WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

RICHMOND, INDIANA

CONSTRUCTION DOCUMENTS

DECEMBER 6, 2018

SHEET INDEX

DLZ PROJECT NO. 1663-1191-90

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

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HVAC ABBREVIATIONS

ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
BAS	BUILDING AUTOMATION SYSTEM
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
D OR DIA	DIAMETER
DB	DRY BULB
DEG OR ˚	DEGREES
DN	DOWN
DP	DIFFERENTIAL PRESSURE
˚F	DEGREESE FAHRENHEIT
EF	EXHAUST FAN
ETR	EXISTING TO REMAIN
FT OR '	FEET
GA	GAUGE
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HP	HORSEPOWER
IN OR "	INCH(ES)
L	LENGTH
MBH	1000 BRITISH THERMAL UNITS PER HOUR
MVD	MANUAL VOLUME DAMPER
MAX	MAXIMUM
MIN	MINIMUM
NC	NORMALLY CLOSED
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NO	NUMBER
OA	OUTSIDE AIR
RA	RETURN AIR
RM	ROOM
SA	SUPPLY AIR
SP	SPACE
T	THERMOSTAT OR TEMPERATURE SENSOR
TOT	TOTAL
TYP	TYPICAL
V OR VOLT	VOLTAGE
WB	WET BULB
WC	WATER COLUMN
W	WIDTH
W/	WITH

DUCTWORK SYMBOLS

- CEILING SUPPLY AIR DIFFUSER
- CEILING RETURN AIR GRILLE
- CEILING EXHAUST AIR GRILLE
- CONNECT TO EXISTING
- DEMOLITION TO POINT SHOWN

CONTROL SYMBOLS

- (T) AHU-2 — THERMOSTAT (LABEL INDICATES EQUIPMENT CONTROLLED)
- (C02) AHU-2 — C02 SENSOR (LABEL INDICATES EQUIPMENT CONTROLLED)
- LS — LOOP SUPPLY
- LR — LOOP RETURN

GENERAL NOTES

A. PLANS OF EXISTING CONDITIONS ARE DIAGRAMMATIC. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING FIELD CONDITIONS, DIMENSIONS, AND QUANTITIES OF EXISTING CONSTRUCTION. CONDITIONS FOUND TO BE IN VARIANCE FROM THE INFORMATION IN THE DRAWINGS OR SPECIFICATIONS SHALL BE SUBMITTED TO THE ARCHITECT IN WRITING FOR CLARIFICATION.

B. COORDINATE WITH OWNER LOCATION AND SIZE OF STAGING AREAS FOR MATERIAL/EQUIPMENT STORAGE AND WASTE DISPOSAL.

C. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK IDENTIFIED WITH ALL DRAWINGS AND INFORMATION IN PROJECT MANUAL, AS A COMPLETE PROJECT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE SPECIFIC SCOPES OF WORK FOR ANY SUBCONTRACTORS FOR THIS PROJECT.

D. THE FACILITY SHALL REMAIN FULLY OPERATIONAL AT ALL TIMES THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL SCHEDULE AND SEQUENCE CONSTRUCTION TO MINIMIZE DISRUPTION TO NORMAL OPERATIONS OF THE FACILITY. COORDINATE SPECIFIC REQUIREMENTS WITH THE MAINTENANCE SUPERVISOR.

E. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL MISCELLANEOUS BLOCKING HANGARS, SUPPORTS, AND ANCHORS REQUIRED FOR INSTALLATION OF ALL BUILDING COMPONENTS, INCLUDING BUT NOT LIMITED TO FURNISHINGS, FIXTURES, EQUIPMENT, HARDWARE, AND BRACKETS. CONTRACTOR SHALL COORDINATE SPECIFIC REQUIREMENTS ASSOCIATED WITH EACH TRADE.

F. FOR WORK IN OCCUPIED AREAS, CONTRACTOR SHALL PROVIDE NECESSARY DUST PROTECTION MEASURES TO PROTECT EXISTING FURNITURE, EQUIPMENT, AND PROPERTY.

G. WHERE WORK IS BEING PERFORMED ABOVE EXISTING ACOUSTICAL PANEL CEILING SYSTEMS, CONTRACTOR SHALL TEMPORARILY REMOVE, SALVAGE, AND REINSTALL EXISTING CEILING PANELS AND GRID AS NEEDED TO ACCESS ABOVE-CEILING WORK. ANY CEILING SYSTEMS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED IN KIND.

HVAC GENERAL NOTES

1. ALL WORK SHALL BE IN CONFORMANCE WITH THE INTERNATIONAL MECHANICAL CODE – LATEST EDITION ADOPTED BY INDIANA, THE INDIANA AMENDMENTS, LOCAL/MUNICIPAL CODES, AND THE AUTHORITY HAVING JURISDICTION.

2. THE INFORMATION CONTAINED ON THE MECHANICAL DRAWINGS IS TO BE USED IN CONJUNCTION WITH ALL OTHER DISCIPLINE DRAWINGS, THE SPECIFICATIONS, TRADE PRACTICES, APPLICABLE STANDARDS, CODES, ETC., AND SHALL BE CONSIDERED THE CONTRACT DOCUMENTS WITH ALL THEREIN BY REFERENCE, WHICH THE CONTRACTOR CERTIFIES KNOWLEDGE OF BY SIGNING THE CONTRACT.

3. CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES.

4. CONNECTION TO EQUIPMENT SHALL CONFORM TO MANUFACTURER'S REQUIREMENTS.

5. SPECIFIED EQUIPMENT REFLECTS THE BASIS-OF-DESIGN FOR THIS PROJECT'S DESIGN INTENT. IT REMAINS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM AND COORDINATE THE SPECIFIC PARAMETERS OF IDENTIFIED ITEMS WITH THE OTHER IDENTIFIED COMPONENTS WITHIN THE CONTRACT DOCUMENTS. IT IS THE DESIGN INTENT THAT THE EQUIPMENT SELECTED SHALL BE INSTALLED TO ESTABLISH FULLY OPERATIONAL MECHANICAL SYSTEMS.

6. THE BASIS-OF-DESIGN HAS BEEN IDENTIFIED TO ESTABLISH THE DESIGN INTENT. IF THE CONTRACTOR PROPOSES TO FURNISH AND INSTALL EQUIPMENT WHICH HAS NOT BEEN IDENTIFIED AS THE BASIS-OF-DESIGN AND IS ACCEPTABLE TO THE ARCHITECT/ENGINEER, IT REMAINS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ALL ASPECTS OF THE PROJECT TO CREATE A FULLY OPERATIONAL SYSTEM, INCLUDING WORK ASSOCIATED WITH OTHER TRADES. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR ALL ASSOCIATED COSTS TO MODIFY THE ORIGINAL BASIS-OF-DESIGN SYSTEM, AS IDENTIFIED IN THE CONTRACT DOCUMENTS, INCLUDING ADDITIONAL COSTS ASSOCIATED WITH OTHER TRADES.

7. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID AND VERIFY ALL EXISTING MECHANICAL SYSTEMS TO DETERMINE EXTENT OF REMOVAL WORK. ANY ITEMS NOT SPECIFICALLY INDICATED ON DRAWINGS OR IN SPECIFICATIONS THAT ARE IN CONFLICT WITH CONTRACT WORK SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE PRIOR TO BID FOR CLARIFICATION. BY SUBMITTING A BID, THE CONTRACTOR ACKNOWLEDGES THAT HE/SHE IS AWARE OF THE CONDITIONS.

8. ALL ITEMS DESIGNATED TO BE REMOVED SHALL INCLUDE ALL EQUIPMENT, PIPING, HANGARS, AND POWER & CONTROLS ASSOCIATED WITH ITEM TO BE REMOVED. CAP ASSOCIATED PIPING AND PNEUMATICS. PATCH WALL TO MATCH EXISTING WHERE THROUGH PENETRATIONS AND/OR REMOVALS OCCURRED. CAREFULLY AND SKILLFULLY REMOVE ALL ITEMS IN ORDER TO PREVENT DAMAGE. REPAIR FINISHES TO MATCH EXISTING. THE OWNER HAS SALVAGE RIGHTS TO ALL REMOVALS. COORDINATE WITH THE OWNER SPECIFIC SALVAGE ITEMS PRIOR TO REMOVAL.

9. THE OWNER WILL OCCUPY THE BUILDING DURING CONSTRUCTION. COORDINATE SPECIFIC CONSTRUCTION SEQUENCES WITH THE OWNER AND ALL OTHER TRADES. INCLUDE NECESSARY PROVISIONS FOR ALL MATERIALS AND LABOR REQUIRED TO IMPLEMENT THE CONSTRUCTION SEQUENCES.

10. THESE DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED TO OBTAIN DIMENSIONS. IF THE DIMENSIONS ARE NOT SHOWN AND CANNOT BE DETERMINED/COORDINATED WITH THE INFORMATION GIVEN, CONTRACTOR SHALL CONTACT ENGINEER, IN WRITING, FOR REQUIRED INFORMATION.

11. CUT, FIT, AND PLACE MISCELLANEOUS METAL MECHANICAL SUPPORTS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION TO SUPPORT AND ANCHOR MECHANICAL MATERIALS AND EQUIPMENT.

12. VOLUME DAMPERS SHOWN PER EXISTING DRAWINGS. NOTIFY ARCHITECT/ENGINEER IF DAMPER DOES NOT EXIST FOR BALANCING AT INDICATED LOCATIONS.

CHILLER SCHEDULE

MARK	MANUFACTURER/MODEL NO.	NOM. TON	KW/ TON	CONDENSER DATA						COOLER DATA						COMP. DATA					REMARKS
				FLUID	FOULING FACTOR	EWT	LWT	GPM	WPD	FLUID	FOULING FACTOR	EWT	LWT	GPM	WPD	KW	VOLT	PH.	MCA	MOCP	
CH-1	YORK/YCWL0094SE17XABBXTX	80.51	0.86	30% ETHYLENE GLYCOL	0.00025	86.5	102.5	162.5	6.59	Water	0.00025	58.34	42	118	4.84	69.29	208	3	255	300	1,2,3,4,5

REMARKS:
1. PROVIDE BACNET INTERFACE TO NEW BUILDING MANAGEMENT SYSTEM.
2. MANUFACTURER PROVIDED STARTER / DISCONNECT.
3. PROVIDE ACOUSTIC SOUND BLANKET OPTION.
4. PROVIDE ELASTOMETRIC ISOLATION OPTION.
5. SINGLE POINT POWER CONNECTION.

CLOSED CIRCUIT COOLER SCHEDULE

MARK	MANUFACTURER/MODEL NO.	SERVING	CAP. MBH	GPM	EWT °F	LWT °F	AIR TEMP. °F wb	NO. OF CELLS	HEATER DATA				FAN MOTOR						SPRAY PUMP MOTOR	REMARKS
									QTY	KW (EA.)	VOLT	PH.	QTY.	MAIN HP	PONY HP	RPM	VOLT	PH.		
CT-1	FXV-0812B-30T-N	HEAT PUMP LOOP	2196	416	102.5	86.5	78	1	1	18	208	3	1	25	7.5	1800	208	3	5	1,2,3

REMARKS:
1. PROVIDE FACTORY DISCONNECT AND MOTOR CONTROLLER.
2. 30% ETHYLENE GLYCOL SOLUTION.
3. SOUND PRESSURE RATING FROM ANY SIDE SHALL NOT EXCEED 65 dB WHEN MEASURED AT 50 FEET.
4. INCLUDE UNIT MOUNTED CONTROL ENCLOSURE, VARIABLE FREQUENCY DRIVES, CIRCUIT BREAKER DISCONNECT, VIBRATION SWITCH.
5. INTERFACE CONTROLS NEW BUILDING MANAGEMENT SYSTEM.

PUMP SCHEDULE

MARK	MANUFACTURER/MODEL NO.	SIZE	SUCTION / DISCHARGE (IN)	GPM	HEAD (FT)	FAN MOTOR				SERVICE	REMARKS
						HP	RPM	VOLT	PH.		
P-1	BELL & GOSSETT / SERIES e1510	3AD	4" / 3"	460.5	111	20	3500	208	3	LOOP WATER	1
P-2	BELL & GOSSETT / SERIES e1510	2AD	2.5" / 2"	118	90	7.5	1750	208	3	CHILLED WATER	1
P-3	BELL & GOSSETT / SERIES 1510	2BD	2.5" / 2"	135	75	7.5	1750	208	3	HEATING HOT WATER	1

REMARKS:
1. PROVIDE VFD FOR SOFT START AND BALANCING AND ELECTRICAL DISCONNECT.

WATER SOURCE HEAT PUMP SCHEDULE

MARK	MANUFACTURER/MODEL NO.	BLOWER		COOLING CAP.			HEATING CAP.		WATER SIDE DATA				ELEC. DATA			PIPE CONNECTION		OUTSIDE AIR CFM	REMARKS
		CFM	ESP	TOTAL	SENS.	EER	TOTAL	COP	GPM	WPD	E.W.T.	L.W.T.	MCA	VOLTS	PHASE	LS/LR (IN)	CD (IN)		
HP-1	JCI - RKTH038SL301CBNNZ8D63SSD	1200	.5"	27.7	22.4	19.1	26.6	5.5	6.0	4	85 F	96.9 F	18.5	208	3	1"	1-1/4"	120	1,2,5
HP-2	JCI - RKSH018SL001CBGNZ8D03SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	1"	1-1/4"	60	1,2,4,5
HP-3	JCI - RKTH038SL301CBNNZ8D63SSD	1200	.5"	27.7	22.4	19.1	26.6	5.5	6.0	4	85 F	96.9 F	18.5	208	3	1"	1-1/4"	120	1,2,5
HP-4	JCI - RKTH026SL001CBNNZ8D63SSD	800	.5"	26.4	17.5	16.6	27	4.7	5.0	4.9	85 F	97.7 F	18.6	208	1	1"	1-1/4"	50	1,2,5
HP-5	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	50	2,3,5
HP-6	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	40	2,3,5
HP-7	JCI - RKSH018EL001CANBA8D00SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	1"	1-1/4"	120	1,2,4,5
HP-8	JCI - RKSH018SL001CBGNZ8D03SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	1"	1-1/4"		1,2,4,5
HP-9	JCI - RKSH012SL000CANBA8D00SSD	300	.5"	9.1	6.0	13	10.1	4	1.8	7.2	85 F	97.8 F	5.7	208	1	3/4"	1-1/4"	30	2,3,5
HP-10	JCI - RKTH026SL001CANBA8D00SSD	800	.5"	27.5	17.5	16.6	27	4.7	5.0	4.9	85 F	97.7 F	18.6	208	1	1"	1-1/4"		1,2,5
HP-11	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"		2,3,5
HP-12	JCI - RKSH012SL000CANBA8D00SSD	300	.5"	9.1	6.0	13	10.1	4	1.8	7.2	85 F	97.8 F	5.7	208	1	3/4"	1-1/4"	30	2,3,5
HP-13	JCI - RKTH038SL301CBNNZ8N03SSD	1100	.5"	35.7	24.1	15.3	35	4.4	6.0	4.1	85 F	99.6 F	18.5	208	3	1"	1-1/4"	100	1,2,5
HP-14	JCI - RKTH038SL301CBNNZ8N03SSD	1100	.5"	35.7	24.1	15.3	35	4.4	6.0	4.1	85 F	99.6 F	18.5	208	3	1"	1-1/4"	100	1,2,5
HP-15	JCI - RKTH038SL301CBNNZ8N03SSD	1100	.5"	35.7	24.1	15.3	35	4.4	6.0	4.1	85 F	99.6 F	18.5	208	3	3/4"	1-1/4"	100	1,2,5
HP-16	JCI - RKTH038SL301CBNNZ8D63SSD	1200	.5"	27.7	22.4	19.1	26.6	5.5	6.0	4	85 F	96.9 F	18.5	208	3	1"	1-1/4"	130	1,2,5
HP-17	JCI - RKTH038SL30ACANBA8D00SSD	1100	.5"	35.7	24.1	15.3	35	4.4	6.0	4.1	85 F	99.6 F	18.5	208	3	1"	1-1/4"	100	1,2,5
HP-18	JCI - RKSH015SL001CBGNA8N03SSD	500	.5"	13.7	9.7	14	14.9	4.5	2.7	3.6	85 F	97.6 F	11.8	208	1	1-1/4"	1-1/4"	50	1,2,4,5
HP-19	JCI - RKSH015SL001CBGNA8N03SSD	500	.5"	13.7	9.7	14	14.9	4.5	2.7	3.6	85 F	97.6 F	11.8	208	1	3/4"	1-1/4"	50	1,2,4,5
HP-20	JCI - RKSH015SL001CBGNA8N03SSD	500	.5"	13.7	9.7	14	14.9	4.5	2.7	3.6	85 F	97.6 F	11.8	208	1	3/4"	1-1/4"	50	1,2,4,5
HP-21	JCI - RKTH038SL301CBNNZ8D63SSD	1200	.5"	27.7	22.4	19.1	26.6	5.5	6.0	4	86 F	96.9 F	18.5	208	3	1"	1-1/4"	120	1,2,5
HP-22	JCI - RKSH015SL001CBGNA8N03SSD	500	.5"	13.7	9.7	14	14.9	4.5	2.7	3.6	85 F	97.6 F	11.8	208	1	3/4"	1-1/4"	100	1,2,4,5
HP-23	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	40	2,3,5
HP-24	JCI - RKTH038SL301CBNNZ8N03SSD	1100	.5"	35.7	24.1	15.3	35	4.4	6.0	4.1	85 F	99.6 F	18.5	208	3	1"	1-1/4"	100	1,2,5
HP-25	JCI - RKTH038SL301CBNNZ8D63SSD	1200	.5"	27.7	22.4	19.1	26.6	5.5	6	4	85 F	96.9 F	18.5	208	3	1"	1-1/4"	120	1,2,4,5
HP-26	JCI - RKTH026SL001CBNNZ8D63SSD	800	.5"	26.4	17.5	16.6	27	4.7	5.0	4.9	85 F	97.7 F	18.6	208	1	1"	1-1/4"	150	1,2,5
HP-27	JCI-RKSH042SL001CBGNZ8N03SSD	1400	.5"	40.7	30.8	17.5	39.7	5.1	8	5.2	85 F	97.2 F	24.9	208	1	1"	1-1/4"	140	1,2,4,5
HP-28	JCI-RKTH049SL301CBGNZ8D03SSD	1550	.5	49.1	32.2	16.1	49.8	4.4	9.6	6.3	85 F	97.4 F	21.5	208	3	1-1/4"	1-1/4"	300	1,2,4,5
HP-29	JCI - RKTH038SL301CBNNZ8N03SSD	1100	.5"	35.7	24.1	15.3	35	4.4	6.0	4.1	85 F	99.6 F	18.5	208	3	1"	1-1/4"	75	1,2,5
HP-30	JCI - RKTH038SL301CBNNZ8D63SSD	1200	.5"	27.7	22.4	19.1	26.6	5.5	6	4	86 F	96.9 F	18.5	208	3	1"	1-1/4"	75	1,2,5
HP-31	JCI - RKSH012SL000CANBA8D00SSD	300	.5"	9.1	6	13	10.1	4	1.8	7.2	85 F	97.8 F	5.7	208	1	3/4"	1-1/4"		2,3,5
HP-32	JCI-RKTH072SL301CBNNZ8D03SSD	2300	.5"	67.5	49.7	13.2	77.5	4.3	13.6	9.2	85 F	97.5 F	29	208	3	1"	1-1/4"		1,2,5
HP-33	JCI - RKTH038SL301CBNNZ8N03SSD	1100	.5"	35.7	24.1	15.3	35	4.4	6.0	4.1	85 F	99.6 F	18.5	208	3	1"	1-1/4"		1,2,5
HP-34	JCI - RKSH018SL001CBGNZ8D03SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	1"	1-1/4"	75	1,2,4,5
HP-35	JCI-RKTH049SL301CBGNZ8D03SSD	1550	.5"	49.1	32.2	16.1	49.8	4.4	9.6	6.3	85 F	97.4 F	21.5	208	3	1"	1-1/4"	110	1,2,4,5
HP-36	JCI - RKSH012SL000CANBA8D00SSD	300	.5"	9.1	6	13	10.1	4	1.8	7.2	85 F	97.8 F	5.7	208	1	3/4"	1-1/4"	30	2,3,5
HP-37	JCI-RKSH012SL000CANBA8D00SSD	300	.5"	9.1	6	13	10.1	4	1.8	7.2	85 F	97.8 F	5.7	208	1	3/4"	1-1/4"	25	2,3,5
HP-38	JCI - RKTH038SL301CBNNZ8N03SSD	1100	.5"	35.7	24.1	15.3	35	4.4	6.0	4.1	85 F	99.6 F	18.5	208	3	1"	1-1/4"	100	1,2,5
HP-39	JCI - RKSH015SL001CBGNA8N03SSD	500	.5"	13.7	9.7	14	14.9	4.5	2.7	3.6	85 F	97.6 F	11.8	208	1	3/4"	1-1/4"	125	1,2,4,5
HP-40	JCI - RKTH026SL001CBNNZ8D63SSD	800	.5"	26.4	17.5	16.6	27	4.7	5.0	4.9	85 F	97.7 F	18.6	208	1	1-1/4"	1-1/4"	125	1,2,5
HP-41	JCI - RKSH018SL001CBGNZ8D03SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	1-1/4"	1-1/4"	60	1,2,4,5
HP-42	JCI - RKTH064SL301CBNNZ8D03SSD	2000	.5"	62.8	44.8	14.4	67.8	4.7	12	8.8	85 F	98 F	27.6	208	3	1-1/4"	1-1/4"	200	1,2,5
HP-43	JCI - RKSH018SL001CBGNZ8D03SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	1"	1-1/4"	60	1,2,4,5
HP-44	JCI - RKTH038SL301CBNNZ8N03SSD	1100	.5"	35.7	24.1	15.3	35	4.4	6.0	4.1	85 F	99.6 F	18.5	208	3	1"	1-1/4"		1,2,5
HP-45	JCI - RKSH015SL001CBGNA8N03SSD	500	.5"	13.7	9.7	14	14.9	4.5	2.7	3.6	85 F	97.6 F	11.8	208	1	3/4"	1-1/4"	50	1,2,4,5
HP-46	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	40	2,3,5
HP-47	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	40	2,3,5
HP-48	JCI - RKTH038SL301CBNNZ8D63SSD	1200	.5"	27.7	22.4	19.1	26.6	5.5	6	4	86 F	96.9 F	18.5	208	3	1"	1-1/4"	100	1,2,5
HP-49	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	40	2,3,5
HP-50	JCI-RKTH049SL301CBGNZ8D03SSD	1550	.5"	49.1	32.2	16.1	49.8	4.4	9.6	6.3	85 F	97.4 F	21.5	208	3	1"	1-1/4"	160	1,2,4,5
HP-51	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	40	2,3,5
HP-52	JCI - RKSH018SL001CBGNZ8D03SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	1"	1-1/4"	60	1,2,4,5
HP-53	JCI - RKSH018EL001CANBA8D00SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	1"	1-1/4"		1,2,4,5
HP-54	JCI - RKTH064SL301CBNNZ8D03SSD	2000	.5"	62.8	44.8	14.4	67.8	4.7	12	8.8	85 F	98 F	27.6	208	3	1"	1-1/4"		1,2,5
HP-55	JCI-RKTH049SL301CBGNZ8D03SSD	1550	.5"	49.1	32.2	16.1	49.8	4.4	9.6	6.3	85 F	97.4 F	21.5	208	3	1"	1-1/4"	260	1,2,4,5
HP-56	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	40	2,3,5
HP-57	JCI - RKSH018EL001CANBA8D00SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	1-1/4"	1-1/4"	80	1,2,4,5
HP-58	JCI - RKSH012SL000CANBA8D00SSD	300	.5"	9.1	6	13	10.1	4	1.8	7.2	85 F	97.8 F	5.7	208	1	3/4"	1-1/4"		2,3,5
HP-59	JCI - RKTH026SL001CBNNZ8D63SSD	800	.5"	26.4	17.5	16.6	27	4.7	5.0	4.9	85 F	97.7 F	18.6	208	1	1"	1-1/4"	80	1,2,5
HP-60	JCI - RKSH018SL001CBGNZ8D03SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	1"	1-1/4"	60	1,2,4,5
HP-61	JCI - RKSH018EL001CANBA8D00SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	96 F	14.5	208	1	1"	1-1/4"		1,2,4,5
HP-62	JCI - RKTH026SL001CBNNZ8D63SSD	800	.5"	26.4	17.5	16.6	27	4.7	5.0	4.9	85 F	97.7 F	18.6	208	1	1"	1-1/4"	60	1,2,5
HP-63	JCI - RKSH018EL001CANBA8D00SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	3/4"	1-1/4"	60	1,2,4,5
HP-64	JCI - RKTH026SL001CBNNZ8D63SSD	800	.5"	26.4	17.5	16.6	27	4.7	5.0	4.9	85 F	97.7 F	18.6	208	1	1"	1-1/4"	80	1,2,5
HP-65	JCI - RKTH026SL001CBNNZ8D63SSD	800	.5"	26.4	17.5	16.6	27	4.7	5.0	4.9	85 F	97.7 F	18.6	208	1	1"	1-1/4"	80	1,2,4,5
HP-66	JCI - RKTH026SL001CBNNZ8D63SSD	800	.5"	26.4	17.5	16.6	27	4.7	5.0	4.9	85 F	97.7 F	18.6	208	1	1"	1-1/4"	80	1,2,5
HP-67	JCI -RKSH018SL001CBGNZ8D03SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	1"	1-1/4"	60	1,2,4,5
HP-68	JCI - RKTH026SL001CBNNZ8D63SSD	800	.5"	26.4	17.5	16.6	27	4.7	5.0	4.9	85 F	97.7 F	18.6	208	1	1"	1-1/4"	80	1,2,5
HP-69	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	40	2,3,5
HP-70	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	40	2,3,5
HP-71	JCI - RKTH038SL301CBNNZ8N03SSD	1100	.5"	35.7	24.1	15.3	35	4.4	6.0	4.1	85 F	99.6 F	18.5	208	3	3/4" & 1"	1-1/4"	100	1,2,5
HP-72	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	40	2,3,5
HP-73	JCI - RKSH012SL000CBNNA8D03SSD	400	.21"	13.1	8.9	15.1	12.2	4.3	2.6	2.9	85 F	97.4 F	6.7	208	1	3/4"	1-1/4"	100	2,3,5
HP-74	JCI - RKTH038SL301CBNNZ8N03SSD	1100	.5"	35.7	24.1	15.3	35	4.4	6.0	4.1	85 F	99.6 F	18.5	208	3	1"	1-1/4"	100	1,2,5
HP-75	JCI - RKSH015SL001CBGNA8N03SSD	500	.5"	13.7	9.7	14	14.9	4.5	2.7	3.6	85 F	97.6 F	11.8	208	1	3/4"	1-1/4"	50	1,2,4,5
HP-76	JCI - RKSH015SL001CBGNA8N03SSD	500	.5"	13.7	9.7	14	14.9	4.5	2.7	3.6	85 F	97.6 F	11.8	208	1	3/4"	1-1/4"	50	1,2,4,5
HP-77	JCI - RKSH018EL001CANBA8D00SSD	630	.5"	16.5	11.3	14.9	19.4	4.2	3.8	7	85 F	95.7 F	14.5	208	1	3/4"	1-1/4"		1,2,4,5
HP-119	JCI - RKSH015SL001CBGNA8N03SSD	500	.5"	13.7	9.7	14	14.9	4.5	2.7	3.6	85 F	97.6 F	11.8	208	1	3/4"	1-1/4"	30	1,2,4,5

REMARKS:
1. VARIABLE SPEED ECM BLOWER.
2. PROVIDE SOUND ATTENUATION KIT, FILTER RACK WITH MERV 4 FILTER, AND INTERNAL SAFETY CONTROLS TO BE INTERFACED WITH DDC CONTROL SYSTEM..
3. PSC MOTOR.
4. PROVIDE HOT GAS BYPASS CONTROL.
5. CONTROLS TO BE PROVIDED PER 2/M701 BY DDC CONTROLS MANUFACTURER.

DLZ
DLZ INDIANA, LLC

JOSHUA R. APLING
REGISTERED
PE 10910274
STATE OF INDIANA
PROFESSIONAL ENGINEER

REVISION
NO.

DRAWN: SB/DWB CHK'D: JRA
DESIGNED: JRA APPRV'D: JRA
DATE: DECEMBER 6, 2018

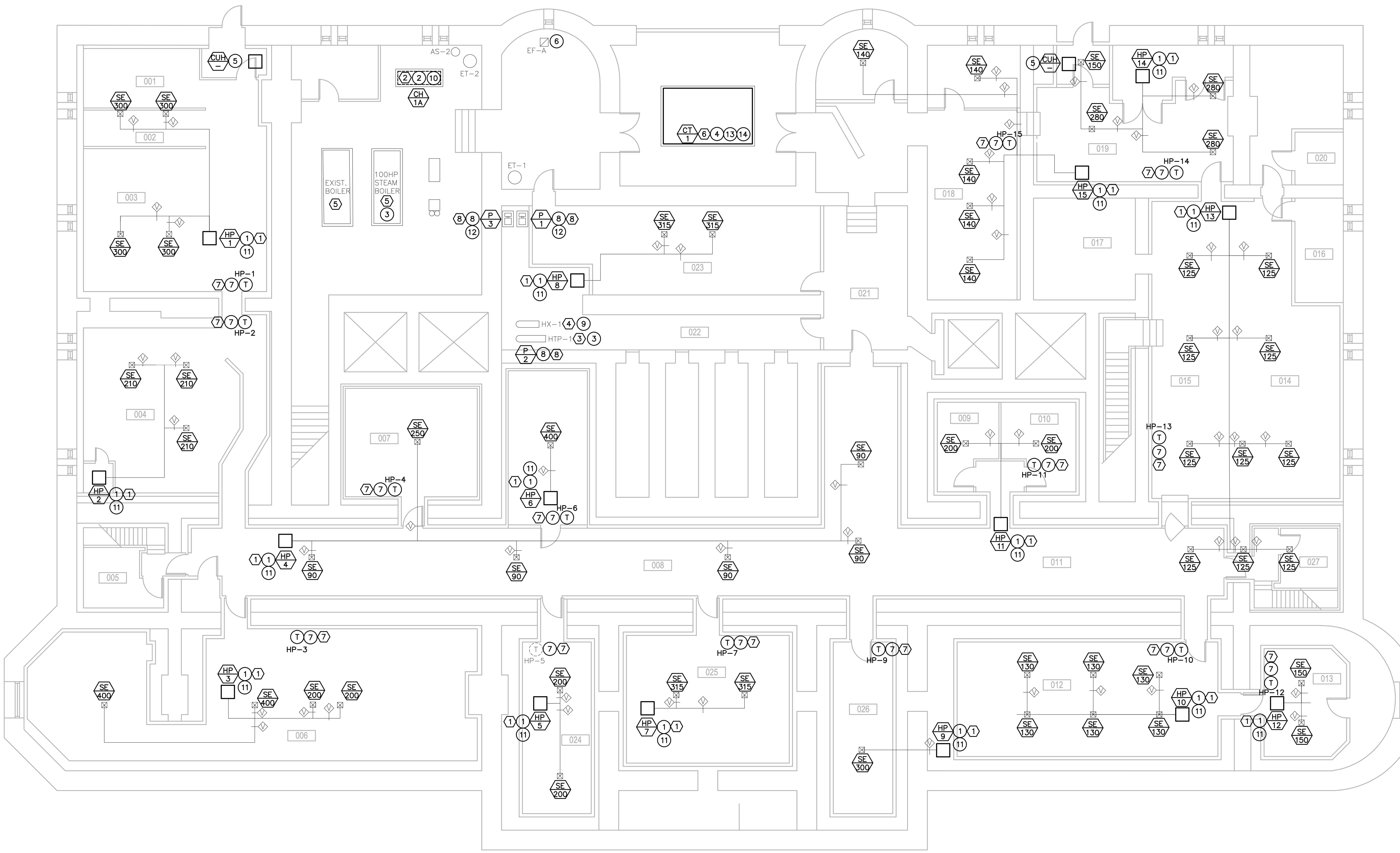
DLZ PROJECT NUMBER
1663-1191-90

RICHMOND INDIANA

WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL
GENERAL NOTES AND SCHEDULES

DRAWING NUMBER
M001



BASEMENT - MECHANICAL PLAN

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

1 / M200

GENERAL NOTES

A. FIELD VERIFY ALL EXISTING CONDITIONS DIMENSIONS, LOCATIONS, AND QUANTITIES PRIOR TO BE BEGINNING WORK.

B. INSTALL ALL EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS.

C. CONTRACTOR SHALL COORDINATE ALL SHUT DOWNS WITH OWNER.

D. ACCESS TO BUILDING SHALL BE COORDINATED WITH OWNER.

E. OWNER RESERVES THE RIGHT TO SALVAGE ANY EQUIPMENT OR MATERIAL INDICATED TO BE DEMOLISHED.

F. ALL EXISTING CONTROLS, INCLUDING SENSORS, DAMPERS, ACTUATORS, CONTROL VALVES, PANELS, VFDS, AND OTHER APPURTENANCES SHALL BE REMOVED AND REPLACED ACCORDING TO SCHEMATICS ON CONTROL DRAWINGS.

G. PROVIDE NEW CONTROLS, INCLUDING SENSORS, DAMPERS, CONTROL VALVES, PANELS, VFDS, AND OTHER APPURTENANCES ACCORDING TO SCHEMATICS ON CONTROL DRAWINGS.

H. REBALANCE SUPPLY GRILLES/DIFFUSERS TO CFM INDICATED ON PLANS USING EXISTING VOLUME DAMPER. IF DAMPER DOES NOT EXIST, NOTIFY THE ARCHITECT/ENGINEER.

I. CONTRACTOR SHALL DISCONNECT POWER TO ANY MECHANICAL EQUIPMENT WHICH IS BEING REMOVED. REMOVE EXISTING DISCONNECT AND CONTROLLER WHERE NEW UNITS ARE REQUIRED TO REPLACE EXISTING. DISPOSE OF OLD DISCONNECTS AND CONTROLS PROPERLY OR GIVE TO OWNER.

J. CONNECT NEW EQUIPMENT TO THE EXISTING CIRCUIT UNLESS OTHERWISE NOTED. REPORT ANY UNSAFE CONDITIONS OR INCOMPATIBLE CIRCUITS TO ENGINEER BEFORE INSTALLATION. REPORT ANY "POWER OUTAGES" TO OWNER BEFORE THESE ARE SCHEDULED.

K. PROVIDE PRE-CONSTRUCTION AND POST CONSTRUCTION BALANCING ON PUMPS AND AIR-HANDLING UNITS.

DEMOLITION KEY NOTES (#)

1. REMOVE EXISTING HEAT PUMP, ASSOCIATED PIPING, CONTROLS AND OTHER APPURTENANCES FOR REPLACEMENT.
2. REMOVE EXISTING CHILLER, HOUSEKEEPING PAD, ASSOCIATED PIPING, FLUE, CONTROLS AND OTHER APPURTENANCES FOR REPLACEMENT.
3. EXISTING HEAT TRANSFER PACKAGE TO REMAIN. REMOVE EXISTING CONTROLS FOR REPLACEMENT.
4. EXISTING HEAT EXCHANGER TO REMAIN. REMOVE EXISTING CONTROLS FOR REPLACEMENT.
5. EXISTING BOILER TO REMAIN. REMOVE EXISTING CONTROLS FOR REPLACEMENT.
6. REMOVE EXISTING CLOSED CIRCUIT COOLER, PIPING AND CONTROLS FOR REPLACEMENT.
7. EXISTING THERMOSTAT TO BE REMOVED FOR REPLACEMENT.
8. REMOVE EXISTING PUMP FOR REPLACEMENT.

PLAN KEY NOTES (#)

1. NEW HEAT PUMP TO REPLACE EXISTING, INSTALL IN SAME LOCATION AS EXISTING. PROVIDE NEW CONTROLS. RE-CONNECT TO EXISTING DUCTWORK, LOOP AND CONDENSATE PIPING. PER DETAIL 2/M701.
2. NEW CHILLER TO REPLACE EXISTING, INSTALL IN APPROX. SAME LOCATION AS EXISTING. PROVIDE NEW CONTROLS. MOUNT NEW UNIT ON 4" CONCRETE HOUSEKEEPING PAD. RE-CONNECT TO EXISTING PIPING.
3. PROVIDE NEW CONTROLS FOR HEATING HOT WATER SYSTEM, SEE DETAILS; 1/M700, 2/M701, 2/M702.
4. PROVIDE NEW CLOSED CIRCUIT COOLER AND NEW CONTROLS. SEE DETAIL 1/M705.
5. PROVIDE NEW CONTROLS FOR CABINET UNIT HEATER, SEE DETAIL 3/M700.
6. PROVIDE NEW CONTROLS FOR EXHAUST FAN, SEE DETAIL 2/M700.
7. PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING.
8. PROVIDE NEW PUMP. CONNECT TO EXISTING PIPING AND CONTROL AS REQUIRED FOR ASSOCIATED SYSTEM.
9. NEW CONTROLS FOR HEAT PUMP LOOP HEAT EXCHANGER. SEE DETAIL 5/M700.
10. EC TO INSTALL FACTORY PROVIDED DISCONNECT AND CONTROLLER. CONNECT TO EXISTING POWER CIRCUIT.
11. PROVIDE NEW 2P-30A DISCONNECT SWITCH WITH FLEX CONNECT TO NEW HP. CONNECT TO EXISTING POWER CIRCUIT.
12. EC TO INSTALL NEW VFD DRIVE AND EXISTING POWER CIRCUIT.
13. INSTALL FACTORY PROVIDED DISCONNECT AND CONTROLLER AND FLEX CONNECT TO TOWER AND ASSOCIATED LOADS. CONNECT TO EXISTING POWER CIRCUIT.
14. REPLACE EXISTING ELECTRIC HEAT TRACE IN-KIND AT THE COLD WATER MAKE-UP LINE AND RECIRCULATION LINE AT THE CLOSED CIRCUIT COOLING TOWER.

DLZ

DLZ INDIANA, LLC

NO.	REVISION

DRAWN:SD/DWB CHK'D. JRA
DESIGNED: JRA APPRV'D: JRA
DATE: DECEMBER 6, 2018

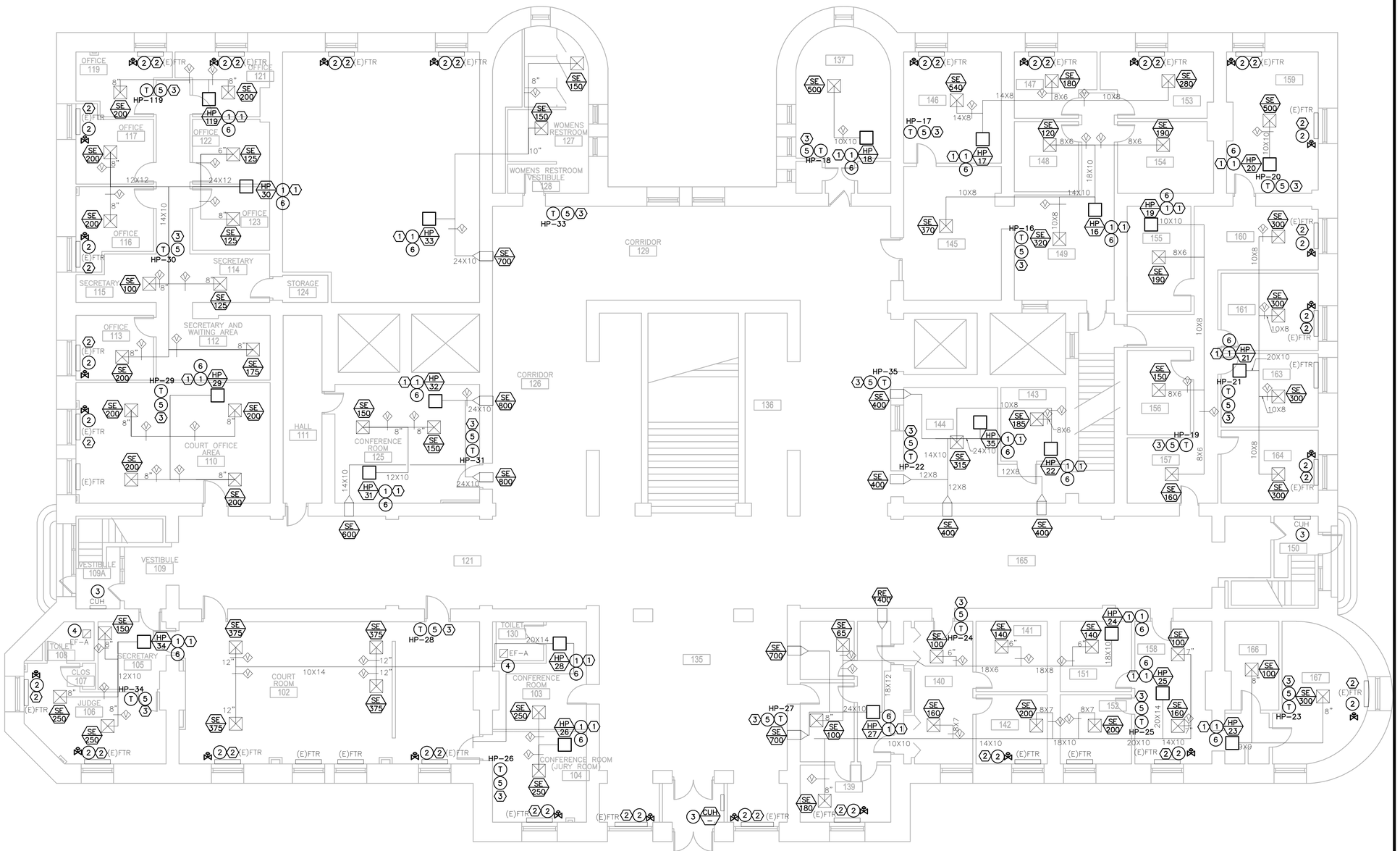
DLZ PROJECT NUMBER
1663-1191-90

RICHMOND INDIANA

WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL
BASEMENT – MECHANICAL PLAN

DRAWING NUMBER
M200



FIRST FLOOR - MECHANICAL PLAN

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

N

GENERAL NOTES

A. FIELD VERIFY ALL EXISTING CONDITIONS DIMENSIONS, LOCATIONS, AND QUANTITIES PRIOR TO BE BEGINNING WORK.

B. INSTALL ALL EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS.

C. CONTRACTOR SHALL COORDINATE ALL SHUT DOWNS WITH OWNER.

D. ACCESS TO BUILDING SHALL BE COORDINATED WITH OWNER.

E. OWNER RESERVES THE RIGHT TO SALVAGE ANY EQUIPMENT OR MATERIAL INDICATED TO BE DEMOLISHED.

F. ALL EXISTING CONTROLS, INCLUDING SENSORS, DAMPERS, ACTUATORS, CONTROL VALVES, PANELS, VFDS, AND OTHER APPURTENANCES SHALL BE REMOVED AND REPLACED ACCORDING TO SCHEMATICS ON CONTROL DRAWINGS.

G. PROVIDE NEW CONTROLS, INCLUDING SENSORS, DAMPERS, CONTROL VALVES, PANELS, VFDS, AND OTHER APPURTENANCES ACCORDING TO SCHEMATICS ON CONTROL DRAWINGS.

H. REBALANCE SUPPLY GRILLES/DIFFUSERS TO CFM INDICATED ON PLANS USING EXISTING VOLUME DAMPER. IF DAMPER DOES NOT EXIST, NOTIFY THE ARCHITECT/ENGINEER.

I. CONTRACTOR SHALL DISCONNECT POWER TO ANY MECHANICAL EQUIPMENT WHICH IS BEING REMOVED. REMOVE EXISTING DISCONNECT AND CONTROLLER WHERE NEW UNITS ARE REQUIRED TO REPLACE EXISTING. DISPOSE OF OLD DISCONNECTS AND CONTROLS PROPERLY OR GIVE TO OWNER.

J. CONNECT NEW EQUIPMENT TO THE EXISTING CIRCUIT UNLESS OTHERWISE NOTED. REPORT ANY UNSAFE CONDITIONS OR INCOMPATIBLE CIRCUITS TO ENGINEER BEFORE INSTALLATION. REPORT ANY "POWER OUTAGES" TO OWNER BEFORE THESE ARE SCHEDULED.

K. PROVIDE PRE-CONSTRUCTION AND POST CONSTRUCTION BALANCING ON PUMPS AND AIR-HANDLING UNITS.

DEMOLITION KEY NOTES

(1) REMOVE EXISTING HEAT PUMP, ASSOCIATED PIPING, CONTROLS AND OTHER APPURTENANCES FOR REPLACEMENT.

(2) EXISTING FINNED TUBE RADIATION TO REMAIN. REMOVE EXISTING CONTROL VALVE FOR REPLACEMENT.

(3) EXISTING THERMOSTAT TO BE REMOVED FOR REPLACEMENT.

PLAN KEY NOTES

(1) NEW HEAT PUMP TO REPLACE (E) EXISTING, INSTALL IN SAME LOCATION AS EXISTING. PROVIDE NEW CONTROLS. RE-CONNECT TO EXISTING DUCTWORK, LOOP AND CONDENSATE PIPING. PER DETAIL 2/M701.

(2) EXISTING FINNED RADIATION SHALL REMAIN. INSTALL NEW STEAM CONTROL VALVE. VALVE MAY SERVE MULTIPLE UNITS. CONTROL VALVE LOCATED ON FLOOR BELOW. RE-CONNECT TO EXISTING PIPING. SEE DETAIL 4/M700.

(3) PROVIDE NEW CONTROLS FOR CABINET UNIT HEATER, SEE DETAIL 3/M700.

(4) PROVIDE NEW CONTROLS FOR EXHAUST FAN, SEE DETAIL 2/M700.

(5) PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING.

(6) PROVIDE NEW 2P-30A DISCONNECT SWITCH WITH FLEX CONNECT TO NEW HP. CONNECT TO EXISTING POWER CIRCUIT.

DLZ INDIANA, LLC

JOSHUA R. APLING REGISTERED PE 10900024 STATE OF INDIANA PROFESSIONAL ENGINEER 8/13/21

NO.	REVISION

DRAWN:SB/DWE CHK'D: JRA
DESIGNED: JRA APPRV'D: JRA
DATE: DECEMBER 6, 2018

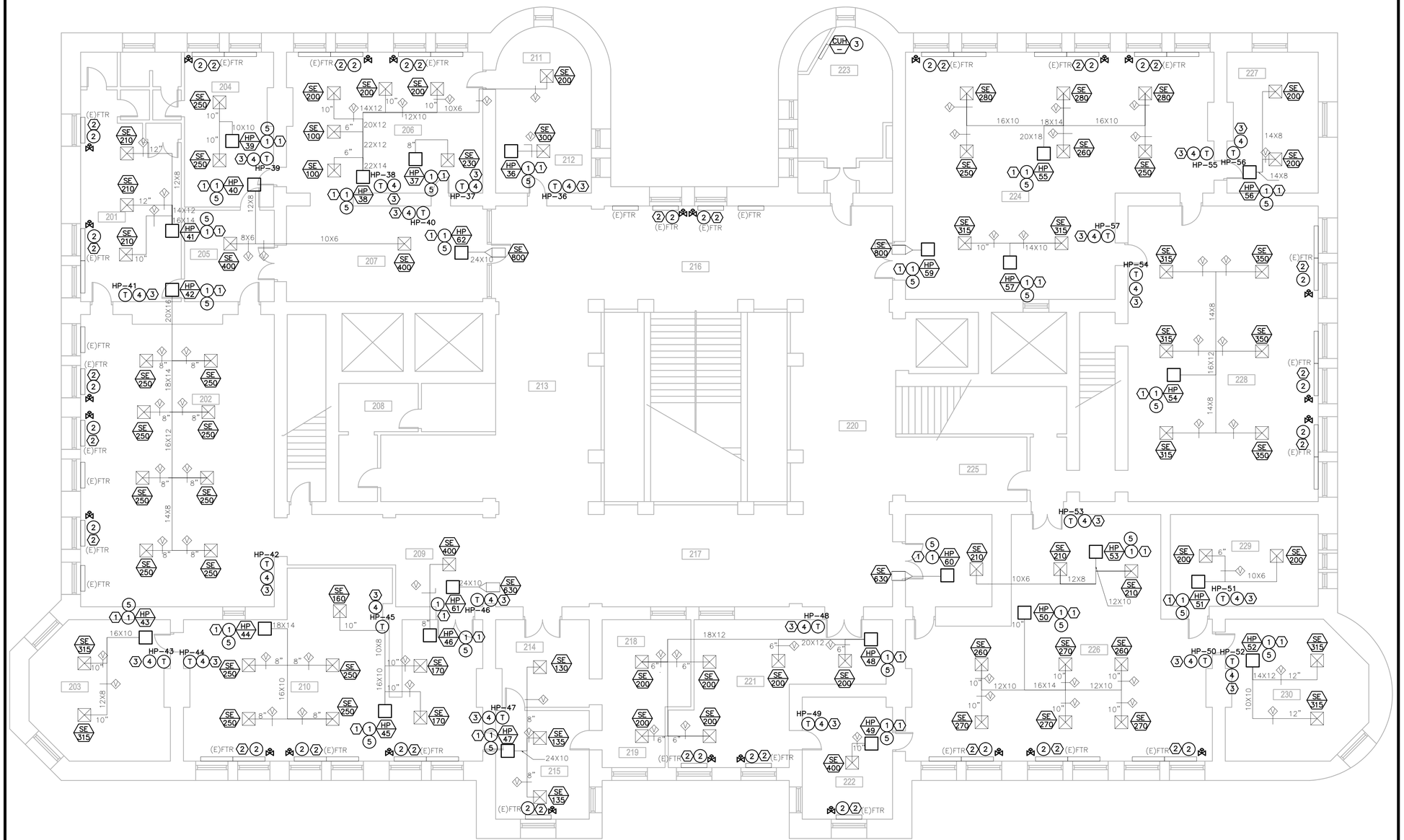
DLZ PROJECT NUMBER
1663-1191-90

RICHMOND INDIANA

WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL
FIRST FLOOR - MECHANICAL PLAN

DRAWING NUMBER
M201



SECOND FLOOR - MECHANICAL PLAN

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

1 / M202

N

GENERAL NOTES

A. FIELD VERIFY ALL EXISTING CONDITIONS DIMENSIONS, LOCATIONS, AND QUANTITIES PRIOR TO BE BEGINNING WORK.

B. INSTALL ALL EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS.

C. CONTRACTOR SHALL COORDINATE ALL SHUT DOWNS WITH OWNER.

D. ACCESS TO BUILDING SHALL BE COORDINATED WITH OWNER.

E. OWNER RESERVES THE RIGHT TO SALVAGE ANY EQUIPMENT OR MATERIAL INDICATED TO BE DEMOLISHED.

F. ALL EXISTING CONTROLS, INCLUDING SENSORS, DAMPERS, ACTUATORS, CONTROL VALVES, PANELS, VFDS, AND OTHER APPURTENANCES SHALL BE REMOVED AND REPLACED ACCORDING TO SCHEMATICS ON CONTROL DRAWINGS.

G. PROVIDE NEW CONTROLS, INCLUDING SENSORS, DAMPERS, CONTROL VALVES, PANELS, VFDS, AND OTHER APPURTENANCES ACCORDING TO SCHEMATICS ON CONTROL DRAWINGS.

H. REBALANCE SUPPLY GRILLES/DIFFUSERS TO CFM INDICATED ON PLANS USING EXISTING VOLUME DAMPER. IF DAMPER DOES NOT EXIST, NOTIFY THE ARCHITECT/ENGINEER.

I. CONTRACTOR SHALL DISCONNECT POWER TO ANY MECHANICAL EQUIPMENT WHICH IS BEING REMOVED. REMOVE EXISTING DISCONNECT AND CONTROLLER WHERE NEW UNITS ARE REQUIRED TO REPLACE EXISTING. DISPOSE OF OLD DISCONNECTS AND CONTROLS PROPERLY OR GIVE TO OWNER.

J. CONNECT NEW EQUIPMENT TO THE EXISTING CIRCUIT UNLESS OTHERWISE NOTED. REPORT ANY UNSAFE CONDITIONS OR INCOMPATIBLE CIRCUITS TO ENGINEER BEFORE INSTALLATION. REPORT ANY "POWER OUTAGES" TO OWNER BEFORE THESE ARE SCHEDULED.

K. PROVIDE PRE-CONSTRUCTION AND POST CONSTRUCTION BALANCING ON PUMPS AND AIR-HANDLING UNITS.

DEMOLITION KEY NOTES

1. REMOVE EXISTING HEAT PUMP, ASSOCIATED PIPING, CONTROLS AND OTHER APPURTENANCES FOR REPLACEMENT.
2. EXISTING FIN-TUBE RADIATOR TO REMAIN. REMOVE EXISTING CONTROL VALVE FOR REPLACEMENT.
3. EXISTING THERMOSTAT TO BE REMOVED FOR REPLACEMENT.

PLAN KEY NOTES

1. NEW HEAT PUMP TO REPLACE EXISTING, INSTALL IN SAME LOCATION AS EXISTING. PROVIDE NEW CONTROLS. RE-CONNECT TO EXISTING DUCTWORK, LOOP AND CONDENSATE PIPING. PER DETAIL 2/M701.
2. EXISTING FIN-TUBE RADIATOR SHALL REMAIN. INSTALL NEW STEAM CONTROL VALVE. VALVE MAY SERVE MULTIPLE UNITS. CONTROL VALVE LOCATED ON FLOOR BELOW. RE-CONNECT TO EXISTING PIPING.SEE DETAIL 4/M700.
3. PROVIDE NEW CONTROLS FOR CABINET UNIT HEATER, SEE DETAIL 3/M700.
4. PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING.
5. PROVIDE NEW 2P-30A DISCONNECT SWITCH WITH FLEX CONNECT TO NEW HP. CONNECT TO EXISTING POWER CIRCUIT.

DLZ

DLZ INDIANA, LLC

JOSHUA R. APLING — REGISTERED — PE 10900624 — STATE OF INDIANA — PROFESSIONAL ENGINEER — 8/13/21

REVISION

NO.

DRAWN:SB/DWE CHK'D: JRA
DESIGNED: JRA APPRV'D: JRA
DATE: DECEMBER 6, 2018

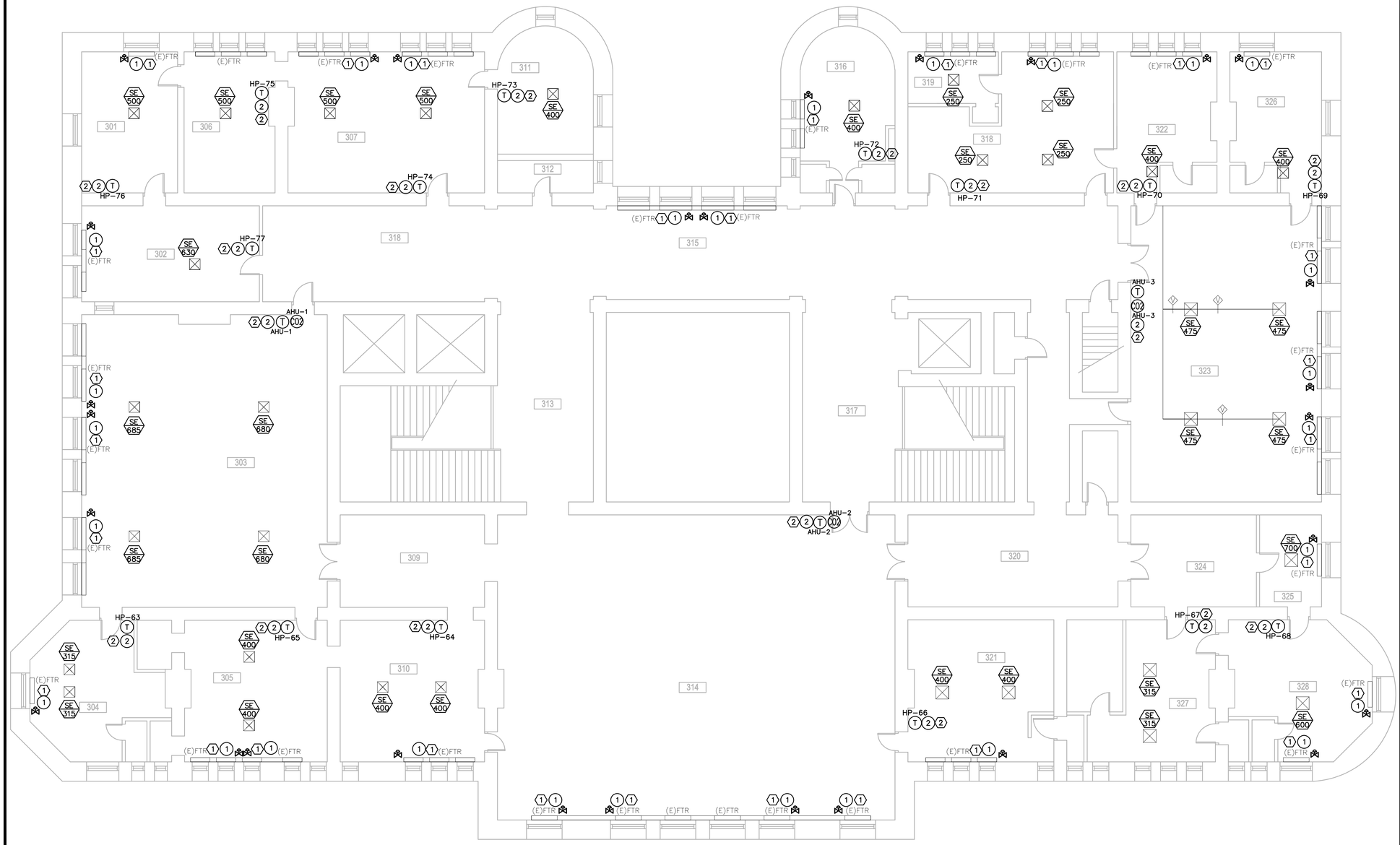
DLZ PROJECT NUMBER
1663-1191-90

RICHMOND INDIANA

WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL
SECOND FLOOR - MECHANICAL PLAN

DRAWING NUMBER
M202



THIRD FLOOR - MECHANICAL PLAN

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

1 / M203

N

GENERAL NOTES

A. FIELD VERIFY ALL EXISTING CONDITIONS DIMENSIONS, LOCATIONS, AND QUANTITIES PRIOR TO BE BEGINNING WORK.

B. INSTALL ALL EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS.

C. CONTRACTOR SHALL COORDINATE ALL SHUT DOWNS WITH OWNER.

D. ACCESS TO BUILDING SHALL BE COORDINATED WITH OWNER.

E. OWNER RESERVES THE RIGHT TO SALVAGE ANY EQUIPMENT OR MATERIAL INDICATED TO BE DEMOLISHED.

F. ALL EXISTING CONTROLS, INCLUDING SENSORS, DAMPERS, ACTUATORS, CONTROL VALVES, PANELS, VFDS, AND OTHER APPURTENANCES SHALL BE REMOVED AND REPLACED ACCORDING TO SCHEMATICS ON CONTROL DRAWINGS.

G. PROVIDE NEW CONTROLS, INCLUDING SENSORS, DAMPERS, CONTROL VALVES, PANELS, VFDS, AND OTHER APPURTENANCES ACCORDING TO SCHEMATICS ON CONTROL DRAWINGS.

H. REBALANCE SUPPLY GRILLES/DIFFUSERS TO CFM INDICATED ON PLANS USING EXISTING VOLUME DAMPER. IF DAMPER DOES NOT EXIST, NOTIFY THE ARCHITECT/ENGINEER.

I. CONTRACTOR SHALL DISCONNECT POWER TO ANY MECHANICAL EQUIPMENT WHICH IS BEING REMOVED. REMOVE EXISTING DISCONNECT AND CONTROLLER WHERE NEW UNITS ARE REQUIRED TO REPLACE EXISTING. DISPOSE OF OLD DISCONNECTS AND CONTROLS PROPERLY OR GIVE TO OWNER.

J. CONNECT NEW EQUIPMENT TO THE EXISTING CIRCUIT UNLESS OTHERWISE NOTED. REPORT ANY UNSAFE CONDITIONS OR INCOMPATIBLE CIRCUITS TO ENGINEER BEFORE INSTALLATION. REPORT ANY "POWER OUTAGES" TO OWNER BEFORE THESE ARE SCHEDULED.

K. PROVIDE PRE-CONSTRUCTION AND POST CONSTRUCTION BALANCING ON PUMPS AND AIR-HANDLING UNITS.

DEMOLITION KEY NOTES

1. EXISTING FIN-TUBE RADIATOR TO REMAIN. REMOVE EXISTING CONTROL VALVE FOR REPLACEMENT.

2. EXISTING THERMOSTAT TO BE REMOVED FOR REPLACEMENT.

PLAN KEY NOTES

1. EXISTING FIN-TUBE RADIATOR SHALL REMAIN. INSTALL NEW STEAM CONTROL VALVE. VALVE MAY SERVE MULTIPLE UNITS. CONTROL VALVE LOCATED ON FLOOR BELOW. RE-CONNECT TO EXISTING PIPING. SEE DETAIL 4/M700.

2. PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING.

DLZ

DLZ INDIANA, LLC

JOSHUA R. APLING — REGISTERED — PE 10900624 — STATE OF INDIANA — PROFESSIONAL ENGINEER — 8/13/21

REVISION

NO.	

DRAWN:SB/DWB CHK'D: JRA
DESIGNED:JRA APPRV'D: JRA
DATE: DECEMBER 6, 2018

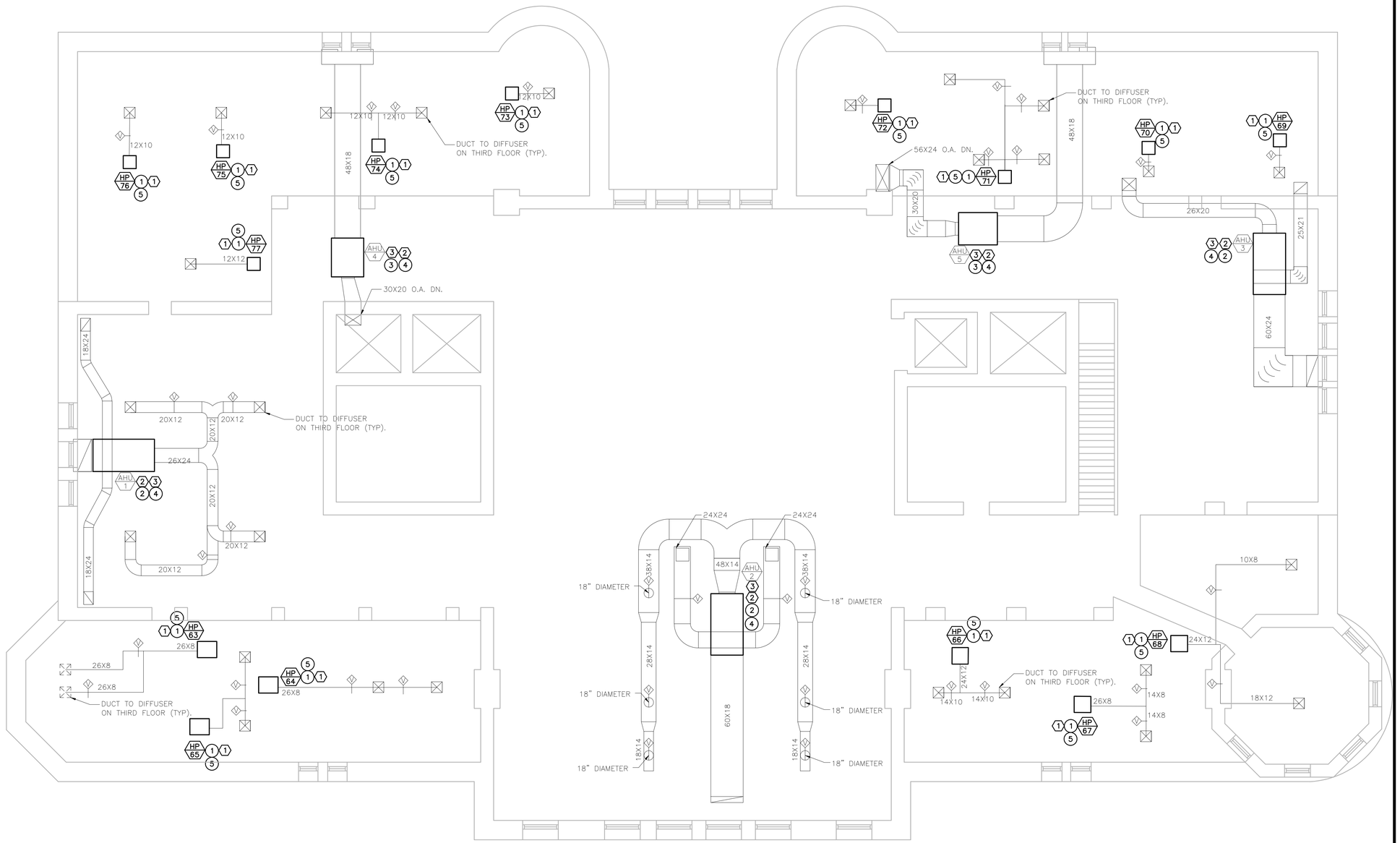
DLZ PROJECT NUMBER
1663-1191-90

INDIANA
RICHMOND

WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL
THIRD FLOOR - MECHANICAL PLAN

DRAWING NUMBER
M203



ATTIC - MECHANICAL PLAN

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

1 / M204

N

GENERAL NOTES

A. FIELD VERIFY ALL EXISTING CONDITIONS DIMENSIONS, LOCATIONS, AND QUANTITIES PRIOR TO BE BEGINNING WORK.

B. INSTALL ALL EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS.

C. CONTRACTOR SHALL COORDINATE ALL SHUT DOWNS WITH OWNER.

D. ACCESS TO BUILDING SHALL BE COORDINATED WITH OWNER.

E. OWNER RESERVES THE RIGHT TO SALVAGE ANY EQUIPMENT OR MATERIAL INDICATED TO BE DEMOLISHED.

F. ALL EXISTING CONTROLS, INCLUDING SENSORS, DAMPERS, ACTUATORS, CONTROL VALVES, PANELS, VFDS, AND OTHER APPURTENANCES SHALL BE REMOVED AND REPLACED ACCORDING TO SCHEMATICS ON CONTROL DRAWINGS.

G. PROVIDE NEW CONTROLS, INCLUDING SENSORS, DAMPERS, CONTROL VALVES, PANELS, VFDS, AND OTHER APPURTENANCES ACCORDING TO SCHEMATICS ON CONTROL DRAWINGS.

H. REBALANCE SUPPLY GRILLES/DIFFUSERS TO CFM INDICATED ON PLANS USING EXISTING VOLUME DAMPER. IF DAMPER DOES NOT EXIST, NOTIFY THE ARCHITECT/ENGINEER.

I. CONTRACTOR SHALL DISCONNECT POWER TO ANY MECHANICAL EQUIPMENT WHICH IS BEING REMOVED. REMOVE EXISTING DISCONNECT AND CONTROLLER WHERE NEW UNITS ARE REQUIRED TO REPLACE EXISTING. DISPOSE OF OLD DISCONNECTS AND CONTROLS PROPERLY OR GIVE TO OWNER.

J. CONNECT NEW EQUIPMENT TO THE EXISTING CIRCUIT UNLESS OTHERWISE NOTED. REPORT ANY UNSAFE CONDITIONS OR INCOMPATIBLE CIRCUITS TO ENGINEER BEFORE INSTALLATION. REPORT ANY "POWER OUTAGES" TO OWNER BEFORE THESE ARE SCHEDULED.

K. PROVIDE PRE-CONSTRUCTION AND POST CONSTRUCTION BALANCING ON PUMPS AND AIR-HANDLING UNITS.

DEMOLITION KEY NOTES

1. REMOVE EXISTING HEAT PUMP, ASSOCIATED PIPING, CONTROLS AND OTHER APPURTENANCES FOR REPLACEMENT.
2. EXISTING AIR HANDLING UNIT TO REMAIN. REMOVE EXISTING CONTROLS FOR REPLACEMENT.
3. REMOVE EXISTING FAN MOTOR, DOOR SEALS AND FAN BELT AND SHEAVE AT AHU FOR REPLACEMENT.

PLAN KEY NOTES

1. NEW HEAT PUMP TO REPLACE EXISTING, INSTALL IN SAME LOCATION AS EXISTING. PROVIDE NEW CONTROLS. RE-CONNECT TO EXISTING DUCTWORK, LOOP AND CONDENSATE PIPING. PER DETAIL 2/M701.
2. PROVIDE NEW CONTROLS FOR CONSTANT VOLUME AIR HANDLING UNIT, SEE DETAIL 1/M704.
3. PROVIDE NEW CONTROLS FOR DEDICATED OUTSIDE AIR HANDLING UNIT, SEE DETAIL 1/M703.
4. PROVIDE NEW FAN MOTOR, ACCESS DOOR SEALS, FAN BELTS AND SHEAVE FOR EACH AHU. REBALANCE AHU AFTER INSTALLATION.
5. PROVIDE NEW 2P-30A DISCONNECT SWITCH WITH FLEX CONNECT TO NEW HP. CONNECT TO EXISTING POWER CIRCUIT.

DLZ
DLZ INDIANA, LLC

JOSHUA R. APLING REGISTERED PE 10900624 STATE OF INDIANA PROFESSIONAL ENGINEER 8/13/21

REVISION
NO.

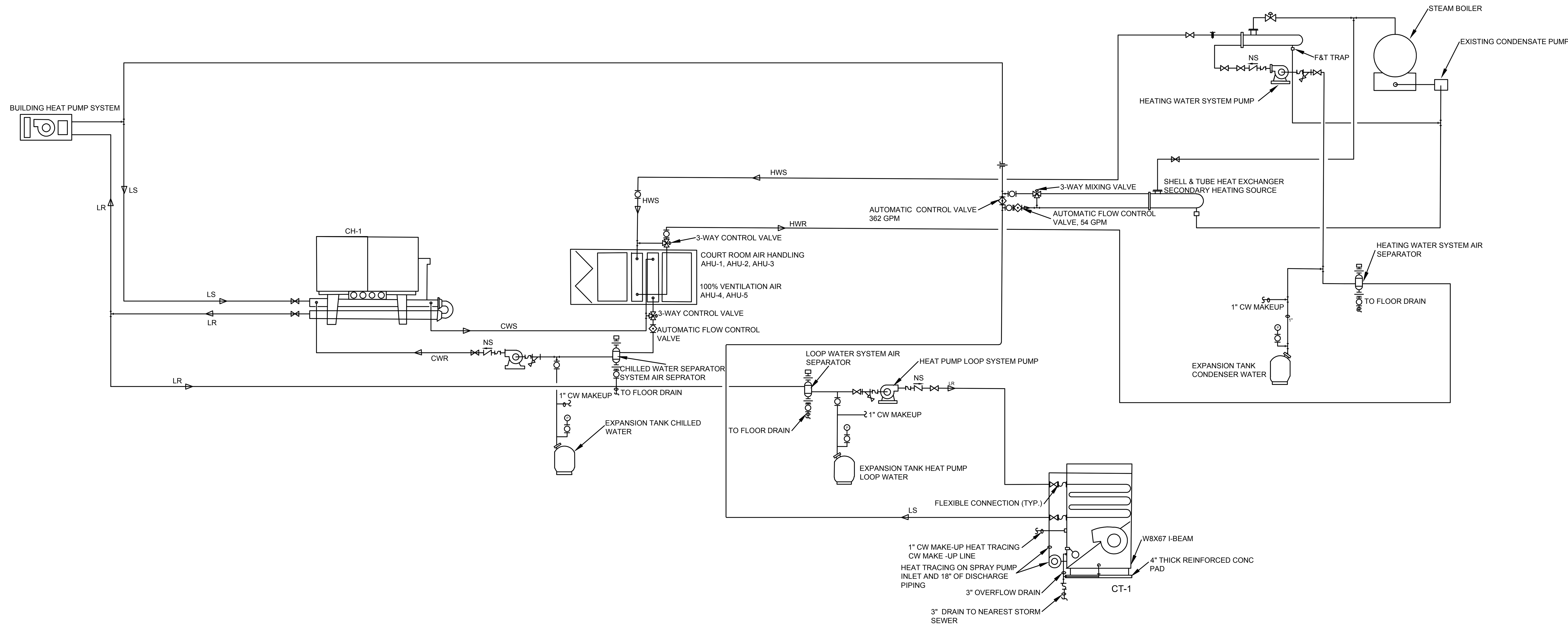
DRAWN:SB/DWG CHK'D: JRA
DESIGNED: JRA APPRV'D: JRA
DATE: DECEMBER 6, 2018

DLZ PROJECT NUMBER
1663-1191-90

RICHMOND INDIANA
WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL
ATTIC - MECHANICAL PLAN

DRAWING NUMBER
M204



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M500

HVAC SYSTEM PIPING DIAGRAM AND FLOW SCHEMATIC

NTS

EXISTING AIR HANDLING UNIT SCHEDULE

MARK	AIR FLOW (CFM)		MOTOR DATA		COOLING COIL							HEATING COIL						ELECTRIC REHEAT COIL			REMARKS
	SUPPLY	O.A.	HP	VOLT/ PH	MBH (TOT.)	MBH (SEN.)	EAT DB/WB (°F)	LAT DB/WB (°F)	EWT (°F)	LWT (°F)	GPM	MBH	EAT (°F)	LAT (°F)	EWT (°F)	LWT(°F)	GPM	KW	VOLTS	PHASE	
AHU-1	2730	683	5	208/3	120.8	79.8	80/67	53.4/52.5	42	60	14.3	134.4	50	95	180	160	14.0	17.2	208	3	1
AHU-2	5625	1406	15	208/3	233.2	158	80/67	54.2/53.4	42	60	27.9	273.7	50	95	180	160	28.8	35	208	3	1
AHU-3	1900	475	5	208/3	89.4	62.3	80/67	55.0/54.1	42	60	10.6	99.1	50	95	180	160	10.3	12	208	3	1
AHU-4	5000	5000	10	208/3	252	171.3	95/76	62.7/62.3	42	60	30	405.0	-10	65	180	160	40.5	-	-	-	1
AHU-5	5000	5000	10	208/3	252	171.3	95/76	62.7/62.3	42	60	30	405.0	-10	65	180	160	40.5	-	-	-	1

REMARKS:
1. AIR HANDLING UNIT TO REMAIN IN PLACE. INFORMATION PROVIDED FOR TESTING AND BALANCING.

DLZ INDIANA, LLC

REVISION

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WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL
HVAC SYSTEM PIPING SCHEMATIC

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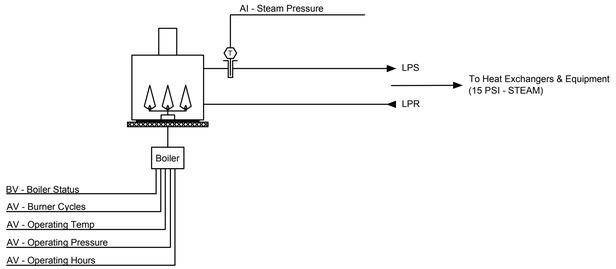
M500

This boiler interface schematic may not reflect the actual sensors and points as supplied by the boiler manufacturer. All interface points shall be coordinated with the boiler supplier.



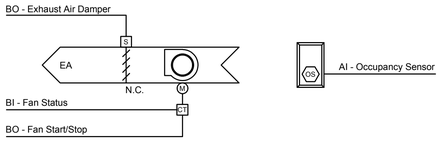
BOILER INTERFACE MONITOR:

CURRENT BOILER STATUS AND OPERATING CONDITIONS WILL BE MONITORED THROUGH ITS COMMUNICATIONS INTERFACE PORT.

THE INTERFACE WILL MONITOR AND TREND THE POINTS AS SHOWN ON THE POINTS LIST.

1 M700 BOILER INTERFACE CONTROL SCHEMATIC

NTS



RUN CONDITIONS - OCCUPANCY SENSOR:

THE UNIT SHALL BE ENABLED BY OCCUPANCY SENSOR WITH MINIMUM RUN TIME OF 10 MINUTES (ADJ.).

EXHAUST AIR DAMPER:

THE EXHAUST AIR DAMPER SHALL OPEN ANYTIME THE UNIT RUNS AND SHALL CLOSE ANYTIME THE UNIT STOPS. THE EXHAUST AIR DAMPER SHALL CLOSE 30 SEC (ADJ.) AFTER THE FAN STOPS.

FAN STATUS:

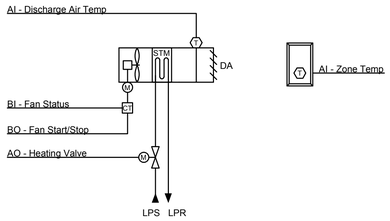
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

2 M700 EXHAUST FAN - OCCUPANCY SENSOR CONTROL SCHEMATIC

NTS



RUN CONDITIONS - CONTINUOUS:
THE UNIT SHALL RUN CONTINUOUSLY AND SHALL MAINTAIN A HEATING SETPOINT OF 55°F (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

FAN:
THE FAN SHALL RUN ANYTIME THE ZONE TEMPERATURE DROPS BELOW HEATING SETPOINT, UNLESS SHUTDOWN ON SAFETIES.

HEATING COIL VALVE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS HEATING SETPOINT.

THE HEATING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 50°F (ADJ.).
- AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
- AND THE FAN IS ON.

DISCHARGE AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
- LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).

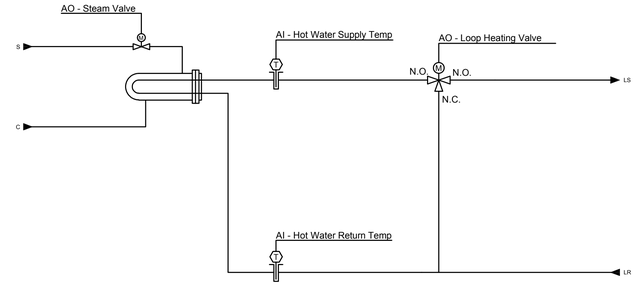
FAN STATUS:
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

3 M700 STEAM CABINET UNIT HEATER CONTROL SCHEMATIC

NTS



LOOP HEATING TEMPERATURE CONTROL:

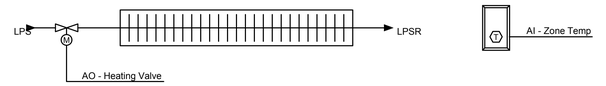
THE CONTROLLER SHALL MEASURE THE LOOP WATER SUPPLY TEMPERATURE AND MODULATE THE LOOP HEATING VALVE TO MAINTAIN A MINIMUM LOOP TEMPERATURE SETPOINT OF 70 DEG-F.

ON DROPPING LOOP WATER SUPPLY TEMPERATURE, THE STEAM VALVE SHALL OPEN TO MAINTAIN A HOT WATER SUPPLY TEMPERATURE OF 180°F (ADJ.) FROM HX-1. THE LOOP HEATING VALVE SHALL MODULATE TO MAINTAIN THE LOOP TEMPERATURE SETPOINT.

ON RISING LOOP WATER SUPPLY TEMPERATURE WHEN HEATING IS NOT REQUIRED, THE STEAM VALVE AND LOOP HEATING VALVE SHALL MODULATE TO THE CLOSED POSITION.

5 M700 LOOP HEATING CONTROL SCHEMATIC

NTS



RUN CONDITIONS -
THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

- OCCUPIED MODE: THE UNIT SHALL MAINTAIN A HEATING SETPOINT OF 70°F (ADJ.).
- UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN A HEATING SETPOINT OF 65°F (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

STEAM COIL VALVE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS HEATING SETPOINT.

THE HEATING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
- AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.

4 M700 STEAM FINNED TUBE RADIATOR CONTROL SCHEMATIC

NTS

DLZ INDIANA, LLC

JOSHUA R. APLING
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STATE OF INDIANA
PROFESSIONAL ENGINEER

REVISION

NO.			

DRAWN: JRA | CHK'D.: JRA
DESIGNED: JRA | APPRV'D.: JRA
DATE: DECEMBER 6, 2018

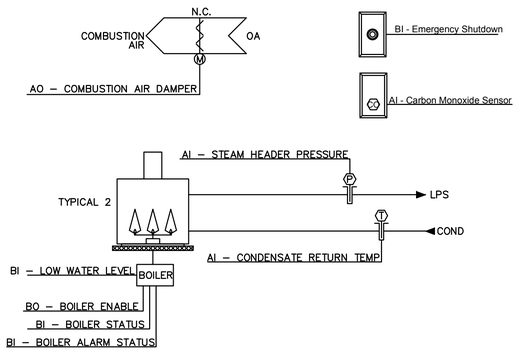
DLZ PROJECT NUMBER
1663-1191-90

INDIANA
RICHMOND

WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL
CONTROL SCHEMATICS

DRAWING NUMBER
M700



BOILER SYSTEM RUN CONDITIONS:
THE BOILER SYSTEM SHALL BE ENABLED TO RUN WHENEVER:
- **THE LOOP MONITOR IS ENABLED BY ZONE REQUIREMENTS.**
- **THE HEATING HOT WATER LOOP IS ENABLED.**
- **AND OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).**

TO PREVENT SHORT CYCLING, THE BOILER SYSTEM SHALL RUN FOR AND BE OFF FOR MINIMUM ADJUSTABLE TIMES (BOTH USER DEFINABLE), UNLESS SHUTDOWN ON SAFETIES OR OUTSIDE AIR CONDITIONS.

THE BOILER SHALL RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

COMBUSTION AIR DAMPERS (EXISTING BOILERS):
THE COMBUSTION AIR DAMPERS SHALL BE COMMANDED OPEN BEFORE BOILERS ARE ENABLED. GENERATE ALARM IF DAMPER COMMANDED OPEN BUT IS NOT PROVEN OPEN.

BOILER SAFETIES:
THE FOLLOWING SAFETIES SHALL BE MONITORED:
- **BOILER ALARM.**
- **LOW WATER LEVEL.**

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- **BOILER ALARM.**
- **LOW WATER LEVEL ALARM.**

BOILER ENABLE:
THE BOILER SHALL BE ENABLED WHEN THE BOILER SYSTEM IS COMMANDED ON. THE BOILER SHALL BE ENABLED AFTER THE COMBUSTION AIR DAMPER IS PROVEN OPEN AND SHALL RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

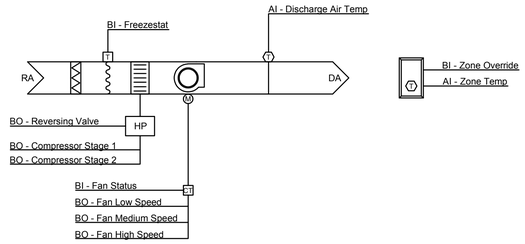
ALARMS SHALL BE PROVIDED AS FOLLOWS:
- **FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.**
- **RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.**

STEAM PRESSURE AND TEMPERATURE MONITORING:
THE FOLLOWING TEMPERATURES AND PRESSURES SHALL BE MONITORED:
- **STEAM HEADER PRESSURE.**
- **CONDENSATE RETURN TEMPERATURE.**

EMERGENCY SHUTDOWN:
THE BOILER SHALL SHUT DOWN AND AN ALARM GENERATED UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL STATUS.

BOILER ROOM CARBON MONOXIDE SENSOR:
THE SENSOR SHALL MONITOR CARBON MONOXIDE LEVELS IN THE BOILER ROOM AND GENERATE AN ALARM IF LEVELS RISE ABOVE USER DEFINED SETPOINT.

1 / M701 **STEAM BOILER CONTROL SCHEMATIC**
NTS



RUN CONDITIONS - SCHEDULED:
THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

- OCCUPIED MODE: THE UNIT SHALL MAINTAIN
  - A 75°F (ADJ.) COOLING SETPOINT
  - A 70°F (ADJ.) HEATING SETPOINT
- UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN
  - A 85°F (ADJ.) COOLING SETPOINT.
  - A 55°F (ADJ.) HEATING SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
- LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

ZONE OPTIMAL START:
THE UNIT SHALL USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THIS ALGORITHM SHALL MINIMIZE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD.

ZONE UNOCCUPIED OVERRIDE:
A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.

EMERGENCY SHUTDOWN:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL

FREEZE PROTECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A FREEZESTAT STATUS.

FAN:
THE FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. THE FAN SPEEDS SHALL BE INDEXED AS FOLLOWS:
- LOW SPEED SHALL RUN ANYTIME THE ZONE TEMPERATURE IS WITHIN SETPOINTS.
- MEDIUM SPEED SHALL RUN ANYTIME THE ZONE TEMPERATURE IS OUTSIDE OF SETPOINTS.
- HIGH SPEED SHALL RUN ANYTIME THE ZONE TEMPERATURE IS OUTSIDE OF SETPOINTS BY A USER DEFINABLE AMOUNT (ADJ.).

HEATING AND COOLING - 2 COMPRESSOR STAGES:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND STAGE THE COMPRESSORS TO MAINTAIN ITS SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE A USER DEFINABLE (ADJ.) DELAY BETWEEN STAGES, AND EACH STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME. THE COMPRESSOR SHALL RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

THE HEATING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
- **AND** THE FAN STATUS IS ON.
- **AND** THE REVERSING VALVE IS IN HEAT MODE.

THE COOLING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS GREATER THAN 60°F (ADJ.).
- **AND** THE FAN STATUS IS ON.
- **AND** THE REVERSING VALVE IS IN COOL MODE.

ON MODE CHANGE, THE COMPRESSOR SHALL BE DISABLED AND REMAIN OFF UNTIL AFTER THE REVERSING VALVE HAS CHANGED POSITION.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- COMPRESSOR 1 RUNTIME EXCEEDED: COMPRESSOR 1 RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).
- COMPRESSOR 2 RUNTIME EXCEEDED: COMPRESSOR 2 RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

FILTER HOURS:
THE CONTROLLER SHALL MONITOR THE FAN RUNTIME.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- FILTER CHANGE REQUIRED: FILTER HAS BEEN IN USE FOR MORE THAN 2200HR (ADJ.).

DISCHARGE AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
- LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).

FAN STATUS:
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

2 / M701 **WATER SOURCE HEAT PUMP CONTROL SCHEMATIC**
NTS

DLZ INDIANA, LLC

JOSHUA R. APLING REGISTERED PE 10900276 STATE OF INDIANA PROFESSIONAL ENGINEER

REVISION

NO.								

DRAWN: JRA | CHK'D: JRA
DESIGNED: JRA | APPR'D: JRA
DATE: DECEMBER 6, 2018

DLZ PROJECT NUMBER
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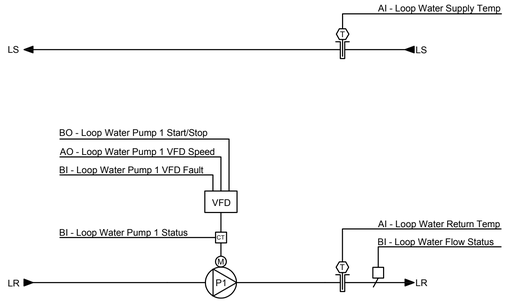
INDIANA
RICHMOND

WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL CONTROL SCHEMATICS

DRAWING NUMBER
M701



RUN CONDITIONS:

SYSTEM SHALL RUN WHENEVER:
- INDICATED BY SCHEDULE (ADJ).
- **OR** A DEFINABLE NUMBER OF UNOCCUPIED ZONES NEED HEATING OR COOLING.

THE FOLLOWING LOOP WATER CONDITIONS SHALL BE MONITORED:
- FLOW STATUS.
- SUPPLY TEMPERATURE.
- RETURN TEMPERATURE.

ALARMS AND A HEAT PUMP SHUTDOWN SIGNAL SHALL BE GENERATED UPON ANY OF THE FOLLOWING LOOP WATER CONDITIONS:
- NO LOOP FLOW.
- HIGH LOOP WATER SUPPLY TEMP SHUTDOWN: IF THE LOOP WATER SUPPLY TEMPERATURE IS GREATER THAN 92°F (ADJ.).
- LOW LOOP WATER SUPPLY TEMP SHUTDOWN: IF THE LOOP WATER SUPPLY TEMPERATURE IS LESS THAN 58°F (ADJ.).

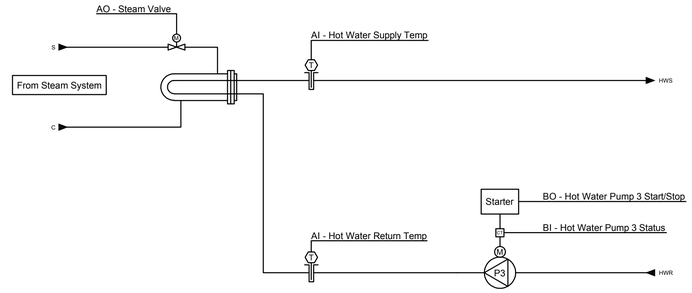
ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH LOOP WATER SUPPLY TEMP: IF THE LOOP WATER SUPPLY TEMPERATURE IS GREATER THAN 92°F (ADJ.).
- LOW LOOP WATER SUPPLY TEMP: IF THE LOOP WATER SUPPLY TEMPERATURE IS LESS THAN 58°F (ADJ.).

LOOP WATER PUMP OPERATION:

PUMP SHALL OPERATE WHENEVER REQUIRED BY THE LOOP MONITOR.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- LOOP WATER PUMP 1
  - FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
  - RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
  - RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.
  - VFD FAULT.

1 M702 **LOOP MONITORING AND PUMPS CONTROL SCHEMATIC**
NTS



RUN CONDITIONS:

THE HEAT EXCHANGER SYSTEM SHALL BE ENABLED TO RUN WHENEVER OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).

TO PREVENT SHORT CYCLING, THE HEAT EXCHANGER SHALL RUN FOR AND BE OFF FOR MINIMUM ADJUSTABLE TIMES (BOTH USER DEFINABLE).

THE HEAT EXCHANGER SYSTEM SHALL ALSO RUN FOR FREEZE PROTECTION WHENEVER OUTSIDE AIR TEMPERATURE IS LESS THAN 38°F (ADJ.).

HOT WATER PUMP:

THE HOT WATER PUMP SHALL RUN ANYTIME IT IS REQUESTED TO RUN.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HOT WATER PUMP FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- HOT WATER PUMP RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- HOT WATER PUMP RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT

HOT WATER SUPPLY TEMPERATURE SETPOINT:

THE HOT WATER SUPPLY TEMPERATURE SETPOINT SHALL BE A FIXED SETPOINT OF 180°F (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH HOT WATER SUPPLY TEMP: IF GREATER THAN 200°F (ADJ.).
- LOW HOT WATER SUPPLY TEMP: IF LESS THAN 100°F (ADJ.).

HEAT EXCHANGER STEAM VALVE - HOT WATER CONTROL:

THE CONTROLLER SHALL MEASURE THE HOT WATER SUPPLY TEMPERATURE AND MODULATE THE STEAM VALVE TO MAINTAIN ITS SETPOINT.

THE STEAM VALVE SHALL BE ENABLED WHENEVER:
- THE HEAT EXCHANGER IS CALLED TO RUN.
- AND HOT WATER SUPPLY TEMPERATURE IS BELOW SETPOINT.

THE STEAM VALVE SHALL CLOSE WHENEVER THE HOT WATER SUPPLY TEMPERATURE RISES FROM 180°F TO 200°F (ADJ.).

2 M702 **HEATING HOT WATER LOOP CONTROL SCHEMATIC**
NTS

DLZ INDIANA, LLC

JOSHUA R. APLING REGISTERED PE 10900276 STATE OF INDIANA PROFESSIONAL ENGINEER

REVISION

NO.							

DRAWN: JRA | CHK'D.: JRA
DESIGNED: JRA | APPRV'D.: JRA
DATE: DECEMBER 6, 2018

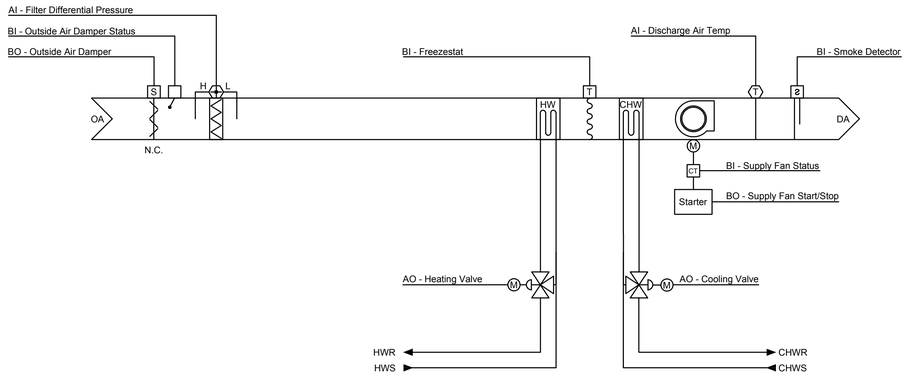
DLZ PROJECT NUMBER 1663-1191-90

INDIANA
RICHMOND

WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL CONTROL SCHEMATICS

DRAWING NUMBER
M702



RUN CONDITIONS - AS SCHEDULED:
THE UNIT SHALL RUN WHEN:

- DEFINED BY OCCUPANCY SCHEDULE (ADJ).

EMERGENCY SHUTDOWN:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL.

FREEZE PROTECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A FREEZESTAT STATUS.

SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SMOKE DETECTOR STATUS.

OUTSIDE AIR DAMPER:
THE OUTSIDE AIR DAMPER SHALL OPEN ANYTIME THE UNIT RUNS AND SHALL CLOSE ANYTIME THE UNIT STOPS. THE SUPPLY FAN SHALL START ONLY AFTER THE DAMPER STATUS HAS PROVEN THE DAMPER IS OPEN. THE OUTSIDE AIR DAMPER SHALL CLOSE 4SEC (ADJ.) AFTER THE SUPPLY FAN STOPS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- OUTSIDE AIR DAMPER FAILURE: COMMANDED OPEN, BUT THE STATUS IS CLOSED.
- OUTSIDE AIR DAMPER IN HAND: COMMANDED CLOSED, BUT THE STATUS IS OPEN.

SUPPLY FAN:

THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME, UNLESS SHUTDOWN ON SAFETIES.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE COOLING COIL VALVE TO MAINTAIN A DISCHARGE AIR TEMPERATURE OF 63°F (ADJ).

THE COOLING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS GREATER THAN 65°F (ADJ.).
- AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT.
- AND THE FAN STATUS IS ON.

THE COOLING COIL VALVE SHALL OPEN TO 50% (ADJ.) WHENEVER THE FREEZESTAT IS ON.

HEATING COIL VALVE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN A DISCHARGE AIR TEMPERATURE OF 65°F (ADJ) .

THE HEATING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
- AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
- AND THE FAN STATUS IS ON.

THE HEATING COIL VALVE SHALL OPEN TO 100% (ADJ.) WHENEVER THE FREEZESTAT IS ON.

FILTER DIFFERENTIAL PRESSURE MONITOR:
THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FILTER CHANGE REQUIRED: FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

DISCHARGE AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
- LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).

1 / M703 **DEDICATED OUTDOOR AIR-HANDLING UNIT CONTROL SCHEMATIC - AHU-4, AHU-5**
NTS

DLZ INDIANA, LLC

JOSHUA R. APLING — REGISTERED — PE 10900276 — STATE OF INDIANA — PROFESSIONAL ENGINEER

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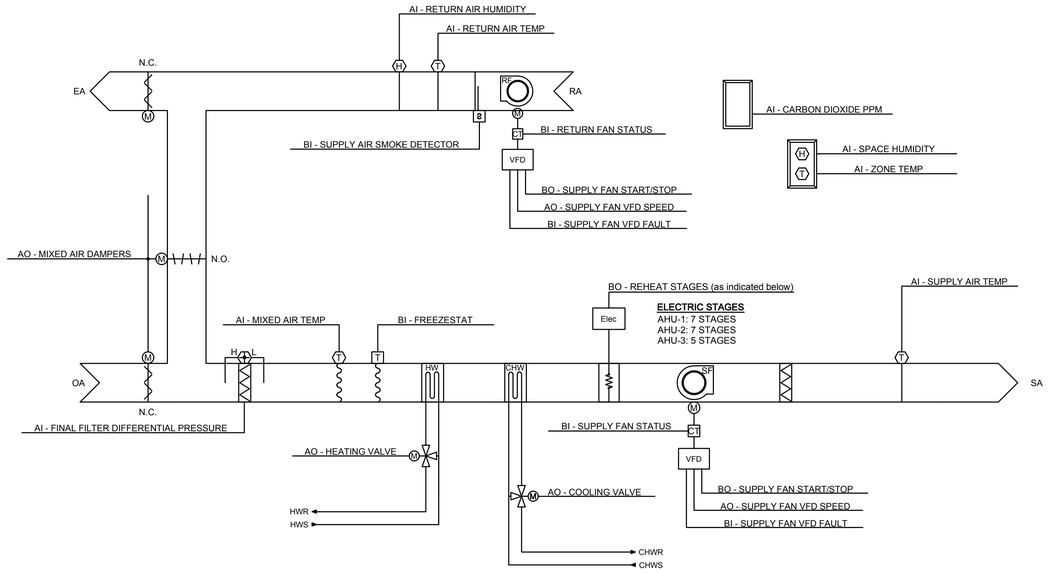
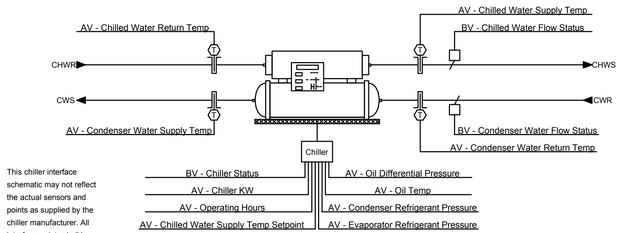
RICHMOND INDIANA

WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL
CONTROL SCHEMATICS

DRAWING NUMBER
M703





This chiller interface schematic may not reflect the actual sensors and points as supplied by the chiller manufacturer. All interface points shall be coordinated with the existing chillers.

2 / M704 **CHILLER INTERFACE CONTROL SCHEMATIC**
NTS

CHILLER INTERFACE MONITOR (CH-1,2):
EXISTING CHILLERS SHALL REMAIN INTERFACED TO THE EXISTING AUTOMATED LOGIC BUILDING MANAGEMENT SYSTEM.

CHILLER INTERFACE MONITOR (CH-3):
CURRENT CHILLER STATUS AND OPERATING CONDITIONS SHALL BE MONITORED THROUGH ITS COMMUNICATIONS INTERFACE PORT TO THE EXISTING AUTOMATED LOGIC BUILDING MANAGEMENT SYSTEM. THE INTERFACE SHALL MONITOR AND TREND THE POINTS SHOWN.

RUN CONDITIONS - CONTINUOUS:

THE UNIT SHALL RUN CONTINUOUSLY AND SHALL MAINTAIN:
- A 78°F (ADJ.) COOLING SETPOINT
- A 65°F (ADJ.) HEATING SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
- LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

FREEZE PROTECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A FREEZESTAT STATUS.

RETURN AIR SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SUPPLY AIR SMOKE DETECTOR STATUS.

OPTIMAL START:
THE UNIT SHALL START PRIOR TO SCHEDULED OCCUPANCY BASED ON THE TIME NECESSARY FOR THE ZONES TO REACH THEIR OCCUPIED SETPOINTS. THE START TIME SHALL AUTOMATICALLY ADJUST BASED ON CHANGES IN OUTSIDE AIR TEMPERATURE AND ZONE TEMPERATURE.

SUPPLY FAN:
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

COOLING COIL VALVE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE COOLING COIL VALVE TO MAINTAIN ITS COOLING SETPOINT.

THE COOLING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS GREATER THAN 60°F (ADJ.).
- AND THE ECONOMIZER IS DISABLED OR FULLY OPEN.
- AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT.
- AND THE SUPPLY FAN STATUS IS ON.
- AND THE HEATING IS NOT ACTIVE.

THE COOLING COIL VALVE SHALL OPEN TO 50% (ADJ.) WHENEVER THE FREEZESTAT IS ON.

HEATING COIL VALVE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS HEATING SETPOINT. VALVE SHALL MAINTAIN A MINIMUM DISCHARGE AIR TEMPERATURE OF 55°F (ADJ.) AND VALVE SHALL MODULATE TO OPEN AS NEEDED TO MAINTAIN THE SPACE HEATING SETPOINT.

THE HEATING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS LESS THAN 60°F (ADJ.).
- AND THE ECONOMIZER IS DISABLED OR FULLY OPEN.
- AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
- AND THE SUPPLY FAN STATUS IS ON.
- AND THE COOLING IS NOT ACTIVE.

THE HEATING COIL VALVE SHALL OPEN TO 100% (ADJ.) WHENEVER THE FREEZESTAT IS ON.

ELECTRIC REHEAT FOR HUMIDITY CONTROL:
THE CONTROLLER SHALL STAGE THE ELECTRIC HEAT AS NECESSARY TO MAINTAIN A SPACE RELATIVE HUMIDITY OF 55% (ADJ.).

ECONOMIZER:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE ECONOMIZER DAMPERS IN SEQUENCE TO MAINTAIN A SETPOINT 2°F LESS THAN THE ZONE COOLING SETPOINT. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM ADJUSTABLE POSITION OF 20% (ADJ.) OPEN WHENEVER OCCUPIED.

THE ECONOMIZER SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
- AND THE OUTSIDE AIR ENTHALPY IS LESS THAN 22 BTU/LB.
- AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE.
- AND THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY.
- AND THE SUPPLY FAN STATUS IS ON.

THE ECONOMIZER SHALL CLOSE WHENEVER:
- MIXED AIR TEMPERATURE DROPS FROM 45°F TO 40°F (ADJ.).
- OR ON LOSS OF SUPPLY FAN STATUS.
- OR FREEZESTAT IS ON.

THE OUTSIDE AIR DAMPER SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN WHEN THE UNIT IS OFF.

MINIMUM OUTSIDE AIR VENTILATION - CARBON DIOXIDE (CO2) CONTROL:
WHEN IN THE OCCUPIED MODE, THE CONTROLLER SHALL MEASURE THE SPACE CO2 SENSOR LEVELS AND MODULATE THE OUTSIDE AIR DAMPERS OPEN ON RISING CO2 CONCENTRATIONS, OVERRIDING NORMAL DAMPER OPERATION TO MAINTAIN A MAXIMUM CO2 SETPOINT OF 1000 PPM (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH RETURN AIR CO2 CONCENTRATION: IF THE RETURN AIR CO2 CONCENTRATION IS GREATER THAN 1000 PPM (ADJ.).

FILTER DIFFERENTIAL PRESSURE MONITOR:
THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FINAL FILTER.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- FILTER CHANGE REQUIRED: FINAL FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

MIXED AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE MIXED AIR TEMPERATURE AND USE AS REQUIRED FOR ECONOMIZER CONTROL.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.).
- LOW MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

RETURN AIR HUMIDITY:
THE CONTROLLER SHALL MONITOR THE RETURN AIR HUMIDITY AND USE AS REQUIRED FOR ECONOMIZER CONTROL.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS GREATER THAN 70% (ADJ.).
- LOW RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS LESS THAN 35% (ADJ.).

RETURN AIR TEMPERATURE:
HE CONTROLLER SHALL MONITOR THE RETURN AIR TEMPERATURE AND USE AS REQUIRED FOR ECONOMIZER CONTROL.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.).
- LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

SUPPLY AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
- LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

1 / M704 **COURTROOM AHU SCHEMATIC - AHU-1, AHU-2, AHU-3**
NTS

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INDIANA
RICHMOND

WAYNE COUNTY COURTHOUSE
MECHANICAL RENOVATION

MECHANICAL CONTROL SCHEMATICS

DRAWING NUMBER
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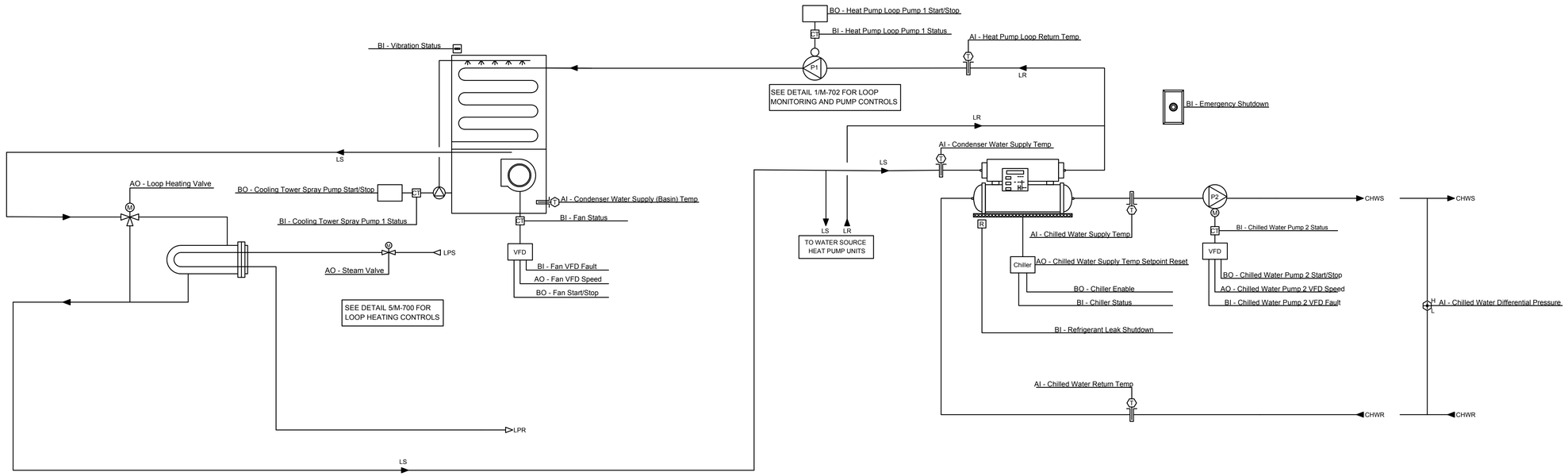

CHILLER - RUN CONDITIONS:

THE CHILLER SHALL BE ENABLED TO RUN WHENEVER:
- THE AHU OUTSIDE AIR CAN NO LONGER COOL THE BUILDING
- **OR** THE OUTSIDE AIR TEMPERATURE IS GREATER THAN 65°F (ADJ.).

TO PREVENT SHORT CYCLING, THE CHILLER SHALL RUN FOR AND BE OFF FOR MINIMUM ADJUSTABLE TIMES (BOTH USER DEFINABLE), UNLESS SHUTDOWN ON SAFETIES OR OUTSIDE AIR CONDITIONS.

THE CHILLER SHALL RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

EMERGENCY SHUTDOWN:
THE CHILLER SHALL SHUT DOWN AND AN ALARM GENERATED UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL STATUS.

REFRIGERANT DETECTION:
THE CHILLER SHALL SHUT DOWN AND AN ALARM GENERATED UPON RECEIVING A REFRIGERANT LEAK DETECTION STATUS.

CHILLED WATER PUMP OPERATION:
THE CHILLED WATER PUMP SHALL RUN ANYTIME THE CHILLER IS CALLED TO RUN. THE CHILLED WATER PUMP SHALL ALSO RUN FOR FREEZE PROTECTION WHENEVER THE OUTSIDE AIR TEMPERATURE IS LESS THAN A USER DEFINABLE SETPOINT (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:
CHILLED WATER PUMP 1
- FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.
- VFD FAULT.

HEAT PUMP LOOP PUMP LEAD/STANDBY OPERATION:

THE HEAT PUMP LOOP PUMP SHALL RUN ANYTIME THE CHILLER IS CALLED TO RUN.

THE PUMP SHALL START PRIOR TO THE CHILLER BEING ENABLED AND SHALL STOP ONLY AFTER THE CHILLER IS DISABLED. THE PUMPS SHALL THEREFORE HAVE:
- A USER ADJUSTABLE DELAY ON START.
- AND A USER ADJUSTABLE DELAY ON STOP.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

HEAT PUMP LOOP PUMP 1
- FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

CHILLER:
THE CHILLER SHALL BE ENABLED A USER ADJUSTABLE TIME AFTER PUMP STATUSES ARE PROVEN ON. THE CHILLER SHALL THEREFORE HAVE A USER ADJUSTABLE DELAY ON START.

THE DELAY TIME SHALL BE SET APPROPRIATELY TO ALLOW FOR ORDERLY CHILLED WATER SYSTEM START-UP, SHUTDOWN AND SEQUENCING.

THE CHILLER SHALL RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- CHILLER FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- CHILLER RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- CHILLER RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.

CHILLED WATER SUPPLY TEMPERATURE SETPOINT:
THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL RESET BASED ON OUTSIDE AIR TEMPERATURE.

AS OUTSIDE AIR TEMPERATURE DROPS FROM 75°F (ADJ.) TO 65°F (ADJ.) THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL RESET UPWARDS BY ADDING FROM 0°F (ADJ.) TO 10°F (ADJ.) TO THE CURRENT SETPOINT.

COOLING TOWER RUN CONDITIONS:

THE COOLING TOWER SYSTEM SHALL BE ENABLED TO RUN WHENEVER:
- THE LOOP MONITOR IS ENABLED BY ZONE REQUIREMENTS.
- **OR** IF REQUIRED BY SIGNAL FROM THE CHILLER.
- **AND** OUTSIDE AIR TEMPERATURE IS GREATER THAN 37°F (ADJ.)

WHEN COOLING TOWER IS RUNNING, THE TOWER SPRAY PUMP SHALL BE ACTIVATED.

VIBRATION SWITCH:

THE COOLING TOWER SHALL SHUTDOWN AND GENERATE AN ALARM UPON RECEIVING A VIBRATION SWITCH STATUS.

COOLING TOWER VFD FAN - CONDENSER WATER TEMPERATURE CONTROL:

THE LOOP CONTROLLER SHALL MEASURE THE COOLING TOWER CONDENSER WATER SUPPLY TEMPERATURE AND MODULATE THE CONDENSER WATER FAN VFD IN SEQUENCE TO MAINTAIN SETPOINTS.

THE FOLLOWING SETPOINTS ARE RECOMMENDED VALUES. ALL SETPOINTS SHALL BE FIELD ADJUSTED DURING THE COMMISSIONING PERIOD TO MEET THE REQUIREMENTS OF ACTUAL FIELD CONDITIONS.

ON RISING SUPPLY TEMPERATURE, THE CONTROLLER SHALL MODULATE THE THE FAN VFD TO MAINTAIN SETPOINT OF 85°F (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- FAN
  - FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
  - RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
  - VFD FAULT.
- HIGH COOLING TOWER SUPPLY (BASIN) TEMP: IF GREATER THAN 86°F (ADJ.).
- LOW COOLING TOWER SUPPLY (BASIN) TEMP: IF LESS THAN 38°F (ADJ.).

CHILLED WATER TEMPERATURE MONITORING:
THE FOLLOWING TEMPERATURES SHALL BE MONITORED:
- CHILLED WATER SUPPLY.
- CHILLED WATER RETURN.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH CHILLED WATER SUPPLY TEMP: IF THE CHILLED WATER SUPPLY TEMPERATURE IS GREATER THAN 55°F (ADJ.).
- LOW CHILLED WATER SUPPLY TEMP: IF THE CHILLED WATER SUPPLY TEMPERATURE IS LESS THAN 38°F (ADJ.).

CONDENSER WATER TEMPERATURE MONITORING:
THE FOLLOWING TEMPERATURES SHALL BE MONITORED:
- CONDENSER WATER SUPPLY TEMPERATURE.
- CONDENSER WATER RETURN TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH CONDENSER WATER SUPPLY TEMP: IF THE CONDENSER WATER SUPPLY TEMPERATURE IS GREATER THAN 86°F (ADJ.).
- LOW CONDENSER WATER SUPPLY TEMP: IF THE CONDENSER WATER SUPPLY TEMPERATURE IS LESS THAN 65°F (ADJ.).
- HIGH CONDENSER WATER RETURN TEMP: IF THE CONDENSER WATER RETURN TEMPERATURE IS GREATER THAN 100°F (ADJ.).
- LOW CONDENSER WATER RETURN TEMP: IF THE CONDENSER WATER RETURN TEMPERATURE IS LESS THAN 75°F (ADJ.).

WATER TREATMENT SYSTEM INTERFACE:
INTERFACE THE NEW DDC CONTROL SYSTEM WITH THE EXISTING WATER TREATMENT CONTROL SYSTEM FOR EACH PLANT.

1 / M705 CHILLER AND AND LOOP COOLING CONTROL SCHEMATIC
NTS

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