

DRAFTING SYMBOLS AND MATERIALS LEGEND



JOLIET
JUNIOR COLLEGE
— 1901 —

**BUILDING 'T' BOILER
REPLACEMENT
JOLIET JUNIOR COLLEGE
1215 HOUBOLT ROAD
JOLIET, IL 60431**


JOLIET JUNIOR COLLEGE
1215 HOUBOLT ROAD
JOLIET, IL 60431

KLUBER ARCHITECTS + ENGINEERS
41 W BENTON STREET
AURORA, ILLINOIS 60506
TEL (630) 406-1213
FAX (630) 406-9472
www.kluberinc.com

BID DOCUMENTS

SEALS & CERTIFICATIONS

ELECTRICAL ENGINEER'S
SEAL



expires 11-30-2025

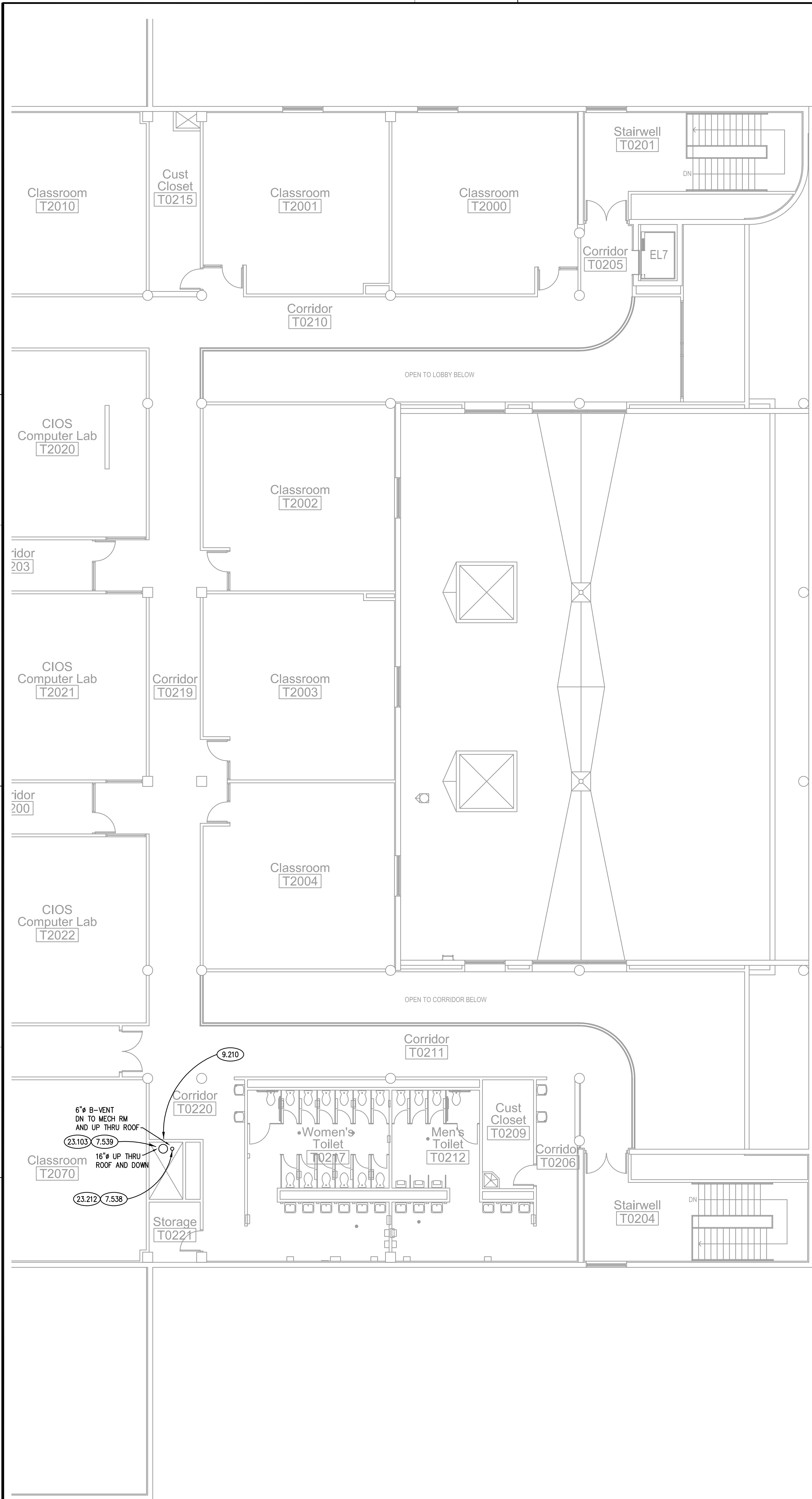
Michael T. Kluber
signature

OCTOBER 31, 2023
date

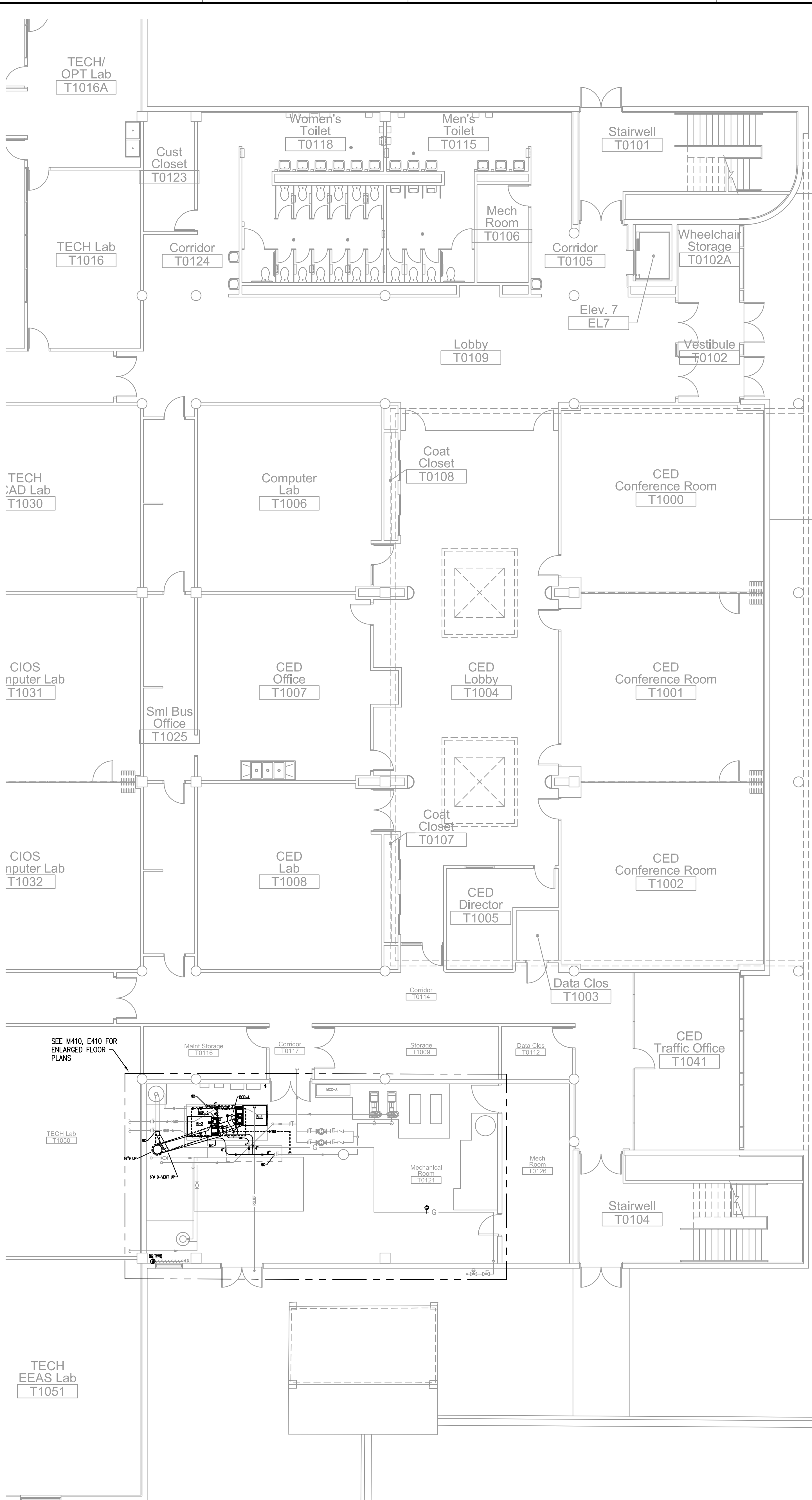
"G" SERIES, "E" SERIES

201508 - JJC - Building T Boiler Replacement\30 Design\Draws\DD-CDU1 Gen\1508GD100.dwg, 10/31/2023 10:21:19 AM, DTDW

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PARTIAL SECOND FLOOR PLAN 2
SCALE: 1/8" = 1'-0"



PARTIAL FIRST FLOOR PLAN 1
SCALE: 1/8" = 1'-0"

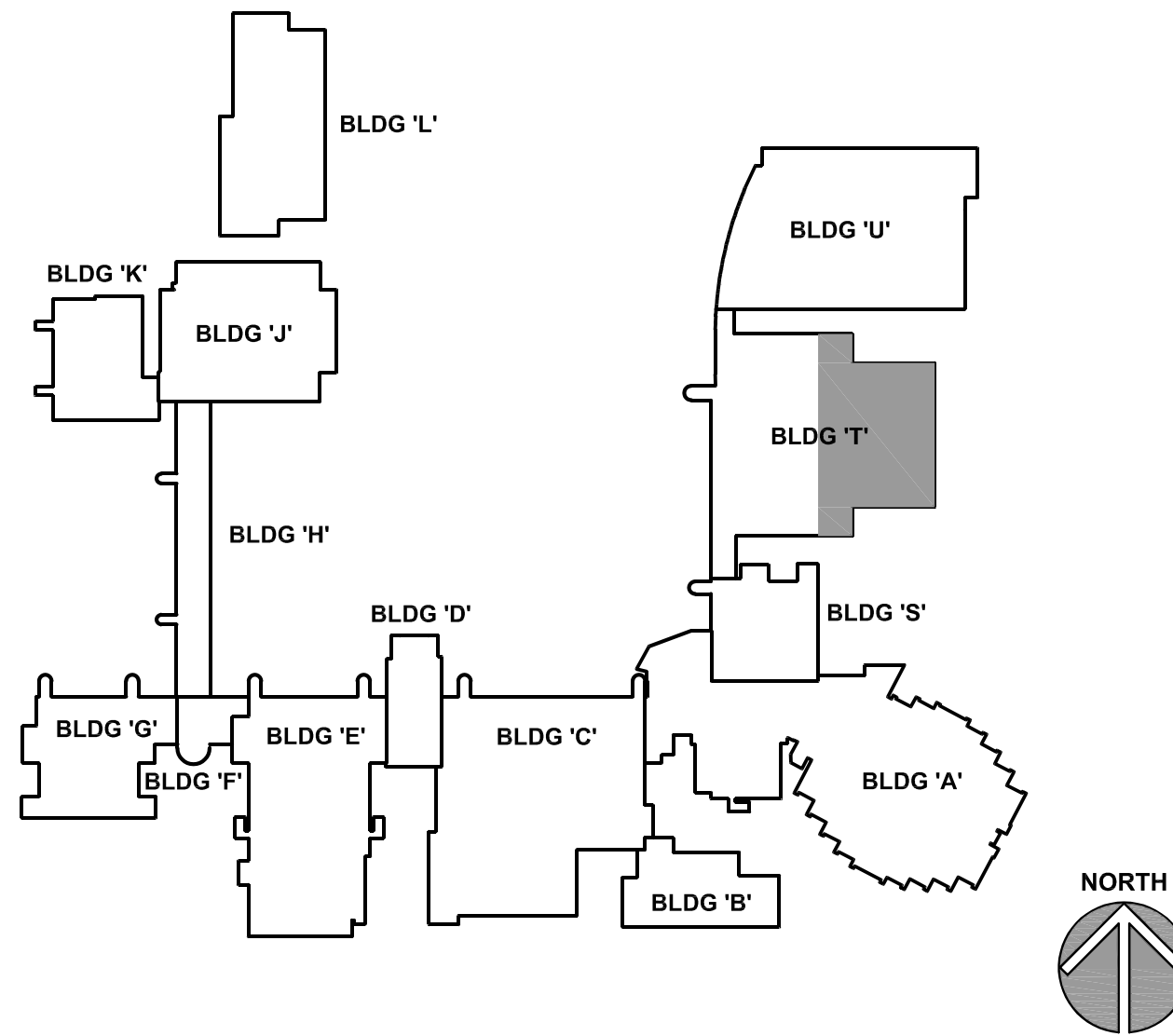
KEYNOTES

- 7.538 ROOFING ASSEMBLY: FLASH WATER HEATER VENT THROUGH EXISTING ROOF SURFACE OUTSIDE EXISTING ROOF CURB FOR BOILER VENT; FLASH IN ACCORDANCE WITH NRCA ROOFING MANUAL: MEMBRANE ROOF SYSTEMS - 2023 CONSTRUCTION DETAIL EPDM-18.
- 7.539 ROOFING ASSEMBLY: MODIFY EXISTING ROOF CURB AND CAP AS REQUIRED TO ACCOMMODATE NEW BOILER VENT; FLASH VENT IN ACCORDANCE WITH NRCA ROOFING MANUAL: MEMBRANE ROOF SYSTEMS - 2023 CONSTRUCTION DETAIL EPDM-17.
- 9.210 CYPRESS BOARD ASSEMBLY: REMOVE WALL OF EXISTING SHAFT AS REQUIRED TO PERMIT INSTALLATION OF NEW BOILER VENT; TAKE NOTE OF EXISTING SHAFT CONSTRUCTION AND FIRE RATINGS; RECONSTRUCT SHAFT WALL MATCHING ORIGINAL CONSTRUCTION AND FIRE RATING; ENSURE RECONSTRUCTION IS SEALED TO CONSTRUCTION OF EXISTING SHAFT; REPAINT ENTIRE WALL SURFACE SURROUNDING RECONSTRUCTED AREA TO MATCH EXISTING.
- 23.103 REMOVE BOILER EXHAUST VENT FROM BOILER UP THROUGH SECOND FLOOR AND ROOF. PROVIDE TEMPORARY CAP ON ROOF OPENING UNTIL NEW BOILERS VENT IS INSTALLED.
- 23.212 PROVIDE WATER HEATER B-VENT FROM MECHANICAL ROOM AND UP THROUGH SECOND FLOOR AND TERMINATE ABOVE ROOF WITH RAIN CAP.

GENERAL NOTES

- REFER TO DRAWING G100 FOR PROJECT GENERAL NOTES.
- EXISTING ROOFING SYSTEM IS WHITE, FULLY-ADHERED SINGLE-PLY EPDM. ORIGINAL INSTALLING CONTRACTOR IS OLSSON ROOFING IN AURORA, IL; 630-892-0449. ROOFING SYSTEM IS CURRENTLY UNDER A 20-YEAR WARRANTY. UTILIZE ORIGINAL INSTALLING CONTRACTOR TO PERFORM ROOFING WORK ASSOCIATED WITH THIS PROJECT.
- ALL PIPING, DUCTWORK AND RACEWAYS ARE SHOWN DIAGRAMMATICALLY AND DO NOT SHOW ALL REQUIRED FITTINGS, OFFSETS, DROPS AND RISES. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL MATERIAL AND LABOR FOR A COMPLETE AND WORKING SYSTEM. COORDINATE WITH OTHER TRADES FOR SPACE AVAILABLE AND RELATIVE LOCATIONS OF EQUIPMENT, PIPING, DUCTWORK, ETC.
- EXISTING PIPING, DUCTWORK AND RACEWAYS INDICATED ON THESE PLANS SHALL BE FIELD VERIFIED FOR EXACT LOCATIONS, QUANTITY AND SIZES.
- SPACE ALLOCATION, COORDINATION WITH ELECTRICAL, ARCHITECTURAL & OTHER MECHANICAL COMPONENTS HAVE BEEN MADE WITH RESPECT TO ALL EQUIPMENT SCHEDULED ON THESE DRAWINGS AND IN THE SPECIFICATIONS OF THE FIRST NAMED MANUFACTURER ONLY. OTHER MANUFACTURERS ARE ACCEPTABLE PROVIDED THEY MEET PERFORMANCE REQUIREMENTS AND AFOREMENTIONED COORDINATION.
- DO NOT CUT THROUGH STRUCTURAL ELEMENTS WHEN INSTALLING OPENINGS REQUIRED FOR ALL DUCTWORK, PIPING, CONDUITS OR OTHER WORK. CONTRACTOR CUTTING THROUGH OR OTHERWISE DAMAGING THESE ELEMENTS WILL BE RESPONSIBLE FOR ALL ASSOCIATED ENGINEERING FEES AND SUBSEQUENT RETRO-FIT/REINFORCING DEEMED NECESSARY TO REINSTATE THE CONTINUITY OF THE DISRUPTED ELEMENTS.
- OBTAIN AND PAY ALL COSTS FOR PERMITS, LICENSES, CERTIFICATE FILING AND ALL INSPECTIONS BY AUTHORITIES HAVING JURISDICTION.

KEY PLAN



NOTE: SCALES DEPICTED ON THIS DRAWING ARE NOT CORRECT UNLESS PLOTTED SHEET SIZE IS 30 X 42 INCHES.

KLUBER

Architects + Engineers

KLUBER, Inc.

Aurora, Illinois 60506

tel. 630.406.1213

Chicago, Illinois 60606

tel. 312.607.1270

www.kluberc.com

BUILDING 'T' BOILER REPLACEMENT

JOLIET JUNIOR COLLEGE

1215 HOUBOLT ROAD

JOLIET, ILLINOIS 60431

ISSUED	10/31/23	BLD DOCUMENTS
JOB NO.	23-292-1508	
DRAWN	KJD	
CHECKED	DDW	
APPROVED	DDW	
SHEET TITLE	MECHANICAL PARTIAL FLOOR PLANS	
SHEET NUMBER	M310	



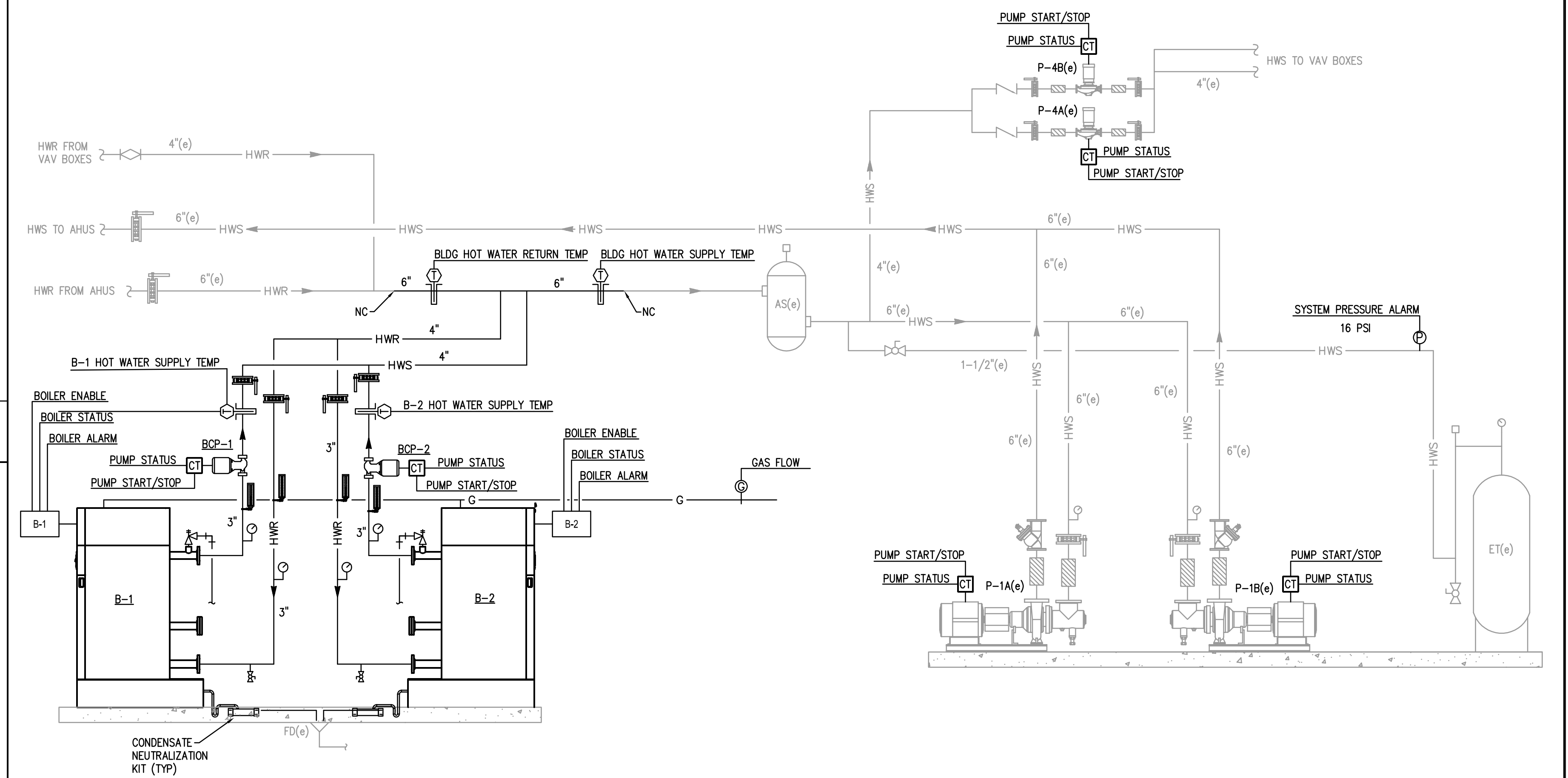
NOTES

1. MODEL BASED ON GRUNDFOS.
2. PERMANENT MAGNET MOTOR, INTEGRAL FREQUENCY CONVERTER FOR SPEED CONTROL AND BUILT-IN DIFFERENTIAL-PRESSURE SENSOR.

MARK	LOCATION	TYPE	FLUID MEDIUM				FUEL		RELIEF VALVE SETTING (PSIG)	MIN. THERMAL EFFICIENCY (AHRH CERT.)	ELECTRICAL (V/PHHZ)	MOC ¹	MODEL	NOTES	
			FLUID	EW ¹ / LW ¹ (°F)	WATER FLOW RATE (GPM)	MAX PRESS DROP (FT)	NATURAL GAS INPUT (MMB)	NATURAL GAS OUTPUT (MMB)							
B-1	T0121	FIRE TUBE	WATER	140 / 180	94	1.0	2000	1880	60	60	95.5	115/1/60	20	CFC-E	1
B-2	T0121	FIRE TUBE	WATER	140 / 180	94	1.0	2000	1880	60	60	95.5	115/1/60	20	CFC-E	1

NOTES
1. MODEL BASED ON CLEAVER BROOKS.

BOILER PIPING AND CONTROL SCHEMATIC



BOILER PLANT	HARDWARE				SOFTWARE			
	AI	AO	DI	DO	SCHED	TREND	ALARM	GRAPHIC
BOILER ENABLE (B-1, B-2)				X	X			
BOILER STATUS (B-1, B-2)							X	X
BOILER ALARM (B-1, B-2)			X				X	X
HOT WATER PUMP START/STOP (P-1A(a), P-1B(a), P-4A(a), P-4B(a))				X	X			
HOT WATER PUMP STATUS (P-1A(a), P-1B(a), P-4A(a), P-4B(a))				X	X			
BOILER CIRCULATION PUMP START/STOP (BCP-1, BCP-2)				X	X			X
BOILER CIRCULATION PUMP STATUS (BCP-1, BCP-2)			X					X
BUILDING SUPPLY WATER TEMPERATURE		X				X	X	
BUILDING RETURN WATER TEMPERATURE						X	X	
BUILDING HOT WATER SETPOINT		X				X	X	
BOILERS HOT WATER SUPPLY TEMPERATURE (B-1, B-2)		X				X	X	
GAS FLOW MEASUREMENT			X			X	X	
OUTSIDE AIR TEMPERATURE			X				X	
SYSTEM PRESSURE			X				X	X
GAS KILL SWITCH STATUS			X				X	X
COMBUSTION AIR DAMPER STATUS (2 TYPICAL)			X				X	X

NOTE: ALL ADDITIONAL POINTS AVAILABLE FROM BOILER CONTROLLERS SHALL BE INTERFACED IN A TABLE FORMAT.

BOILER (B-1, B-2):

THE BOILER CONTROLLER SHALL CONTROL THE OPERATION OF THE TWO BOILERS AND ASSOCIATED BOILER CIRCULATION PUMPS. THE LEAD BOILER SHALL BE ENABLED WHEN THE OUTSIDE AIR TEMPERATURE FALLS BELOW 60 DEGREES F (ADJ.). THE BOILER CONTROL PANEL SHALL EQUALIZE THE RUN TIME OF THE TWO BOILERS AUTOMATICALLY AT SET INTERVALS. EACH BOILER SHALL ENABLE ITS' ASSOCIATED BOILER CIRCULATION PUMP (BCP) WHEN IT IS ENERGIZED.

THE LEAD BOILER CONTROL PANEL SHALL ENERGIZE THE BOILERS IN A ENERGY OPTIMIZATION SEQUENCE. ON A CALL FOR HEAT THE FIRST BOILER SHALL BE ENERGIZED. THE FIRST BOILER SHALL MODULATE ITS FIRING RATE TO MAINTAIN THE HEATING WATER TEMPERATURE SETPOINT. ONCE THE FIRST BOILER REACHES 50% OF ITS FIRING RATE THE SECOND BOILER SHALL BE ENERGIZED. THE BOILER CONTROLLER SHALL CALCULATE THE RATE AT WHICH THE FIRST AND SECOND BOILER SHOULD FIRE TO MEET THE BUILDING LOAD. THE BOILERS SHALL THEN MODULATE THEIR FIRING RATE TOGETHER TO MAINTAIN THE HEATING WATER TEMPERATURE SETPOINT.

AS THE HEATING DEMAND DECREASES, THE BOILERS FIRING RATE SHALL MODULATE DOWN TOGETHER UNTIL THEY REACH A MINIMUM OF 10% OF THE FIRING RATE AT WHICH TIME THE SECOND BOILER SHALL BE DENERGIZED. THE FIRST BOILER FIRING RATE SHALL THEN MODULATE TO MEET THE HEATING LOAD.

THE HEATING WATER TEMPERATURE SHALL BE RESET BASED ON OUTDOOR AIR TEMPERATURE. THE WATER TEMPERATURE SHALL BE 140 DEGREES F WHEN THE OUTDOOR AIR TEMPERATURE IS 0 DEGREES F. THE WATER TEMPERATURE SHALL BE 100 DEGREES F WHEN THE OUTDOOR AIR TEMPERATURE IS 60 DEGREES F. TEMPERATURE RESET CURVES AND SETPOINTS SHALL BE ADJUSTABLE.

AN ALARM SHALL BE GENERATED IF THERE IS A BOILER ALARM, A LOW WATER LEVEL ALARM OR A LOW SYSTEM PRESSURE ALARM (BELOW 10 PSIG ADJ).

THE TOP COMBUSTION AIR DAMPERS SHALL OPEN WHENEVER ONE BOILER IS ENERGIZED, BOTH COMBUSTION AIR DAMPERS SHALL OPEN WHENEVER TWO BOILERS ARE ENERGIZED. OTHERWISE THE DAMPERS SHALL REMAIN CLOSED.

PUMP (P-1A(e), P-1B(e))

UPON A CALL FOR HEAT THE LEAD PUMP SHALL BE ENERGIZED.

THE HEATING WATER PUMPS SHALL OPERATE IN A LEAD/LAG SEQUENCE. IF THE LEAD PUMP FAILS, THE LAG PUMP SHALL BE ENERGIZED. THE PUMPS SHALL BE ALTERNATED AS LEAD AT SET INTERVALS.

AN ALARM SHALL BE GENERATED UPON A PUMP FAULT STATUS.

PUMP (P-4A(e), P-4B(e))

THE LEAD PUMP SHALL BE ENABLED WHEN THE OUTSIDE AIR TEMPERATURE FALLS BELOW 50 DEGREES (ADJ).

THE HEATING WATER PUMPS SHALL OPERATE IN A LEAD/LAG SEQUENCE. IF THE LEAD PUMP FAILS, THE LAG PUMP SHALL BE ENERGIZED. THE PUMPS SHALL BE ALTERNATED AS LEAD AT SET INTERVALS.

AN ALARM SHALL BE GENERATED UPON A PUMP FAULT STATUS.

KEYNOTES

KEYNOTES ARE TYPICALLY NOT DUPLICATED WITHIN A GIVEN DETAIL. AN UN-KEYNOTED ITEM IN A DETAIL IS THE SAME AS A KEYNOTED ITEM HAVING THE SAME APPEARANCE WITHIN THE SAME DETAIL.

- 26.100 DEMOLISH EXISTING ELECTRICAL CONNECTION TO BOILER TO BE REMOVED. DEMOLISH EXISTING WIRING BACK TO SOURCE. CUT EXISTING CONDUIT AT FLOOR AND PATCH.
- 26.101 LABEL EXISTING CIRCUIT BREAKER IN MCC-A AS SPARE.
- 26.200 PROVIDE ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT. REFER TO MECHANICAL EQUIPMENT SCHEDULE THIS SHEET.

PANEL : EM5T (EXISTING)			60 AMPERE MAIN BREAKER		
CKT. NO.	BRKR	DESCRIPTION	PHASE A B C	DESCRIPTION	BRKR CKT. NO.
1	1P20	EM & NT LTS	E	EM & NT LTS	1P20 2
3	1P20	EM & NT LTS	E	EM & NT LTS	1P20 4
5	1P20	EXIT LTS	E	EM & NT LTS	1P20 6
7	1P20	DATA CLOSET T1003	E	EM & NT LTS	1P20 8
9	1P20	EM & KAY LTS	E	EM & NT LTS	1P20 10
11	1P20	EXIT LIGHTS	E	EXIT LTS	1P20 12
13	1P20*	FIRE ALARM PANEL AV	E	RECEPT UNDER PANEL	1P20 14
15	1P20*	FIRE ALARM PANEL	E	SPARE	1P20 16
17	1P20*	FIRE ALARM BELL	E	DATA CLOSET T0112	1P20 18
19	1P20	DATA CLOSET T1012	E	-	- 20
21	1P20	SPARE	E	-	- 22
23	1P20	DATA CLOSET TR0112	E	-	- 24
25	1P20	SPARE	E	-	- 26
27	1P20	SPARE	E	-	- 28
29	1P20	SPARE	E	-	- 30
31	1P20	EM & NT LTS	E	-	- 32
33	1P30	EM & NT LTS	E	-	- 34
35	1P20	EXIT LTS	E	-	- 36
37	3P60	MAIN BREAKER	E	-	- 38
39	/		E	-	- 40
41	/		E	-	- 42
TOTAL PHASE A: 0			NOTES: *DENOTES HANDLELOCK		
TOTAL PHASE B: 0			CIRCUIT BREAKER		
TOTAL PHASE C: 0			MOUNTING: SURFACE VOLTAGE (LL) 120		
DEMAND VA: 0			RATING: 10KAC VOLTAGE (LL) 208		
DEMAND AMPS: 0			ENCLOSURE: NEMA 1 PHASE 3		
			FED FROM: EMS WIRE 4		
			FEEDER SIZE: EXISTING		
			LOCATION: MECH ROOM T0126		
			SQUARE D NO PANELBOARD (CAT # NQ442L2C)		

PANEL : EM5T (REMODELED)			60 AMPERE MAIN BREAKER		
CKT. NO.	BRKR	DESCRIPTION	PHASE A B C	DESCRIPTION	BRKR CKT. NO.
1	1P20	EM & NT LTS	E	EM & NT LTS	1P20 2
3	1P20	EM & NT LTS	E	EM & NT LTS	1P20 4
5	1P20	EXIT LTS	E	EM & NT LTS	1P20 6
7	1P20	DATA CLOSET T1003	E	EM & NT LTS	1P20 8
9	1P20	EM & KAY LTS	E	EM & NT LTS	1P20 10
11	1P20	EXIT LIGHTS	E	EXIT LTS	1P20 12
13	1P20*	FIRE ALARM PANEL AV	E	RECEPT UNDER PANEL	1P20 14
15	1P20*	FIRE ALARM PANEL	E	SPARE	1P20 16
17	1P20*	FIRE ALARM BELL	E	DATA CLOSET T0112	1P20 18
19	1P20	DATA CLOSET T1012	E	-	- 20
21	1P20	SPARE	E	-	- 22
23	1P20	DATA CLOSET TR0112	E	-	- 24
25	1P20	BOILER B-1	E	-	- 26
27	1P20	BOILER B-2	E	-	- 28
29	1P20	BCP-1, BCP-2	E	-	- 30
31	1P20	EM & NT LTS	E	-	- 32
33	1P30	EM & NT LTS	E	-	- 34
35	1P20	EXIT LTS	E	-	- 36
37	3P60	MAIN BREAKER	E	-	- 38
39	/		E	-	- 40
41	/		E	-	- 42
TOTAL PHASE A: 1860			NOTES: *DENOTES HANDLELOCK		
TOTAL PHASE B: 1860			CIRCUIT BREAKER		
TOTAL PHASE C: 1108			MOUNTING: SURFACE VOLTAGE (LL) 120		
DEMAND VA: 4828			RATING: 10KAC VOLTAGE (LL) 208		
DEMAND AMPS: 13.40			ENCLOSURE: NEMA 1 PHASE 3		
			FED FROM: EMS WIRE 4		
			FEEDER SIZE: EXISTING		
			LOCATION: MECH ROOM T0126		
			SQUARE D NO PANELBOARD (CAT # NQ442L2C)		

ELECTRICAL EQUIPMENT CONNECTION SCHEDULE

NO.	DESCRIPTION	FLA	KW	HP	VOL	PH	CRCT NO.	MCCP POLE	DISC. FURN BY	CIRCUIT WIRING	NOTE
B-1	BOILER	15.5	-	-	120	1	EM5T-25	1P, 20A	EC	2#12, #12G, 3/4"C	1
B-2	BOILER	15.5	-	-	120	1	EM5T-27	1P, 20A	EC	2#12, #12G, 3/4"C	1
BCP-1	BOILER CIRCULATION PUMP	-	0.5	-	120	1	EM5T-29	1P, 20A	EC	2#12, #12G, 3/4"C	
BCP-2	BOILER CIRCULATION PUMP	-	0.5	-	120	1	EM5T-29	1P, 20A	EC	2#12, #12G, 3/4"C	

NOTES:
1. PROVIDE 120V DEDICATED CIRCUIT FOR BOILER EQUIPMENT.

ELECTRICAL SCHEDULES

SCALE: N.T.S.

3

ENLARGED FIRST FLOOR ELECTRICAL DEMOLITION PLAN

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

2

ENLARGED FIRST FLOOR ELECTRICAL PLAN

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

1

ISSUED
T010123 BID DOCUMENTS

JOB NO. 23-292-1508
DRAWN ATR
CHECKED MTK
APPROVED MTK

SHEET TITLE

ELECTRICAL
ENLARGED FLOOR
PLANS & SCHEDULES

SHEET NUMBER

E410

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JOLIET, ILLINOIS 60431

Kluber, Inc.

Aurora, Illinois 60506
tel. 630.406.2113Chicago, Illinois 60606
tel. 312.607.2070

www.klubernc.com

Kluber
Architects + Engineers