID.
10. COORDINATION FOR ALL MODIFICATIONS TO EACH DISCIPLINE WHICH RESULT FROM SUBSTITUTION OF EQUIPMENT OR MATERIALS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SUBSTITUTIONS WHICH ARE INSTALLED AND SUBSEQUENTLY ARE PROVEN UNSATISFACTORY BY OWNER AND/OR ENGINEER WITHIN THE WARRANTY PERIOD, SHALL BE REMOVED COMPLETELY BY THE CONTRACTOR AND REPLACED WITH THE ORIGINAL DESIGN OR CORRECTED AS DIRECTED BY THE ENGINEER WITHOUT ADDITIONAL COST TO OWNER.
11. ALL EXPOSED CONTROL WIRING NOT LOCATED WITHIN EQUIPMENT SHALL BE INSTALLED IN CONDUIT.
12. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN DETAILS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR

JOB SPECIFIC MECHANCIAL NOTES:

1. HEATING HOT WATER PIPING TO BE TYPE L COPPER PIPING WITH BRAISED, SOLDERED, OR PRESS FITTINGS, OR SCHEDULE 40 BLACK STEEL WITH WELDED OR SCREWED FITTINGS. GROOVED FITTINGS SHALL NOT BE ALLOWED ON HEATING HOT WATER PIPING.
2. HEATING HOT WATER PIPING 1.5" AND SMALLER SHALL BE INSULATED WITH 1" INSULATION.
3. HEATING HOT WATER PIPING OVER 1.5" SHALL BE INSULATED WITH 2" INSULATION.
4. HEATING HOT WATER PUMPS TO BE INSULATED WITH 1" ARMAFLEX CLOSED CELL INSULATION.
5. ALL OUTDOOR CHILLED WATER PIPING SHALL BE HEAT TRACED, INSULATED PER THE NOTES BELOW, AND JACKETED WITH ALUMINUM JACKET.
6. CHILLED WATER PIPING TO BE TYPE L COPPER PIPING WITH BRAISED, SOLDERED, OR PRESS FITTINGS, OR SCHEDULE 40 BLACK STEEL WITH WELDED, GROOVED OR SCREWED FITTINGS.
7. CHILLED WATER PIPING 1.5" AND SMALLER SHALL BE INSULATED WITH 1/2" INSULATION.
8. CHILLED WATER PIPING OVER 1.5" SHALL BE INSULATED WITH 1" INSULATION.
9. ALL INDOOR CHILLED WATER PIPING AND HEATING HOT WATER PIPING INSULATION TO HAVE ALL PVC JACKETING.
10. CHILLED WATER PUMPS TO BE INSULATED WITH 1" ARMAFLEX CLOSED CELL INSULATION.
11. CHILLED WATER AIR SEPARATOR SHALL BE INSULATED WITH 1" ARMAFLEX CLOSED CELL INSULATION.
12. ALL NEW PIPING SHALL BE CLEARLY LABELED WITH SYSTEM NAME AND FLOW ARROWS.
13. ALL OPENINGS (NEW AND EXISTING) IN THE WALL ENCLOSING THE BOILER ROOM SHALL BE PATCHED AND FIRE STOPPED TO PROVIDE A 1HR RATED PARTITION.
14. CONTRACTOR SHALL NOT DISTURB ANY LOAD BEARING WALLS. CONTACT ENGINEER IF UNITS CANNOT BE INSTALLED WITHOUT DISRUPTION OF LOAD BEARING WALL.

ASME CSD-1 CONTROLS AND SAFETY NOTES:

1. BOILER, BOILER CONTROLS, AND BOILER INSTALLATION SHALL COMPLY WITH ASME CSD-1 (VERSION 2018).
2. A DISCONNECTING MEANS CAPABLE OF BEING LOCKED IN THE OPEN POSITION SHALL BE INSTALLED AT AN ACCESSIBLE LOCATION AT THE BOILER SO THAT THE BOILER CAN BE DISCONNECTED FROM ALL SOURCES OF POTENTIAL. THIS DISCONNECTING MEANS SHALL BE AN INTEGRAL PART OF THE BOILER OR ADJACENT TO IT.
3. A MANUALLY OPERATED REMOTE SHUTDOWN SWITCH OR CIRCUIT BREAKER SHALL BE LOCATED JUST OUTSIDE THE BOILER ROOM DOOR AND MARKED FOR EASY SHUTDOWN.
   - 3.1. CONSIDERATION SHOULD BE GIVEN TO THE TYPE AND LOCATION OF THE REMOTE SHUTDOWN SWITCH TO SAFEGUARD AGAINST TAMPERING. IF THE BOILER ROOM DOOR IS ON THE BUILDING EXTERIOR, THE SWITCH SHOULD BE LOCATED JUST INSIDE THE DOOR. IF THERE IS MORE THAN ONE DOOR TO THE BOILER ROOM, THERE SHOULD BE A REMOTE SHUTDOWN SWITCH LOCATED AT EACH DOOR.
4. ACTIVATION OF THE REMOTE SHUTDOWN SWITCH OR CIRCUIT BREAKER SHALL IMMEDIATELY SHUT OFF THE FUEL OR ENERGY SUPPLY.
5. ALL UNINSULATED LIVE METAL PARTS AND ALL ROTATING OR MOVING PARTS THAT MAY CAUSE INJURY SHALL BE GUARDED TO AVOID ACCIDENTAL CONTACT.
6. THE POWER SUPPLY TO THE ELECTRICAL CONTROL SYSTEM SHALL BE FROM A TWO-WIRE BRANCH CIRCUIT THAT HAS A GROUNDED CONDUCTOR; OTHERWISE, AN ISOLATION TRANSFORMER WITH A TWO-WIRE SECONDARY SHALL BE PROVIDED. WHEN AN ISOLATION TRANSFORMER IS PROVIDED, ONE SIDE OF THE SECONDARY WINDING SHALL BE GROUNDED. CONTROL VOLTAGE SHALL NOT EXCEED 150 NOMINAL VOLTS, LINE TO LINE.
   - 6.1. ONE SIDE OF ALL COILS SHALL BE ELECTRICALLY LOCATED IN THE GROUNDED SIDE OF THE CIRCUIT. ALL SWITCHES, CONTACTS, AND OVERCURRENT DEVICES SHALL BE ELECTRICALLY LOCATED IN THE UNGROUNDED OR 'HOT' SIDE OF THE CIRCUIT.
   - 6.2. ALL ELECTRICAL CONTACTS OF EVERY SAFETY DEVICE INSTALLED IN THE SAME CONTROL CIRCUIT SHALL BE ELECTRICALLY CONNECTED IN SERIES.
7. ALL ELECTRICAL COMPONENTS AND DEVICES SHALL HAVE A VOLTAGE RATING COMMENSURATE WITH THE SUPPLY VOLTAGE OF THE CONTROL SYSTEM.
8. ALL ELECTRICAL COMPONENTNS AND DEVICES SHALL BE PROVIDED WITH AN ELECTRICAL ENCLOSURE THAT IS AT LEAST NEMA TYPE 1 (GENERAL PURPOSE). WHERE ELECTRICAL DEVICES WILL BE SUBJECT TO DRIPPING MOISTURE, THE ENCLOSURE SHALL BE AT LEAST NEMA TYPE 2 (DRIPTIGHT).
9. ALL ELECTRICAL CONTROL DEVICES SHALL BE OF A TYPE TESTED AND ACCEPTED BY A NATIONALLY RECOGNIZED TESTING AGENCY.
10. THE DESIGN OF THE CONTROL CIRCUITS SHALL BE SUCH THAT LIMIT AND PRIMARY SAFETY CONTROLS SHALL DIRECTLY OPEN A CIRCUIT THAT FUNCTIONS TO INTERRUPT THE SUPPLY OF FUEL TO COMBUSTION UNITS.
11. AUTOMATIC RESETTING DEVICES, CONTROLS, OR SWITCHES SHALL BE INSTALLED IN ACCORDANCE WITH THE INSTRUCTIONS OF THE COMBUSTION SAFEGUARD CONTROL MANUFACTURER. NO AUTOMATIC RESETTING DEVICE, CONTROL, OR SWITCH SHALL BE INSTALLED IN THE WIRING BETWEEN THE LOAD SIDE (TERMINAL) OF THE PRIMARY OR PROGRAMMING CONTROL AND THE MAIN OR IGNITION FUEL VALVE OR VALVES. THIS DOES NOT PRECLUDE THE INSTALLATION OF MANUALLY OPERATED TEST SWITCHES FOR THE PURPOSES OF TESTING TIGHT CLOSURE OF INDIVIDUAL FUEL FEEDS.

PUMP NOTES:

1. INSTALL PUMPS TO PROVIDE ACCESS FOR PERIODIC MAINTENANCE INCLUDING REMOVING MOTORS, IMPELLERS, COUPLINGS, AND ACCESSORIES.
2. INDEPENDENTLY SUPPORT PUMPS AND PIPING SO WEIGHT OF PIPING IS NOT SUPPORTED BY PUMPS AND WEIGHT OF PUMPS IS NOT SUPPORTED BY PIPING.
3. INSTALL BASE-MOUNTED PUMPS ON CAST-IN-PLACE CONCRETE EQUIPMENT BASES.
4. INSTALL IN-LINE PUMPS WITH CONTINUOUS-THREAD HANGER RODS AND ELASTOMERIC VIBRATION DAMPENING HANGERS.
5. PERFORM PUMP ALIGNMENT SERVICE
   - 5.1. COMPLY WITH REQUIREMENTS IN HYDONICS INSTITUTE STANDARDS FOR ALIGNMENT OF PUMP AND MOTOR SHAFT. ADD SHIMS TO THE MOTOR FEET AND BOLT MOTOR TO BASE FRAME. DO NOT USE GROUT BETWEEN MOTOR FEET AND BASE FRAME.
   - 5.2. COMPLY WITH PUMP AND COUPLING MANUFACTURERS' WRITTEN INSTRUCTIONS.
   - 5.3. AFTER ALIGNMENT IS CORRECT, TIGHTEN FOUNDATION BOLTS EVENLY BUT NOT TOO FIRMLY. COMPLETELY FILL BASEPLATE WITH NONSHRINK, NONMETALLIC GROUT WHILE METAL BLOCKS AND SHIMS OR WEDGES ARE IN PLACE. AFTER GROUT HAS CURED, FULLY TIGHTEN FOUNDATION BOLTS.
6. WHERE INSTALLING PIPING ADJACENT TO PUMP, ALLOW SPACE FOR SERVICE AND MAINTENANCE.
7. CONNECT PIPING TO PUMPS. INSTALL VALVES THAT ARE THE SAME SIZE AS PIPING CONNECTED TO PUMPS, AND REDUCE PIPING TO PUMP CONNECTION SIZE AT THE PUMP. REDUCTIONS SHALL ALL BE ECCENTRIC AND FLAT ON TOP TO AVOID TRAPPING AIR.

greenacorn
GREEN ACORN LLC
OK COA# 8292
www.GreenAcornLLC.com
1350 S. BOULDER AVE, #950
TULSA, OKLAHOMA 74119
918-629-4291

LICENSED PROFESSIONAL ENGINEER
ALLEN MERK
31032
OKLAHOMA
3.6.2025

NO.	ISSUE LOG	DATE & INITIALS
1	ISSUED FOR BID	3.6.25

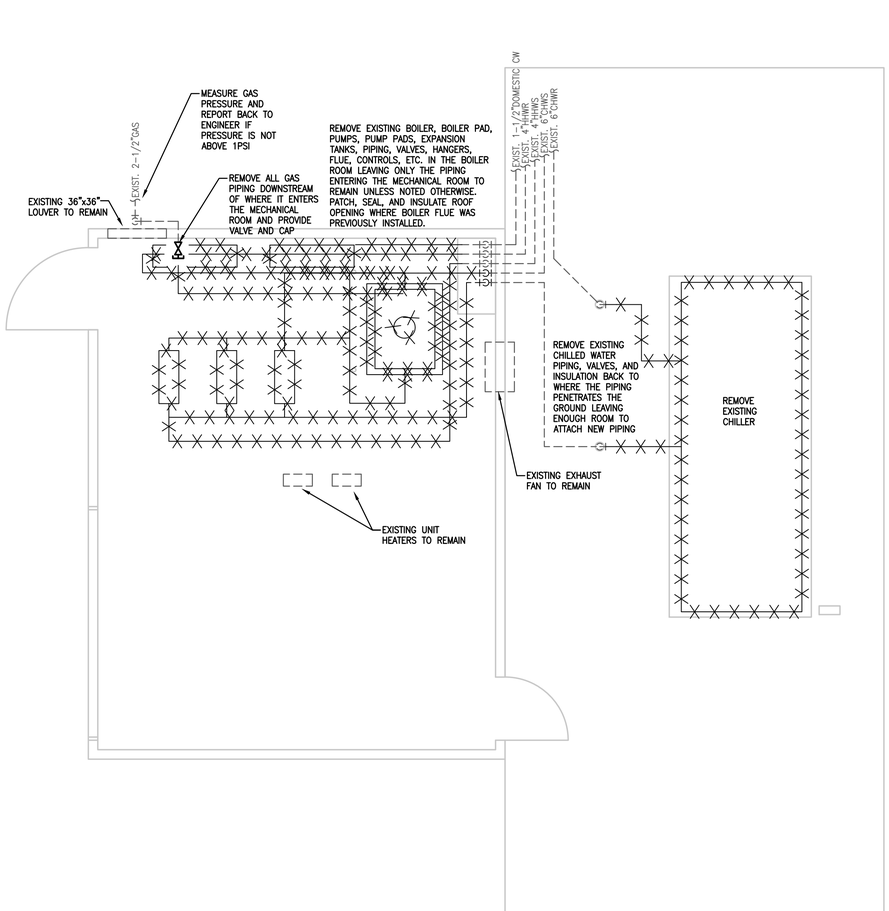
SHA
ROXIE WEBER
BOILER & CHILLER

807 S LOWRY STREET
STILLWATER, OK 74074

MECHANICAL NOTES

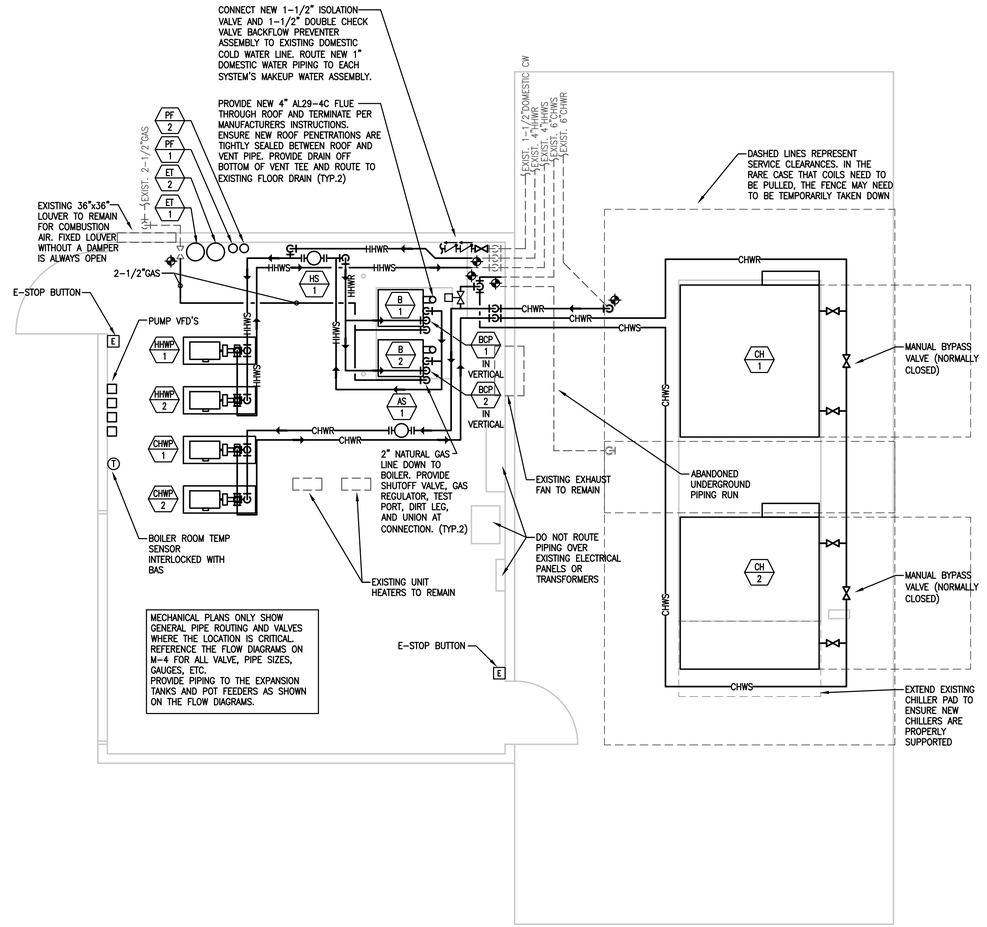
INITIAL DATE: 3-6-2025	JOB NO: 3144
DRAWN BY: AM / CHECKED BY: JS	SHEET: M-0
PRINT DATE:	SHEET NO: 1 OF 9

FILE NAME:



2 - DEMO MECHANICAL PLAN

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



1 - MECHANICAL PLAN

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

0 2' 4' 8'

1/4" = 1'-0"

greenacorn
GREEN ACORN LLC
OK COA# 8292
www.GreenAcornLLC.com
1350 S. BOULDER AVE, #950
TULSA, OKLAHOMA 74119
918-629-4291

LICENSED PROFESSIONAL ENGINEER
ALLEN MERK
31032
OKLAHOMA
3.6.2025

NO.	ISSUE LOG	DATE & INITIALS
1	ISSUED FOR BID -	3.6.25 -

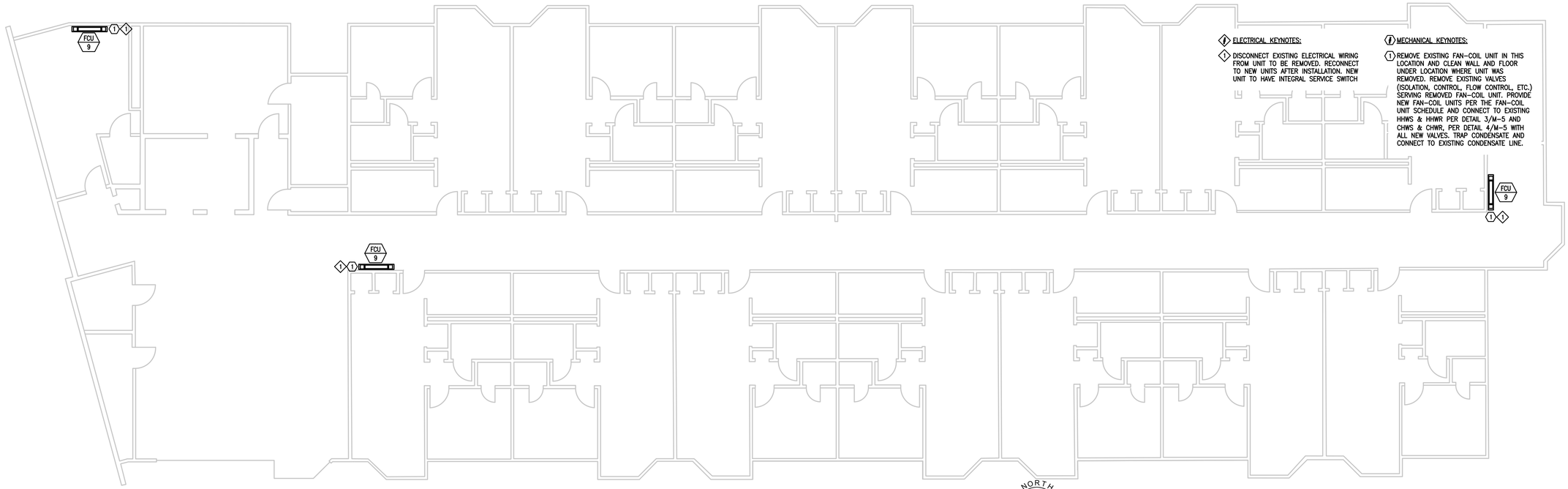
SHA
ROXIE WEBER
BOILER & CHILLER

807 S LOWRY STREET
STILLWATER, OK 74074

MECHANICAL PLANS
BOILER & CHILLER PLANT

INITIAL DATE:	JOB NO:
3-6-2025	3144
DRAWN BY: AM	CHECKED BY: JS
PRINT DATE:	SHEET: M-1
	SHEET NO: 2 OF 9

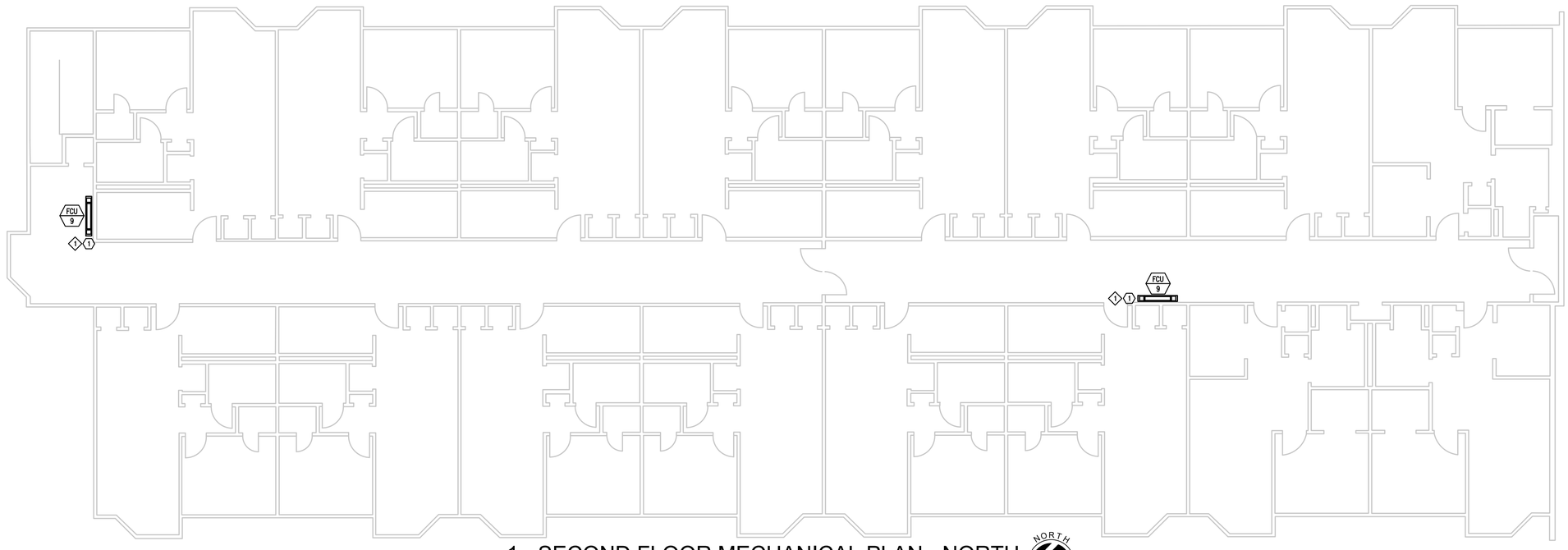
FILE NAME



2 - SECOND FLOOR MECHANICAL PLAN - SOUTH

SCALE : 1/8" = 1'-0"

NORTH



1 - SECOND FLOOR MECHANICAL PLAN - NORTH

SCALE : 1/8" = 1'-0"

NORTH

ELECTRICAL KEYNOTES:

1. DISCONNECT EXISTING ELECTRICAL WIRING FROM UNIT TO BE REMOVED. RECONNECT TO NEW UNITS AFTER INSTALLATION. NEW UNIT TO HAVE INTEGRAL SERVICE SWITCH

MECHANICAL KEYNOTES:

1. REMOVE EXISTING FAN-COIL UNIT IN THIS LOCATION AND CLEAN WALL AND FLOOR UNDER LOCATION WHERE UNIT WAS REMOVED. REMOVE EXISTING VALVES (ISOLATION, CONTROL, FLOW CONTROL, ETC.) SERVING REMOVED FAN-COIL UNIT. PROVIDE NEW FAN-COIL UNITS PER THE FAN-COIL UNIT SCHEDULE AND CONNECT TO EXISTING HHWS & HHWR PER DETAIL 3/M-5 AND CHWS & CHWR, PER DETAIL 4/M-5 WITH ALL NEW VALVES. TRAP CONDENSATE AND CONNECT TO EXISTING CONDENSATE LINE.

greenacorn

GREEN ACORN LLC
OK COA# 8292
www.GreenAcornLLC.com

1350 S. BOULDER AVE, #950
TULSA, OKLAHOMA 74119
918-629-4291

LICENSED PROFESSIONAL ENGINEER
ALLEN MERK
31032
OKLAHOMA

3.6.2025

NO.	ISSUE LOG	DATE & INITIALS
1	ISSUED FOR BID –	3.6.25 –

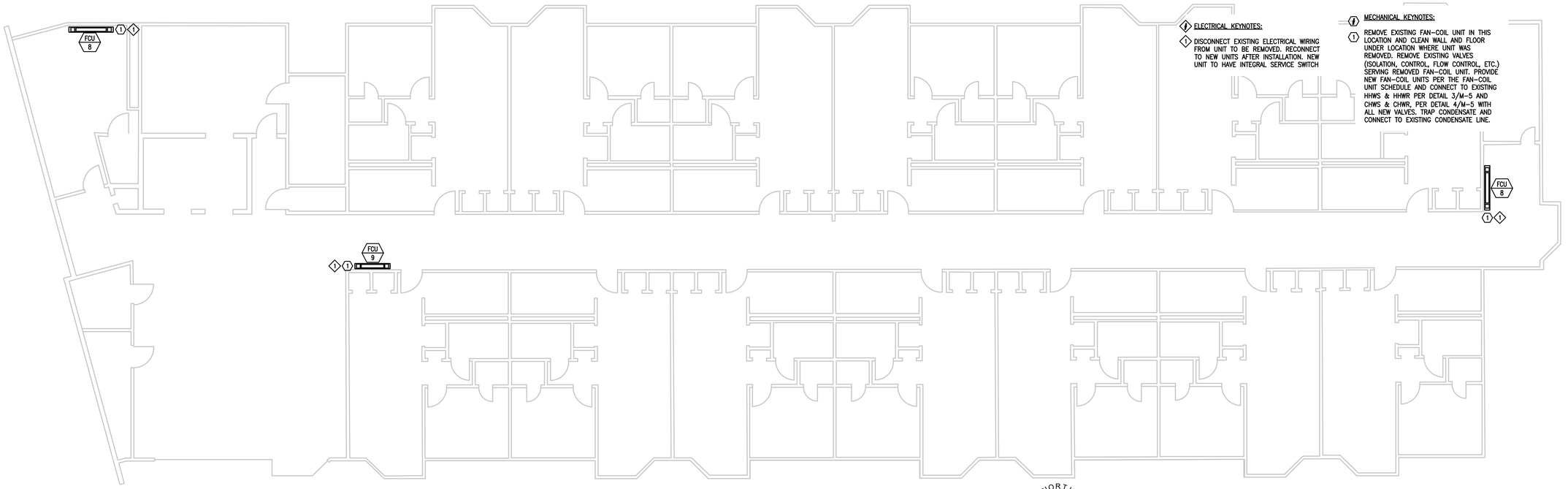
SHA
ROXIE WEBER
BOILER & CHILLER

807 S LOWRY STREET
STILLWATER, OK 74074

MECHANICAL PLANS
SECOND FLOOR

INITIAL DATE:	JOB NO:
3-6-2025	3144
DRAWN BY: AM / CHECKED BY: JS	SHEET: M-2
PRINT DATE:	SHEET NO: 3 OF 9

FILE NAME



ELECTRICAL KEYNOTES:

1. DISCONNECT EXISTING ELECTRICAL WIRING FROM UNIT TO BE REMOVED. RECONNECT TO NEW UNITS AFTER INSTALLATION. NEW UNIT TO HAVE INTEGRAL SERVICE SWITCH

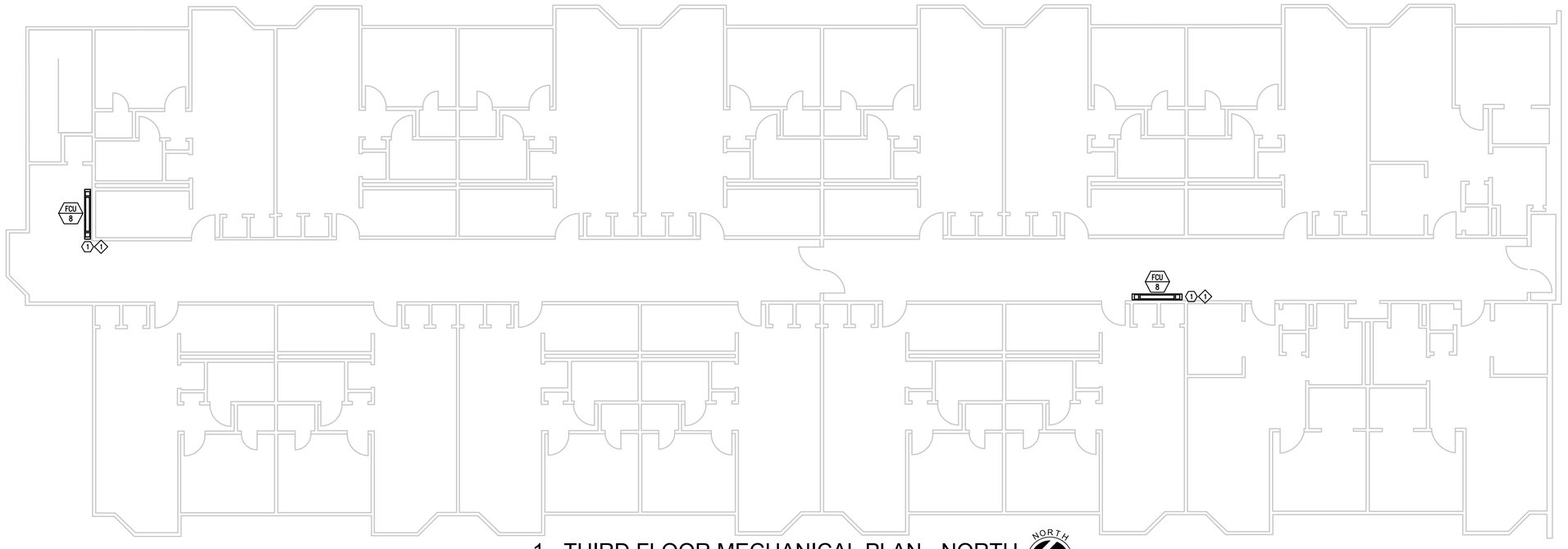
MECHANICAL KEYNOTES:

1. REMOVE EXISTING FAN-COIL UNIT IN THIS LOCATION AND CLEAN WALL AND FLOOR UNDER LOCATION WHERE UNIT WAS REMOVED. REMOVE EXISTING VALVES (ISOLATION, CONTROL, FLOW CONTROL, ETC.) SERVING REMOVED FAN-COIL UNIT. PROVIDE NEW FAN-COIL UNITS PER THE FAN-COIL UNIT SCHEDULE AND CONNECT TO EXISTING HHWS & HHWR PER DETAIL 3/M-5 AND CHWS & CHWR, PER DETAIL 4/M-5 WITH ALL NEW VALVES. TRAP CONDENSATE AND CONNECT TO EXISTING CONDENSATE LINE.

2 - THIRD FLOOR MECHANICAL PLAN - SOUTH

SCALE : 1/8" = 1'-0"

NORTH



1 - THIRD FLOOR MECHANICAL PLAN - NORTH

SCALE : 1/8" = 1'-0"

NORTH

greenacorn
GREEN ACORN LLC
OK COA# 8292
www.GreenAcornLLC.com
1350 S. BOULDER AVE, #950
TULSA, OKLAHOMA 74119
918-629-4291

LICENSED PROFESSIONAL ENGINEER
ALLEN MERK
31032
OKLAHOMA

3.6.2025

NO.	ISSUE LOG	DATE & INITIALS
1	ISSUED FOR BID –	3.6.25 –

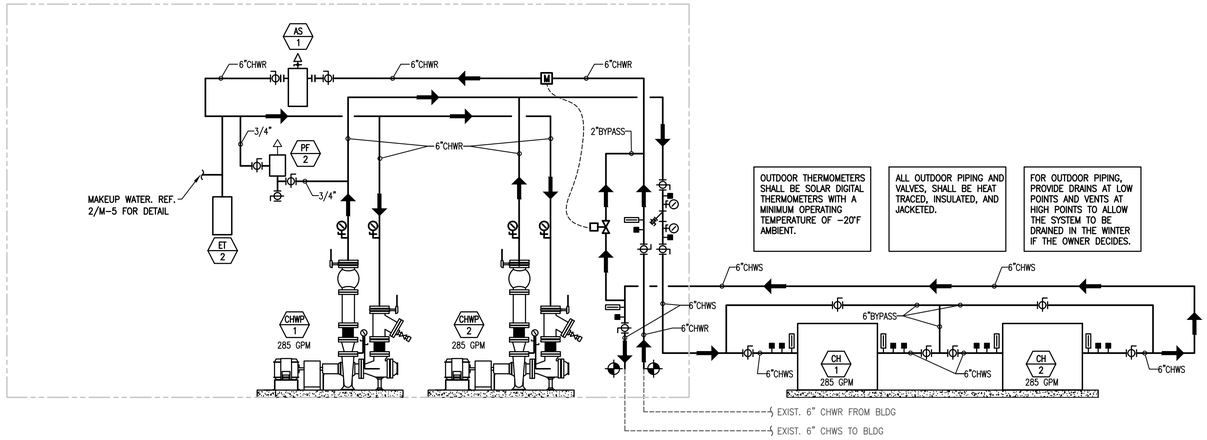
SHA
ROXIE WEBER
BOILER & CHILLER

807 S LOWRY STREET
STILLWATER, OK 74074

MECHANICAL PLANS
THIRD FLOOR

INITIAL DATE:	JOB NO:
3-6-2025	3144
DRAWN BY: AM / CHECKED BY: JS	SHEET: M-3
PRINT DATE:	SHEET NO: 4 OF 9

FILE NAME:

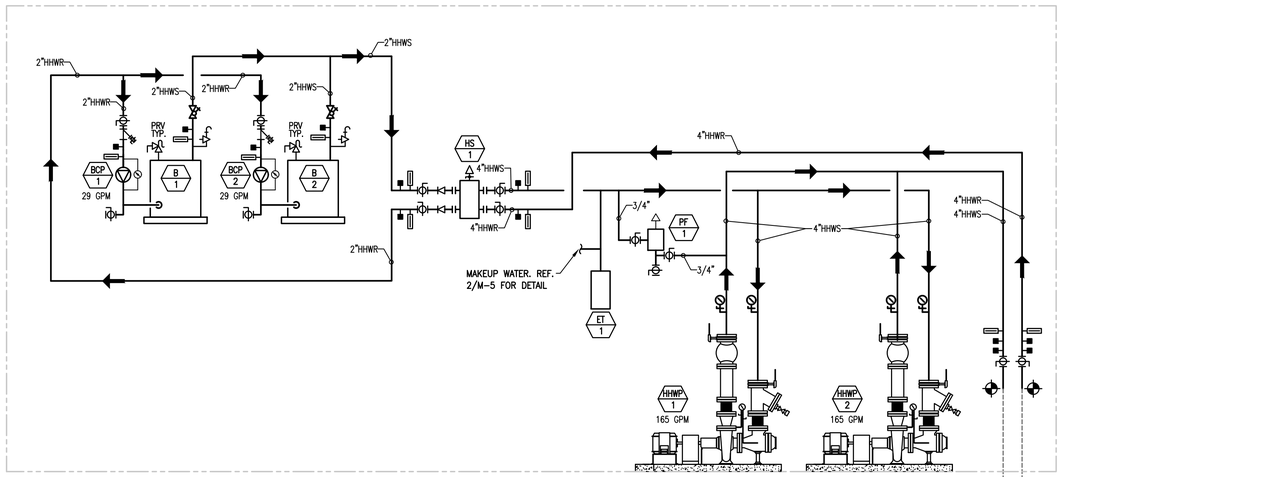


2 - CHILLER PLANT FLOW DIAGRAM

SCALE : NTS

MECHANICAL SYMBOLS

FULL-PORT ISOLATION VALVE: 2-1/2" AND SMALLER = BALL 3" AND LARGER = BUTTERFLY	2-WAY MOTORIZED CONTROL VALVE
Y-STRAINER WITH VALVE & HOSE CONNECTION	PUMP - FLOW IN DIRECTION OF ARROW
THERMOMETER	CONNECT TO EXISTING
CONTROL WELL / TEST PORT	EQUIPMENT TAG
TRIPLE DUTY VALVE - ISLOATION, CHECK, CIRCUIT SETTER	CONTINUATION
REDUCER	FLOW ARROW
PRESSURE GUAGE	NON-SWING CHECK VALVE - FLOW IN DIRECTION OF ARROW
AUTOMATIC AIR VENT	CAP
MANUAL AIR VENT	PRESSURE RELIEF VALVE
MOTORIZED 3-WAY VALVE	FLOW METER



1 - BOILER PLANT FLOW DIAGRAM

SCALE : NTS

greenacorn
GREEN ACORN LLC
OK COA# 8292
www.GreenAcornLLC.com
1350 S. BOULDER AVE, #950
TULSA, OKLAHOMA 74119
918-629-4291

LICENSED PROFESSIONAL ENGINEER
ALLEN MERK
31032
OKLAHOMA
3.6.2025

NO.	ISSUE LOG	DATE & INITIALS
1	ISSUED FOR BID –	3.6.25 –

SHA
ROXIE WEBER
BOILER & CHILLER

807 S LOWRY STREET
STILLWATER, OK 74074

FLOW DIAGRAMS

INITIAL DATE:	JOB NO:
3-6-2025	3144
DRAWN BY: AM / CHECKED BY: JS	SHEET: M-4
PRINT DATE:	SHEET NO: 5 OF 9

FILE NAME

AIR COOLED CHILLER SCHEDULE (CH)

TAG	NOMINAL CAPACITY (TONS)	ACTUAL CAPACITY (TONS)	REFRIG.	MIN CAP.	MIN OPERATING TEMP (°F)	EVAPORATOR DATA						CONDENSER DATA			ELECTRICAL DATA							EER	OPERATING WEIGHT (LBS.)	MANUFACTURER	MODEL	REMARKS
						FLUID	GPM	EWT °F	LWT °F	MAX PD (FT.)	FOULING FACTOR	AMBIENT AIR °F	NO. OF FANS	FAN POWER (KW)	NO. OF COMP.	MCA	MOCP	COMP. POWER (KW)	UNIT POWER (KW)	IPLV (KW/TON)	VOLTS/PH/HZ					
CH-1	67	62	R-32	25%	-20	WATER	285	55	50	17.2	0.0001	105	4	12.9	4	146	150	65	78	17.8	460/3/60	9.5	4400	CARRIER	30RC-0676S01GJ8-8	ALL
CH-2	67	62	R-32	25%	-20	WATER	285	50	45	17.2	0.0001	105	4	12.9	4	146	150	65	78	17.8	460/3/60	9.5	4400	CARRIER	30RC-0676S01GJ8-8	ALL

REMARKS:

1. AIR-COOLED CHILLER WITH SHELL-AND-TUBE HEAT EXCHANGER, VARIABLE SPEED CONDENSER FANS, COLORED CONTROL DISPLAY WITH QUICK RESTART/CAPACITY RECOVERY, BACNET IP & BACNET MS/TP CARD, EVAPORATOR HEATER AND EVAPORATOR INSULATION FOR FREEZE PROTECTION, NON-FUSED DISCONNECT, SINGLE POINT POWER, SECURITY GRILLES AND END HAIL GUARDS ADN LOW SOUND PACKAGE.
2. ALTERNATE MANUFACTURERS WILL BE ACCEPTED IF THEY CAN MEET THE PERFORMANCE AND FEATURES OF THE BASIS OF DESIGN CHILLER (THOSE WITHOUT SHELL-AND-TUBE HEAT EXCHANGER ARE NOT ALLOWED), CAN MEET THE OWNER'S LEAD TIMES FOR CHILLER REPLACEMENTS, AND CAN BE INSTALLED WITHOUT MODIFICATION TO THE PIPING DESIGN.

FAN COIL UNIT SCHEDULE (FCU)

TAG	FAN DATA				HEATING COIL DATA								COOLING COIL DATA									MANUFACTURER	MODEL	REMARKS
	CFM	ESP (IN.)	FLA	VOLTS/PH/HZ	MBH	ROWS	EAT DB °F	LAT DB °F	EWT °F	LWT °F	GPM	MAX PD (FT.)	TOTAL MBH	SENS. MBH	ROWS	EAT DB °F	EAT WB °F	LAT DB °F	LAT WB °F	EWT °F	LWT °F	GPM	MAX PD (FT.)			
FCU-8	686	0.27	3.9	115/1/60	25.9	1	60	94.3	160	130.8	1.8	3.7	21.7	16.3	4	80	67	58.4	57	45	57	3.6	1.9	CARRIER	42VBD10GRAYDCYKV	ALL
FCU-9	416	0.25	2.2	115/1/60	17.6	1	60	98.4	160	147.3	2.8	5.6	13.5	10	4	80	67	58.2	56.7	45	57.7	2.1	3.2	CARRIER	42VBD06GRAYDCYKV	ALL

REMARKS:

1. STAINLESS STEEL DRAIN PAN
2. TAMPER PROOF FASTENERS ON CONTROL DOORS
3. NON-FUSED SERVICE SWITCH
4. CLOSED CELL INSULATION
5. CONDENSATE OVERFLOW SWITCH
6. FRONT RETURN / TOP SUPPLY UNIT ARRANGEMENT
7. FLOOR MOUNTED

PUMP SCHEDULE

TAG	MFR.	MODEL	TYPE	GPM	DISCH. HEAD (FT.W.G.)	NPSH	ELEC. DATA				PIPE CONN.		UNIT WT (LB)	REMARKS
							HP	RPM	VOLT	PH	INLET	OUTLET		
BCP-1	TACO	PB 502-1302	INLINE CIRCULATOR	29	18	3	0.5	1760	120	1	2"	2"	90	1
BCP-2	TACO	PB 502-1302	INLINE CIRCULATOR	29	18	3	0.5	1760	120	1	2"	2"	90	1
CHWP-1	TACO	FI 2506D	BASE-MOUNTED SPLIT-COUPLED	285	105	15	15	3500	460	3	3"	2.5"	500	2,3,4,5
CHWP-2	TACO	FI 2506D	BASE-MOUNTED SPLIT-COUPLED	285	105	15	15	3500	460	3	3"	2.5"	500	2,3,4,5
HHWP-1	TACO	FI 2009D	BASE-MOUNTED SPLIT-COUPLED	165	90	4	7.5	1760	460	3	2.5"	2"	500	2,3,4,5
HHWP-2	TACO	FI 2009D	BASE-MOUNTED SPLIT-COUPLED	165	90	4	7.5	1760	460	3	2.5"	2"	500	2,3,4,5

REMARKS:

1. INSTALL IN VERTICAL BOILER PIPING AND PROVIDE ACCESSORIES SHOWN ON PIPING DIAGRAM.
2. PROVIDE NEW CONCRETE PAD AND SECURE PUMP TO PAD AND GROUTE PUMP BASE INTO PAD
3. PROVIDE ACCESSORIES AND INSTALL PER BASE MOUNTED PUMP DETAIL (1/M3)
4. PROVIDE VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECT AND BACNET CARD.
5. SHAFT GROUNDING RING

BOILER SCHEDULE

Tag	Manufacturer	Model	Heating Data		GPM	EWT	LWT	WPD	Pipe Conn.		Elec.		Vent Conn. Size	Gas Conn. Size	Unit Wt: (lb)	Remarks
			BTUH (in)	BTUH (out)					Inlet	Outlet	V/PH/HZ	MCA				
B-1	LOCHINVAR	PBN0502	500,000	425,000	29	146	160	1"	2.5"	2.5"	120	6.7	4"	1"	505	ALL
B-2	LOCHINVAR	PBN0502	500,000	425,000	29	146	160	1"	2.5"	2.5"	120	6.7	4"	1"	505	ALL

REMARKS:

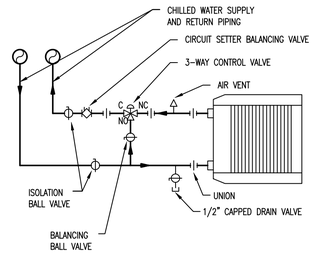
1. PROVIDE 4" CONCRETE HOUSEKEEPING PAD FOR BOILER
2. PROVIDE NEW 4" CAT IV AL29-4C BOILER FLUE. PROVIDE DRIP TEE AND DRAIN AT OUTLET TO CAPTURE CONDENSATE.
3. PROVIDE DIRT LEG AND UNION AT NATURAL GAS CONNECTION.
4. PROVIDE BACNET CARD AND ANY GATEWAYS REQUIRED TO INTEGRATE BOILER INTO CONTROL SYSTEM
5. ASME "H" STAMPED COPPER-FINNED TUBE HEAT EXCHANGER, MODULATING 5:1 TURNDOWN, ASME RELIEF VALVE
6. HIGH AND LOW GAS PRESSURE SWITCHES WITH MANUAL RESET
7. SYSTEM SAFETY AND OPERATING DEVICES AND CONTROLS SHALL BE FULLY CONFIGURED, CALIBRATED, AND FACTORY TESTED.

HYDRONIC SPECIALTIES SCHEDULE

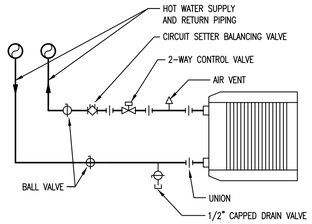
TAG	MFR.	MODEL	DESCRIPTION	GPM	VOL (GAL)	ACCEP. (GAL)	PIPE. CONN.		UNIT WT (LB)	REMARKS
							INLET	OUTLET		
AS-1	TACO	4906AD-125	HI VELOCITY AIR/DIRT SEPARATOR (MAX RATING = 469 GPM)	285	-	-	6"	6"	245	1
ET-1	TACO	CA215-125	FULL ACCEPTANCE EXPANSION TANK	-	57	57	1"	-	290	2
ET-2	TACO	CA215-125	FULL ACCEPTANCE EXPANSION TANK	-	57	57	1"	-	290	2
HS-1	TACO	5904P-42	HYDRAULIC SEPARATOR (MAX RATING = 173 GPM)	165	-	-	4"	4"	265	4
PF-1	WESSELS	CPFTA-5	POT FEEDER	-	5	-	3/4"	3/4"	23	3
PF-2	WESSELS	CPFTA-5	POT FEEDER	-	5	-	3/4"	3/4"	23	3

REMARKS:

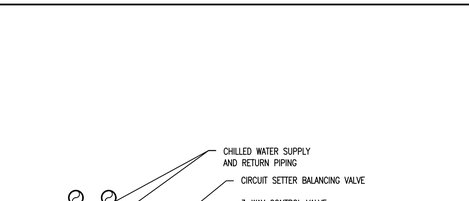
1. ASME RATED, 304 STAINLESS STEEL COALESCENCE PALL RINGS, AIR VENT
2. ASME RATED, PROVIDE 4" CONCRETE HOUSEKEEPING PAD
3. POT FEDER WITH FUNNEL AND STAND
4. ASME RATED, 304 STAINLESS STEEL COALESCENCE PALL RINGS, AIR VENT



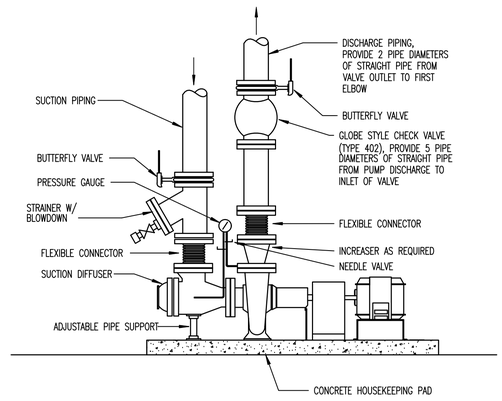
4 - COIL CONNECTION DETAIL (CHW)



3 - COIL CONNECTION DETAIL (HHW)



2 - MAKEUP WATER DETAIL



1 - BASE MOUNTED PUMP W/SUCTION DIFFUSER DETAIL

greenacorn
1350 S. BOULDER AVE, #950
TULSA, OKLAHOMA 74119
918-629-4291
GREEN ACORN LLC
OK COA# 8292
www.GreenAcornLLC.com

LICENSED PROFESSIONAL ENGINEER
ALLEN MERK
31032
OKLAHOMA
3.6.2025

NO.	ISSUE LOG	DATE & INITIALS
1	ISSUED FOR BID –	3.6.25 –

SHA
ROXIE WEBER
BOILER & CHILLER

807 S LOWRY STREET
STILLWATER, OK 74074

MECHANICAL SCHEDULES

INITIAL DATE:	JOB NO:
3-6-2025	3144
DRAWN BY: AM / CHECKED BY: JS	SHEET: M-5
PRINT DATE:	SHEET NO: 6 OF 9

FILE NAME

CONTROLS SYSTEM OVERVIEW:
CONTROLS ARE DESIGN/BUILD WITH DESIGN OF THE CONTROL SYSTEM DELEGATED TO THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETELY FUNCTIONAL CONTROL SYSTEM THAT PERFORMS THE SERVICES BELOW. FURNISH ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR A COMPLETE AND OPERATING BUILDING MANAGEMENT SYSTEM (BAS), UTILIZING DIRECT DIGITAL CONTROLS AS SHOWN ON THE DRAWINGS AND AS DESCRIBED HEREIN. ALL CONTROLLERS FURNISHED IN THIS SECTION SHALL COMMUNICATE ON A PEER-TO-PEER BUS OVER AN OPEN PROTOCOL BUS OR IP NETWORK THAT COMPLIES WITH ANSI/ASHRAE STANDARD 135 NATIVE BACNET DEVICES. CONTRACTOR TO PULL POWER REQUIRED FOR CONTROLS FROM SPARE BREAKERS IN EXISTING ELECTRICAL PANELS.

FRONT END:
PROVIDE THE MOST RECENT VERSION OF TRIDIUM NIAGARA TO SERVE AT THE SUPERVISORY FRONT-END OF THE CONTROL SYSTEM. THE SYSTEM SHALL BE SETUP WITH THE FOLLOWING FEATURES:
- SYSTEM ARCHITECTURE SHALL PROVIDE SECURE WEB ACCESS USING GOOGLE CHROME BROWSER FROM ANY COMPUTER ON THE OWNER'S LAN.
- ANY CONTROL VENDOR THAT SHALL PROVIDE ADDITIONAL BAS SERVER SOFTWARE SHALL BE UNACCEPTABLE. ONLY SYSTEMS THAT UTILIZE THE NIAGARA 4 FRAMEWORK SHALL SATISFY THE REQUIREMENTS OF THIS SECTION.
- THE BAS SERVER SHALL HOST ALL GRAPHIC FILES FOR THE CONTROL SYSTEM.
- CONTROL AND MONITORING OF ALL BACNET COMPATIBLE EQUIPMENT.
  - PERFORMANCE MONITORING. THE SYSTEM SHALL PROVIDE THE SPECIFIED PERFORMANCE MONITORING FUNCTIONALITY, INCLUDING REQUIRED MONITORING POINTS AND PERFORMANCE METRICS, SYSTEM ACCURACY, DATA ACQUISITION AND DATA MANAGEMENT CAPABILITIES, AS WELL AS ALL REQUIRED GRAPHICAL AND DATA DISPLAYS.
- SYSTEM ARCHITECTURE SHALL FULLY SUPPORT A MULTI-VENDOR ENVIRONMENT AND BE ABLE TO INTEGRATE THIRD PARTY SYSTEMS VIA EXISTING VENDOR PROTOCOLS INCLUDING, AS A MINIMUM, LONTALK, BACNET AND MODBUS.
- ALL CONTROL DEVICES FURNISHED WITH THIS SECTION SHALL BE PROGRAMMABLE DIRECTLY FROM THE NIAGARA 4 WORKBENCH EMBEDDED TOOLSET UPON COMPLETION OF THIS PROJECT. THE USE OF CONFIGURABLE OR PROGRAMMABLE CONTROLLERS THAT REQUIRE ADDITIONAL SOFTWARE TOOLS FOR POST-INSTALLATION MAINTENANCE SHALL NOT BE ACCEPTABLE.
- OWNER SHALL OWN THE CONTROL SYSTEM. OWNER SHALL RECEIVE ALL ADMINISTRATOR LEVEL LOGIN AND PASSWORDS FOR ENGINEERING TOOLSET AT FIRST TRAINING SESSION. THE OWNER SHALL HAVE FULL LICENSING AND FULL ACCESS RIGHTS FOR ALL NETWORK MANAGEMENT, OPERATING SYSTEM SERVER, ENGINEERING AND PROGRAMMING SOFTWARE REQUIRED FOR THE ONGOING MAINTENANCE AND OPERATION OF THE BAS.
- OPEN NIC STATEMENTS – ALL NIAGARA 4 SOFTWARE LICENSES SHALL HAVE THE FOLLOWING NICS: "ACCEPT.STATION.IN=*"; "ACCEPT.STATION.OUT=*"AND "ACCEPT.WB.IN=*"AND "ACCEPT.WB.OUT=*". ALL OPEN NIC STATEMENTS SHALL FOLLOW NIAGARA OPEN NIC SPECIFICATIONS.
- GLOBAL SCHEDULING
- ALARM ALERTS VIA TEXT MESSAGE, EMAIL, AND FRONT-END ALARMING
- TRENDING
- MULTIPLE USER LEVELS
  - ADMINISTRATOR
  - OPERATOR
  - VIEWER
- UNIT GRAPHICS FOR EACH PIECE OF MECHANICAL EQUIPMENT SHOWING ALL REQUESTED CONTROL MONITORING POINTS
- COORDINATE INFORMATION TECHNOLOGY REQUIREMENTS SUCH AS IP ADDRESSES, MAC ADDRESSES, AND SUBNET MASKS WITH OWNER

GENERAL ITEMS:
- OWNER CONTROL SYSTEM TRAINING AND OWNER DESIRED SYSTEM REPROGRAMMING SHALL BE PROVIDED AT THE FOLLOWING INTERVALS:
  - BOILER PLANT INSTALLATION
  - CHILLER PLANT INSTALLATION
  - 3 MONTHS AFTER BOILER PLANT INSTALLATION
  - 3 MONTHS AFTER CHILLER PLANT INSTALLATION
- INCLUDE 20 HOURS OF REPROGRAMMING TIME DURING THE FIRST YEAR OF OCCUPANCY TO BE USED AT THE OWNER'S DISCRETION.
- PROVIDE ONE YEAR WARRANTY ON PARTS AND LABOR.
- PROVIDE FIVE YEAR SOFTWARE MAINTENANCE AGREEMENT ON THE FRONT END AND ALL CONTRACTOR PROVIDED CONTROLLERS WITH UPDATES AND CYBER SECURITY PROTECTION INCLUDED.
- PROVIDE CONTROL'S SUBMITTAL FOR REVIEW BY OWNER AND ENGINEER THAT INCLUDE THE FOLLOWING:
  - NETWORK COMMUNICATIONS DIAGRAM
  - FRONT END GRAPHICS
  - SEQUENCE OF OPERATIONS
  - POINTS LIST
  - SETPOINTS
- PROVIDE AS-BUILT CONTROL DRAWINGS
  - NETWORK COMMUNICATIONS DIAGRAM
  - FRONT END GRAPHICS
  - SEQUENCE OF OPERATIONS
  - POINTS LIST
  - SETPOINTS
  - POINT-TO-POINT COMMISSIONING REPORT
  - PERFORMANCE VERIFICATION SHEETS
  - CONTROLLER CHECKOUT/CALIBRATION SHEETS
- ANY CONTROL WIRING THAT WILL NOT BE CONCEALED SHALL BE INSTALLED IN CONDUIT
- COORDINATE CONTROL PANEL LOCATION WITH OWNER

EXISTING MECHANICAL ROOM UNIT HEATERS:
- PROVIDE TEMPERATURE SENSOR IN THE MECHANICAL ROOM AND INTEGRATE INTO THE BAS TO ALARM IF THE MECHANICAL ROOM TEMPERATURE DROPS BELOW 40°F FOR MORE THAN 5 MINUTES (ADJ).
- ADJUST EXISTING UNIT HEATER CONTROLS TO MAINTAIN A SPACE TEMPERATURE OF 55°F IN THE MECHANICAL ROOM.

NEW FAN-COIL UNITS (FCU-8'S AND FCU-9'S):
- PROVIDE STAND-ALONE CONTROLS TO CONTROL THE NEW FAN-COIL UNITS TO MAINTAIN A SPACE TEMPERATURE BETWEEN 70°F-74°F (ADJ)
- PROVIDE WALL MOUNTED THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT.
- PROVIDE NEW CHILLED WATER AND HOT WATER CONTROL VALVES.
- WHEN TEMPERATURE IS OUTSIDE OF SETPOINT, RUN FAN-COIL UNIT FAN CONSTANTLY AND MODULATE EITHER THE HEATING VALVE OR THE COOLING VALVE TO MAINTAIN SETPOINT.

BOILER PLANT CONTROLS:
- THE BOILERS (B-1 & B-2), BOILER CIRCULATOR PUMPS (BCP-1 & BCP-2), HOT WATER PUMPS AND VFD'S (HHWP-1 & HHWP-2) SHALL BE INTEGRATED INTO THE CONTROL SYSTEM.
- PROVIDE ALL SENSORS REQUIRED FOR MONITORING AND CONTROL TO ACHIEVE THE SEQUENCES AND POINTS BELOW.
- BELOW IS A LIST OF PREDETERMINED POINTS:
  - OUTSIDE AIR TEMPERATURE
  - HOT WATER SUPPLY SETPOINT
  - HOT WATER SUPPLY TEMPERATURE (PER BOILER)
  - HOT WATER SUPPLY TEMPERATURE (LEAVING BOILER ARRAY)
  - HOT WATER RETURN TEMPERATURE
  - BOILER ENABLE/DISABLE COMMAND
  - BOILER STATUS
  - BOILER FIRING RATE
  - BOILER CIRCULATOR PUMP COMMAND
  - BOILER CIRCULATOR PUMP STATUS
  - HOT WATER PIPING DIFFERENTIAL PRESSURE
  - HOT WATER PIPING DIFFERENTAIL PRESSURE SETPOINT
  - HOT WATER PUMP SPEED COMMAND (PER PUMP)
  - HOT WATER PUMP SPEED (PER PUMP)
  - HOT WATER PUMP STATUS (PER PUMP)
  - EMERGENCY STOP BUTTON STATUS
- SEQUENCE OF OPERATIONS:
- WHEN OUTDOOR AIR TEMPERATURE IS BELOW 65°FA (ADJ), RUN THE BOILER PLANT.
- MODULATE THE DUTY HHWP TO MAINTAIN THE HOT WATER PIPING DIFFERENTIAL PRESSURE SETPOINT (DETERMINED DURING BALANCING). HHWP'S ARE EACH SIZED TO HANDLE THE FULL SYSTEM FLOW. HHWP'S SHALL OPERATE IN DUTY/STANDBY OPERATION WITH THE DUTY PUMP ROTATING EVERY TUESDAY MORNING AT 8AM. IF THE DUTY PUMP FAILS, AN ALARM SHALL GENERATE AT THE BAS AND AUTOMATICALLY SWITCH TO THE STANDBY PUMP.
- USE INTERNAL LOGIC TO STAGE BOILERS AND BOILER CIRCULATOR PUMPS TO PROVIDE WATER AT THE SUPPLY WATER SETPOINT.
- SUPPLY WATER TEMPERATURE SHALL BE RESET BETWEEN 160°F-180°FA DEPENDING ON OUTSIDE AIR TEMPERATURE WITH 180°F WATER BEING PROVIDED ANYTIME THE OUTDOOR AIR TEMPERATURE IS BELOW FREEZING. LOGIC SHALL BE IN PLACE TO ENSURE THE WATER ENTERING THE BOILER NEVER GETS BELOW 145°F.
- ALARM THE SYSTEM IF ANY OF THE FOLLOWING OCCUR
  - PUMP FAILURE/ALARM
  - VFD FAILURE/ALARM
  - BOILER FAILURE/ALARM
  - IF THE BOILER PLANT IS ENABLED AND THE HHWR TO THE BOILER PRIMARY LOOP IS BELOW 145°F FOR 10 MINUTES (ADJ).
  - IF THE BOILER PLANT IS ENABLED AND THE HHWS IN THE BOILER PRIMARY LOOP IS MORE THAN 5°F BELOW SETPOINT FOR MORE THAN 10 MINUTES (ADJ).

CHILLER PLANT:
- THE CHILLERS (CH-1 & CH-2), CHILLED WATER PUMPS (CHWP-1 & CHWP-2) VFD'S, CHILLED WATER FLOW METER, AND CHILLED WATER BYPASS VALVE SHALL BE INTEGRATED INTO THE CONTROL SYSTEM.
- BELOW IS A LIST OF PREDETERMINED POINTS:
  - STATUS: ON/OFF
  - COMMAND: ON/OFF
  - CHILLED WATER SUPPLY TEMPERATURE (CH-1)
  - CHILLED WATER SUPPLY TEMPERATURE SETPOINT (CH-1)
  - CHILLED WATER SUPPLY TEMPERATURE (CH-2)
  - CHILLED WATER SUPPLY TEMPERATURE SETPOINT (CH-2)
  - CHILLED WATER RETURN TEMPERATURE (CH-1)
  - CHILLED WATER RETURN TEMPERATURE (CH-2)
  - CHILLED WATER SUPPLY TEMPERATURE (TO BUILDING)
  - CHILLED WATER RETURN TEMPERATURE (FROM BUILDING)
  - COMPRESSOR STATUS (PER CHILLER)
  - RUN TIME (PER CHILLER)
  - CHILLED WATER FLOW (FROM FLOW METER INSTALLED BY CONTRACTOR)
  - CHILLED WATER BYPASS VALVE COMMAND
  - CHILLED WATER BYPASS VALVE FEEDBACK/POSITION
  - PRESSURE DIFFERENTIAL ACROSS CHILLED WATER RETURN STRAINER
  - PRESSURE DIFFERENTIAL ACROSS CHILLER (PER CHILLER)
  - CHILLED WATER PIPING DIFFERENTIAL PRESSURE
  - CHILLED WATER PIPING DIFFERENTIAL PRESSURE SETPOINT
  - CHILLED WATER PUMP COMMAND (PER PUMP)
  - CHILLED WATER PUMP SPEED (PER PUMP)
- SEQUENCE OF OPERATIONS:
  - RUN CHILLER PLANT WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 65°F (ADJ).
  - MODULATE THE DUTY CHWP TO MAINTAIN THE HOT WATER PIPING DIFFERENTIAL PRESSURE SETPOINT (DETERMINED DURING BALANCING). CHWP'S ARE EACH SIZED TO HANDLE THE FULL SYSTEM FLOW. CHWP'S SHALL OPERATE IN DUTY/STANDBY OPERATION WITH THE DUTY PUMP ROTATING EVERY TUESDAY MORNING AT 8AM. IF THE DUTY PUMP FAILS, AN ALARM SHALL GENERATE AT THE BAS AND AUTOMATICALLY SWITCH TO THE STANDBY PUMP.
  - CHILLERS ARE PIPED IN SERIES AND EACH CHILLER SHALL USE INTERNAL LOGIC TO MAINTAIN THE CHILLER LEAVING WATER TEMPERATURE SETPOINT. CHILLERS SHALL ONLY BE ENABLED WHEN A CHWP IS RUNNING.
    - CH-1 LWT SETPOINT = 50°F (ADJ)
    - CH-2 LWT SETPOINT = 45°F (ADJ)
  - REVIEW CHILLER DATA TO DETERMINE CHILLER MINIMUM FLOW REQUIREMENTS. BASIS OF DESIGN CHILLER MINIMUM FLOW IS 72 GPM. MONITOR THE TOTAL SYSTEM FLOW THROUGH THE FLOW METER AND MODULATE THE CHILLED WATER BYPASS VALVE TO ENSURE MINIMUM FLOW IS MET AT ALL TIMES WITHOUT HAVING THE CHILLED WATER BYPASS VALVE OPEN WHEN IT IS NOT REQUIRED.

greenacorn
GREEN ACORN LLC
OK COA# 8292
www.GreenAcornLLC.com
1350 S. BOULDER AVE, #950
TULSA, OKLAHOMA 74119
918-629-4291

LICENSED PROFESSIONAL ENGINEER
ALLEN MERK
31032
OKLAHOMA
3.6.2025

NO.	ISSUE LOG	DATE & INITIALS
1	ISSUED FOR BID	3.6.25

SHA
ROXIE WEBER
BOILER & CHILLER

807 S LOWRY STREET
STILLWATER, OK 74074

CONTROL NOTES

INITIAL DATE:	JOB NO:
3-6-2025	3144
DRAWN BY: AM / CHECKED BY: JS	SHEET: M-6
PRINT DATE:	SHEET NO: 7 OF 9

FILE NAME

GENERAL ELECTRICAL NOTES

1. ALL WORK SHALL BE PERFORMED IN STRICT COMPLIANCE WITH LATEST ADOPTED VERSION OF THE NATIONAL ELECTRICAL CODE (NEC) (INCLUDING LOCAL AMENDMENTS), AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES. WHERE CONFLICTS ARISE, THE MOST STRINGENT REQUIREMENT SHALL APPLY.
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE PROJECT SITE PRIOR TO SUBMITTING BID IN ORDER TO VERIFY THE EXTENT OF THE CONSTRUCTION WORK AND THE ACTUAL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED. SUBMITTAL OF BID SHALL BE CONSIDERED PROOF THAT THE CONTRACTOR HAS VISITED THE JOB SITE AND IS FAMILIAR WITH THE SITE SPECIFIC CONSTRUCTION REQUIREMENTS.
3. CONTRACTOR IS RESPONSIBLE FOR PROCURING ALL NECESSARY PERMITS AND LICENSES REQUIRED FOR WORK. PAY ALL LAWFUL FEES, INCLUDING, BUT NOT LIMITED TO UTILITY DEPOSITS, INSPECTION FEES, AND TEMPORARY AND PERMANENT CONSTRUCTION FEES.
4. CONTRACTOR SHALL COORDINATE INSTALLATION OF ELECTRICAL SYSTEMS WITH OTHER TRADES. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EXACT LOCATIONS OF MECHANICAL AND PLUMBING EQUIPMENT. FAILURE TO COORDINATE WITH OTHER TRADES SHALL NOT RESULT IN A CHANGE ORDER.
5. NOTIFY ARCHITECT AND REQUEST ADDITIONAL INFORMATION FOR PROPOSED ALTERNATE OR ALTERNATE EQUIPMENT OTHER THAN LISTED IN CONTRACT DOCUMENTS OR SUBMITTED DURING PRODUCT REVIEW WHICH REQUIRES ADDITIONAL SPACE, SUPPORT, LAYOUT OR ELECTRICAL REQUIREMENT. PROVIDE WORK ONLY AFTER WRITTEN NOTICE TO PROCEED FROM ENGINEER OF RECORD.
6. USE OF METALCLAD CABLE IS ACCEPTABLE FOR LIGHTING WHIPS. OTHER USES ARE SUBJECT TO APPROVAL BY ENGINEER OF RECORD PRIOR TO INSTALLATION.
7. SERVICE EQUIPMENT SHALL BE MARKED WITH THE AVAILABLE FAULT CURRENT ON THE PANEL PER NEC 110.24. COORDINATE WITH LOCAL UTILITY.
8. PROVIDE HANDLE TIES ON ALL MULTIWIRE BRANCH CIRCUITS TO MEET THE REQUIREMENTS OF NEC 210.4(B).
9. PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR (SIZED PER NEC) IN ALL CONDUITS CONTAINING POWER CIRCUITS. CONDUIT SHALL BE SIZED PER NEC BASED ON THWN 600 VOLT COPPER SINGLE CONDUCTORS, PLUS THE EQUIPMENT GROUNDING CONDUCTOR.
10. PROVIDE A COMPLETE TYPED PANELBOARD IDENTIFICATION SCHEDULE AND PANELBOARD NAMEPLATE FOR ALL PANELS.
11. PROVIDE DEVICE LABELS (STICK ON MYLAR TAPE LABEL/ WITH PANEL AND BRANCH CIRCUIT–1/4" HIGH BLACK LETTER) FOR ALL ELECTRICAL DEVICES.
12. BRANCH CIRCUIT CONDUCTORS SHALL BE MINIMUM #12 AWG IN 1/2" C UNLESS NOTED OTHERWISE IN SCHEDULES. WHERE 20A BRANCH CIRCUITS HAVE #8 AND LARGER WIRE SPECIFIED, #10 AWG WIRE MAY BE USED FOR THE FINAL 15–FT OF RUN.
13. CONTRACTOR SHALL SIZE CONDUIT AND DERATE CURRENT CARRYING CONDUCTORS PER NEC 310.15(B)(3)(a) WHERE CIRCUITS ARE GROUPED.
14. ALL FEEDER AND BRANCH CIRCUITS SHALL BE INSTALLED ABOVE GROUND, UNLESS SPECIFICALLY NOTED IN PLANS TO BE BELOW GRADE.
15. PROVIDE ARC FLASH WARNING LABELS ON ALL REQUIRED EQUIPMENT.
16. HOMERUNS ARE SHOWN SEPARATELY TO PRESERVE DRAWING CLARITY. CONTRACTOR IS PERMITTED TO COMBINE HOMERUNS SERVING LIGHTING AND WIRING DEVICES AS ALLOWED BY THE NEC.
17. WIRING DEVICES: DEVICE MOUNTING HEIGHTS ARE FROM FINISHED FLOOR TO CENTER OF OUTLET BOX UNLESS NOTED OTHERWISE ON PLANS. COORDINATE THE STANDARD MOUNTING HEIGHTS WITH MASONRY:
    A. LIGHTING DEVICES +48"
    B. RECEPTACLES +18"
    C. GFI RECEPTACLES +24"
    D. TELEPHONE +48"
    E. TELEPHONE/DATA +18"
    F. DATA +18"
    G. FIRE ALARM PULL STATION +48"
18. PROVIDE SEALS AT RACEWAY PENETRATIONS AS FOLLOWS:
    A. EXTERIOR: REFER TO ARCHITECTURAL DOCUMENTS FOR SEALING REQUIREMENTS AT ALL EXTERIOR MOUNTED DEVICES, FIXTURES, ENCLOSURES, AND RACEWAY PENETRATIONS AND EXACT LOCATIONS.
    B. FIRE RATED WALLS: SEAL PER SPECIFICATIONS FOR FIRE STOPPING.
19. UPON COMPLETION OF ELECTRICAL INSTALLATION AND PRIOR TO ENERGIZING THE CIRCUIT:
    A. INSPECT WIRE AND CABLE FOR PHYSICAL DAMAGE.
    B. PERFORM CONTINUITY TEST.
    C. VERIFY PROPER PHASING CONNECTION TO ALL THREE PHASE MOTOR LOADS.
20. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ACCEPTABLE MANUFACTURERS SHALL BE AS INDICATED FOR EQUIPMENT SCHEDULED UNLESS OTHERWISE NOTED. CONTRACTOR SHALL PROVIDE ALL NECESSARY WIRING AND EQUIPMENT AND MAKE ALL FINAL CONNECTIONS FOR A COMPLETE AND OPERATIONAL SYSTEM.
21. COORDINATE EXACT LOCATION OF ALL DEVICES WITH ARCHITECTURAL ELEVATIONS AND MILLWORK PRIOR TO ROUGH–IN.
22. PROVIDE LIQUID–TIGHT FLEXIBLE METAL CONDUIT AND WIRING FROM DISCONNECT SWITCH OR JUNCTION BOX TO EQUIPMENT KNOCKOUT OR ELECTRICAL CONNECTION POINT FOR ALL OUTDOOR OR OTHER WET–LOCATION EQUIPMENT CONNECTIONS.
23. WHERE PROVIDED EQUIPMENT NAMEPLATE PROTECTIVE DEVICE RATING DIFFERS FROM SIZE SPECIFIED, PROVIDE WIRING AND OVERCURRENT DEVICE WITH APPROPRIATE RATING PER NEC.
24. MINIMIZE VISIBILITY OF SURFACE–MOUNTED CONDUIT. GROUP CONDUITS AND ROUTE HORIZONTALLY TO NEAREST BREAK IN WALL, TURN 90 DEGREES AND ROUTE TO STRUCTURE. GROUP BRANCH CIRCUITS WHEN POSSIBLE TO REDUCE CONDUITS. UTILIZE NEAREST WALL CHASES WHEN POSSIBLE.
25. COORDINATE EXACT LOCATION AND REQUIREMENTS OF ALL APPLIANCES AND OTHER DEVICES WITH OTHER TRADES AND VENDORS PRIOR TO ROUGH–IN. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ELECTRICAL REQUIREMENTS AS REQUIRED BY EQUIPMENT PROVIDER AND/OR EQUIPMENT DRAWINGS. PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
26. COORDINATE EXACT ELECTRICAL REQUIREMENTS OF ALL MECHANICAL AND PLUMBING EQUIPMENT PRIOR TO ROUGH–IN. ADJUST CIRCUITS AS REQUIRED.
27. REFER TO MECHANICAL PLANS FOR CONTROL OF EXHAUST FANS, VRF SYSTEM, BRANCH CONTROLLERS, AHU'S, MAU'S ETC. PROVIDE ALL ELECTRICAL REQUIREMENTS INCLUDING DISCONNECT SWITCH, SPEED CONTROLLER, AND MOTOR STARTER.
28. PROVIDE ELECTRICAL UTILITY WITH THE CONSTRUCTION SCHEDULE WHEN IT BECOMES AVAILABLE.
29. EXTERIOR AND ROOF MOUNTED MAINTENANCE RECEPTACLES SHALL BE GFCI/WR TYPE. RECEPTACLES SHALL BE INSTALL IN METALLIC WP BOX WITH METALLIC IN–USE COVER.
30. REFER TO ARCHITECTURAL ELEVATIONS AND DETAILS FOR EXACT LOCATIONS OF ELECTRICAL ITEMS. THESE SHALL TAKE PRECEDENCE OVER ANY INDICATIONS IN ELECTRICAL CONSTRUCTION DOCUMENTS.
31. ALL PENETRATIONS THROUGH SIDE WALLS OR ROOF ARE TO BE COORDINATED WITH ARCHITECT AND SEALED IN A WAY THAT MAINTAINS MANUFACTURER'S WARRANTY.
32. CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS TO ALL EQUIPMENT IN CONFORMANCE WITH EQUIPMENT MANUFACTURER WIRING DIAGRAMS.
33. CONDUIT FITTINGS SHALL BE COMPRESSION TYPE ONLY. SET–SCREW TYPE ARE NOT ACCEPTABLE.

ABBREVIATIONS

A	Amperes	IDF	Intermediate Distribution Frame
AC	Air Conditioning	IMC	Intermediate Metal Conduit
AIC	Amperes Interrupting Capacity	kV	Kilovolts
ATS	Automatic Transfer Switch	kVA	KiloVolt–Amperes
BAS	Building Automation System	kW	Kilowatts
BPS	Bolted Pressure Switch	LCD	Liquid Crystal Display
C	Conduit	LED	Light Emitting Diode
CB	Circuit Breaker	LV	Low Voltage
CDF	Cable Distribution Frame	MC	Momentary Contact
CKT	Circuit	MDF	Main Distribution Frame
conc	concrete encased	N	Neutral
ded	dedicated	O.C.	On Center
DP	Distribution Panel	P	Pole
EB	Electronic Ballast	PC	Photocell
EMT	Electric Metallic Tubing	PNL	Panel
fc	Footcandles	PVC	Polyvinyl Chloride
FU	Fused	SPD	Surge Protective Device
G	Ground	SW	Switch
GFI	Ground Fault Interrupter	SWBD	Switchboard
GFP	Ground Fault Protection	UPS	Uninterruptible Power Supply
GND	Ground	UTP	Unshielded Twisted Pair
GRC	Galvanized Rigid Conduit	V	Volts
HID	High Intensity Discharge	VA	Volt–Amperes
HVAC	Heating, Ventilation, and Air Conditioning	W	Watts
HWG	Heavy Wall Gauge	w/	with

FIRE ALARM NOTE

IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MODIFICATIONS TO THE EXISTING FIRE ALARM SYSTEM COMPLIANT WITH NFPA 72 RESULTING IN A COMPLETE AND OPERABLE FIRE ALARM SYSTEM AND IS APPROVED BY THE OWNER AND THE AUTHORITIES HAVING JURISDICTION. FIRE ALARM SCOPE IS LIMITED TO MECHANICAL EQUIPMENT MODIFICATIONS DETAILED IN THESE DRAWINGS. FIRE ALARM CONTRACTOR SHALL SUBMIT FIRE DRAWINGS DESIGNED BY NICET LEVEL IV INDIVIDUAL, EQUIPMENT CUT SHEETS, ETC. PER LOCAL CODE AND NFPA 72 TO LOCAL AUTHORITIES HAVING JURISDICTION AND ENGINEER FOR APPROVAL PRIOR TO ORDERING EQUIPMENT. INCLUDE IN BID ALL COSTS FOR PERMITS AND FEES. DEVICES SHALL BE STANDARD PRODUCT OF SINGLE MANUFACTURER, SHALL DISPLAY THE MANUFACTURER'S NAME ON EACH COMPONENT, AND SHALL BE COMPATIBLE WITH EXISTING SYSTEM. COORDINATE WITH OWNER FOR ACCEPTABLE MODELS AND DESIGN REQUIREMENTS.

PROJECT SCOPE NOTES

THE SCOPE OF THIS PROJECT IS TO REPLACE THE BOILER PLANT AND CHILLER PLANT AT STILLWATER HOUSING AUTHORITY ROXY WEBER PLAZA:

DEMO SCOPE:
1. DISCONNECT EXISTING PUMPS AND REMOVE CONDUIT AND WIRE TO SOURCE: (1) HEATING WATER PUMP, (1) CHILLED WATER PUMP, AND (1) STANDBY/ SWING PUMP.
2. DISCONNECT EXISTING BOILER AND REMOVE CONDUIT AND WIRE TO SOURCE.
3. DISCONNECT EXISTING CHILLER AND REMOVE CONDUIT AND WIRE TO SOURCE.

CONSTRUCTION SCOPE:
1. REPLACE EXISTING 300A/3 CHILLER BREAKER WITH NEW 350A/3 CHILLER BREAKER IN PANEL 'HA'.
2. PROVIDE (3) NEW 20A/1 BREAKERS IN AVAILABLE SPACE IN PANEL 'LA'.
3. PROVIDE POWER TO (2) NEW BOILERS AND BOILER CIRCULATOR PUMPS FROM (1) EXISTING AND (3) NEW 20A/1 BREAKERS USING NEW CONDUIT & WIRE.
4. PROVIDE POWER TO (2) NEW CHILLERS FROM NEW BREAKER USING NEW 150A/3 FUSED DISCONNECTS, CONDUIT & WIRE. EXTEND CIRCUIT THROUGH NEW WIRE GUTTER TO DISCONNECT LOCATIONS AND FROM DISCONNECTS TO CHILLERS.
5. PROVIDE POWER TO NEW DUTY/STANDBY CONFIGURED HHWP–1 & HHWP–2 THROUGH NEW VFDs USING EXISTING HHWP BREAKER IN PANEL 'HA' AND NEW CONDUIT & WIRE. EXTEND CIRCUITS THROUGH NEW WIRE GUTTER TO VFD LOCATIONS AND FROM VFDs TO PUMPS.
5. PROVIDE POWER TO NEW DUTY/STANDBY CONFIGURED CHWP–1 & CHWP–2 THROUGH NEW VFDs USING EXISTING CHWP BREAKER IN PANEL 'HA' AND NEW CONDUIT & WIRE. EXTEND CIRCUITS THROUGH NEW WIRE GUTTER TO VFD LOCATIONS AND FROM VFDs TO PUMPS.

greenacorn
GREEN ACORN LLC
OK COA# 8292
www.GreenAcornLLC.com
1350 S. BOULDER AVE, #950
TULSA, OKLAHOMA 74119
918-629-4291

LICENSED PROFESSIONAL ENGINEER
PATRICK TEAGUE
28837
6-Mar-25
OKLAHOMA

NO.	ISSUE LOG	DATE & INITIALS
1	ISSUED FOR BID	3.6.25

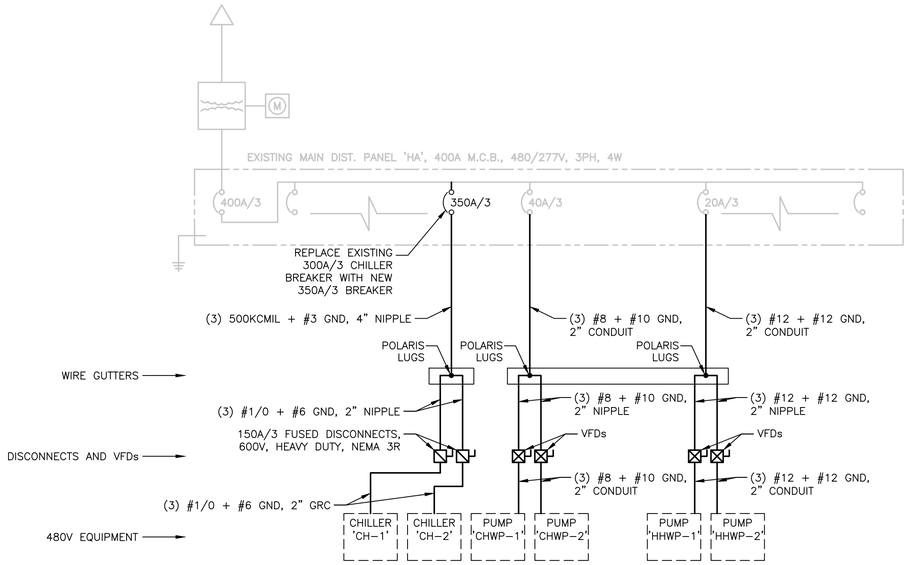
SHA
ROXIE WEBER
BOILER & CHILLER

807 S LOWRY STREET
STILLWATER, OK 74074

ELECTRICAL NOTES, SYMBOLS, AND PARTIAL ONE LINE DIAGRAM

INITIAL DATE: 3-6-2025	JOB NO: 3144
DRAWN BY: PT / CHECKED BY: AM	SHEET: E-0
PRINT DATE:	SHEET NO: 8 OF 9

FILE NAME:

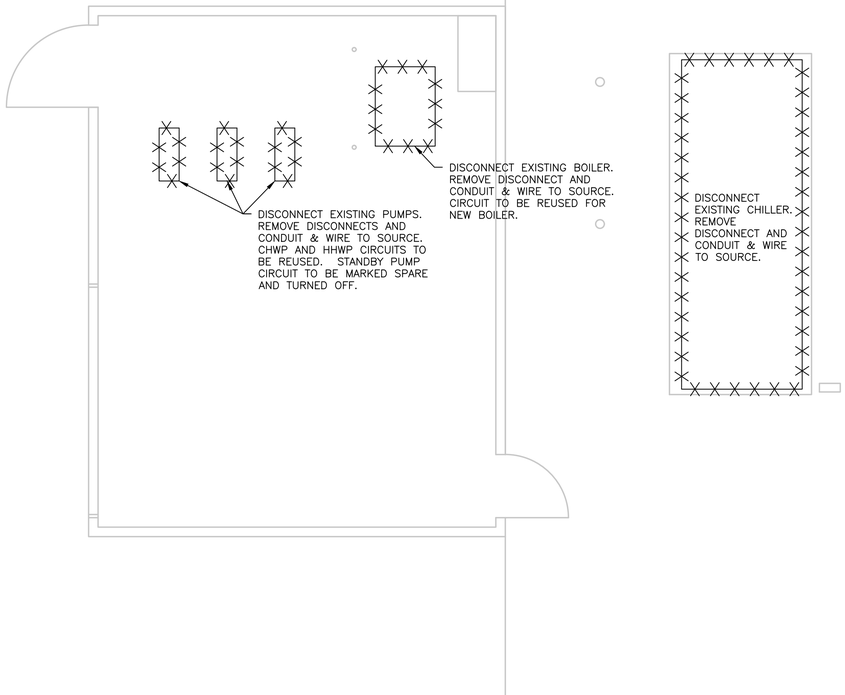


3 - PARTIAL ONE LINE DIAGRAM

SCALE : N.T.S.

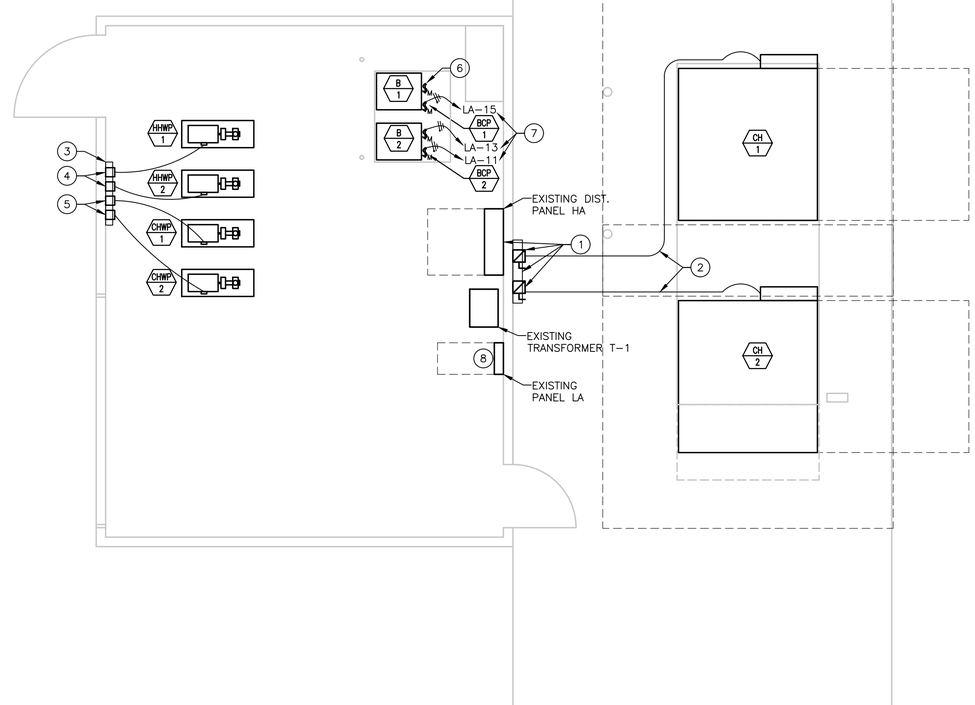
ⓧ ELECTRICAL KEYNOTES

1. REMOVE EXISTING 300A/3 BREAKER PREVIOUSLY SERVING CHILLER FROM PANEL 'HA' AND REPLACE WITH NEW 350A/3 BREAKER TO FEED NEW CHILLERS. PROVIDE NEW FEEDER AND ROUTE THROUGH BACK OF PANEL 'HA' AND INTO WIRE GUTTER. PROVIDE (2) NEW NEMA 3R 150A/3 FUSED DISCONNECT SWITCHES MOUNTED ON BUILDING EXTERIOR ABOVE WIRE GUTTER. TAP NEW FEEDER WITHIN WIRE GUTTER AND PROVIDE NEW CHILLER CONDUCTORS TO FUSED DISCONNECTS. REFER TO PARTIAL ONE LINE DIAGRAM FOR SIZING INFORMATION.
2. PROVIDE NEW CHILLER FEEDERS IN GRC FROM DISCONNECT SWITCHES TO CHILLERS. ROUTE GRC TO WITHIN (2) FEET OF CHILLER POINT OF CONNECTION. FINAL (2) FEET OF CONDUIT RUN SHALL BE LFMC. REFER TO PARTIAL ONE LINE DIAGRAM FOR SIZING INFORMATION.
3. PROVIDE NEW WIRE GUTTER ABOVE VFDs. PUMP CIRCUITS SHALL BE ROUTED FROM PANEL 'HA' THROUGH NEW WIRE GUTTER.
4. USING EXISTING 20A/3 HHWP BREAKER IN PANEL 'HA', PROVIDE POWER TO NEW HHWP-1 & HHWP-2 THROUGH NEW VFDs. ROUTE FROM PANEL 'HA' TO NEW WIRE GUTTER. TAP FEEDER WITHIN WIRE GUTTER AND PROVIDE NEW CONDUCTORS TO BOTH VFDs. ROUTE FROM VFDs TO WITHIN (2) FEET OF PUMP POINT OF CONNECTION. FINAL (2) FEET OF CONDUIT RUN SHALL BE LFMC. REFER TO PARTIAL ONE LINE DIAGRAM FOR SIZING INFORMATION.
5. USING EXISTING 40A/3 CHWP BREAKER IN PANEL 'HA', PROVIDE POWER TO NEW CHWP-1 & CHWP-2 THROUGH NEW VFDs. ROUTE FROM PANEL 'HA' TO NEW WIRE GUTTER. TAP FEEDER WITHIN WIRE GUTTER AND PROVIDE NEW CONDUCTORS TO BOTH VFDs. ROUTE FROM VFDs TO WITHIN (2) FEET OF PUMP POINT OF CONNECTION. FINAL (2) FEET OF CONDUIT RUN SHALL BE LFMC. REFER TO PARTIAL ONE LINE DIAGRAM FOR SIZING INFORMATION.
6. USING EXISTING 20A/1 BREAKER PREVIOUSLY SERVING BOILER FROM PANEL 'LA', PROVIDE POWER TO NEW BOILER B-1 USING (2) #12 + #12 GND WIRE IN 3/4" CONDUIT. PROVIDE 120V MANUAL MOTOR STARTER MOUNTED NEXT TO BOILER AT +56". ROUTE CIRCUIT FROM PANEL THROUGH MANUAL MOTOR STARTER SWITCH TO BOILER. LABEL MOTOR STARTER "BOILER 1".
7. USING EXISTING EMPTY SPACE IN PANEL 'LA', PROVIDE NEW 20A/1 BREAKERS FOR (1) NEW BOILER AND (2) BOILER CIRC PUMPS. PROVIDE POWER FOR EACH PIECE OF EQUIPMENT FROM CIRCUIT INDICATED USING (2) #12 + #12 GND WIRE IN 3/4" CONDUIT. PROVIDE 120V MANUAL MOTOR STARTERS MOUNTED NEXT TO BOILER AT +56". ROUTE CIRCUIT FROM PANEL THROUGH MANUAL MOTOR STARTER SWITCHES TO EQUIPMENT. LABEL MOTOR STARTERS "BOILER CIRC PUMP 1", "BOILER 2", AND "BOILER CIRC PUMP 2", RESPECTIVELY.
8. USING EXISTING EMPTY SPACE IN PANEL 'LA', PROVIDE NEW 20A/1 BREAKERS FOR HEAT TRACE CIRCUITS. PROVIDE POWER TO HEAT TRACE. REFERENCE MECHANICAL PLANS FOR HEAT TRACE LOCATIONS.



1 - ELECTRICAL DEMO PLAN

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



1 - ELECTRICAL PLAN

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

0 2' 4' 8'
1" = 1'-0"

greenacorn
GREEN ACORN LLC
OK COA# 8292
www.GreenAcornLLC.com
1350 S. BOULDER AVE, #950
TULSA, OKLAHOMA 74119
918-629-4291

LICENSED PROFESSIONAL ENGINEER
PATRICK TEAGUE
28837
6-Mar-25
OKLAHOMA

NO.	ISSUE LOG	DATE & INITIALS
1	ISSUED FOR BID	3.6.25

SHA
ROXIE WEBER
BOILER & CHILLER

807 S LOWRY STREET
STILLWATER, OK 74074

ELECTRICAL PLANS

INITIAL DATE:	JOB NO:
3-6-2025	3144
DRAWN BY: PT / CHECKED BY: AM	SHEET: E-1
PRINT DATE:	SHEET NO: 9 OF 9

FILE NAME