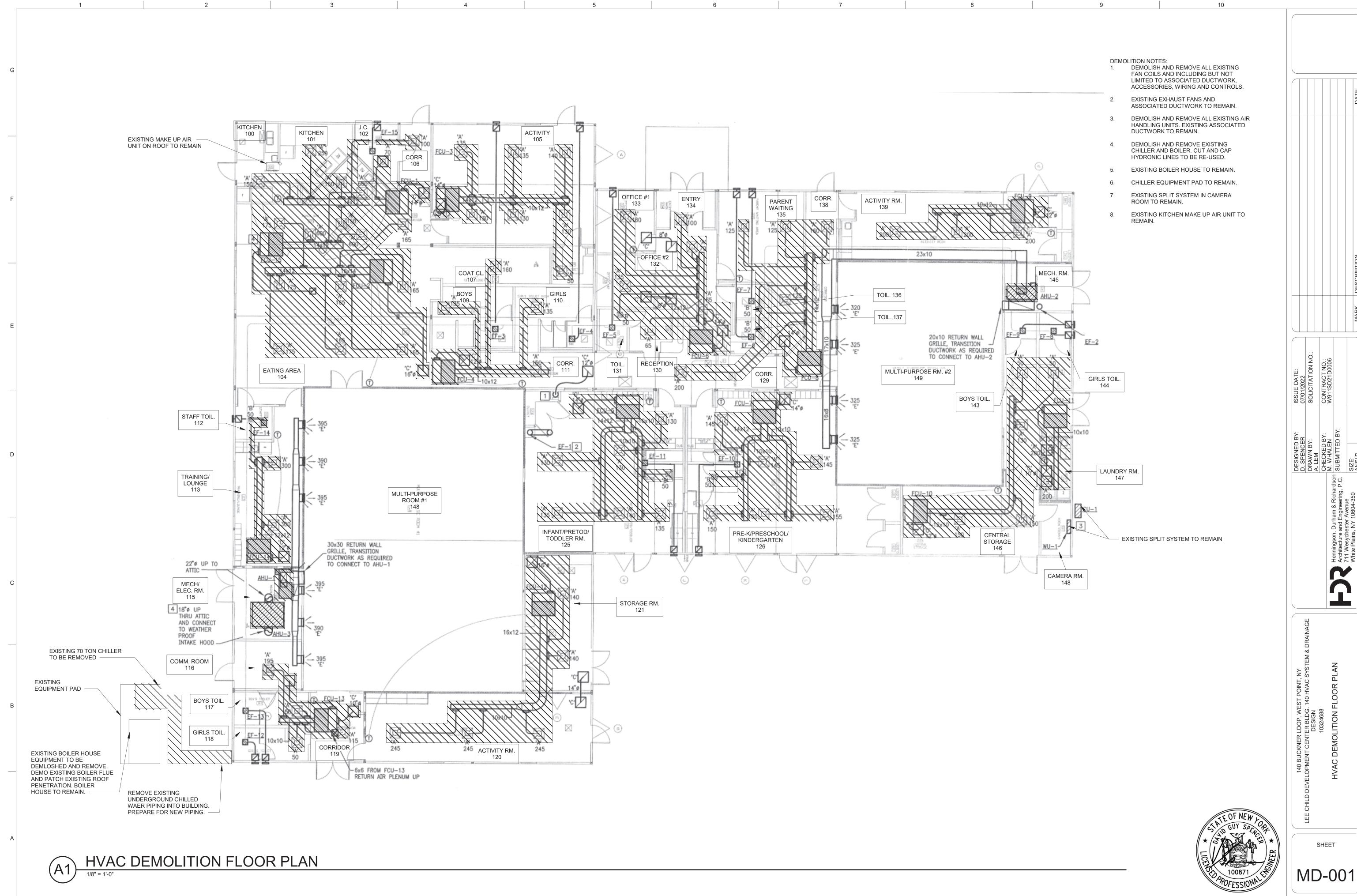
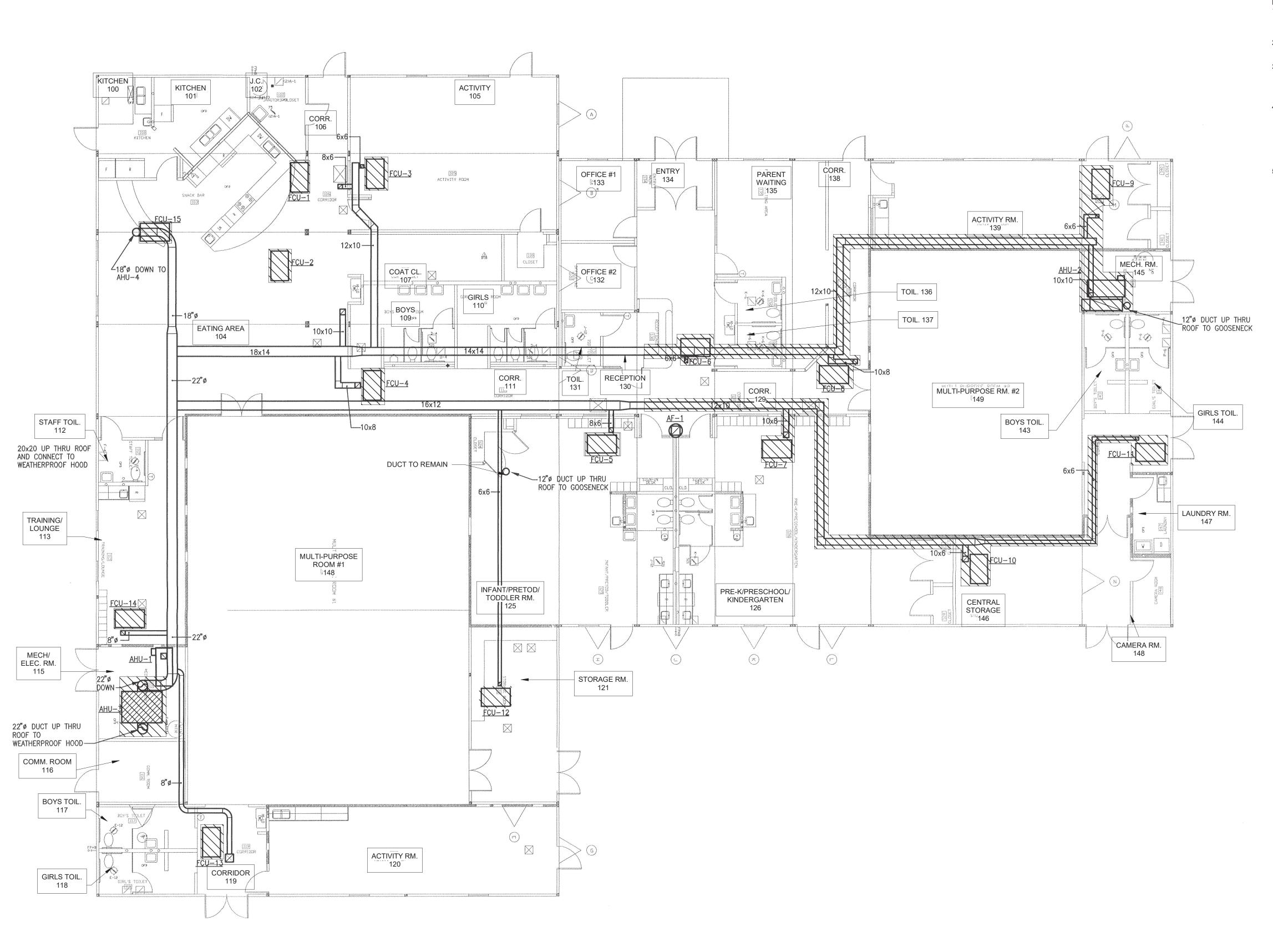


10

SHEET





HVAC DEMOLITION ATTIC PLAN

DEMOLITION NOTES: DEMOLISH AND REMOVE ALL EXISTING FAN COILS AND INCLUDING BUT NOT LIMITED TO ASSOCIATED

CAP CONDENSATE DRAIN LINES AT FAN COILS. CONDENSATE DRAIN PIPING SYSTEM TO REMAIN.

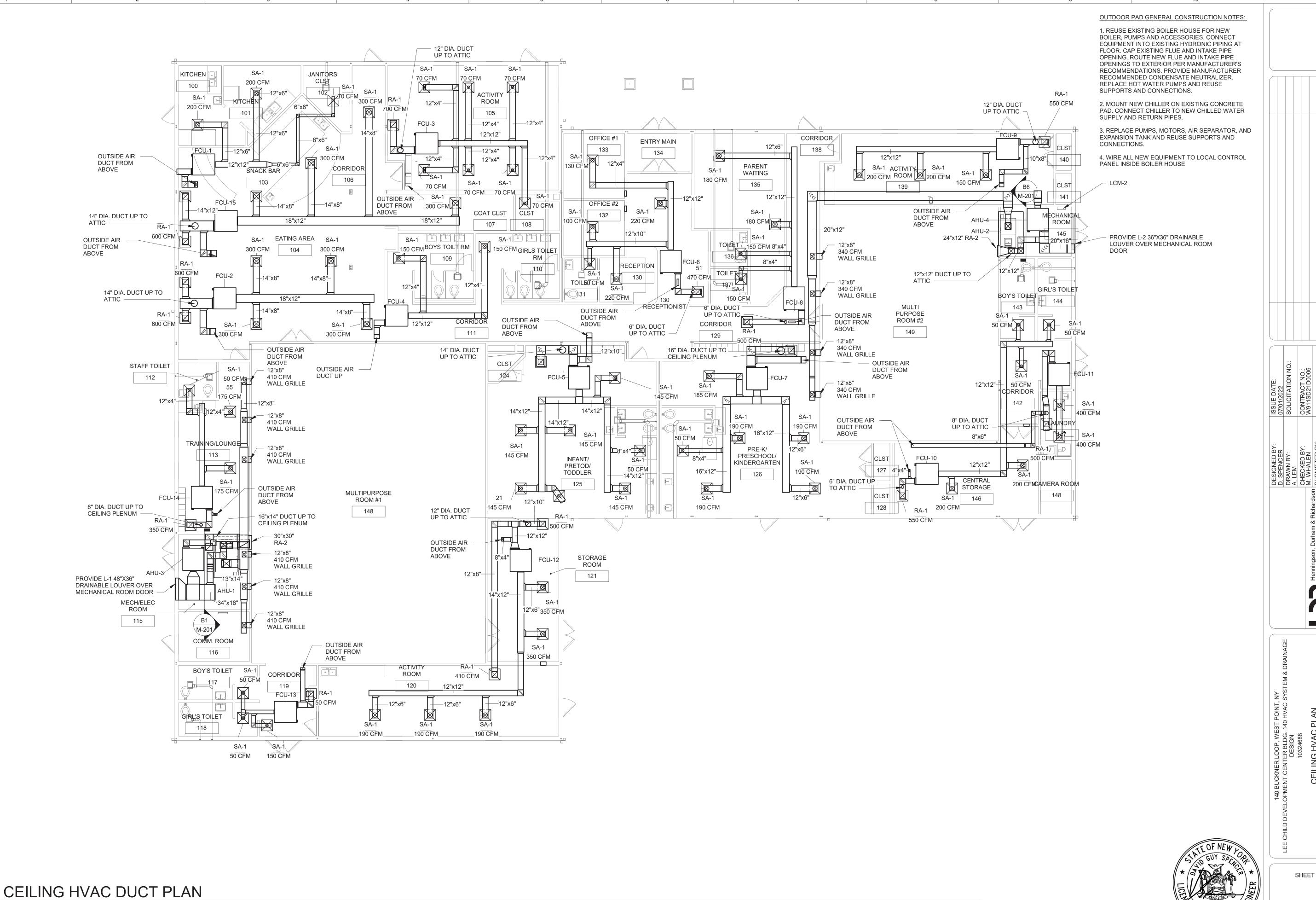
DUCTWORK, ACCESSORIES, WIRING AND CONTROLS.

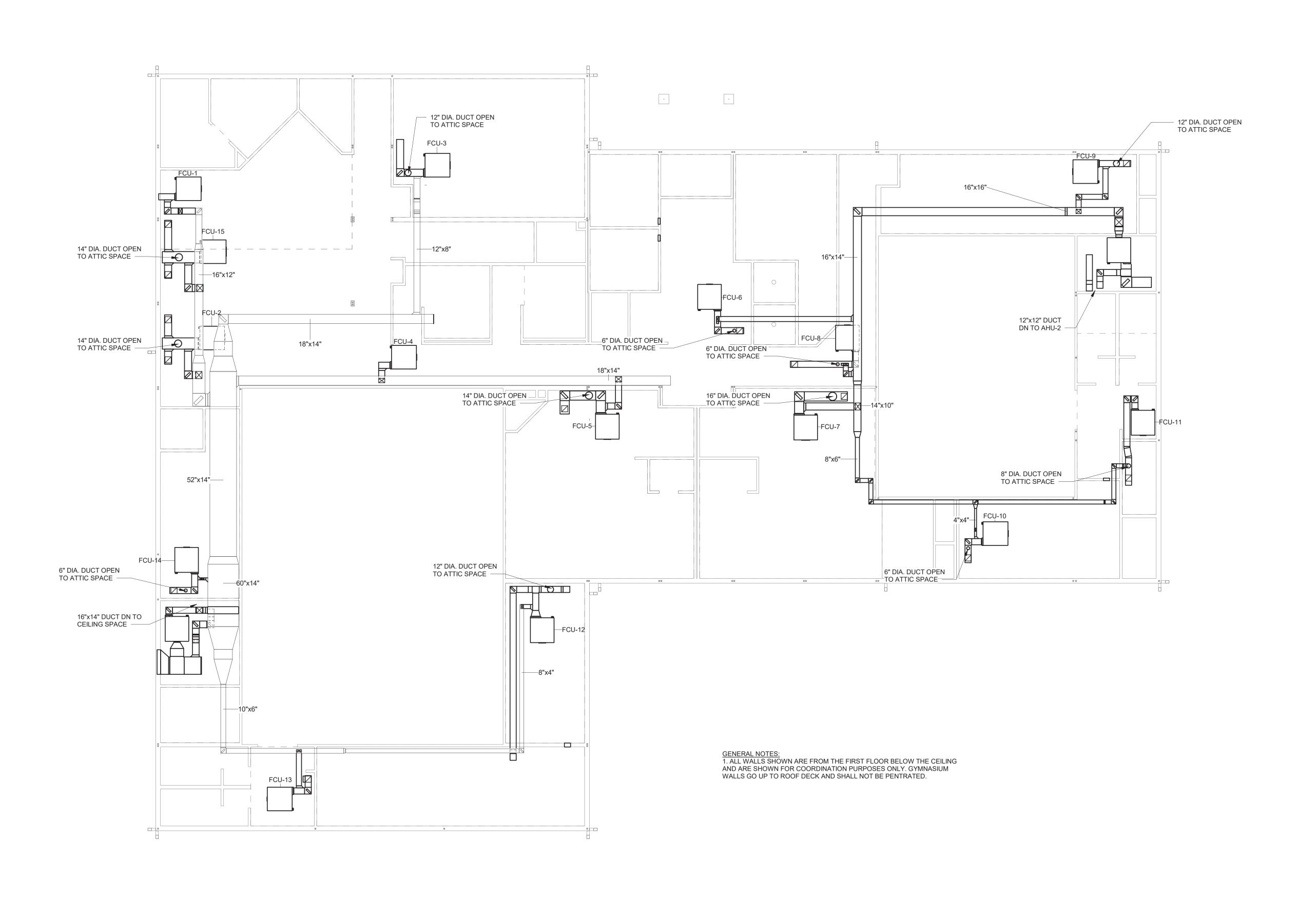
DEMOLISH AND REMOVE ALL EXISTING AIR HANDLING UNITS AND INCLUDING BUT NOT LIMITED TO ASSOCIATED DUCTWORK, ACCESSORIES, WIRING AND

DEMOLISH AND REMOVE ALL EXISTING OUTSIDE AIR SUPPLY DUCT ON THE PLAN EAST SIDE SIDE OF THE BUILDING AT NEAREST FITTING TO DEMO AREA SHOWN ON PLAN. EXISTING OUTSIDE AIR SUPPLY DUCT ON THE PLAN WEST SIDE OF THE BUILDING TO BE REUSED. CAP EXISTING DUCTWORK AFTER REMOVAL.

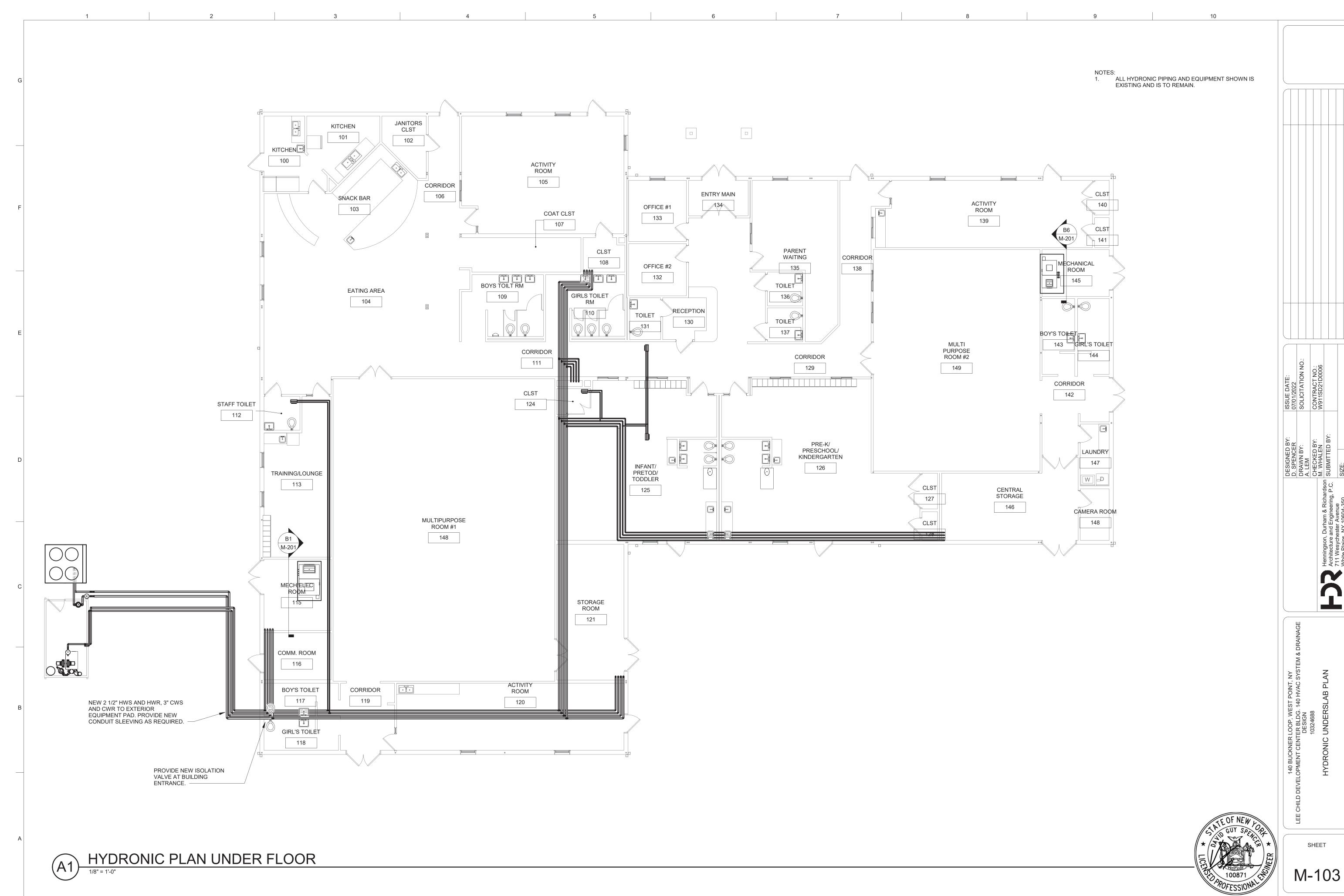
CLEAN ALL EXISTING DUCTWORK BEFORE CONSTRUCTION OF ANY NEW DUCTWORK.

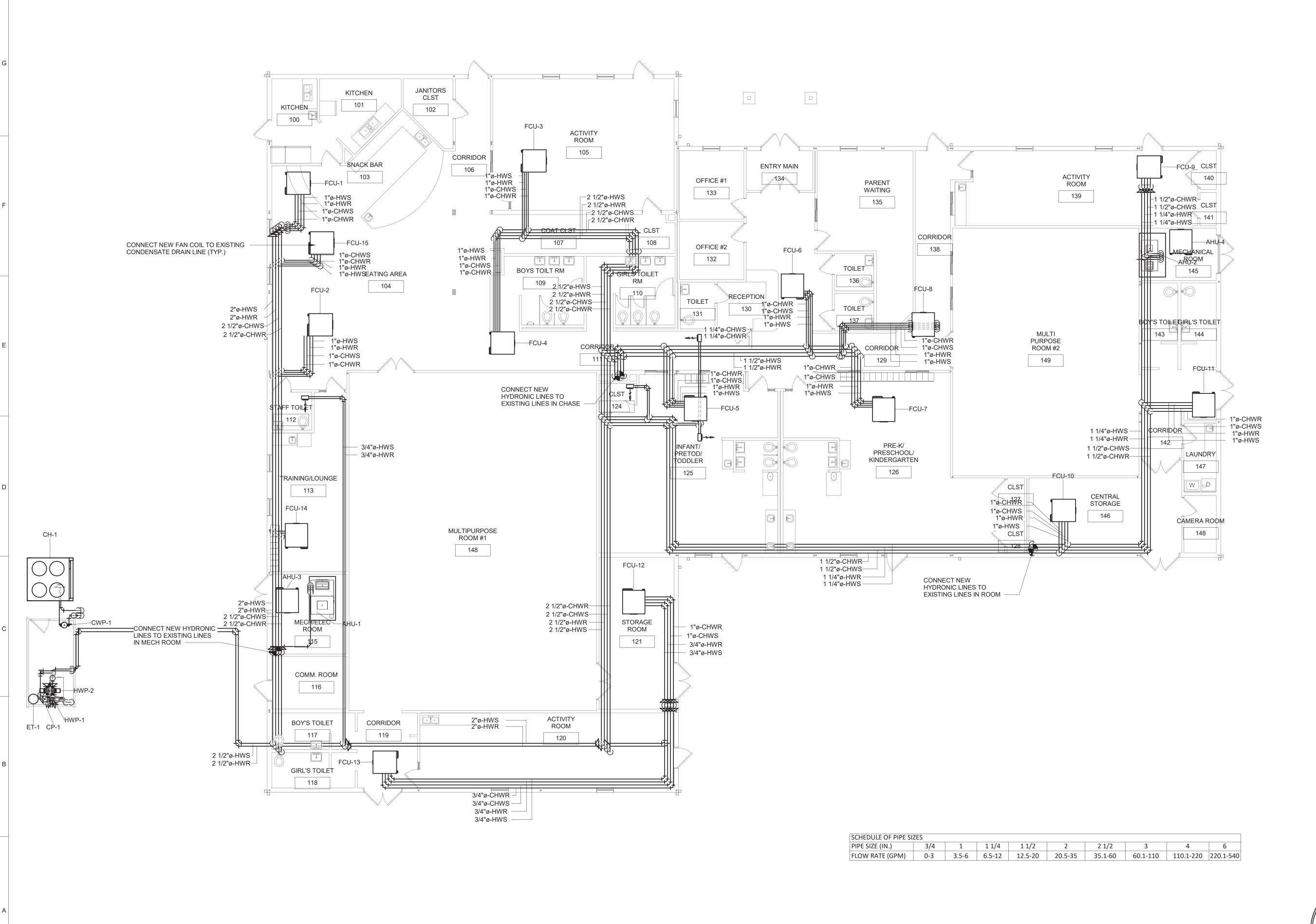
MD-002











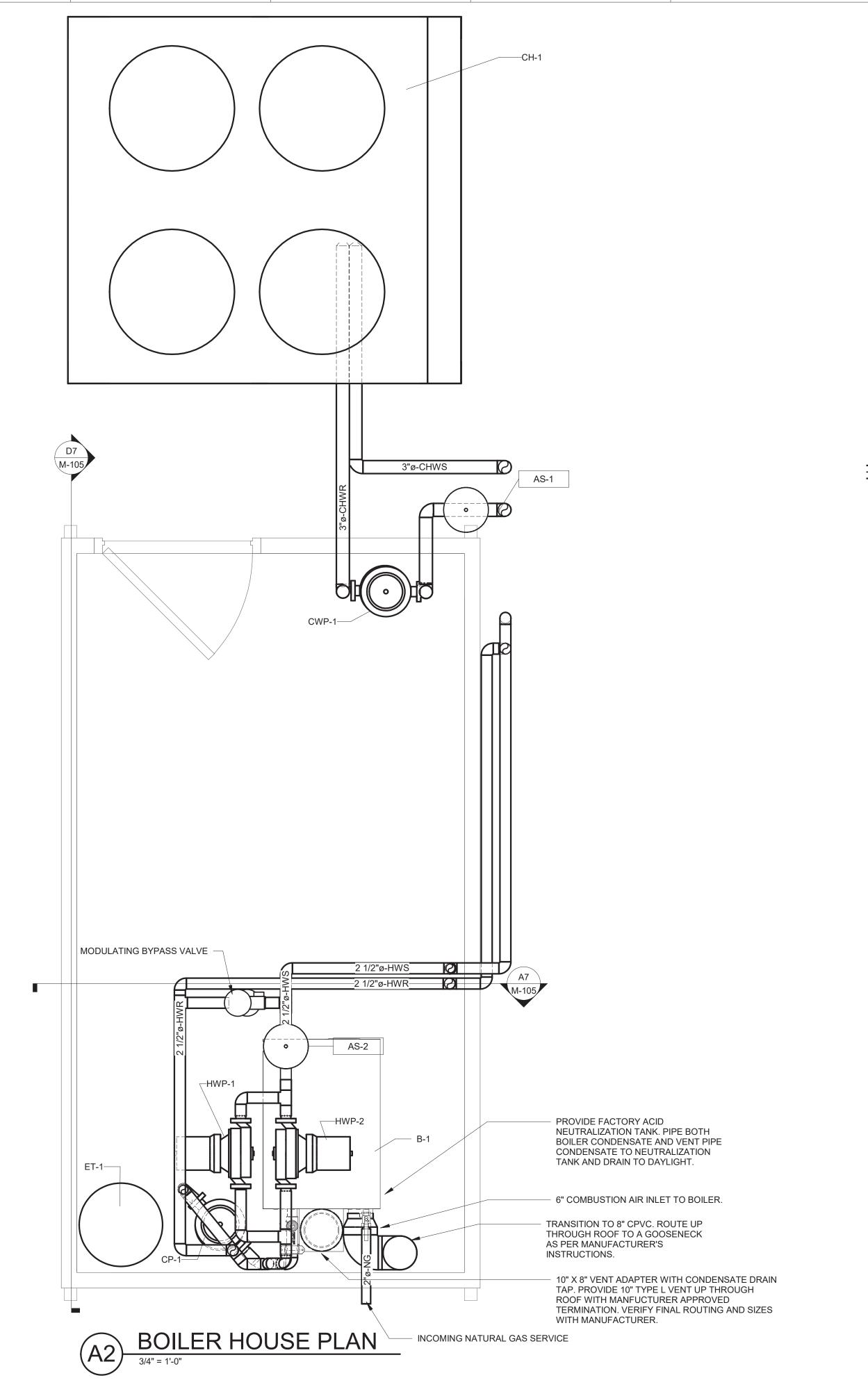
140 BUCKNER LOOP, WEST POINT, NY
LEE CHILD DEVELOPMENT CENTER BLDG. 140 HVAC SYSTEM &
DESIGN
10324688
HYDRONIC, CEILING PLENLIM PLAN

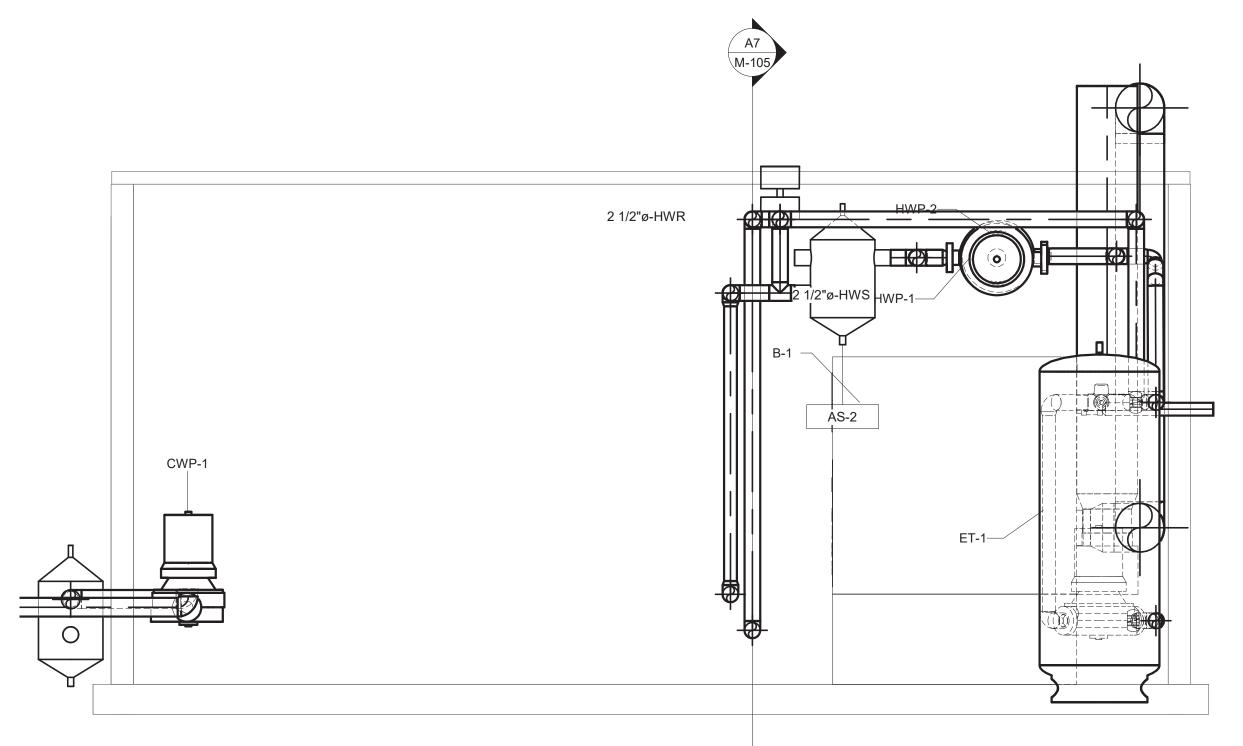
SHEET

M-104

HYDRONIC PLAN CEILING PLAN

1/8" = 1'-0"





BOILER HOUSE LONG SECTION

3/4" = 1'-0"

(A7) BOILER HOUSE SHORT SECTION

3/4" = 1'-0"

GENERAL NOTES:

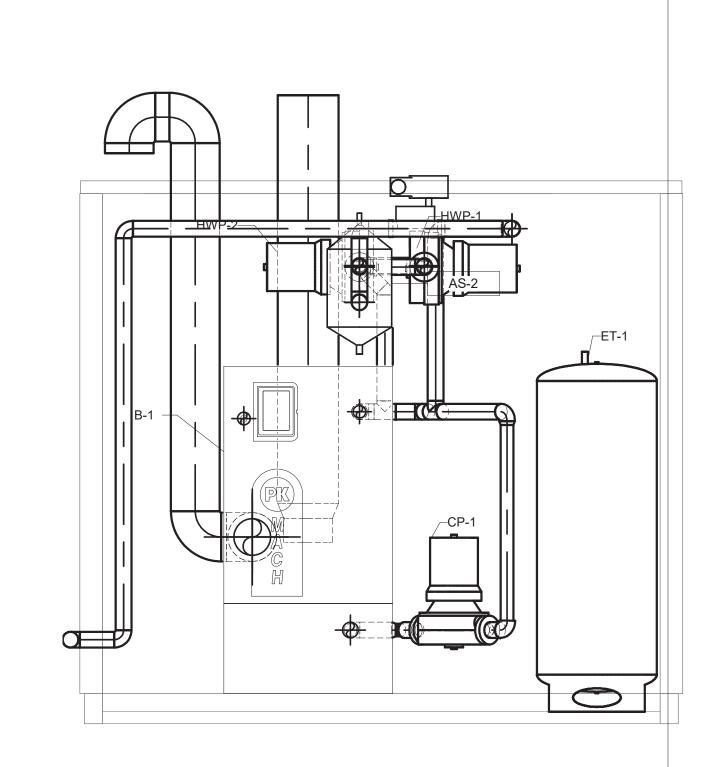
1. ALL FLOOR MOUNTED EQUIPMENT SHALL BE INSTALLED ON 4" HOUSKEEPING PAD. PAD SHALL

BE ANCHORED AND GROUTED.
2. CONTRACTOR SHALL VERIFY EXISTING MEANS

BOILER PIPING. IF NONE PRESENT, PROVIDE A NEW 1/2" CW MAKEUP AT 4' BELOW GRADE FROM

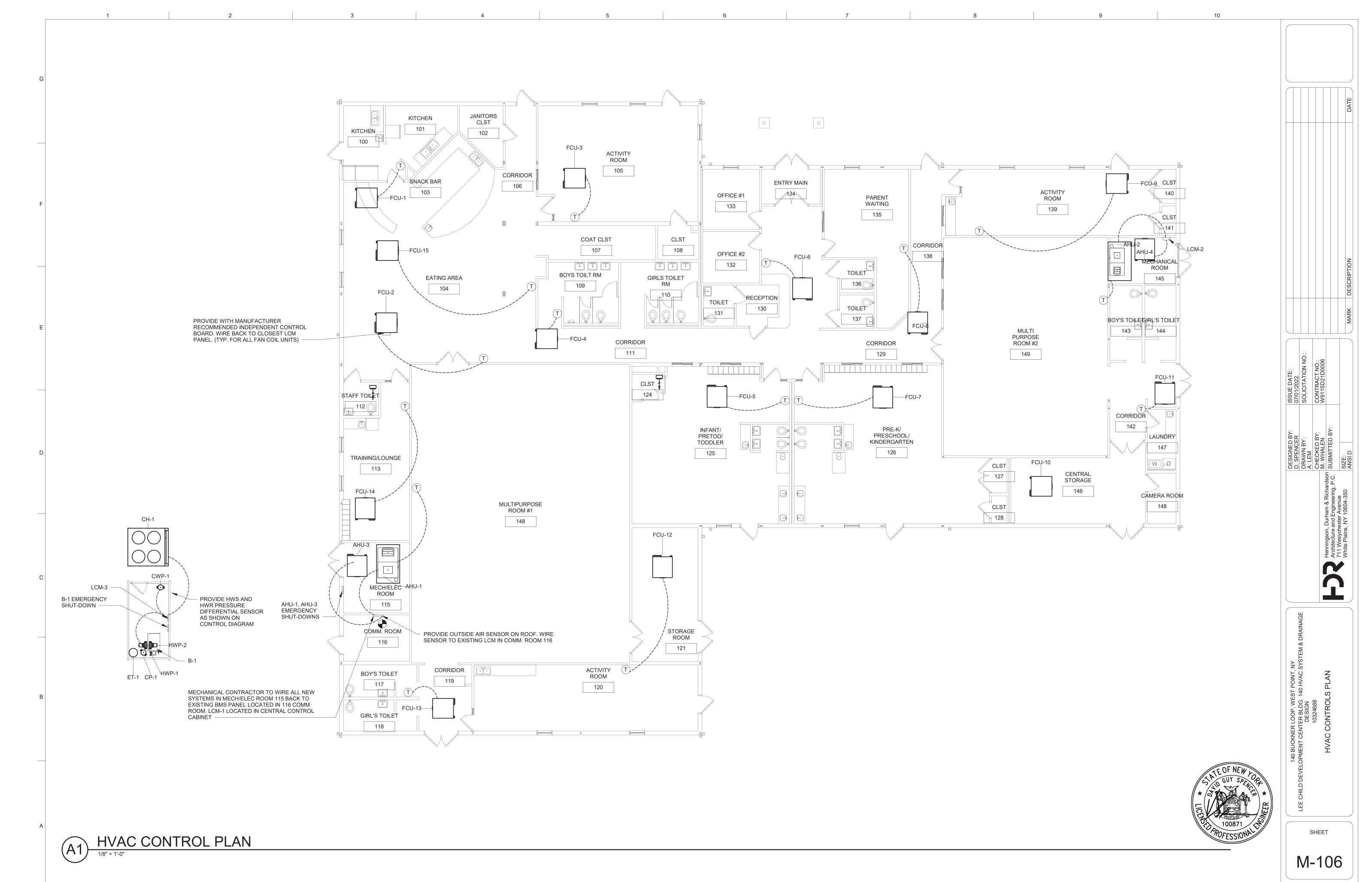
INSIDE THE BUILDING WITH NEW BACKFLOW PREVENTOR INSTALLED INSIDE BOILER HOUSE.

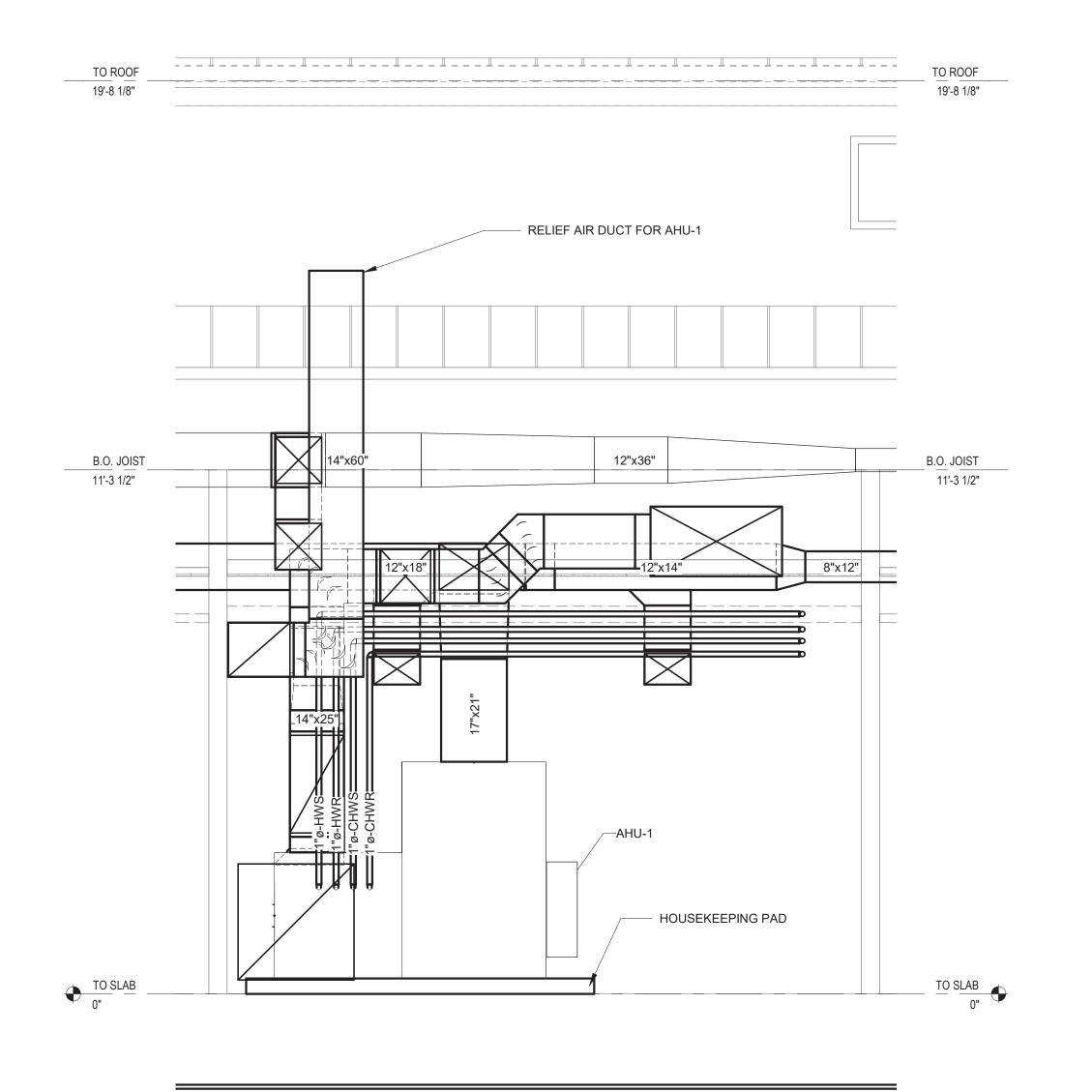
OF BOILER MAKEUP WATER AND CONECT TO NEW

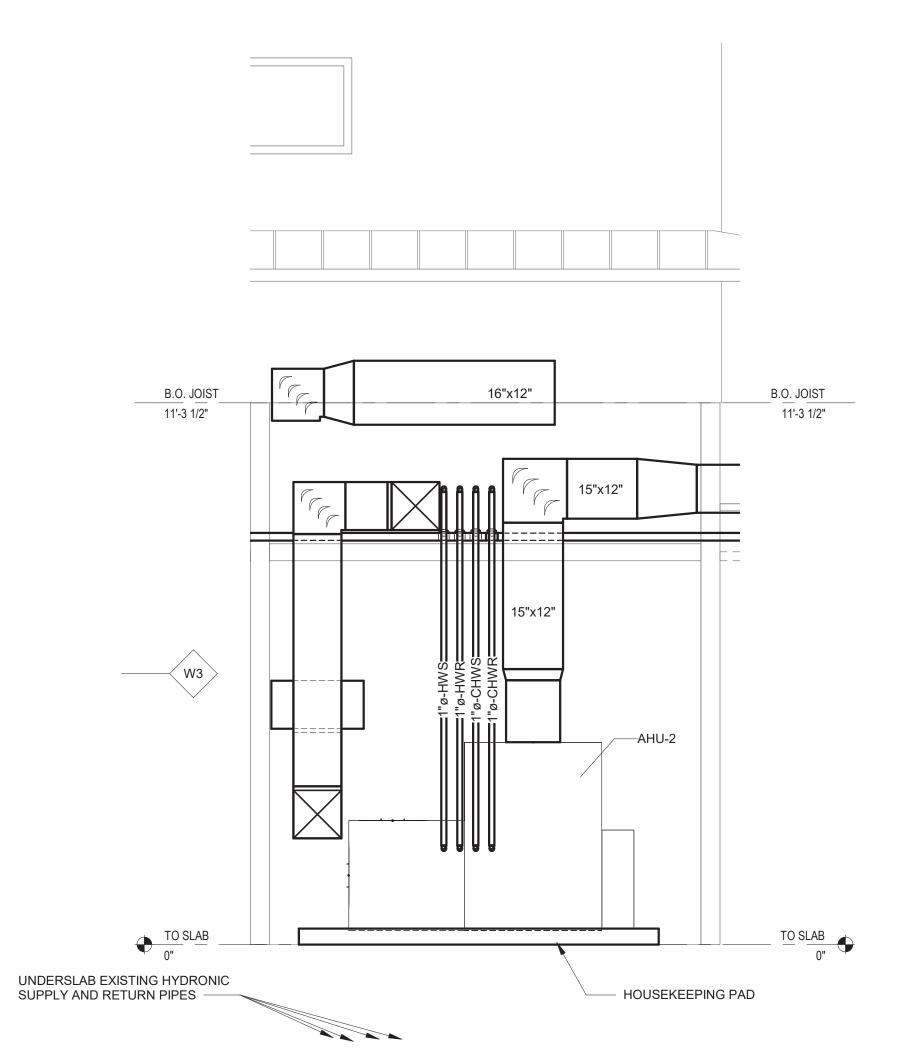




SHEET M-105





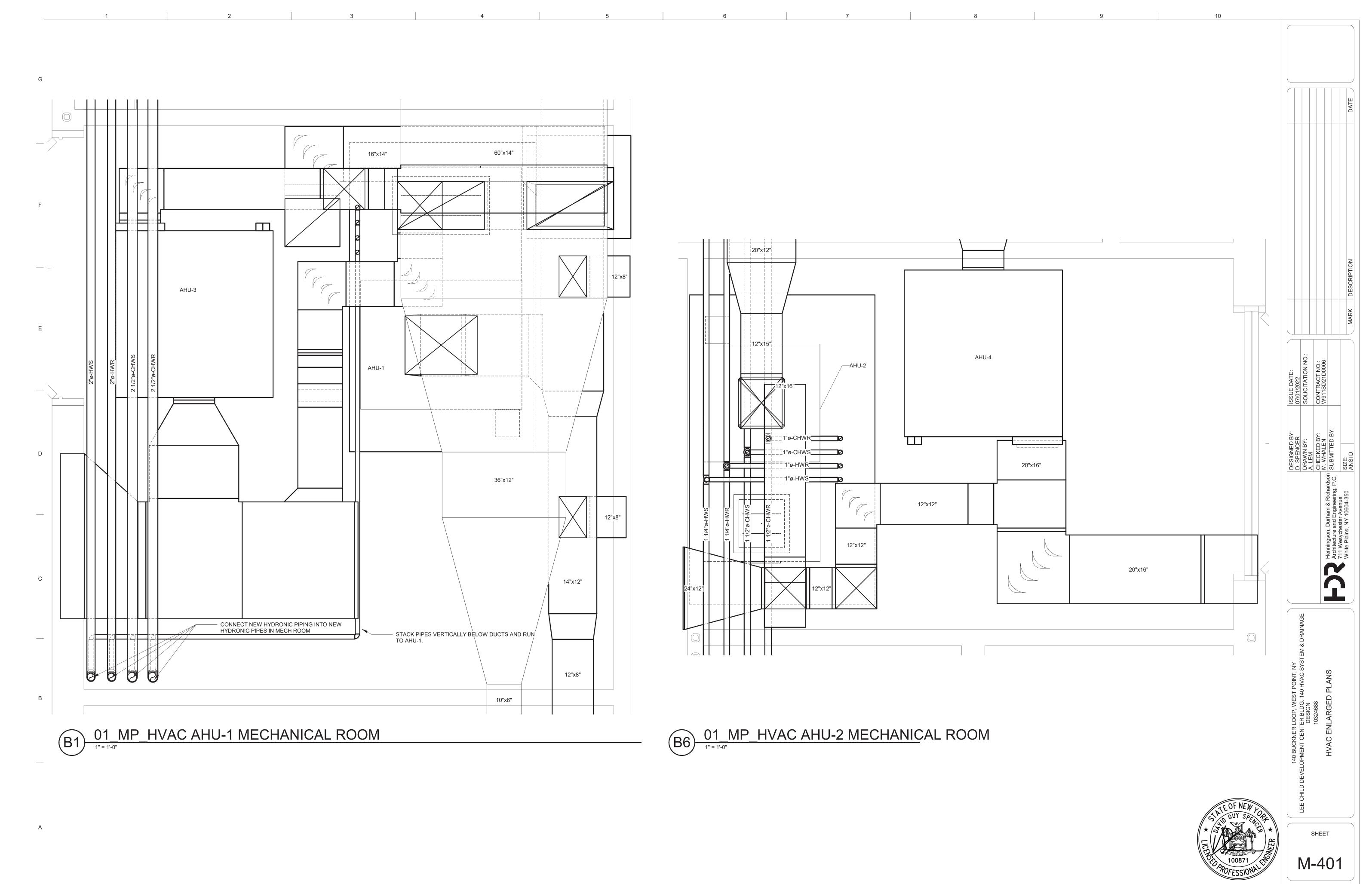


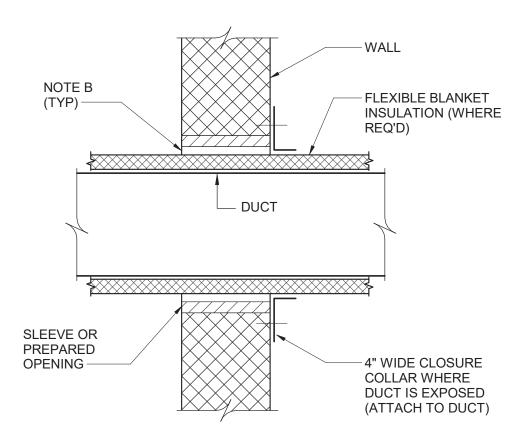
B1 AHU-1 MECHANICAL ROOM SECTION

B6 AHU-2 MECHANICAL ROOM SECTION

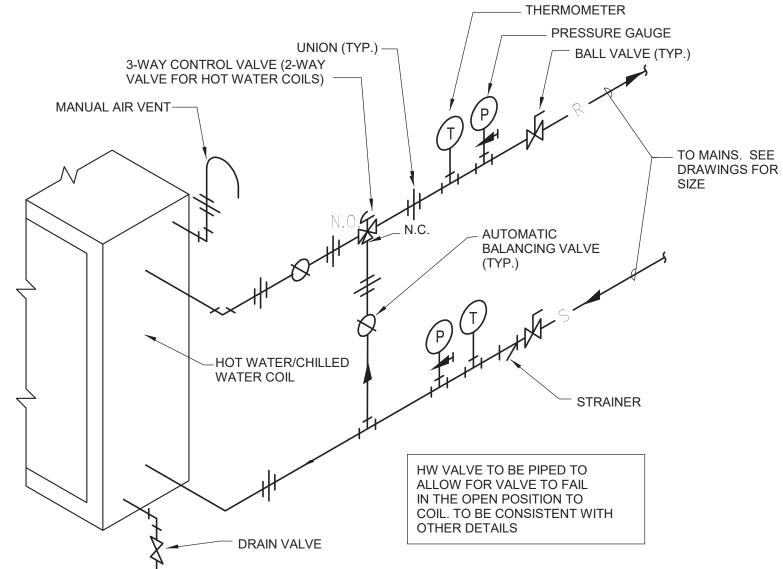


140 BUC
LEE CHILD DEVELOPMENT
LEE CHILD DEVELOPMENT





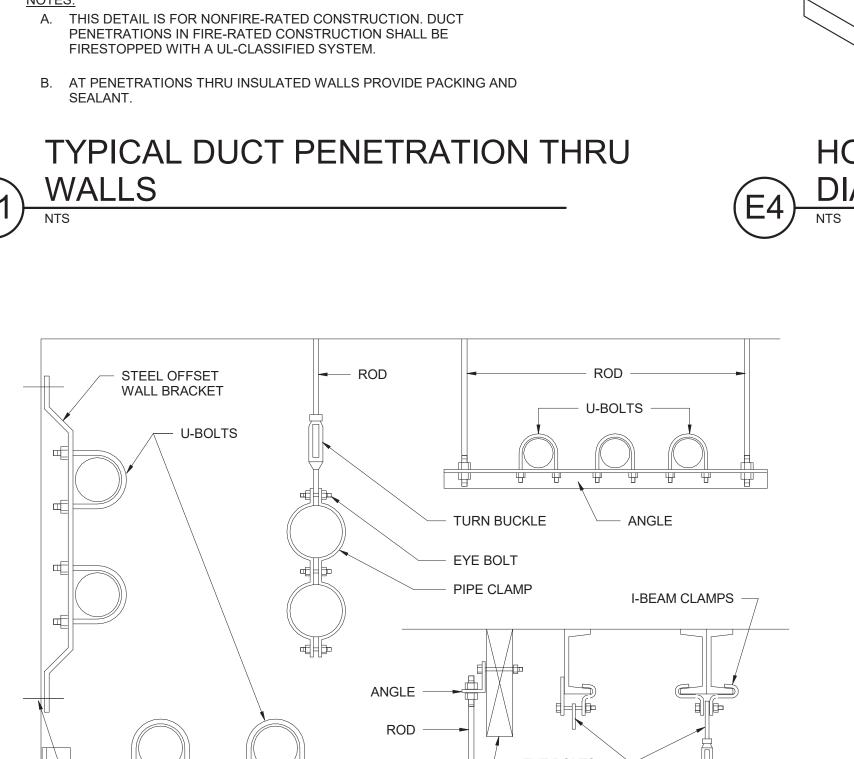
NOTES:

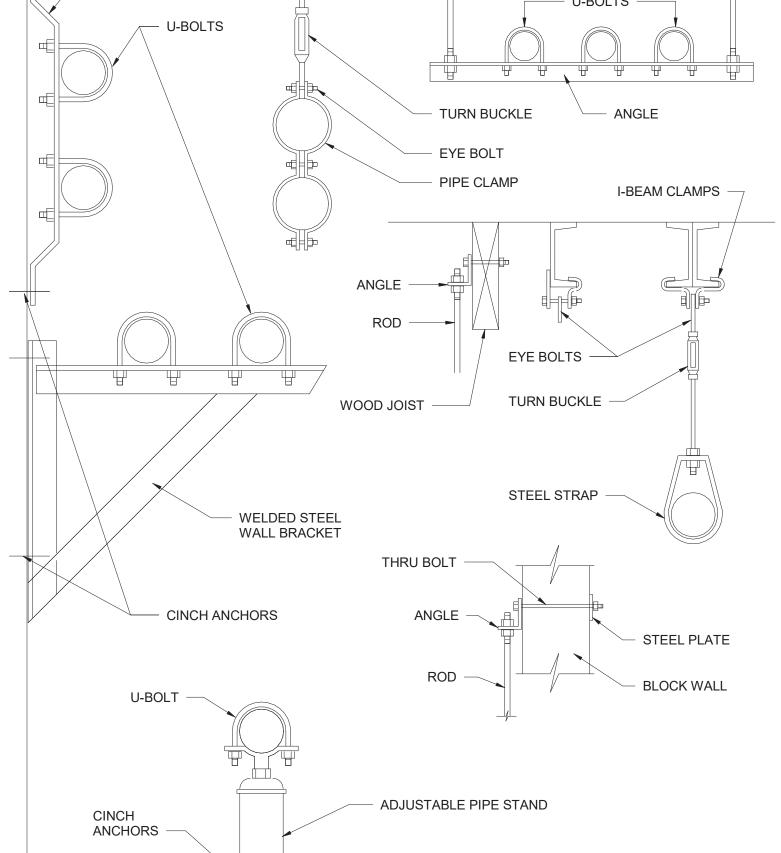


HOT/CHILLED WATER COIL PIPING

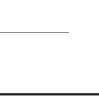
DIAGRAM

NTS





TYPICAL PIPE SUPPORT DETAILS



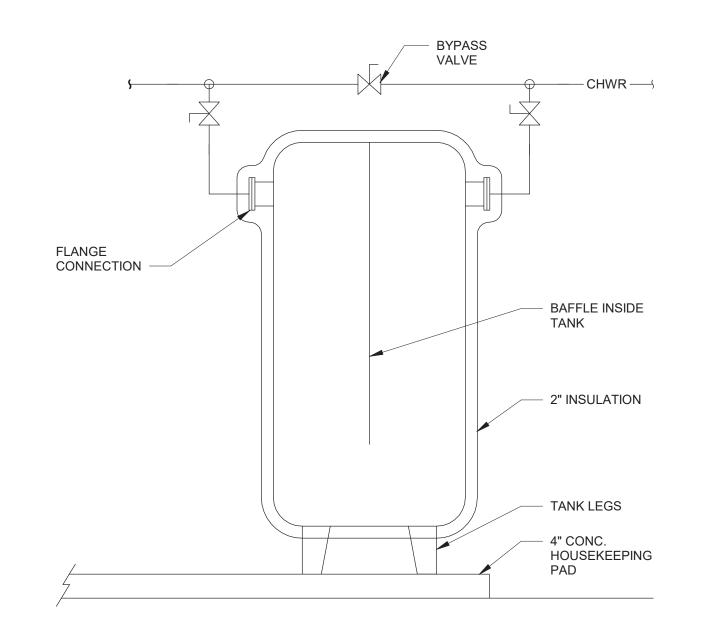
AIR VENT NON INSULATE BODY AND PIPING PER SPEC.

CW/HW WATER AIR SEPARATOR

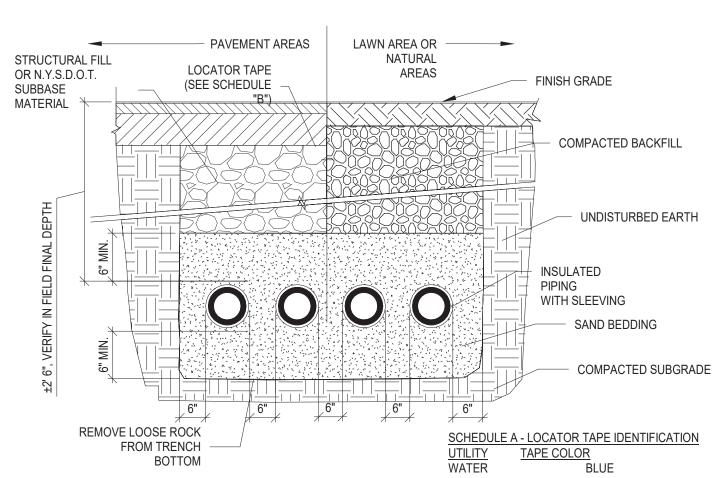
BLOWDOWN INSULATE W/ REMOVEABLE CAP

VALVE STEM EXTENSION REQUIRED

A4 AIR SEPARATOR DETAIL



E7 EXPANSION TANK PIPING DETAIL



PIPE TRENCH DETAIL

NTS



LEE CHILD DEVELOPMENT CENTER BLDG. 140 HVAC SYSTE DESIGN 10324688

HVAC DETAILS

M-501

AIR COOLED	CHILLER UNIT	T SCHEDULE																					,		
			UNIT EFFICIE	NCY	COMPRES	SOR DATA					EVAPOR	RATOR DATA			PACKAGED PUMP		CONDENSER/FAN D	ATA	UNIT ELECTRI	CAL DATA					
MARK NO.	REFRIG. TYPE	MIN. TONS ARI RATING	FULL LOAD EER	IPLV EER	NO.	TYPE	VOLT	PH	HZ	FLUID TEMP. ENT./LV. (DEG. F)	FLUID TYPE	DESIGN FLOW RATE (GPM)	PRESSURE DROP (FT. H20)	NO. OF PUMPS	EXTERNAL HEAD 30% P.G. (FT. H20)	MIN. % EFF.	AMB. AIR ENT. COND. (DEG F)	NO.	MIN. CIRC. AMPS	MAX FUSE SIZE	SCCR	DIMENSIONS	WEIGHT (LBS)	BASIS OF DESIGN	REMARKS
CH-1	R-410A	70.0	10	15.52	4	SCROLL	208	3	60	52/42	30% P.G.	160	11	2	42	84%	95	4	313	350	65000	95"'L X89"W X92"H	3,500	DAIKIN AGZ070C	1 2 3 4 5 6 7 8 9

- 1. AIR COOLED CHILLER UNIT CH-1 SHALL BE COMPONENTS IN A SINGLE PACKAGED CHILLED SYSTEM PROVIDED BY ONE MANUFACTURER
- 2. CHILLER SHALL BE PACKAGED WITH AN INTEGRAL BUFFER TANK. VOLUME SHALL BE LARGE ENOUGH TO ACCOMMODATE 5 MINUTE MINIMUM RUN TIME FOR SCROLL COMPRESSORS
- 3. UNIT CONTROL SYSTEM SHALL DELAY OR EXTEND PERIODS OF COMPRESSOR OPERATION TO STABILIZE HEAD PRESSURE AS REQUIRED BY MANUFACTURER
- 4. PROVIDE UNIT WITH FULL LOUVERED ENCLOSURE TO CONCEAL ALL COMPRESSORS AND PIPING, AND PROVIDE WITH SOUND REDUCTION ENCLOSURES AND INSULATION ON COMPRESSORS

5. PROVIDE ULTRA LOW SOUND FANS

6. UNIT MOUNTED NON-FUSED DISCONNECT

7. PUMP PACKAGE TO OPERATE IN LEAD/LAG OPERATION CONTROLLED BY THE MANUFACTURE SUPPLIED CONTROL PANEL.

8. PROVIDE WITH BUILT IN EXPANSION TANK SIZED BY MANUFACTURER.

9. OR APPROVED EQUAL

PUMP SCHEDULE

				1	1			1						1		
						LIEAD		MOTOR D	ATA							
	MARK NO.	SERVES	LOCATION	TYPE	FLOW (GPM)	HEAD 30%P.G. (FT WAT)	MIN % EFF.	RPM	HP	VOLT	PH	HZ	MANUFACTURER		REMARK	3
	CWP-1	CHILLED WATER	BOILER ENCLOSURE	BASE MOUNT	120	80	84.00%	1800	7.5	208	3	60	ARMSTRONG 4380	1	2	
.	HWP-1	HOT WATER	BOILER ENCLOSURE	BASE MOUNT	65	80	84.00%	1800	5	208	3	60	ARMSTRONG 4380	1	2	3
	HWP-2	HOT WATER	BOILER ENCLOSURE	BASE MOUNT	65	80	84.00%	1800	5	208	3	60	ARMSTRONG 4380	1	2	3
	CP-1	BOILER CIRC.	BOILER ENCLOSURE	INLINE	65	15	84.00%	1800	3/4	208	3	60	ARMSTRONG 4360	1	2	

- 1. PROVIDE STRAIGHT CONSTRUCTION SCREENS AND FINAL OPERATING SCREENS
- 2. PROVIDE CONTROLS PER SPECIFICATIONS
- 3. VFD OPERATION.

MICCELL VNEULG	MECHANICAL	EQUIDMENT SCHEDILLE
MISCELLANEOUS	MECHAMICAL	EQUIPMENT SCHEDULE

							BASIS OF DESIGN	NOTES
	MARK NO.	TYPE	SERVICE	LOCATION	OPERATING CONDITIONS	CAPACITY AND SIZE		
	AS-1	AIR SEPARATOR	CHILLED WATER	EXTERIOR MECH	WORKING PRESSURE=125 PSI	160 GPM 4" CONN.	TACO AC04	1
_	AS-2	AIR SEPARATOR	HOT WATER	EXTERIOR MECH	WORKING PRESSURE=125 PSI	60 GPM 2.5" CONN.	TACO AC02	1
	ET-1	EXPANSION TANK	HOT WATER	EXTERIOR MECH	WORKING PRESSURE=125 PSI	34 GAL VOLUME	TACO CBX130	1

1. OR APPROVED EQUAL

2. INSTALL ALL FLOOR MOUNTED EQUIPMENT ON HOUSEKEEPING...

DIFFUSER S	CHEDULE				
MARK NO.	TYPE	MOUNTING	NECK SIZE	SIZE	BASIS OF DESIGN
SA-1	SUPPLY AIR	LAY-IN	SEE NOTE 1	24"X24"	TITUS OMNI
SA-2	SUPPLY AIR	SURFACE	SEE NOTE 1	6"X48"	TITUS DL-30
RA-1	RETURN AIR	LAY-IN	SEE NOTE 1	24"X24"	TITUS PAR
RA-2	RETURN AIR	SURFACE	SEE NOTE 1	AS SHOWN	TITUS 23RL
EA-1	EXHAUST AIR	LAY-IN	SEE NOTE 1	24"X24"	TITUS PAR
TG-1	TRANSFER AIR	LAY-IN	SEE NOTE 1	24"X24"	TITUS PAR
NOTES					

SCHEDULE DOES NOT INDICATE QUANTITIES. FOR QUANTITIES OF EACH ITEM SEE PLANS

1. NECK SIZE SHALL BE AS FOLLOWS

6" DIA NECK FOR CFM RANGE (0 CFM-100 CFM) 8" DIA NECK FOR CFM RANGE (101 CFM-200 CFM)

10" DIA NECK FOR CFM RANGE (201 CFM-400 CFM) 12" DIA NECK FOR CFM RANGE (401 CFM-500 CFM)

14" DIA NECK FOR CFM RANGE (501 CFM-600 CFM

2. OR APPROVED EQUAL

BOILER SCHEDUL	E	
MARK NO.		B-1
TYPE		CONDENSING
FUEL		NAT GAS
OUTPUT BTU/HR		986,000
INPUT BTU/HR		1,050,000
MIN BTU/HR OUTPUT		197,190
ENTERING/LEAVING V	VATER TEMPERATURE (F)	120 / 150
MAX GPM		65
MIN GPM		18.6
TURNDOWN		5:1
EFF%		94%
ELECTRICAL DATA	VOLTAGE/PHASE/AMPS	120/1PH/10A
BOILER HORSEPOWE		29.5
OPERATING WEIGHT		580
MIN/MAX INLET GAS F		3.5/14 IN WC
OVERALL SIZE (PLAN)		53"x29"
HEIGHT		60"
LOCATION		MECHANICAL ROOM
REMARKS		INLET GASKET VICT.
BASIS OF DESIGN	PATTERSON KELLY	MACH C1050

REMARKS

- 1. INLET & OUTLET CONN. SIZE 2" M.P.T.
- 2. DIRECT VENTING, CATEGORY IV POSITIVE PRESSURE 8"&
- 3. IRI GAS TRAIN
- 4. LOW WATER CUT-OFF OPTION
- 5. REMOTE MODULATING CONTROL OPTION (0-10V INPUT)
- 6. OUTDOOR AIR RESET
- 7. BOILER INLET STRAINER 8. GAS PRESSURE REGULATOR
- 9. VERTICAL COMBUSTION AIR INTAKE AND VENTING, 316L STAINLESS STEEL
- 10. NEUTRALIZATION TANK (S)
- 11. INSTALL BOILER ON CONCRETE HOUSEKEEPING PAD.
- 12. OR APPROVED EQUAL



M-601

SHEET

AIR HANDLING UNIT SCHEDULE

AIR II	ANDLING UNIT SCHE	DOLE																		
						SUPPLY F	AN				CHI	LLED WATER C	OIL				HOT W	ATER COIL		
MAR	K LOCATION	BASIS OF DESIGN	OVERALL DIMENSION S, IN.	DESIGN I AIRFLOW , CFM	MIN OUTSIDE AIRFLOW, CFM	EXTERNA L STATIC, IN. WG	DRIVE TYPE	HP	FAN POWER (V/PH/HZ)	ENTERING AIR TEMP. (DB F)	LEAVING AIR TEMP. (DB F)	MIN. TOTAL CAPACITY (MBH)	MIN. SENSIBLE CAPACITY	TOTAL FLOW (GPM)	, ENTERING AIR TEMP. (F)		ENTERING WATER TEMP. (F)	LEAVING WATER TEMP. (F)	MIN. SENSIBLE CAP.	TOTAL FLOW (GPM)
AHU-	-1 MECHANICAL RO	OM 1 DAIKIN	68"x54"x74"	2,360	1,000	0.50	DIRECT	1.5	208-3-60	75.8	55	89	48.8	6.5	41.7	90.0	150.0	120.0	123.1	8.2
AHU-	-2 MECHANICAL RC	OM 2 DAIKIN	68"x54"x66"	1,295	600	0.50	DIRECT	1.5	208-3-60	75.4	55	65	38.0	5.1	39.5	90.0	150.0	120.0	70.6	4.7
AHU-	-3 MECHANICAL RO	OM DAIKIN	76"x58"x34"	3,610	3,610	1.50	DIRECT	5.0	208-3-60	92.0	55	181	92.9	19.8	10.0	70.0	150.0	120.0	233.9	15.6
AHU-	-4 MECHANICAL RO	OM DAIKIN	72"x46"x30"	1,770	1,770	1.25	DIRECT	3.0	208-3-60	92.0	55	100	42.2	9.7	10.0	70.0	150.0	120.0	114.7	7.6

- 1. VARIABLE FREQUENCY DRIVE MOTORS AND SUPPLY FANS. 208 VOLT, 3 PHASE, 4 WIRE POWER TO ALL MOTORS.
- 2. PRIOR TO ORDERING MOTORS, COORDINATE WITH ELECTRICAL CONTRACTOR TO CONFIRM BREAKER SIZE.
- 3. FLOW PATH SHALL BE AS FOLLOWS: RETURN AIR FAN, EXHAUST BOX, MIXING BOX, MERV 13 FILTER, CHILLED WATER COIL, HOT WATER COIL, SUPPLY FAN
- 4. INSTALL A TRAPPED CONDENSATE DRAIN LINE AT UNIT DRAIN CONNECTION. ALL UNITS HAVE A 1 IN. FPT DRAIN CONNECTION.
- 5. UNITS SHALL BE MOUNTED WITH CROSSBEAM MOUNTS WITH VIBRATION ISOLATORS.
- 6. ALL UNITS SHALL BE DOUBLE WALL CONSTRUCTION WITH 1 INCH INSULATION.
- 7. 2 INCH PLEATED MERV 13 FILTERS. PROVIDE THROWAWAY MERV 13 FILTERS DURING CONSTRUCTION.
- 8. PROVIDE ADJUSTABLE SHEAVES FOR ALL BELT DRIVES.
- 9. OR APPROVED EQUAL
- 10. ALL MOTORS SHALL BE PREMIUM EFFICIENCY
- 11. PROVIDE A SPARE FILTER SET FOR EACH UNIT
- 12. OR APPROVED EQUAL

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FAN COIL UNI	T SCHEDULE																		
					SUPPLY F	AN				CHII	LLED WATER (COIL				HOT W	ATER COIL		
MARK	SERVES	BASIS OF DESIGN	DESIGN AIRFLOW, CFM	MIN OUTSIDE AIRFLOW, CFM	EXTERNAL STATIC, IN. WG	DRIVE TYPE	HP	FAN POWER (V/PH/HZ)	ENTERING AIR TEMP. (DB F)	LEAVING AIR TEMP. (DB F)	MIN. TOTAL CAPACITY (MBH)	NO. OF ROWS	TOTAL FLOW (GPM)	ENTERING AIR TEMP. (F)	LEAVING AIR TEMP. (F)	ENTERING WATER TEMP. (F)	LEAVING WATER TEMP. (F)	MIN. SENSIBLE CAP.	TOTAL FLOW (GPM)
FCU-1	SNACK BAR 103	JCI	870	500	0.50	DIRECT	1/6	120-1-60	74.3	55	23	6.0	3.1	67.9	95.0	150.0	120.0	25	1.7
FCU-2	EATING AREA 104	JCI	1,350	600	0.50	DIRECT	1/4	120-1-60	75.6	55	56	6.0	7.5	67.2	95.0	150.0	120.0	41	2.7
FCU-3	ACTIVITY ROOM 105	JCI	850	440	0.50	DIRECT	1/6	120-1-60	74.8	55	28	6.0	3.7	67.6	95.0	150.0	120.0	25	1.7
FCU-4	TOILET ROOMS	JCI	570	350	0.50	DIRECT	1/4	120-1-60	73.9	55	22	6.0	2.9	68.1	95.0	150.0	120.0	17	1.1
FCU-5	INFANT/TODDLER 125	JCI	850	550	0.50	DIRECT	1/6	120-1-60	73.5	55	35	6.0	4.7	68.2	95.0	150.0	120.0	25	1.6
FCU-6	RECEPTION 130	JCI	665	250	0.25	DIRECT	1/4	120-1-60	76.2	55	21	6.0	2.8	66.9	95.0	150.0	120.0	20	1.3
FCU-7	PREK/K 126	JCI	945	600	0.50	DIRECT	1/6	120-1-60	73.7	55	37	6.0	4.9	68.2	95.0	150.0	120.0	27	1.8
FCU-8	PARENT WAITING 135	JCI	840	280	0.50	DIRECT	1/6	120-1-60	76.7	55	27	6.0	3.6	66.7	95.0	150.0	120.0	26	1.7
FCU-9	ACTIVITY ROOM 139	JCI	600	350	0.40	DIRECT	1/4	120-1-60	74.2	55	20	6.0	2.7	67.9	95.0	150.0	120.0	18	1.2
FCU-10	OFFICE 146	JCI	530	190	0.15	DIRECT	1/6	120-1-60	76.4	55	24	6.0	3.2	66.8	95.0	150.0	120.0	16	1.1
FCU-11	LAUNDRY 147	JCI	400	100	0.50	DIRECT	1/6	120-1-60	77.5	55	6.9	6.0	0.9	66.3	95.0	150.0	120.0	12	0.8
FCU-12	ACTIVITY ROOM 129	JCI	1,015	400	0.50	DIRECT	1/4	120-1-60	76.1	55	42.1	6.0	5.6	67.0	95.0	150.0	120.0	31	2.0
FCU-13	TOILET ROOM 117	JCI	410	150	0.50	DIRECT	1/6	120-1-60	76.3	55	12.9	6.0	1.7	66.8	95.0	150.0	120.0	12	0.8
FCU-14	TRAINING/LOUNGE 113		650	120	0.25	DIRECT	1/4	120-1-60	78.2	55	25	6.0	3.3	65.9	95.0	150.0	120.0	20	1.4
FCU-15	SNACK BAR 103	JCI	1,050	500	0.25	DIRECT	1/4	120-1-60	75.2	55	51	6.0	6.8	67.4	95.0	150.0	120.0	31	2.1

- 1. ECM MOTORS ON SUPPLY FANS. 208 VOLT, 3 PHASE, 4 WIRE POWER TO ALL MOTORS.
- 2. INSTALL A TRAPPED CONDENSATE DRAIN LINE AT UNIT DRAIN CONNECTION. ALL UNITS HAVE A 1 IN. FPT DRAIN CONNECTION.
- 3. UNITS SHALL BE MOUNTED WITH CROSSBEAM MOUNTS WITH VIBRATION ISOLATORS.
- 4. ALL UNITS SHALL BE DOUBLE WALL CONSTRUCTION WITH 1 INCH INSULATION. 5. 2 INCH PLEATED MERV 13 FILTERS. PROVIDE THROWAWAY MERV 13 FILTERS DURING CONSTRUCTION.
- 6. OR APPROVED EQUAL

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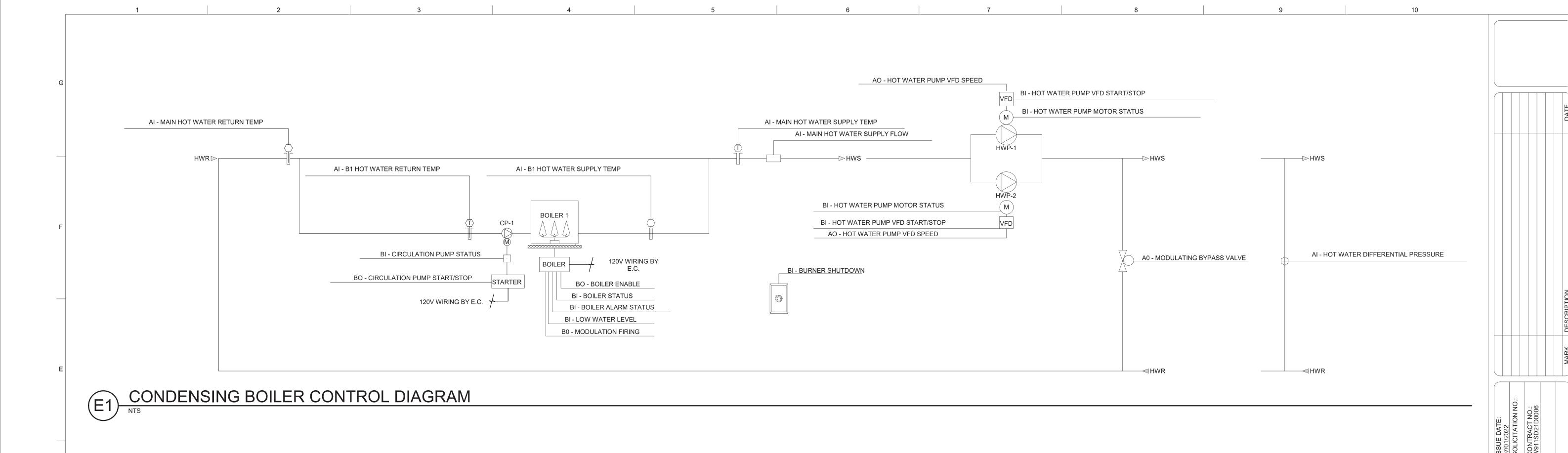
MARK NO.	TYPE	MOUNTING	LOCATION	SIZE	BASIS OF DESIGN
L-1	STATIONARY	WALL	SEE PLANS	48"X36"	RUSKIN L375D
L-2	STATIONARY	WALL	SEE PLANS	36"X36"	RUSKIN L375D

- SCHEDULE DOES NOT INDICATE QUANTITIES. FOR QUANTITIES OF EACH ITEM SEE PLANS
- 1. LOUVER TO HAVE A MINIMUM 0.55 SQFT OF FREE AREA
- 2. LOUVER TO BE RATED FOR OUTDOOR USE AND DRAINABLE 3. VERIFY COLOR WITH BUILDING OWNER PRIOR TO ORDERING LOUVERS
- 4. OR APPROVED EQUAL

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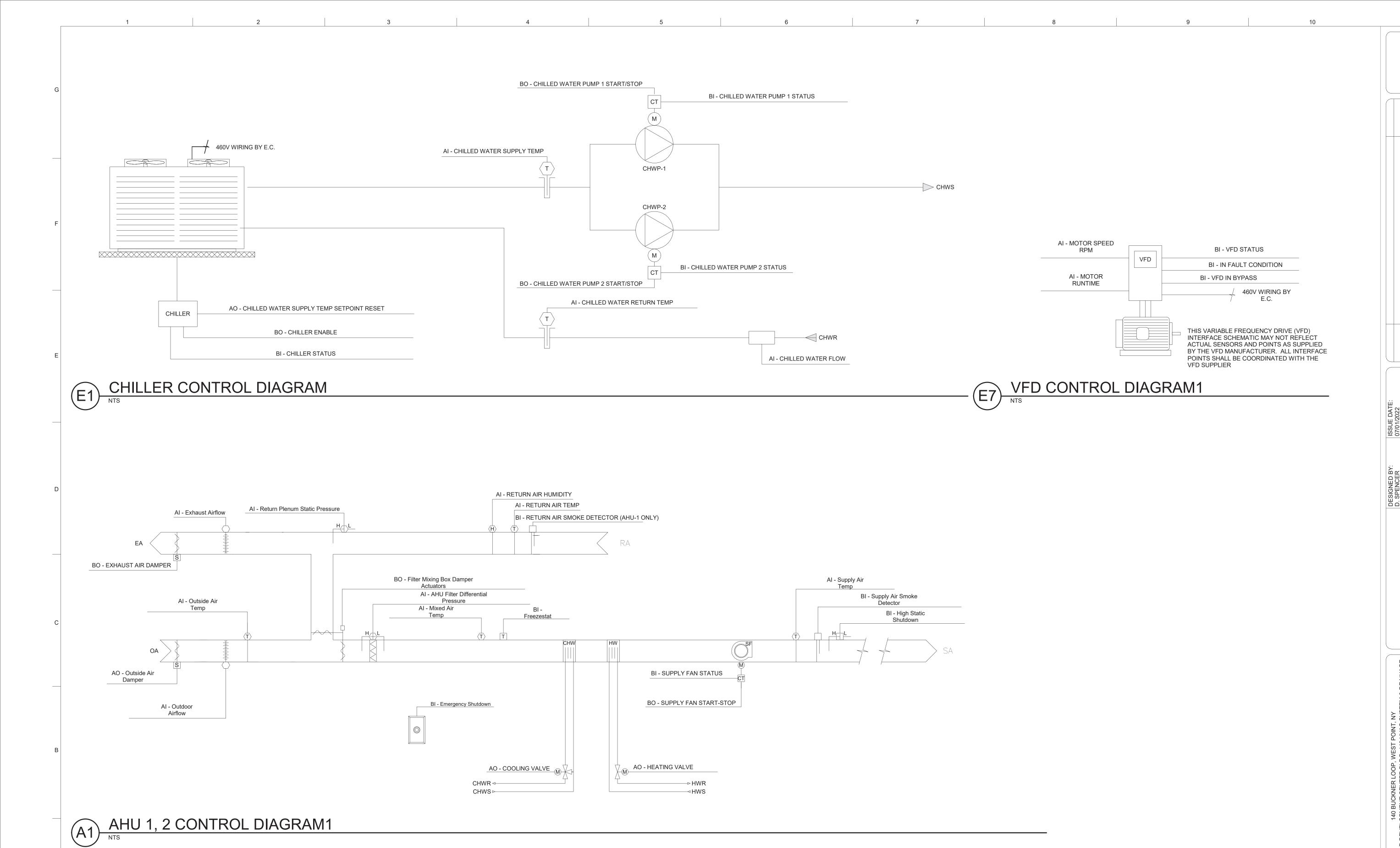
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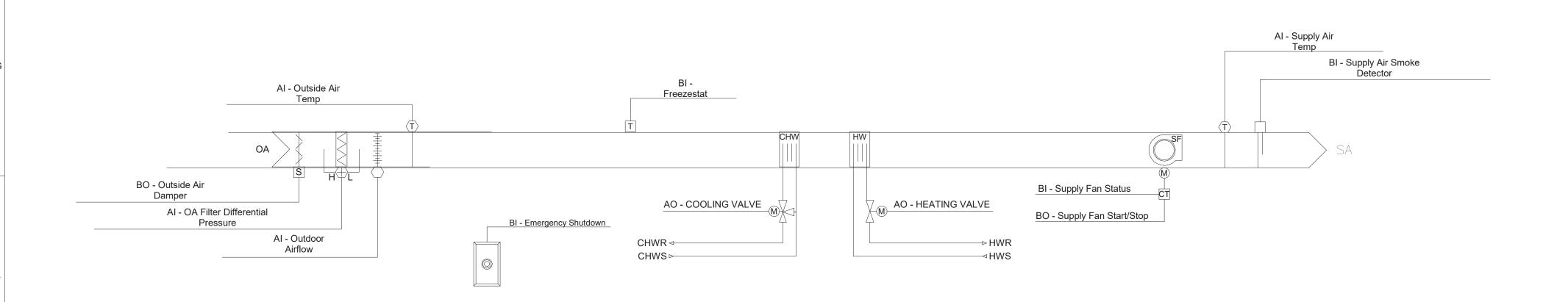
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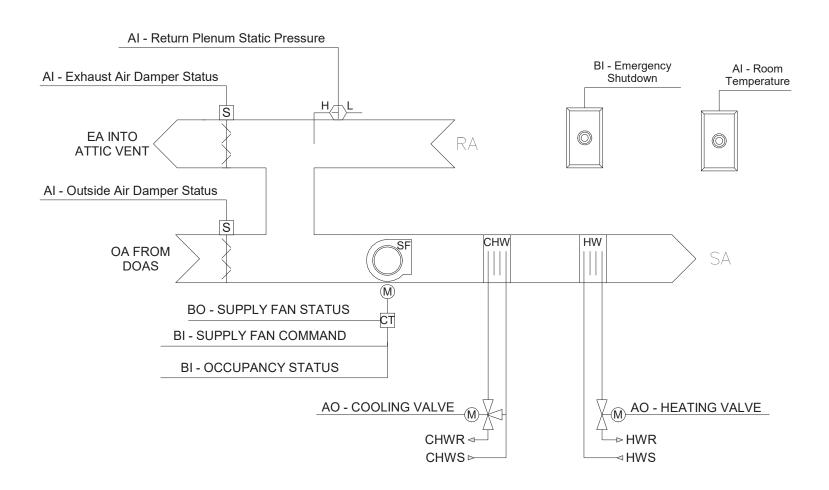
TOPPOFESSIONAL

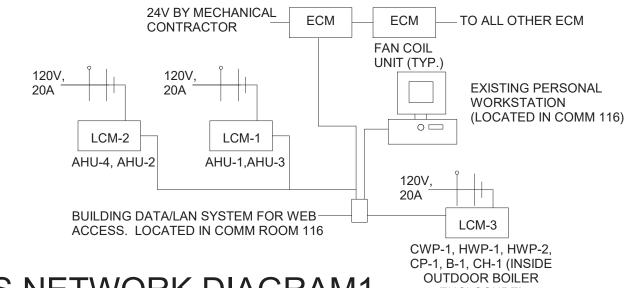


TE OF NEW PORT



E1 AHU-3,4 DOAS CONTROL DIAGRAM





C1 FCU CONTROL DIAGRAM

SHEET M-703

RTA SUBMISSION

CWP-1, HWP-1, HWP-2, CP-1, B-1, CH-1 (INSIDE OUTDOOR BOILER ENCLOSURE) BMS NETWORK DIAGRAM1

Point Name		IARDWA	RE POII	NTS						
	Al	AO	BI	во	AV	BV	SCHED	TREND	ALARM	GRAPHIC
CHILLED WATER RETURN TEMP	×							×		×
CHILLED WATER SUPPLY TEMP	×							×		×
CHILLED WATER SUPPLY TEMP										
CHILLED WATER SUPPLY TEMP RESET		×						×		×
EMERGENCY SHUTDOWN			×					×	×	×
CHILLED WATER ISOLATION VALVE STATUS			×					×		×
CHILLED WATER PUMP 1 STATUS			×					×		×
CHILLER STATUS			×					×		×
CHILLED WATER ISOLATION VALVE				×						×
CHILLED WATER PUMP 1 START/STOP				×						×
CHILLER ENABLE				×						×
OUTSIDE AIR TEMP					×					×
CHILLED WATER ISOLATION VALVE FAILURE									×	
CHILLED WATER PUMP 1 FAILURE									×	
CHILLED WATER PUMP 1 IN HAND									×	
CHILLER FAILURE									×	
CHILLER RUNNING IN HAND									×	
CHILLER RUNTIME EXCEEDED									×	
HIGH CHILLED WATER SUPPLY TEMP									×	

AIR HANDLING UNITS POINTS LIST		HARDWAF	RE POINTS	3						
POINT NAME	Al	АО	ВІ	во	AV	BV	SCHED	TREND	ALARM	SHOW ON GRAPHIC
SUPPLY AIR STATIC PRESSURE	X							Х	Х	Х
RETURN PLENUM STATIC PRESSURE	X							Х	X	Χ
OUTSIDE AIR TEMPERATURE	X							X	7.	X
EXHAUST AIR TEMPERATURE	X							X		X
BUILDING STATIC PRESSURE	X							X		X
AHU FILTER DIFFERENTIAL PRESSURE	X								X	X
MIXED AIR TEMPERATURE	X								^	X
								X		
RETURN AIR CARBON DIOXIDE PPM	X							X		X
RETURN AIR HUMIDITY	Х							Х		X
RETURN AIR TEMPERATURE	Х									X
SUPPLY AIR TEMPERATURE	X									X
COOLING VALVE		X								X
HEATING VALVE		X								X
EXHAUST AIR DAMPER		Х								Χ
FREEZESTAT			X							X
SUPPLY AIR SMOKE DETECTOR			X							Х
RETURN AIR SMOKE DETECTOR			Х							Х
SUPPLY FAN STATUS			Х							X
EXHAUST AIR DAMPER STATUS			X							X
SUPPLY FAN START/STOP			X							X
SUPPLY AIR STATIC PRESSURE SETPOINT					X					X
RETURN PLENUM STATIC PRESSURE SETPOINT					X					X
SUPPLY AIR TEMPERATURE SETPOINT					X					X
BUILDING STATIC PRESSURE SETPOINT										
DEHUMIDIFICATION SETPOINT					X					X
SCHEDULE					^					^
							Х			
HIGH SUPPLY AIR STATIC PRESSURE									Х	
LOW SUPPLY AIR STATIC PRESSURE									X	
SUPPLY FAN FAILURE									X	
SUPPLY FAN IN HAND									X	
HIGH RETURN PLENUM STATIC PRESSURE									X	
LOW RETURN PLENUM STATIC PRESSURE									X	
HIGH SUPPLY AIR TEMPERATURE									X	
LOW SUPPLY AIR TEMPERATURE									Х	
EXHAUST AIR DAMPER FAILURE									X	
EXHAUST AIR DAMPER IN HAND									Х	
AHU FILTER CHANGE REQUIRED									X	Х
HIGH MIXED AIR TEMPERATURE									X	
LOW MIXED AIR TEMPERATURE									X	
HIGH RETURN AIR CARBON DIOXIDE									X	
HIGH RETURN AIR HUMIDITY									X	
LOW RETURN AIR HUMIDITY									X	
HIGH RETURN AIR TEMPERATURE									X	
LOW RETURN AIR TEMPERATURE									X	
HIGH SUPPLY AIR TEMPERATURE									X	
LOW SUPPLY AIR TEMPERATURE	V							\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	X	V
OUTDOOR AIRFLOW CFM	X							X		X
EXHAUST AIRFLOW CFM	X							X		Х
OUTDOOR AIR DAMPER POSITION		X								X
MIXING BOX DAMPER POISITIONS		Х								X
OUTDOOR AIR DAMPER STATUS			X					X		X

POINT NAME		HARDWAF	RE POINTS	5		SOF					
	AI	АО	ВІ	во	AV	BV	SCHED	TREND	ALARM	SHOW ON GRAPHIC	
ROOM TEMPERATURE	Х							Х	Х	Х	1
OCCUPANCY STATUS				X				Х	X	X	
UNOCCUPIED COOLING SETPOINT	X							Х		X	\neg
UNOCCUPIED HEATING SETPOINT	X								X	Χ	\neg
FAN COMMAND			X					Х		X	
RETURN PLENUM STATIC PRESSURE	X										
EXHAUST AIR DAMPER				X							
COOLING VALVE		X						X		X	\Box
HEATING VALVE		X						X		X	
SEQUENCE OF OPERATION	X									X	\neg
SYSTEM MODE	X									X	
OCCUPANCY COMMAND				X						X	
FAN STATUS				X						X	

	H	IARDW <i>A</i>	RE POI	NTS						
POINT NAME	Al	AO	ВІ	во	AV	BV	SCHED	TREND	ALARM	SHOW ON GRAPHIC
MAIN HWS TEMP	X							Х		Х
MAIN HWR TEMP	X							X		X
MAIN HWS FLOW	X							X		X
BOILER 1 FAILURE									X	X
EMERGENCY SHUTDOWN			Х					X	X	X
HIGH MAIN HWS TEMP									X	
LOW MAIN HWS TEMP									X	
HIGH MAIN HWR TEMP									X	
LOW MAIN HWR TEMP									X	
B-1 MODULATING FIRE				Х				X		Χ
CP-1 ON/OFF	X								Χ	X
HOT WATER DIFFERENTIAL PRESSURE	X							X		X
HOT WATER RETURN TEMP	X							X		X
HOT WATER SUPPLY TEMP	X							X		Х
HOT WATER PUMP 1 VFD SPEED		Х						X		Х
HOT WATER PUMP 2 VFD SPEED		Х						X		X
HOT WATER PUMP 1 STATUS			Х					X		Х
HOT WATER PUMP 2 STATUS			Х					Х		Х
HOT WATER PUMP 1 VFD FAULT			Х						Х	Х
HOT WATER PUMP 2 VFD FAULT			Х						X	Х
HOT WATER PUMP 1 START/STOP				Х				X		Х
HOT WATER PUMP 2 START/STOP				Х				X		Х
OUTSIDE AIR TEMP					Х					Х
HOT WATER DIFF PRESSURE SETPOINT					Х					Х
HIGH HOT WATER DIFF PRESSURE									Х	
LOW HOT WATER DIFF PRESSURE									X	
HOT WATER PUMP 1 FAILURE									Х	
HOT WATER PUMP 2 FAILURE									Х	
HOT WATER PUMP 1 RUNNING IN HAND									X	
HOT WATER PUMP 2 RUNNING IN HAND									X	

OUTDOOR AIR CONDITIONS POINTS LIST POINT NAME		HARDWARE POINTS					SOFTWARE POINTS						
	Al	AO	ВІ	во	AV	BV	SCHED	TREND	ALARM	SHOW ON GRAPHIC			
OUTSIDE AIR TEMPERATURE	X							X		Х			
OUTSIDE AIR HUMIDITY	X							X		X			
OUTSIDE AIR ENTHALPY					Х			Х		X			
HIGH TEMPERATURE TODAY								Х		X			
HIGH TEMPERATURE MONTH TO DATE								X		X			
HIGH TEMPERATURE YEAR TO DATE								Х		X			
LOW TEMPERATURE TODAY								Х		X			
LOW TEMPERATURE MONTH TO DATE								X		X			
LOW TEMPERATURE YEAR TO DATE								X		X			
SENSOR FAILURE										X			
OUTSIDE CARBON DIOXIDE	X							Χ	X				
OUTSIDE STATIC PRESSURE	X							X		X			



140 BUCKNER LOOP, WEST POINT, NY
DEVELOPMENT CENTER BLDG. 140 HVAC SYSTEM & DRAINAGE
DESIGN
10324688
HVAC CONTROL DIAGRAMS
Architectu

THE OUTISDE AIR TEMPERATURE IS LESS THAN 38 DEG. F (ADJ.)

THE FOLLOWING SAFETIES SHALL BE MONITORED: - BOILER ALARM - LOW WATER LEVEL ALARMS SHALL BE PROVIDED AS FOLLOWS:

HOT WATER PUMP PRIMARY/STANDBY OPERATION: THE TWO HOT WATER PUMPS SHALL OPERATE IN A PRIMARY/STANDBY

FASHION. - THE PRIMARY PUMP SHALL RUN FIRST - ON FAILURE OF THE PRIMARY PUMP, THE STANDBY PUMP SHALL RUN AND THE PRIMARY PUMP SHALL TURN OFF.

- ON DECREASING HOT WATER DIFFERENTIAL PRESSURE, THE VFD SHALL ADJUST PUMP SPEED TO MAINTAIN HOT WATER DIFFERENTIAL PRESSURE

THE DESIGNATED PRIMARY PUMP SHALL ROTATE UPON ONE OF THE FOLLOWING CONDITIONS (USER SELECTABLE):

- MANUALLY THROUGH A SOFTWARE SWITCH - IF PUMP RUNTIME (ADJ.) IS EXCEEDED

- DAILY - WEEKLY

- MONTHLY

- BOILER ALARM

- LOW WATER LEVEL ALARM

ALARMS SHALL BE PROVIDED AS FOLLOWS: - HOT 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

ALARMS SHALL BE PROVIDED AS FOLLOWS: - HIGH HOT WATER DIFFERENTIAL PRESSURE: IF THE HOT WATER DIFFERENTIAL PRESSURE IS GREATER THAN 18 PSI (ADJ.) - LOW HOT WATER DIFFERENTIAL PRESSURE: IF THE HOT WATER DIFFERENTIAL PRESSURE IS LESS THAN 10 PSI (ADJ.)

THE CIRCULATION PUMP 1 SHALL RUN ANYTIME BOILER 1 IS CALLED RUN AND SHALL HAVE A USER DEFINABLE DELAY (ADJ.) ON STOP.

ALARMS SHALL BE PROVIDED AS FOLLOWS: - CIRCULATION PUMP 1 FAILURE: COMMANDED ON, BUT THE STATUS IS OFF - CIRCULATION PUMP 1 RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS

- CIRCULATION PUMP 1 RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER-DEFINABLE LIMIT.

THE PUMP VFDS SHALL BE CONTROLLED BY THE PIPING SYSTEM PRESSURE DIFFERENTIAL SENSOR TO CONTROL THE SPEED OF THE PUMP TO MAINTAIN A FIELD DETERMINED PRESSURE DIFFERENTIAL AS 2-WAY VALVES ON AHUS AND FCUS OPEN AND CLOSE.

SINGLE AIR-COOLED CHILLER (CH-1)

CHILLER - RUN CONDITIONS: THE CHILLER SHALL BE ENABLED TO RUN WHENEVER: · A DEFINABLE NUMBER OF CHILLED WATER COILS NEED COOLING · AND THE OUTSIDE AIR TEMPERATURE IS GREATER THAN 54°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. CHILLED WATER PUMP LEAD/STANDBY OPERATION: THE TWO CHILLED WATER PUMPS SHALL RUN ANYTIME THE CHILLER IS CALLED TO

THE SUPPLY PUMP SHALL START PRIOR TO THE CHILLER BEING ENABLED AND SHALL STOP ONLY AFTER THE CHILLER IS DISABLED. THE PUMP(S) SHALL THEREFORE HAVE: · A USER ADJUSTABLE DELAY ON START. AND A USER ADJUSTABLE DELAY ON STOP.

THE DELAY TIMES SHALL BE SET APPROPRIATELY TO ALLOW FOR ORDERLY CHILLED WATER SYSTEM START-UP, SHUTDOWN AND SEQUENCING. THE TWO PUMPS SHALL OPERATE IN A LEAD/STANDBY FASHION.

· THE LEAD PUMP SHALL RUN FIRST. · ON FAILURE OF THE LEAD PUMP, THE STANDBY PUMP SHALL RUN AND THE LEAD PUMP SHALL TURN OFF.

THE SUPPLY PUMP SHALL ROTATE UPON ONE OF THE FOLLOWING CONDITIONS (USER SELECTABLE): MANUALLY THROUGH A SOFTWARE SWITCH · IF PUMP RUNTIME (ADJ.) IS EXCEEDED DAILY

WEEKLY · MONTHLY ALARMS SHALL BE PROVIDED AS FOLLOWS: · CHILLED WATER PUMP 1

ON START.

- 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.

CHILLER: THE CHILLER SHALL BE ENABLED A USER ADJUSTABLE TIME AFTER PUMP STATUS IS PROVEN ON. THE CHILLER SHALL THEREFORE HAVE A USER ADJUSTABLE DELAY

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

CHILLED WATER SUPPLY TEMPERATURE - SETPOINT RESET: THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL RESET USING A TRIM AND RESPOND ALGORITHM BASED ON COOLING REQUIREMENTS. THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL RESET TO A LOWER VALUE AS THE FACILITY'S CHILLED WATER VALVES OPEN BEYOND A USER DEFINABLE THRESHOLD (90% OPEN, TYP.). ONCE THE CHILLED WATER COILS ARE SATISFIED (VALVES CLOSING) THEN THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL GRADUALLY RISE OVER TIME TO REDUCE COOLING ENERGY USE.

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.)

SINGLE ZONE CONSTANT VOLUME AIR HANDLER (AHU-1, AHU-2) <u> RUN CONDITIONS - SCHEDULED:</u>

ΓHE UNIT SHALL RUN BASED UPON AN OPERATOR ADJUSTABLE SCHEDULE.

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 -SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.)

THE CONTROLLER SHALL READ THE ROOM THERMOSTAT SETPOINT TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS COOLING SETPOINT.

THE COOLING SHALL BE ENABLED WHENEVER: -OUTSIDE AIR TEMPERATURE IS GREATER THAN 50 DEG. F (ADJ.) -AND THE SUPPLY FAN STATUS IS ON. -AND THE HEATING (IF PRESENT) IS NOT ACTIVE THE COOLING COIL VALVE SHALL OPEN TO 50% (ADJ.) WHENEVER THE OUTDOOR TEMPERATURE IS BELOW 32F (ADJ.)

ALARMS SHALL BE PROVIDED AS FOLLOWS: -HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5 DEG. F (ADJ.) GREATER THAN SETPOINT.

<u>HEATING COIL VALVE</u> THE CONTROLLER SHALL READ THE ROOM THERMOSTAT SETPOINT TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS

THE HEATING SHALL BE ENABLED WHENEVER: -OUTSIDE AIR TEMPERATURE IS GREATER THAN 55 DEG. F (ADJ.) -AND THE SUPPLY FAN STATUS IS ON. -AND THE COOLING (IF PRESENT) IS NOT ACTIVE THE HEATING COIL VALVE SHALL OPEN WHENEVER: -SUPPLY AIR TEMPERATURE DROPS FROM 45F TO 40F -OR THE FREEZESTAT IS ON.

ALARMS SHALL BE PROVIDED AS FOLLOWS: -LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5 DEG F LESS THAN SETPOINT.

PRESSURE EXCEEDS A USER DEFINABLE LIMIT.

BUILDING STATIC PRESSURE CONTROL:
THE CONTROLLER SHALL MEASURE THE BUILDING STATIC PRESSURE AND MODULATE THE EXHAUST AIR DAMPER TO MAINTAIN BUILDING STATIC PRESSURE SETPOINT OF 0.05IN H20. EXHAUST DAMPER SHALL BE ENABLED WHEN THE SUPPLY FAN STATUS IS PROVEN AND CLOSED WHEN THE UNIT IS

ALARMS SHALL BE PROVIDED AS FOLLOWS: -HIGH BUILDING STATIC PRESSURE: IF THE BUILDING STATIC PRESSURE IS 25% GREATER THAN SETPOINT -LOW BUILDING STATIC PRESSURE: IF THE BUILDING STATIC PRESSURE IS

25% LESS THAN SETPOINT. AHU UNIT RETURN AIR FILTER DIFFERENTIAL PRESSURE MONITOR: THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS

THE FILTER BANK. ALARMS SHALL BE PROVIDED AS FOLLOWS: -AHU RETURN AIR FILTER CHANGE REQUIRED: FILTER DIFFERENTIAL

RETURN AIR TEMPERATURE:

THE CONTROLLER SHALL MONITOR THE RETURN AIR TEMPERATURE AND USE AS REQUIRED FOR SETPOINT CONTROL.

ALARMS SHALL BE PROVIDED AS FOLLOWS: -HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 90 DEG. F

-LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 45

SUPPLY AIR TEMPERATURE

THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE ALARMS SHALL BE PROVIDED AS FOLLOWS: -HIGH SUPPLY AIR TEMPERATURE: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 100 DEG. F

-COIL VALVES SHALL GO TO FULL OPEN AND FAN SPEED SHALL GO TO MAXIMUM WITH ROOM SENSOR CONTROLLING VALVE TO MEET MORNING WARM-UP SETPOINT.

-AFTER MORNING WARM-UP IS COMPLETED AS DETERMINED BY THREE SELECTED ROOM INPUTS BUT NOT BEFORE 8:30 AM. THE CONTROLLER SHALL PROVIDE INPUT TO START THE DEDICATED OUTSIDE AIR SYSTEM.

THE CONTROLLER SHALL MEASURE THE RETURN AIR HUMIDITY AND OVERRIDE THE COOLING SEQUENCE TO MAINTAIN SUPPLY AIR HUMIDITY AT OR BELOW 60% RH. DEHUMIDIFICATION SHALL BE ENABLED WHENEVER THES SUPPLY FAN STATUS IS ON.

<u>RUN CONDITIONS - SCHEDULEI</u> THE UNIT SHALL RUN BASED UPON AN OPERATOR ADJUSTABLE SCHEDULE.

THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED ON, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE SCHEDULED RUNTIME.

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

ALARMS SHALL BE PROVIDED AS FOLLOWS:

-SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.)

THE COOLING COIL VALVE TO MAINTAIN ITS COOLING SETPOINT.

THE COOLING SHALL BE ENABLED WHENEVER: -OUTSIDE AIR TEMPERATURE IS GREATER THAN 70 DEG. F (ADJ.) -AND THE SUPPLY FAN STATUS IS ON. -AND THE HEATING (IF PRESENT) IS NOT ACTIVE THE COOLING COIL VALVE SHALL OPEN TO 50% (ADJ.) WHENEVER THE OUTDOOR TEMPERATURE IS BELOW 32F (ADJ.)

ALARMS SHALL BE PROVIDED AS FOLLOWS: -HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5 DEG. F (ADJ.) GREATER THAN SETPOINT.

THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS HEATING SETPOINT

THE HEATING SHALL BE ENABLED WHENEVER: -OUTSIDE AIR TEMPERATURE IS GREATER THAN 55 DEG. F (ADJ.) -AND THE SUPPLY FAN STATUS IS ON. -AND THE COOLING (IF PRESENT) IS NOT ACTIVE THE HEATING COIL VALVE SHALL OPEN WHENEVER: -SUPPLY AIR TEMPERATURE DROPS FROM 45F TO 40F -OR THE FREEZESTAT IS ON. ALARMS SHALL BE PROVIDED AS FOLLOWS: -LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5 DEG F LESS THAN

AHU UNIT OUTSIDE AIR FILTER DIFFERENTIAL PRESSURE MONITOR THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER

ALARMS SHALL BE PROVIDED AS FOLLOWS: -AHU OUTSIDE AIR FILTER CHANGE REQUIRED: FILTER DIFFERETNAIL PRESSURE EXCEEDS A USER DEFINABLE LIMIT.

THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE ALARMS SHALL BE PROVIDED AS FOLLOWS:

-HIGH SUPPLY AIR TEMPERATURE: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 100 DEG. F

THE CONTROLLER SHALL MEASURE THE OUTSIDE AIR HUMIDITY AND OVERRIDE THE COOLING SEQUENCE TO MAINTAIN SUPPLY AIR HUMIDITY AT OR BELOW 60% RH.

DEHUMIDIFICATION SHALL BE ENABLED WHENEVER THES SUPPLY FAN STATUS IS ON.

SINGLE ZONE CONSTANT VOLUME FAN-COIL UNIT (FCU-#)

RUN CONDITIONS - SCHEDULED:

THE UNIT SHALL RUN BASED UPON AN OPERATOR ADJUSTABLE SCHEDULE.

THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED ON, 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 -SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.)

COOLING COIL VALVE THE CONTROLLER SHALL READ THE ROOM THERMOSTAT SETPOINT TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS

<u>HEATING COIL VALVE</u> THE CONTROLLER SHALL READ THE ROOM THERMOSTAT SETPOINT TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS HEATING SETPOINT.

BUILDING STATIC PRESSURE CONTROL

THE CONTROLLER SHALL MEASURE THE RETURN AIR STATIC PRESSURE AND MODULATE THE EXHAUST AIR DAMPER TO MAINTAIN BUILDING STATIC PRESSURE SETPOINT OF 0.05IN H20. EXHAUST DAMPER SHALL BE ENABLED WHEN THE SUPPLY FAN STATUS IS PROVEN AND CLOSED WHEN THE UNIT IS



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SHEET