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## HVAC LEGEND

(ALL MAY NOT APPLY)

	REFRIGERATION MONITORING SYSTEM ALARM DEVICE
	SPACE TEMPERATURE SENSOR - MOUNTING HEIGHT 48"
	SPACE HUMIDISTAT
	SPACE MOTION SENSOR
	THERMOSTAT ELECTRIC - MOUNTING HEIGHT 48"
	THERMOSTAT PNEUMATIC - MOUNTING HEIGHT 48"
	CARBON MONOXIDE SENSOR
	SPACE PRESSURE SENSOR
	EXISTING EQUIPMENT TAG
	NEW EQUIPMENT REFERENCE SYMBOL
	NOTE SYMBOL
	CONNECT TO EXISTING SYMBOL
	ROOM NUMBER
	APPROXIMATE ELEVATION FROM FLOOR TO BOTTOM OF DUCT, PIPE OR EQUIPMENT ITEM
	SECTION "A" DESIGNATION, SHOWN ON SHEET H1
	DETAIL REFERENCE SYMBOL, DETAIL "A" SHOWN ON SHEET H1
	CEILING MOUNTED AIR DEVICE, E1-AIR DEVICE DESIGNATION, REFER TO SCHEDULE, 22"x22" NECK SIZE, 1,200 REQUIRED CFM, DUCT SIZE SAME AS NECK SIZE UNLESS INDICATED OTHERWISE.
	CEILING MOUNTED AIR DEVICE, R1-AIR DEVICE DESIGNATION, REFER TO SCHEDULE, 22"x22" NECK SIZE, 1,200 REQUIRED CFM, DUCT SIZE SAME AS NECK SIZE UNLESS INDICATED OTHERWISE.
	2-WAY SUPPLY DIFFUSER
	WALL OR DUCT MOUNTED AIR DEVICE, S1 AIR DEVICE DESIGNATION, REFER TO SCHEDULE, 10"x6" NECK SIZE, 200-750 CFM, MOUNTING HEIGHT FROM FLOOR TO BOTTOM OF AIR DEVICE, BRANCH DUCT SIZE SAME AS NECK SIZE UNLESS INDICATED OTHERWISE.
	MANUAL BALANCING VOLUME DAMPER WITH LOCKING DEVICE
	1" DOOR UNDER CUT
	EXISTING TO REMAIN
	NEW WORK
	DEMOLITION OF DUCTWORK, PIPING, EQUIPMENT ETC.
	DUCT RISE IN DIRECTION OF AIR FLOW 45° OFFSET
	DUCT DROP IN DIRECTION OF AIR FLOW 45° OFFSET
	LINED DUCTWORK
	DOUBLE WALL DUCT WITH 1" INSULATION PERFORATED LINER
	FLEXIBLE DUCT CONNECTION
	AIR TURNING VANES
	AIR TRANSFER ASSEMBLY
	FIRE DAMPER AND CONFIGURATION TYPE
	EXISTING FIRE DAMPER
	SMOKE DAMPER
	EXISTING SMOKE DAMPER
	COMBINATION SMOKE/FIRE DAMPER AND CONFIGURATION TYPE
	EXST. COMBINATION SMOKE/FIRE DAMPER AND CONFIG. TYPE
	MOTOR OPERATED DAMPER (OPPOSED)
	MOTOR OPERATED DAMPER (PARALLEL)
	DUCT TEMPERATURE SENSOR
	DUCT HUMIDITY SENSOR
	DUCT HUMIDITY HIGH LIMIT SENSOR
	DUCT AIR FLOW SENSOR
	DUCT STATIC PRESSURE SENSOR TO CONTROL AIR HANDLER VFD
	MEDIUM PRESSURE CONICAL LOW LOSS DUCT TEE
	LOW PRESSURE BELL MOUTH WITH LOCKING QUADRANT DAMPER
	SUPPLY AND/OR OUTSIDE AIR DUCT DROP
	RETURN, EXHAUST AND/OR RELIEF AIR DROP
	SUPPLY AND/OR OUTSIDE AIR RISE
	RETURN, EXHAUST AND/OR RELIEF AIR RISE
	SINGLE LINE DUCT TRANSITION
	VRV SYSTEM BRANCH SELECTOR BOX

## HVAC LEGEND

(ALL MAY NOT APPLY)

	PRESSURE GAUGE WITH SHUTOFF COCK SNUBBER REQUIRED FOR STEAM SERVICE
	THERMOMETER
	THERMOSTATIC AIR VENT
	MANUAL AIR VENT WITH SHUTOFF COCK
	AUTOMATIC AIR VENT WITH SHUTOFF COCK, VENT TO DRAIN
	WATER TEMPERATURE SENSOR
	VARIABLE SPEED PUMPING DIFFERENTIAL PRESSURE SENSOR
	METER
	FLEXIBLE CONNECTOR
	UNION
	CLEAN OUT
	STRAINER WITH BLOW DOWN
	SHUTOFF/ISOLATION VALVE
	COMBINATION BALANCING/SHUTOFF VALVE
	CHECK VALVE
	THREE WAY CONTROL VALVE
	TWO WAY CONTROL VALVE
	TRIPLE DUTY VALVE
	3/4" NPT PETES PLUG
	PRESSURE REDUCING VALVE
	OS&Y VALVE
	SOLENOID VALVE
	2-WAY SUPPLY DIFFUSER
	GLOBE VALVE
	PRESSURE RELIEF VALVE WITH INDICATED SETTING
	FILL VALVE
	BALL VALVE
	BUTTERFLY VALVE
	PLUG VALVE
	CIRCUIT SETTER
	NEEDLE VALVE
	AUTOMATIC FLOW CONTROL VALVE WITH SHUTOFF
	FLOW CONTROL VALVE
	FLOW SWITCH
	VACUUM BREAKER
	PIPE FLANGE
	CONCENTRIC PIPE REDUCER
	ECCENTRIC PIPE REDUCER
	VENTURI FLOW METER
	PIPE CAP
	PIPE DROP
	PIPE RISE
	PIPE TEE UP
	PIPE TEE DOWN
	VALVE IN RISER
	PIPE ANCHOR
	PIPE GUIDE
	PIPE EXPANSION JOINT
	PRESSURE DIFFERENTIAL SWITCH WITH SHUTOFF COCK
	F&T TRAP
	BUCKET TRAP
	PITCH DOWN
	DIRECTION OF FLOW
	PRE ENGINEERED EXPANSION LOOP, SEE SPECIFICATIONS

## HVAC LEGEND

(ALL MAY NOT APPLY)

	DRAIN PIPE
	EXISTING STEAM CONDENSATE (GRAVITY RETURN)
	STEAM CONDENSATE (GRAVITY RETURN)
	EXISTING PUMPED CONDENSATE
	PUMPED CONDENSATE
	EXISTING CONDENSER WATER RETURN
	CONDENSER WATER SUPPLY
	CONDENSER WATER RETURN
	EXISTING CONDENSER WATER SUPPLY
	CHILLED WATER RETURN
	EXISTING CHILLED WATER RETURN
	CHILLED WATER SUPPLY
	EXISTING CHILLED WATER SUPPLY
	EXISTING LOW PRESSURE RETURN
	LOW PRESSURE RETURN
	EXISTING MEDIUM PRESSURE RETURN
	MEDIUM PRESSURE RETURN
	EXISTING HIGH PRESSURE RETURN
	HIGH PRESSURE RETURN
	EXISTING STEAM SUPPLY (VALUE INDICATES PRESSURE)
	STEAM SUPPLY (VALUE INDICATES PRESSURE)
	EXISTING HOT WATER RETURN
	HOT WATER RETURN
	EXISTING HOT WATER SUPPLY
	HOT WATER SUPPLY
	EXISTING MAKE UP WATER
	MAKE UP WATER
	REFRIGERANT LIQUID
	REFRIGERANT HOT GAS BYPASS LINE
	REFRIGERANT DISCHARGE
	REFRIGERANT SUCTION

## HVAC GENERAL NOTES

- A. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS AND AS SPECIFIED.
- B. ALL WORK SHALL BE INSTALLED ACCORDING TO THE LATEST LOCAL, STATE AND NATIONAL CODES. ALL DUCTWORK SHALL BE INSTALLED ACCORDING TO THE LATEST ASHRAE RECOMMENDATIONS AND SMACNA INSTALLATION MANUALS.
- C. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK ARE DIAGRAMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
- D. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
- E. PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS CONNECTED TO AND WITHIN 50 FEET OF ISOLATED EQUIPMENT THROUGHOUT MECHANICAL EQUIPMENT ROOMS.
- F. COORDINATE CONSTRUCTION OF ALL NEW WORK WITH EXISTING ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL ITEMS, ETC. VISIT SITE PRIOR TO BIDDING.
- G. MAINTAIN A MINIMUM OF 6"-8" CLEARANCE TO UNDERSIDE OF PIPES, DUCTS, CONDUITS, SUSPENDED EQUIPMENT, ETC., THROUGHOUT ACCESS ROUTES IN MECHANICAL ROOMS.
- H. CAULK SPACE BETWEEN SLEEVES, DUCTS AND PIPES WHERE DUCTS AND PIPES PASS THROUGH WALLS. CAULKING TO BE AIRTIGHT.
- I. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
- J. COORDINATE OPENINGS THROUGH OUTSIDE WALLS WITH EXISTING STRUCTURAL AND ARCHITECTURAL CONDITIONS.
- K. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.
- L. MINIMUM CONCRETE PAD THICKNESS SHALL BE 6 INCHES FOR EXTERIOR EQUIPMENT. PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 4 INCHES ON EACH SIDE, WITH BEVELED EDGES.
- M. INLET DUCTWORK TO DIFFUSERS SHALL BE SAME SIZE AS DIFFUSER NECK SIZE UNLESS NOTED OTHERWISE. INLET DUCTWORK TO AIR TERMINAL BOXES SHALL BE SAME SIZE AS BOX INLET UNLESS NOTED OTHERWISE.
- N. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN DETAILS FOR PIPING, DUCTWORK AND EQUIPMENT (UNLESS NOTED OTHERWISE) SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
- O. ALL DUCTWORK, PIPING AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH STRUCTURAL REQUIREMENTS. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C-CLAMPS SHALL NOT BE PERMITTED.
- P. LOCATION AND SIZE OF ALL FLOOR, WALL AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL EXISTING CONDITIONS.
- Q. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED. SEE SPECIFICATIONS FOR REQUIREMENTS.
- R. ALL AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH AIR HANDLING UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH P-TRAP, AND PIPED TO NEAREST DRAIN. PROVIDE CONDENSATE TRAP AS REQUIRED.
- S. PROVIDE AN AIR VENT AT THE HIGH POINT OF EACH DROP IN CLOSED WATER PIPING SYSTEMS. ALL PIPING SHALL GRADE TO LOW POINTS. PROVIDE HOSE END DRAIN VALVES AT THE BOTTOM OF ALL RISERS AND LOW POINTS.
- T. UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD, TIGHT TO UNDERSIDE OF STRUCTURE OR SLAB, WITH SPACE FOR INSULATION WHERE REQUIRED IN THE SPECIFICATIONS.
- U. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
- V. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED WITH POSITION INDICATORS AND MAXIMUM ADJUSTABLE STOPS (MEMORY STOPS).
- W. UNIONS AND/OR FLANGES SHALL BE INSTALLED AT EACH PIECE OF EQUIPMENT, IN BYPASSES, AND IN LONG PIPING RUNS (100 FEET OR MORE) TO PERMIT DISASSEMBLY FOR ALTERATIONS AND REPAIRS.
- X. ALL PIPING WORK AND DUCTWORK SHALL BE COORDINATED WITH ALL EXISTING EQUIPMENT, PIPING, DUCTWORK AND ARCHITECTURAL ITEMS. OFFSETS IN PIPING AND DUCTS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
- Y. CERTAIN ITEMS SUCH AS RISERS AND DROPS IN DUCTWORK, ACCESS DOORS, VOLUME DAMPERS, ETC., ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTEND OF THE REQUIREMENTS FOR THESE ITEMS.
- Z. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS.
- AA. PROVIDE 90 DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED.
- BB. COORDINATE DIFFUSER, REGISTER AND GRILLE LOCATIONS WITH CEILING, LIGHTING, AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.
- CC. PROVIDE MINIMUM 4" FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN AND EXHAUST) CONNECTED TO AIR HANDLING UNITS, FANS AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.
- DD. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF STRUCTURE, WITH SPACE FOR INSULATION WHERE REQUIRED IN THE SPECIFICATIONS.
- EE. RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 7 FEET AND SHALL NOT BE USED FOR 90 DEGREE BENDS.
- FF. PROVIDE ACCESS DOORS IN DUCTWORK FOR ACCESS TO ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, COILS AND OTHER ITEMS LOCATED IN THE DUCTWORK WHICH REQUIRE SERVICE AND/OR INSPECTION.
- GG. SMOKE DETECTORS SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MOUNTING THE SMOKE DETECTOR IN THE DUCTWORK AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS.
- HH. CONTRACTOR TO PROVIDE FIRE STOPPING AT ALL RATED HORIZONTAL AND VERTICAL ASSEMBLIES. CONTRACTOR SHALL NOT LEAVE OPENINGS UNPROTECTED DURING THE CONSTRUCTION PERIOD EXCEPT FOR SHORT DURATIONS WHILE ITEMS ARE BEING INSTALLED THROUGH OPENINGS.
- II. ALL EXISTING HVAC EQUIPMENT, PIPING, AND DUCTWORK NOT SHOWN ON DRAWINGS IS TO BE REMOVED AS NECESSARY FOR COMPLETION OF NEW WORK (CONTRACTOR SHALL INCLUDE THIS COST IN BASE BID PRICE).
- JJ. ALL EXISTING EQUIPMENT, PIPING, ECT. THAT IS ABOVE CEILING THAT CONFLICTS WITH NEW DUCTWORK AND PIPING LAYOUT IS TO BE RELOCATED AS NECESSARY TO ALLOW FOR NEW LAYOUT INSTALLATION (CONTRACTOR SHALL INCLUDE THIS COST IN BASE BID PRICE).
- KK. FURNISH AND INSTALL ISOLATION VALVES AND PIPE CAPS IN PIPING AS REQUIRED FOR PHASING OF ALL WORK.
- LL. CONTRACTOR SHALL FIELD-VERIFY ALL EXISTING PIPING, DUCTWORK, AND EQUIPMENT SIZES AND REPORT TO ENGINEER ANY DISCREPANCIES ON DRAWINGS BEFORE ANY EQUIPMENT IS PURCHASED.

## FANS

FAN TYPES: PRV - POWER ROOF VENTILATOR IL - INLINE CENTRIFUGAL ILD - INLINE DUCT BLOWER CE - CEILING MOUNTED EXHAUST			US - UTILITY SET SWV - SIDEWALL VENTILATOR PFSF - PENTHOUSE FILTERED SUPPLY FAN LBE - UP BLAST EXHAUSTER					PF - PLENUM FAN SWP - SIDEWALL PROPELLER HPRE - HOODED PROPELLER ROOF EXHAUSTER						
TAG	TYPE	SERVICE / LOCATION	CFM	ESP (IN)	MAX KONES	(WHEEL DIA(IN))	RPM	MOTOR DATA			MFG.	MODEL	FAN CONTROL	REQ'D ACCY
								HP	WATTS	VOLTAGE				
EF-1	PRV	RELIEF/AUDITOR, MEZ.	6995	0.5	11	AS REQ'D	528	1.5	208	3	-	-	43	1.9
EF-2	PRV	RELIEF/AUDITOR, MEZ.	6995	0.5	11	AS REQ'D	528	1.5	208	3	-	-	43	1.9
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- REQ'D ACCY:  
1. STANDARD DISCONNECT, FACTORY MOUNTED & WIRED  
2. GRAVITY BACKDRAFT DAMPER  
3. INLET/OUTLET FLEX DUCT FLANGES  
4. SPRING ISOLATORS  
5. STANDARD FINISH, COLOR BY ARCHITECT  
6. BAKED ENAMEL FINISH, COLOR BY ARCHITECT  
7. INLET GUARD  
8. R-4.5 VIBRATION ISOLATION HANGERS  
9. PROVIDE INSULATED ADAPTER ROOF CURB TO MATCH EXISTING ROOF CURB  
10. HINGED BASE  
11. UL 762 LISTING  
12. GREASE TERMINATOR  
13. STAINLESS STEEL BIRDSCREEN  
14. ELECTRONIC SPEED CONTROLLER  
15. LOCKABLE DISCONNECT, FACTORY MOUNTED AND WIRED  
16. GRAVITY SHUTTER  
17. SHUTTER GUARD  
18. WHITE ALUMINUM GRILLE
- FAN CONTROL:  
PROVIDED BY BAS CONTRACTOR:  
21. TIME SCHEDULED DDC ON/OFF  
22. WALL MOUNTED DDC SPACE SENSOR  
23. WALL MOUNTED THERMOSTAT - MOUNTED & WIRED BY EC  
24. UNIT MOUNTED THERMOSTAT - MOUNTED & WIRED BY EC  
25. HARDWIRE INTERLOCK ASSOCIATED MOTORIZED DAMPER WITH FAN  
26. HARDWIRE INTERLOCK FAN TO REFRIGERANT MONITOR PANEL
- PROVIDED BY HC WITH UNIT:  
31. WALL MOUNTED THERMOSTAT - MOUNTED & WIRED BY EC  
32. UNIT MOUNTED THERMOSTAT - MOUNTED & WIRED BY EC  
33. INTEGRAL THERMOSTAT - FACTORY MOUNTED & WIRED

## VARIABLE FREQUENCY DRIVES

TAG	SERVICE	ENCLOSURE	NOTES
AH-1	AH-1 SUPPLY FAN	SEE SPECIFICATIONS	1,2,3,4
AH-5	AH-5 SUPPLY FAN	SEE SPECIFICATIONS	1,2,3,4
AH-6	AH-6 SUPPLY FAN	SEE SPECIFICATIONS	1,2,3,4
P-1	P-1	SEE SPECIFICATIONS	1,2,3,4
P-2	P-2	SEE SPECIFICATIONS	1,2,3,4
P-3	P-3	SEE SPECIFICATIONS	1,2,3,4
P-4	P-4	SEE SPECIFICATIONS	1,2,3,4
AH-4(E)	AH-4(E) SUPPLY FAN	SEE SPECIFICATIONS	1,2,3,4
-	-	-	-

- NOTES:  
1. ALL VFD'S TO BE FROM SAME MANUFACTURER.  
2. REFER TO EQUIPMENT SCHEDULES FOR MOTOR DATA.  
3. FURNISH DRIVE WITH BYPASS.  
4. FURNISH DRIVE WITH COMMUNICATION INTERFACE.

## AIR HANDLING UNITS

- WATER TYPE HEATING COIL CAPACITY BASED ON 5 PSI STEAM ENTERING COIL - WATER TYPE COOLING COIL CAPACITY BASED ON 45°F E.W.T./55°F L.W.T.			
UNIT NUMBER	AH-1	AH-5	AH-6
AREA SERVED	1ST FLOOR OFFICES	1ST FLOOR OFFICES	1ST FLOOR OFFICES
UNIT CONFIG.	DUAL DECK	HORIZ.	HORIZ.
SUPPLY FAN	CFM	9300	2000
	ESP - IN. W.G.	1.80	0.70
	WHEEL DIA.	24.5	7
	WHEEL TYPE	PL	FC
STEAM HEATING COIL	MOTOR H.P.	10.0	3.0
	FACE AREA	8.9	4.0
	CAP'Y - MBH	255.7	131.1
	ENT. AIR TEMP.	52.5	48.7
COOLING COIL	LVG. AIR TEMP.	85.6	109.4
	CFM	7150	2000
	MAX. AIR P.D. - IN. W.C.	0.21	0.15
	PRESSURE ENT. COIL (PSI)	15	15
SENSIBLE CL'G MBH	ENT. AIR TEMP.	288.6	50.1
	DRY WB	418.3	71.6
	LVG. AIR TEMP.	84.3/68.2	78.9/65.8
	DRY WB	54.3/53.0	54.9/53.5
TOTAL CL'G MBH	CFM	9300	2000
	MAX. AIR P.D. - IN. W.C.	0.42	0.38
	DRY WB	82.7	14.2
	MAX. WATER P.D. FT.	9.0	5.2
TYPE - FINAL	2" PLEATED	2" PLEATED	2" PLEATED
	RATING	MERV 8	MERV 8
	P.D. IN. W.C. CLEAN/DIRTY	0.30/0.45	0.10/0.25
	0.21/0	-	-
OUTSIDE AIR - CFM (MIN.)	2325	600	270
	REQ'D ACCESS.	1,2,3,4	1,2,3
	UNIT WEIGHT (LBS)	4380	1552
	1382	-	-

- REQ'D ACCESS:  
1. 208/3/60 ELECTRIC  
2. PROVIDE VARIABLE FREQUENCY DRIVE  
3. SELECT CONTROL VALVE WITH PRESSURE DROP OF 10 PSI  
4. 3-WAY CONTROL VALVE  
5. UNIT SHALL BE CAPABLE OF BEING COMPLETELY ASSEMBLED ON SITE.  
CONTRACTOR SHALL ASSEMBLE UNIT ON SITE.

## CHILLER(S)

AMBIENT TEMP 95°F DB PROPYLENE GLYCOL 30%														
TAG	DESCRIPTION / LOCATION	EWV °F	LWT °F	GPM	PD (FT)	TONS	NPLV / EER	ELECTRICAL DATA (VOLTS) (PHASE) (MCA) (MOCP)			MFR	MODEL	REQ'D ACCESS	
(CH-1)(E)	EXISTING AIR COOLED CHILLER 1ST FLOOR	54	44	240	25	90	-	208	3	-	-	MCQUAY	AGZ090B212	-
CH-2	AIR COOLED CHILLER 1ST FLOOR	54	44	89.2	6.1	37.2	14.5/10.1	208	3	99.2	110	-	-	ALL
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

REQ'D ACCESS			
1. FACTORY MOUNTED DISCONNECT		4. SINGLE POINT POWER CONNECTION	
2. VIBRATION ISOLATORS (SPRINGS / NEOPRENE)		5. WATER FLOW SWITCH	
3. HOT GAS BY-PASS ALL CIRCUITS (RECIPROCATING COMPRESSOR(S) ONLY)		6. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS	

REQ'D ACCESS: 1. FACTORY MOUNTED DISCONNECT 2. VIBRATION ISOLATORS (SPRING / NEOPRENE) 3. HOT GAS BY-PASS ALL CIRCUITS (RECIPROCATING COMPRESSOR(S) ONLY)											
4. SINGLE POINT POWER CONNECTION 5. WATER FLOW SWITCH 6. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS											

## PUMPS

TAG	DESCRIPTION	SERVICE	MFR	MODEL	CAPACITY (GPM) (FT HD)	MOTOR DATA (BHP) (HP) (VOLT) (PHASE)	RPM	(NPSH) (FT)	MIN EFF %	CONN. SIZE (IN) (SUCTION) (DISCH)	REQ'D ACCESS
P-1	INLINE PUMP	PRIMARY CH-1/E	-	-	240 55	7.5 208 3	1760	8	59	3 3 3	3
P-2	INLINE PUMP	CH-2	-	-	89 50	3 208 3	1760	8	52	2 2 2	3
P-3	BASE-MOUNTED	SECONDARY PUMP	-	-	330 80	10 208 3	1760	12	78	3 2.5	2,3
P-4	BASE-MOUNTED	SECONDARY PUMP	-	-	330 80	10 208 3	1760	12	78	3 2.5	2,3

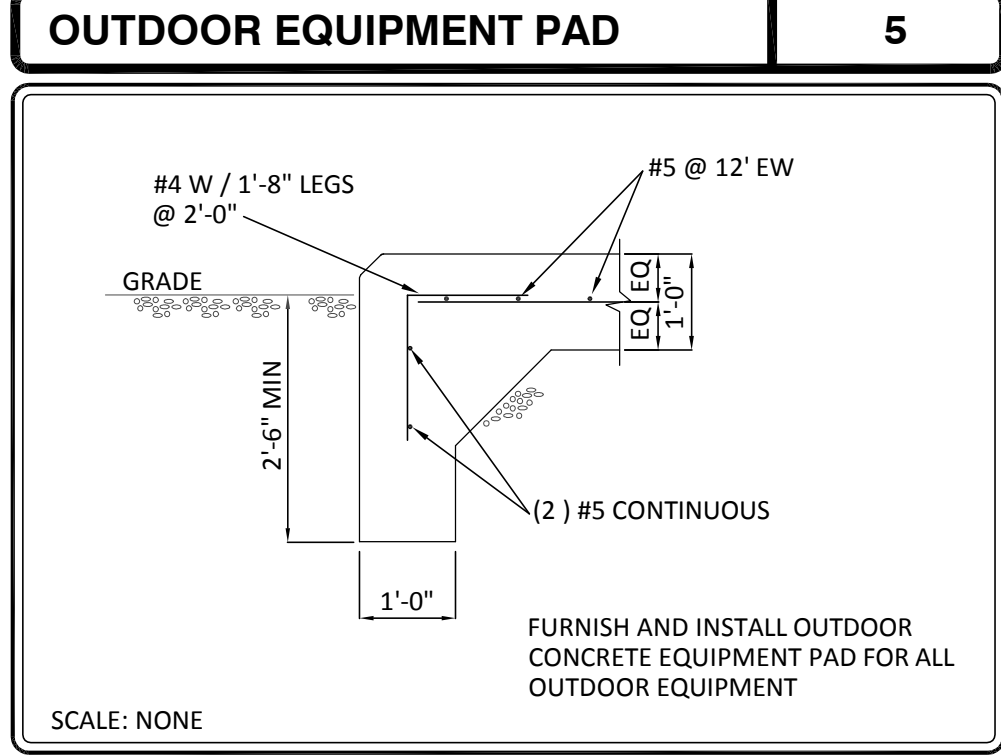
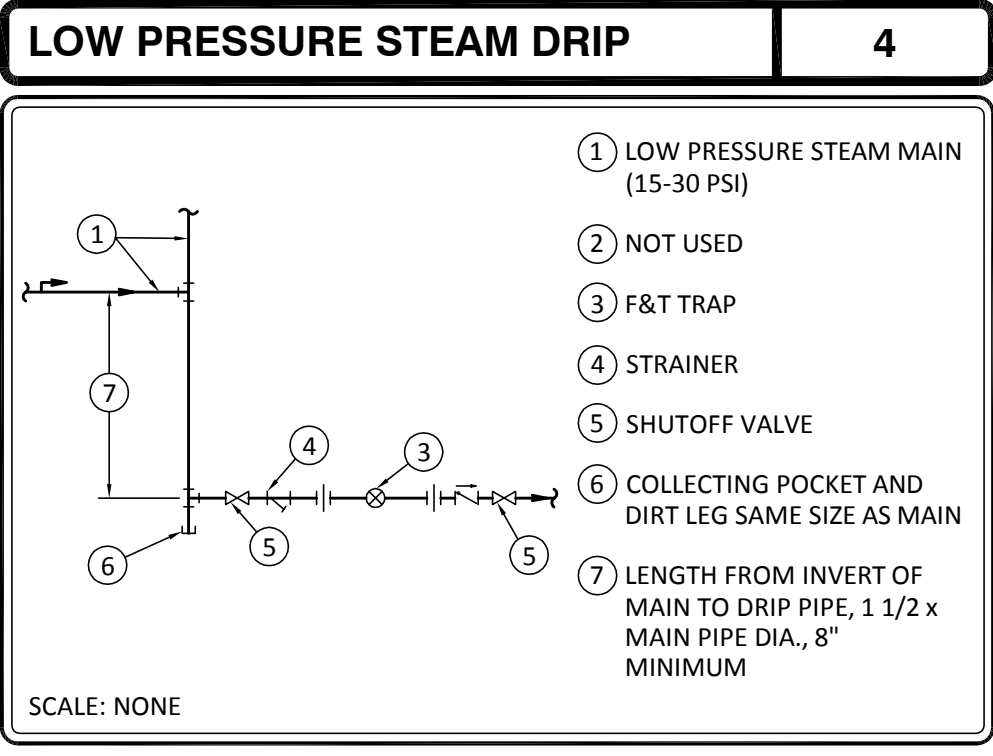
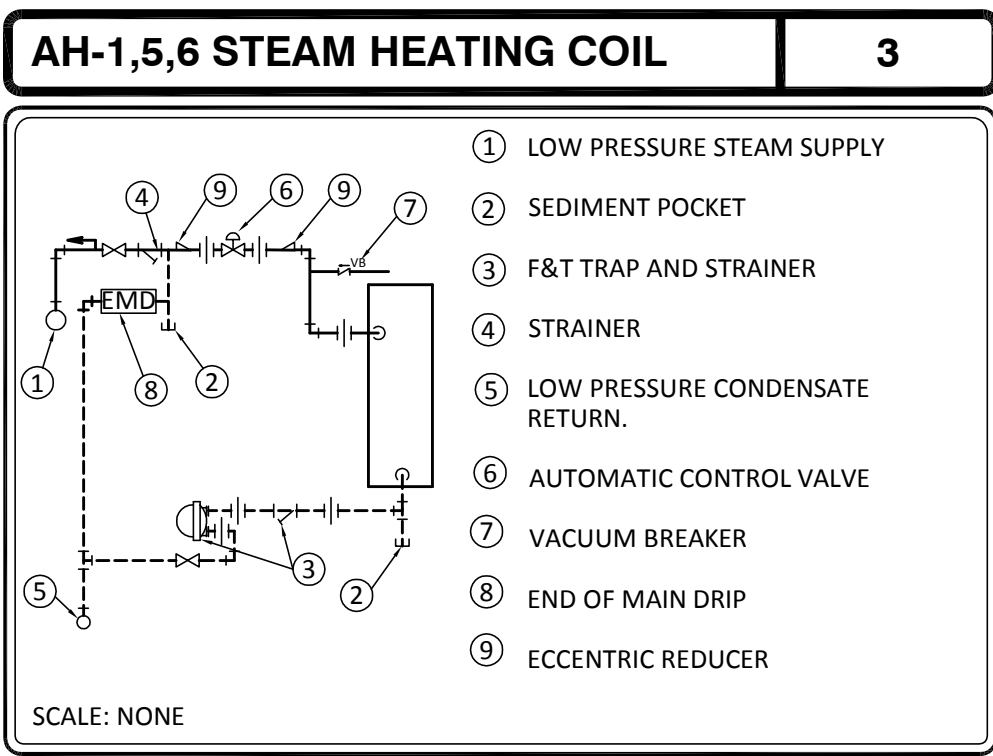
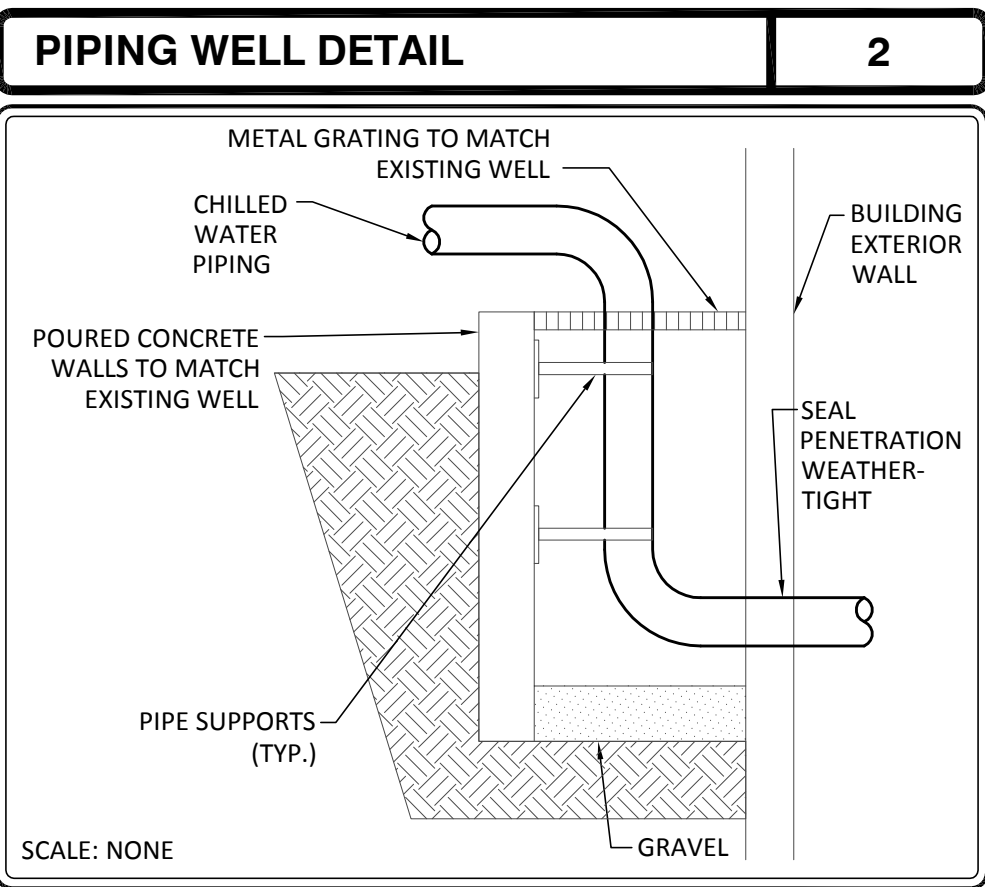
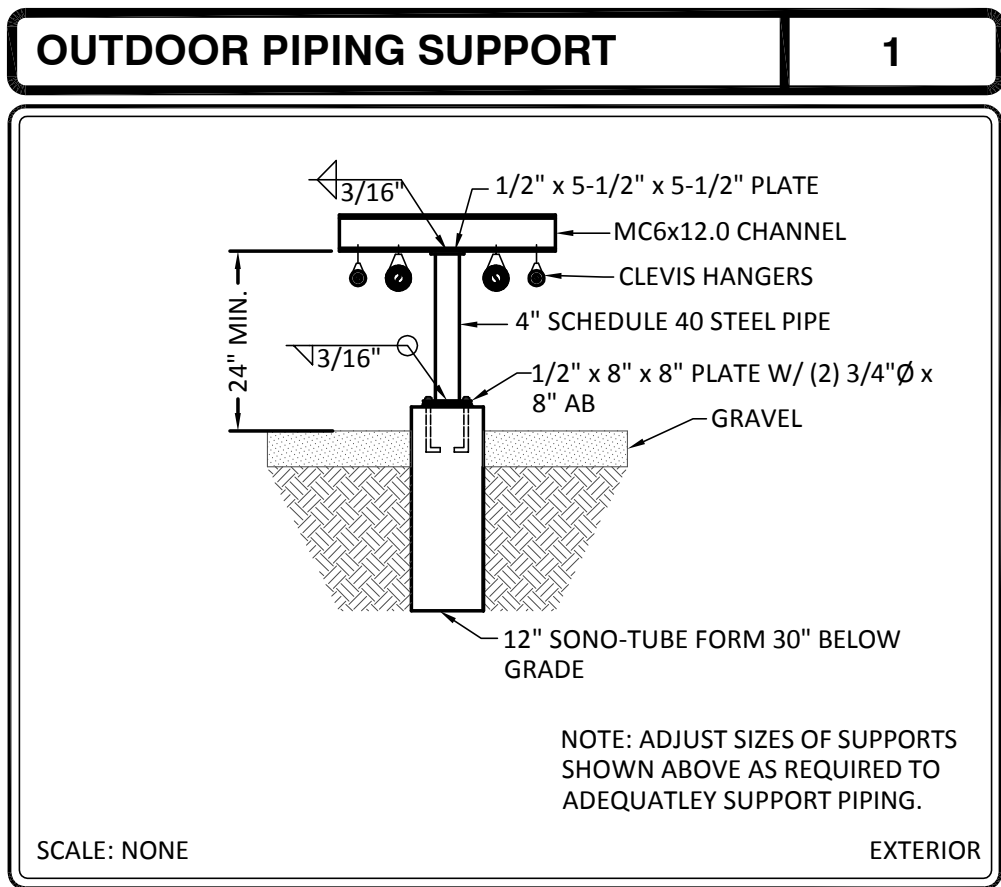
- REQ'D ACCESS:  
1. TRIPLE DUTY VALVE  
2. SUCTION DIFFUSER  
3. VARIABLE FREQUENCY DRIVE

## AIR TERMIN

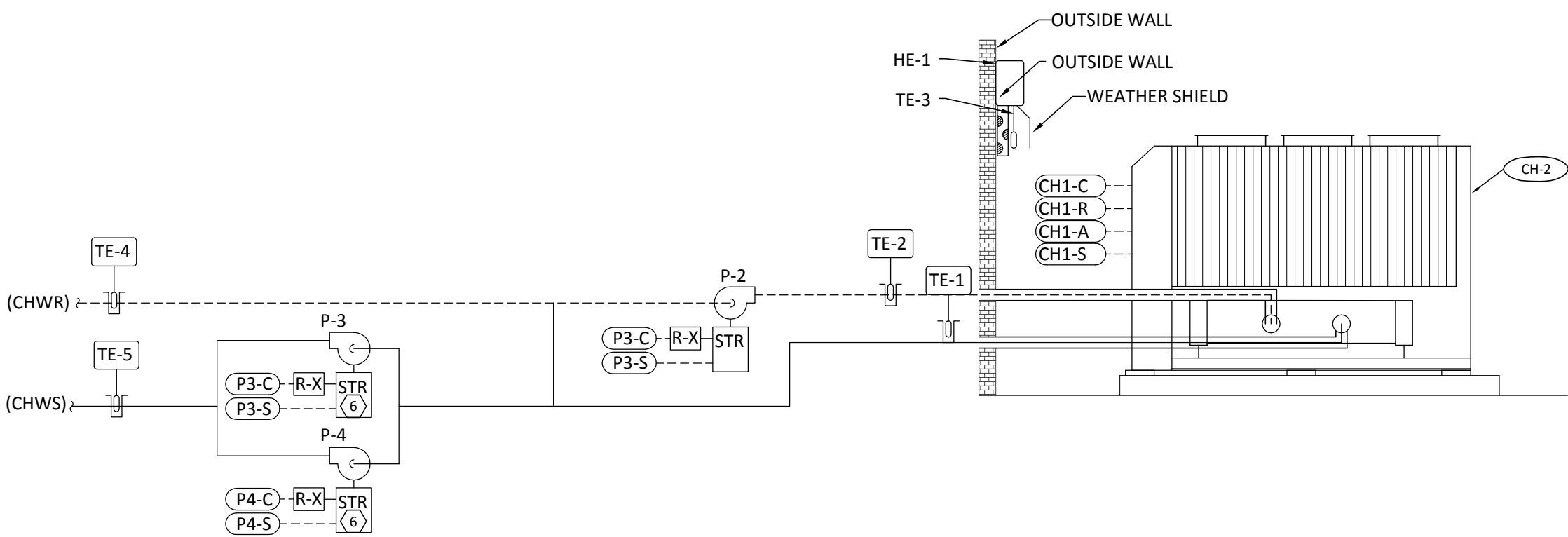


A  
B  
C  
D  
E  
F

three inches = one foot  
one and one half inches = one foot  
one inch = one foot  
three quarters inch = one foot  
one half inch = one foot  
three eighths inch = one foot  
one quarter inch = one foot  
one eighth inch = one foot



**CHILLED WATER CONTROLS**



**CHILLER PLANT OPERATION SEQUENCE**

**SEQUENCE OF OPERATIONS (PRIMARY CHILLED WATER SYSTEM)**

**CHILLER ENABLE** - THE CHILLER SYSTEM SHALL BE OPERATIONAL WHENEVER THE OUTSIDE AIR TEMPERATURE IS ABOVE 55 DEG F, AND ANY OF THE FOLLOWING CONDITIONS ARE MET (SPECIFIC TO ONLY THE AIR HANDLERS SERVED BY THIS CHILLER SYSTEM):

1. ANY AIR HANDLER IS IN THE OCCUPIED MODE.
2. ANY AIR HANDLER IS OPERATING DUE TO NIGHT SETUP HIGH TEMPERATURE, AND ECONOMIZER IS NOT AVAILABLE.

WHEN THE CHILLER SYSTEM BECOMES OPERATIONAL, THE CHILLER SHALL BE INDEXED TO OPERATE.

THE CHILLER SYSTEM SHALL STOP WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 55 DEG F, OR WHEN ALL AIR HANDLERS AND ZONED AREAS HAVE ENTERED THE UNOCCUPIED MODE.

WHEN THE CHILLER IS INDEXED TO OPERATE, ITS ASSOCIATED CHILLED WATER PUMP SHALL BE STARTED AND RUN CONTINUOUSLY. UPON PROOF OF PUMP STATUS, THE CHILLER SHALL THEN BE ENABLED TO RUN UNDER ITS OWN CONTROLS.

A FLOW SWITCH IN THE CHILLED WATER SHALL PROVE FLOW BEFORE THE COMPRESSOR ACTUALLY OPERATES. FURNISH ALL NECESSARY AUXILIARY CONTACTS AND EXTERNAL RELAYS, AND ALL WIRING (INCLUDING FLOW SWITCHES), REQUIRED TO ACCOMPLISH THE DESCRIBED START-UP, OPERATING AND SAFETY SEQUENCE DESCRIBED. ALL CHILLER CONTROL DEVICE INSTALLATION AND SET-UP SHALL BE PROVIDED UNDER THIS CONTRACT.

WHEN THE CHILLER SYSTEM'S OPERATIONAL CONDITIONS ARE NO LONGER SATISFIED, THE CHILLER SHALL BE STOPPED FIRST. AFTER A 5 MINUTE TIME DELAY, ITS ASSOCIATED CHILLED WATER PUMP SHALL BE STOPPED.

THE CHILLER SHALL UTILIZE A MINIMUM ON TIMER AND A MINIMUM OFF TIMER TO PREVENT SHORT CYCLING.

IF THE CHILLER OR ITS ASSOCIATED CHILLED WATER PUMP FAILS TO PROVE STATUS DURING THEIR OPERATION, AN ALARM SHALL BE INITIATED AT THE OPERATOR WORKSTATION.

WHEN THE OUTSIDE AIR TEMPERATURE FALLS BELOW 32 DEG F, THE PRIMARY CHILLED WATER PUMP SHALL BE STOPPED. IF THE LEAVING CHILLED WATER TEMPERATURE FROM THE CHILLER RISES ABOVE 90 DEG F, THE ASSOCIATED PUMP SHALL CYCLE OFF. IF THE OUTSIDE AIR TEMPERATURE REMAINS BELOW 32 DEG F, AND THE SUPPLY CHILLED WATER TEMPERATURE (TE-1) DROPS BELOW 40 DEG F, THE PUMPS SHALL BE ENABLE AGAIN FOR OPERATION UNTIL THE CHILLED WATER TEMPERATURE RISES ABOVE 90 DEG F. THIS PROCESS SHALL CONTINUE AS LONG AS THE OUTSIDE AIR TEMPERATURE REMAINS BELOW 32 DEG F.

**CHILLER PLANT OPERATION SEQUENCE**

**SEQUENCE OF OPERATIONS (SECONDARY CHILLED WATER SYSTEM)**

THE SECONDARY CHILLED WATER PUMPS SHALL OPERATE ON A LEAD/LAG BASIS. THE LEAD PUMP SHALL BE OPERATOR SELECTABLE AND SHALL AUTOMATICALLY ALTERNATE ON A MONTHLY BASIS. WHEN THE ALTERNATION OCCURS, THE PUMP WITH THE LEAST AMOUNT OF OVERALL TOTALIZED RUNTIME SHALL BECOME THE LEAD.

THE LEAD PUMP SHALL START AND RUN CONTINUOUSLY WHENEVER THE PRIMARY CHILLED WATER SYSTEM IS OPERATIONAL.

THE SPEED OF THE LEAD PUMP SHALL BE MODULATED TO MAINTAIN A CONSTANT DIFFERENTIAL PRESSURE AS SENSED BETWEEN THE SUPPLY AND RETURN OF SECONDARY CHILLED WATER SYSTEM. THE DIFFERENTIAL SETPOINT TO BE DETERMINED BY THE BALANCING CONTRACTOR.

1. THE LOCAL DIFFERENTIAL PRESSURE SENSOR SHALL BE HARD WIRED TO THE LOCAL CONTROLLER PERFORMING THE PRESSURE CONTROL SEQUENCE.
2. A REMOTE DIFFERENTIAL PRESSURE SENSOR SHALL BE USED TO RESET THE LOCAL DIFFERENTIAL PRESSURE SETPOINT WHEN THE BAS COMMUNICATIONS NETWORK IS ON-LINE AND OPERATIONAL. AS THE REMOTE DIFFERENTIAL PRESSURE VARIES FROM THE REMOTE PRESSURE SETPOINT, THE LOCAL SETPOINT SHALL BE RESET ACCORDINGLY.
3. THE LOCAL AND REMOTE DIFFERENTIAL SETPOINTS SHALL BE DETERMINED BY THE BALANCING CONTRACTOR.

**PUMP SEQUENCING**

1. IF THE SPEED OF THE LEAD PUMP EXCEEDS 90% PERCENT CAPACITY, THE LAG PUMP SHALL BE STARTED. ITS SPEED SHALL BE SLOWLY RAMPED UP, AND THE SPEED OF BOTH OPERATING PUMPS SHALL BE CONTROLLED IN UNISON TO MAINTAIN THE DIFFERENTIAL PRESSURE SETPOINT.
2. WHEN BOTH THE LEAD AND LAG PUMPS ARE OPERATING, AND THE SPEED OF BOTH PUMPS IS BELOW 40% CAPACITY, THE LAG PUMP SHALL BE STOPPED.

IF THE LEAD PUMP FAILS TO PROVE STATUS DURING ITS OPERATION, THE LEAD PUMP SHALL BE STOPPED, THE LAG PUMP SHALL BE STARTED AND AN ALARM SHALL BE INITIATED AT THE OPERATOR WORKSTATION. IF THE LAG PUMP FAILS TO PROVE STATUS DURING ITS OPERATION, AN ALARM SHALL BE INITIATED AT THE OPERATOR WORKSTATION.

**CHILLER PLANT OPERATION SEQUENCE**

**SEQUENCE OF OPERATIONS FOR EXISTING CHILLER (CH-1E)**

MODIFY EXISTING CONTROLS FOR CH-2 AS REQUIRED TO ACCOMPLISH THE FOLLOWING:

IF CHILLER CH-2 LEAVING WATER TEMPERATURE RISES ABOVE THE DESIGNATED LEAVING WATER TEMPERATURE (44 DEG. F. ADJUSTABLE) FOR MORE THAN 15 MINUTES, INDEX (CH-1E) TO OPERATE.

WHEN THE CHILLER IS INDEXED TO OPERATE, THE ASSOCIATED CHILLED WATER PUMP SHALL BE STARTED AND RUN CONTINUOUSLY. UPON PROOF OF PUMP STATUS, THE CHILLER SHALL THEN BE ENABLED TO RUN UNDER ITS OWN CONTROLS.

MODIFY EXISTING CONTROLS AND/OR PROVIDE NEW SO THAT BAS CAN MONITOR AMPERAGE DRAW FROM EACH CHILLER. WHEN AMPERAGE DRAW OF (CH-1E) IS LESS THAN 25% OF (CH-1E) CAPACITY, DISABLE CH-2.

CHILLERS (CH-1E) AND CH-2 SHALL USE A MIN. ON TIMER AND MIN. OFF TIMER TO PREVENT SHORT CYCLING.

WHEN THE QUANTITY OF CHILLERS IN OPERATION CHANGES, A DELAY TIMER SHALL PREVENT ADDITIONAL STAGING FOR A PERIOD OF 15 MINUTES TO ALLOW THE SYSTEM TO STABILIZE.

**CHILLER CONTROLLER POINTS**

**TYPE:**  
AI - ANALOG INPUT  
AO - ANALOG OUTPUT  
DI - DIGITAL INPUT  
DO - DIGITAL OUTPUT  
PI - PULSED INPUT

**FEATURES:**  
D - DISPLAYED ON WORKSTATION GRAPHICS  
M - MODIFIED/OVERRIDE FROM WORKSTATION GRAPHICS  
A - ALARMS AT WORKSTATION  
L - LOGGED/TRENDED AT WORKSTATION  
S - TIME SCHEDULED AT WORKSTATION  
G - GLOBALLY SHARED TO ALL CONTROLLERS

**NOTE:**  
\*INCLUDE ALL POINTS LISTED BELOW AND PROVIDE ANY OTHER POINTS AS REQUIRED TO ACCOMPLISH THE SEQUENCE OF OPERATION.

TAG	TYPE	DESCRIPTION	QTY	D	M	A	L	S	G	NOTES
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**CHILLER PLANT CONTROLLER POINTS**

CH2-C	DO	CHILLER 2 COMMAND	1	X	X	-	-	-	-	-
CH2-R	AO	CHILLER 2 WATER RESET SETPOINT	1	X	X	-	-	-	-	-
CH2-S	DI	CHILLER 2 STATUS	1	X	-	X	-	-	-	-
CH2-A	DI	CHILLER 2 ALARM	1	X	-	X	-	-	-	-
TE-1	AI	MAIN CHILLED WATER SUPPLY TEMPERATURE	1	X	-	-	X	-	-	-
TE-2	AI	MAIN CHILLED WATER RETURN TEMPERATURE	1	X	-	-	X	-	-	-
TE-3	AI	OUTSIDE AIR TEMPERATURE	1	X	-	-	X	-	-	-
TE-4	AI	SECONDARY RETURN TEMPERATURE	1	X	-	-	X	-	-	-
TE-5	AI	SECONDARY SUPPLY TEMPERATURE	1	X	-	-	X	-	-	-
P3-C	DO	CHILLED WATER PUMP 3 COMMAND	1	X	X	-	-	-	-	-
P3-S	DI	CHILLED WATER PUMP 3 STATUS	1	X	-	X	-	-	-	-
P3-SC	AO	CHILLED WATER PUMP 3 SPEED COMMAND	1	X	X	-	-	-	-	-
P4-C	DO	CHILLED WATER PUMP 4 COMMAND	1	X	X	-	-	-	-	-
P4-SC	AO	CHILLED WATER PUMP 4 SPEED COMMAND	1	X	X	-	-	-	-	-
P2-C	DO	CHILLED WATER PUMP 2 COMMAND	1	X	X	-	-	-	-	-
P2-S	DI	CHILLED WATER PUMP 2 STATUS	1	X	-	X	-	-	-	-
P2-SC	AO	CHILLED WATER PUMP 2 SPEED COMMAND	1	X	X	-	-	-	-	-

**NOTES:**  
1.

DESIGNER/ENGINEER: SH  
CAD OPERATOR: SH  
QA/QC CHECKER: SS

95% OWNER REVIEW  
ISSUE FOR BID DOCUMENTS

1/18/2013  
1/31/2013

**Dynamix Engineering Ltd.**  
Facility Engineering Consultants  
855 Grandview Avenue, 3rd Floor Columbus, Ohio 43215  
Phone: (614)443-1178 · Fax: (614)443-1594 · Email: dynamix@dynamix-ltd.com  
Comm. No.: 120053



Revised By:

Drawing Title  
HVAC SCHEDULES AND DETAILS

Approved: Project Engineer  
Philip Kirk

Project Title  
REPLACE CONDENSING  
UNITS, B-305

Building Number  
305

Checked  
DYNAMIX

Drawn  
SH

Location  
4100 WEST THIRD ST  
DAYTON, OH 45428

Date  
1-18-2013

Project No.  
552-13-303

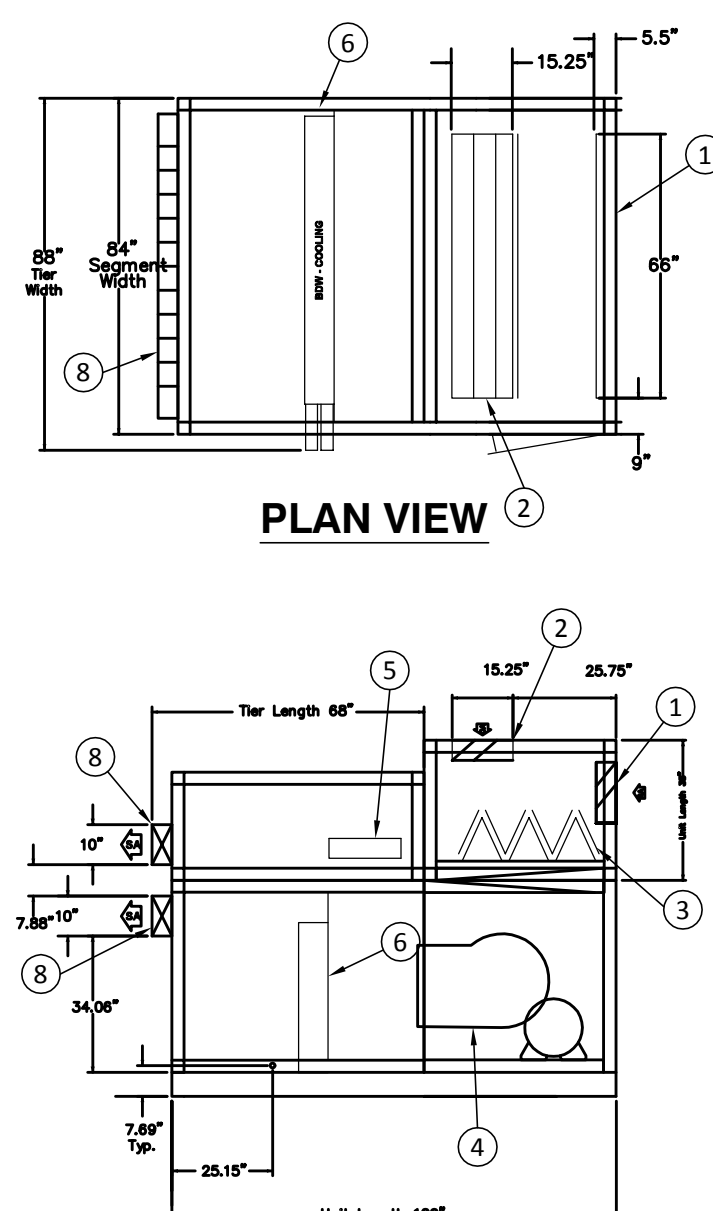
Drawing No.  
M1





AH-1 DETAIL

1

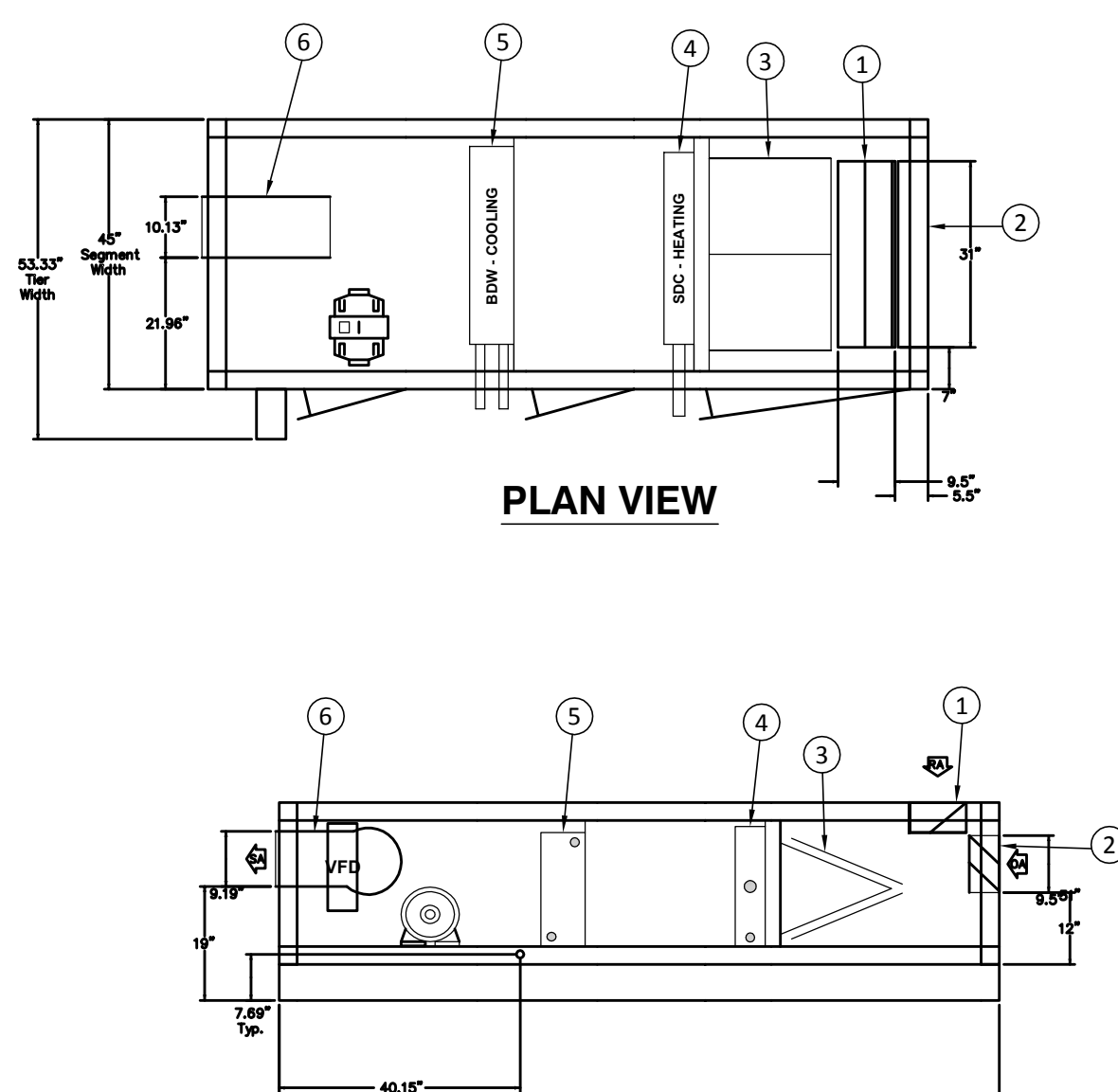


SCALE: NONE

- COMPONENTS
- 1 RETURN AIR OPENING WITH MOTORIZED DAMPER
  - 2 OUTSIDE AIR OPENING WITH MOTORIZED DAMPER
  - 3 PANEL FILTER
  - 4 FAN
  - 5 STEAM HEATING COIL
  - 6 CHILLED WATER COOLING COIL
  - 7 NOT USED
  - 8 MULTIZONE DAMPERS, CUT TO SUPPLY DUCT DIMENSIONS IN FIELD.

AH-5 DETAIL

2

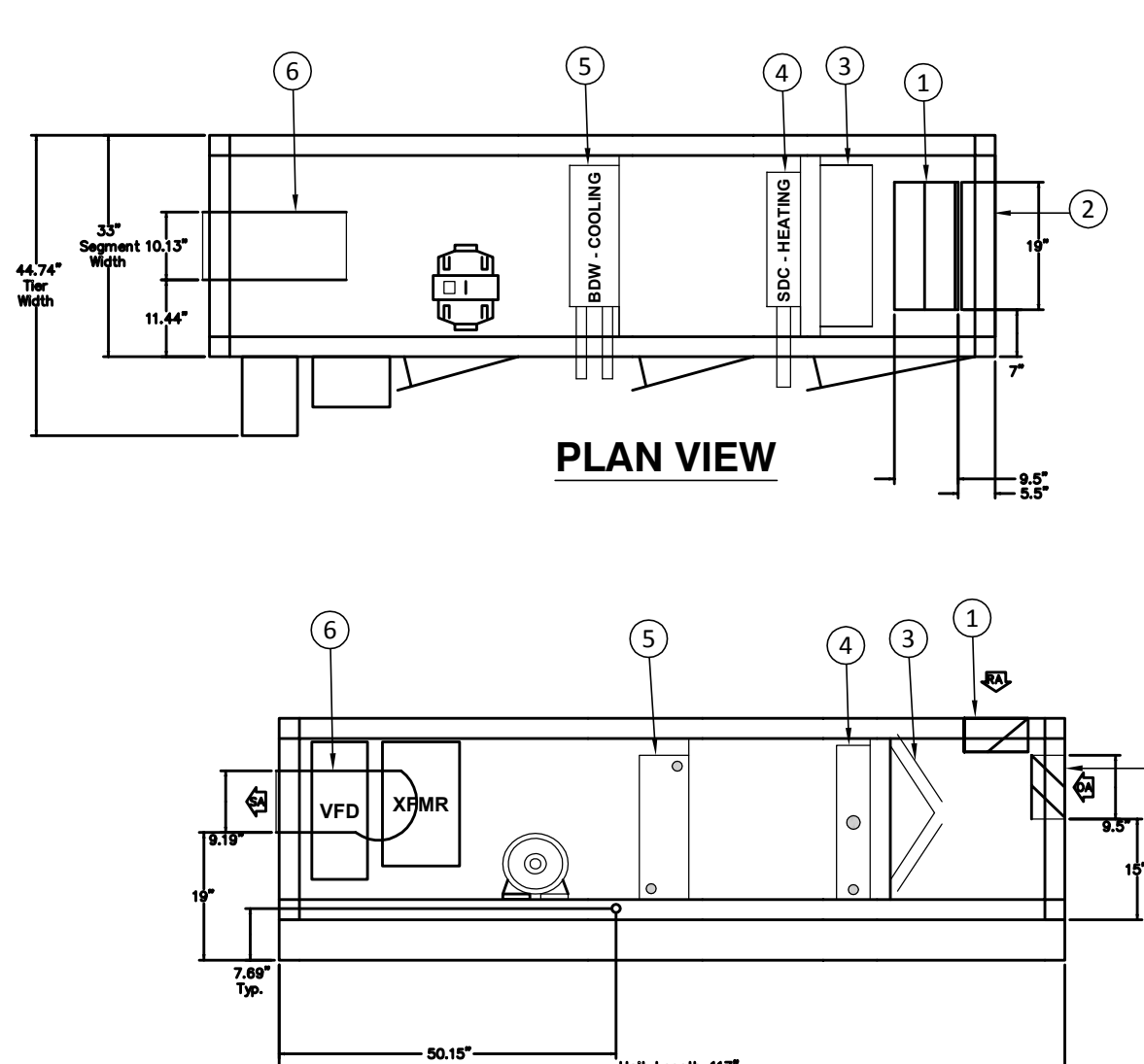


SCALE: NONE

- COMPONENTS
- 1 RETURN AIR OPENING WITH MOTORIZED DAMPER
  - 2 OUTSIDE AIR OPENING WITH MOTORIZED DAMPER
  - 3 PANEL FILTER
  - 4 STEAM HEATING COIL
  - 5 CHILLED WATER COOLING COIL
  - 6 FAN

AH-6 DETAIL

3

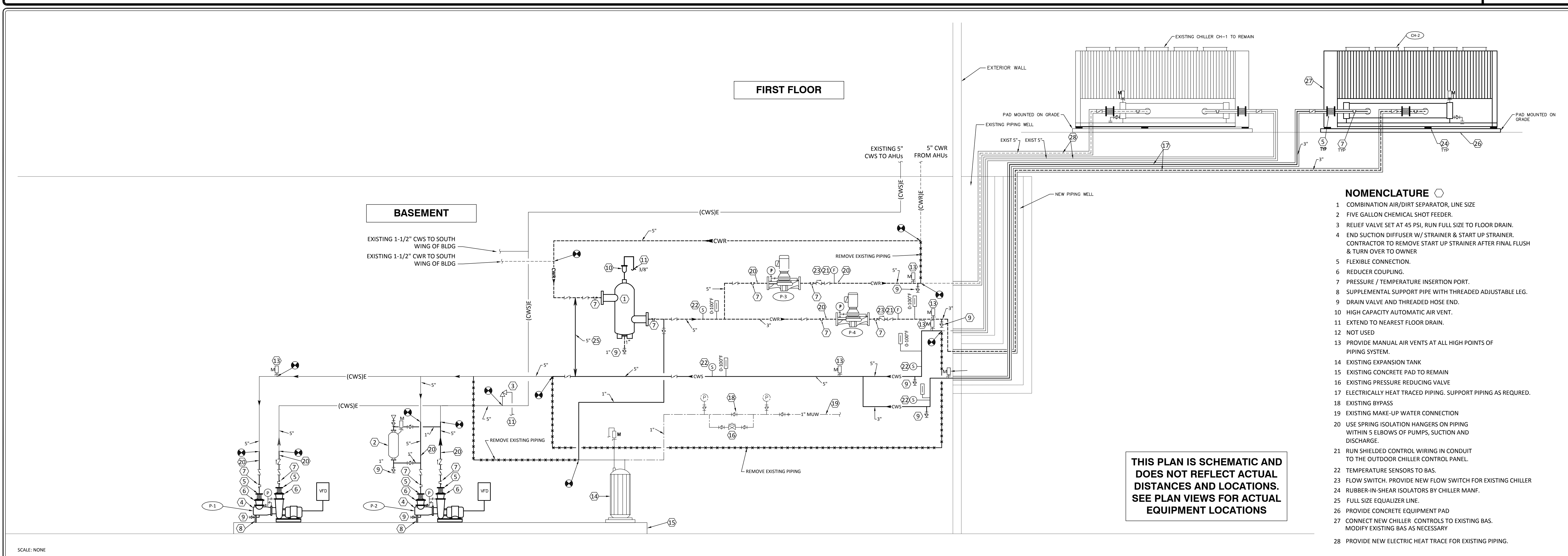


SCALE: NONE

- COMPONENTS
- 1 RETURN AIR OPENING WITH MOTORIZED DAMPER
  - 2 OUTSIDE AIR OPENING WITH MOTORIZED DAMPER
  - 3 PANEL FILTER
  - 4 STEAM HEATING COIL
  - 5 CHILLED WATER COOLING COIL
  - 6 FAN

CHILLED WATER PIPING SCHEMATIC

4



DESIGNER/ENGINEER  
CAD OPERATOR  
CHECKED/REVIEWER

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Facility Engineering Consultants  
855 Grandview Avenue, 3rd Floor Columbus, Ohio 43215  
Phone: (614)443-1178 · Fax: (614)443-1594 · Email: dynamix@dynamix-ltd.com  
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Revised By:

Drawing Title  
HVAC SCHEDULES AND DETAILS

Approved: Project Engineer  
Philip Kirk

Project Title  
REPLACE CONDENSING  
UNITS, B-305

Building Number  
305

Checked  
DYNAMIX

Drawn  
SH

Location  
4100 WEST THIRD ST  
DAYTON, OH 45428

Date  
1-18-2013

Project No.  
552-13-303

Drawing No.  
M2



VA Department of Veterans Affairs

A

B

C

D

E

F

F

F

F

A

B

C

D

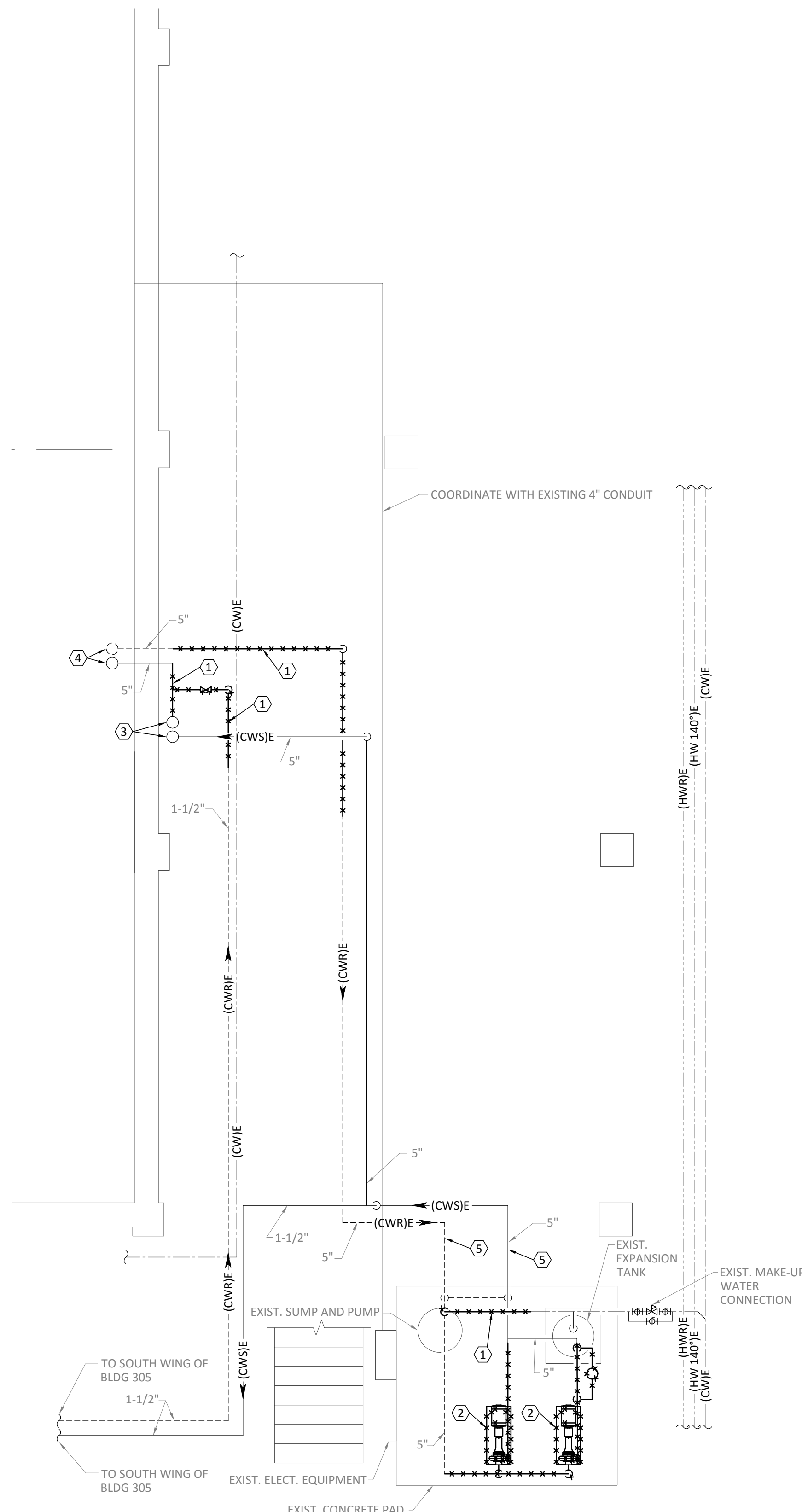
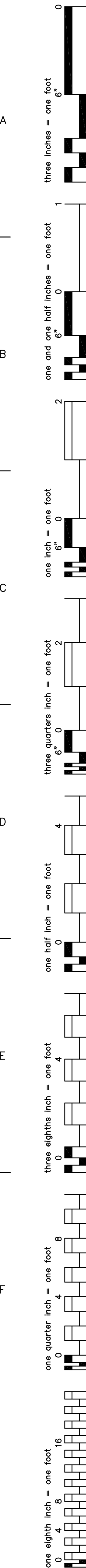
E

F

F

F

F



**PARTIAL BASEMENT DEMOLITION FLOOR PLAN**

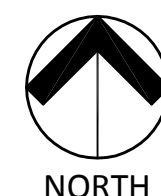
SCALE: 1/4"=1'-0"

**PARTIAL BASEMENT DEMO PLAN NOTES**

- 1.-REMOVE EXISTING PIPING AS SHOWN.
- 2.-REMOVE EXISTING PUMPS AND ASSOCIATED VALVES. BEFORE REMOVAL OF PUMPS, TAKE PRELIMINARY WATER FLOW MEASUREMENTS AND SUBMIT TO ENGINEER BEFORE ORDERING NEW EQUIPMENT.
- 3.-EXISTING 5" CWS AND CWR UP TO ATTIC.
- 4.-EXISTING 5" CWS AND CWR UP THRU PIPING WELL TO EXTERIOR OF BUILDING.
- 5.-REMOVE INSULATION FROM EXISTING CWS AND CWR PIPING IN CRAWL SPACE.

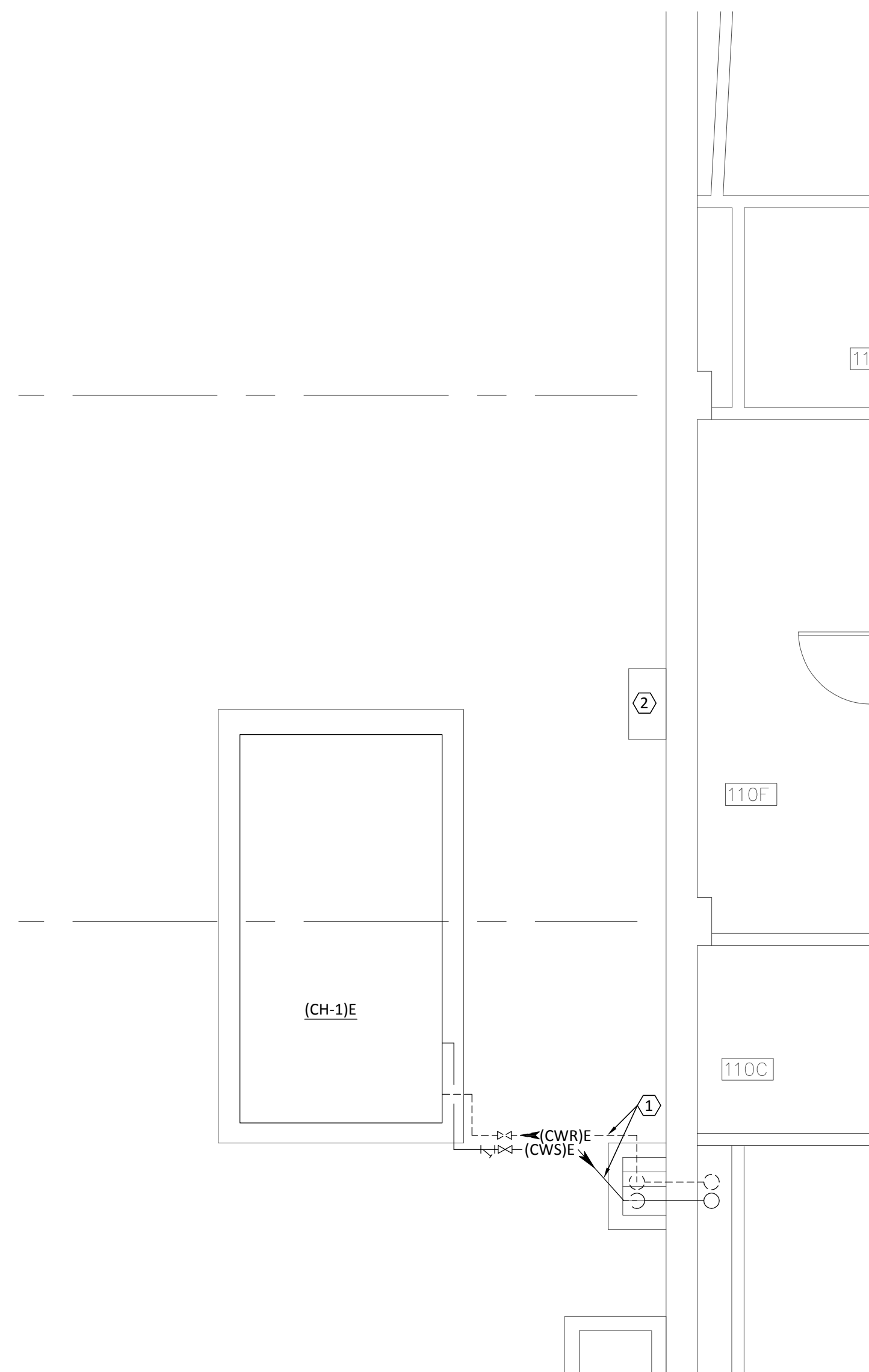
**GENERAL ASBESTOS ABATEMENT NOTES**

- A.-ALL ASBESTOS ABATEMENT SHALL BE CONDUCTED IN ACCORDANCE WITH 02 82 11 TRADITIONAL ASBESTOS ABATEMENT SPECIFICATIONS.
- B.-ABATE EXISTING ACM CAULK/PUTTY LOCATED ON METAL DUCTS AND EXISTING ACM BRIDGING ENCAPSULANT LOCATED ON FIBERGLASS DUCT INSULATION.
- C.- ABATE EXISTING ACM FLEXIBLE EQUIPMENT/DUCT CONNECTIONS.
- D.-ABATE EXISTING ACM BRIDGING ENCAPSULANT LOCATED ON FIBERGLASS PIPE INSULATION.
- E.- ALL DUCTWORK, PIPING AND FLEXIBLE CONNECTIONS SHOWN TO BE DEMOLISHED ARE TO BE ASSUMED TO BE ASBESTOS CONTAINING.



**PARTIAL DEMOLITION FIRST FLOOR PLAN**

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



**PARTIAL DEMO FIRST FLOOR PLAN NOTES**

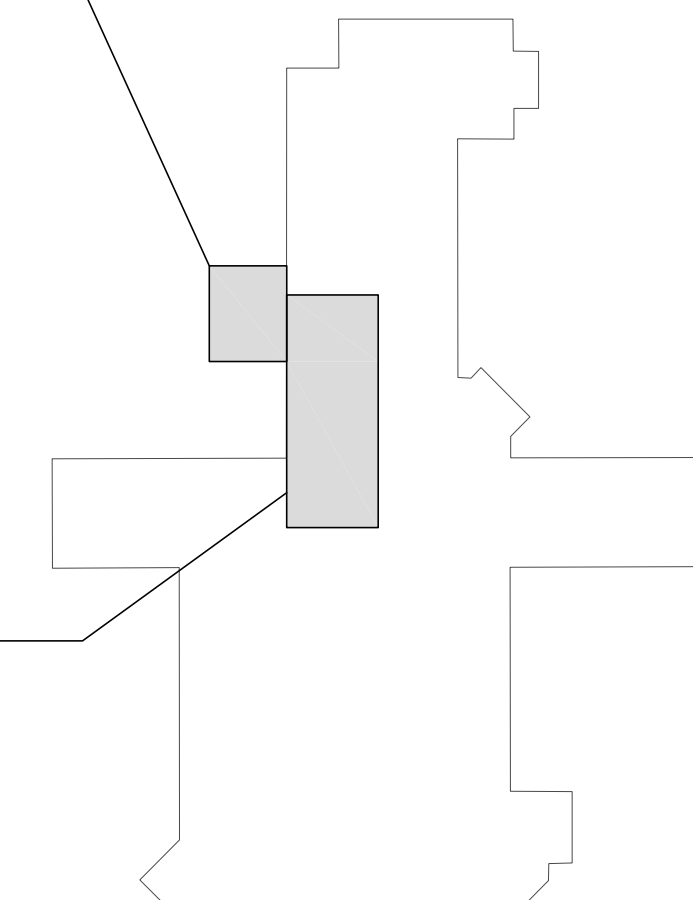
- 1.-REMOVE EXISTING INSULATION AND HEAT TRACING SYSTEM FOR EXISTING CWS AND CWR PIPING. PIPING TO REMAIN.
- 2.-EXISTING CHILLER DISCONNECT SWITCH TO REMAIN.

**GENERAL ASBESTOS ABATEMENT NOTES**

- A.-ALL ASBESTOS ABATEMENT SHALL BE CONDUCTED IN ACCORDANCE WITH 02 82 11 TRADITIONAL ASBESTOS ABATEMENT SPECIFICATIONS.
- B.-ABATE EXISTING ACM CAULK/PUTTY LOCATED ON METAL DUCTS AND EXISTING ACM BRIDGING ENCAPSULANT LOCATED ON FIBERGLASS DUCT INSULATION.
- C.- ABATE EXISTING ACM FLEXIBLE EQUIPMENT/DUCT CONNECTIONS.
- D.-ABATE EXISTING ACM BRIDGING ENCAPSULANT LOCATED ON FIBERGLASS PIPE INSULATION.
- E.- ALL DUCTWORK, PIPING AND FLEXIBLE CONNECTIONS SHOWN TO BE DEMOLISHED ARE TO BE ASSUMED TO BE ASBESTOS CONTAINING.

SEE "PARTIAL  
DEMOLITION FIRST  
FLOOR PLAN"

SEE "PARTIAL BASEMENT  
DEMOLITION FLOOR PLAN"



**KEY PLAN**

DESIGNER/ENGINEER  
CAD OPERATOR  
CHECKER

95% OWNER REVIEW  
ISSUE FOR BID DOCUMENTS

1/18/2013  
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Facility Engineering Consultants  
855 Grandview Avenue, 3rd Floor Columbus, Ohio 43215  
Phone: (614)443-1178 · Fax: (614)443-1594 · Email: dynamix@dynamix-ltd.com  
Comm. No.: 120053



Professional Seal

Revised By:

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

Drawing Title  
FIRST FLOOR  
HVAC DEMOLITION PLAN

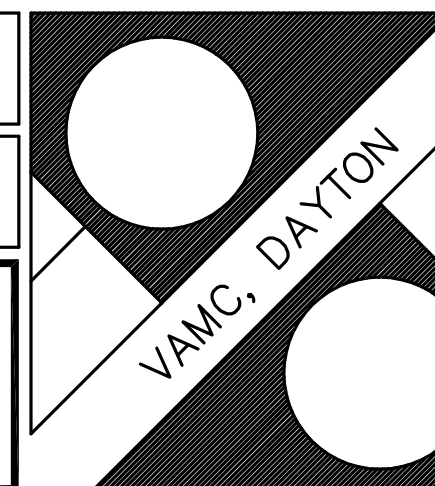
Approved: Project Engineer  
Philip Kirk

Project Title  
REPLACE CONDENSING  
UNITS, B-305

Building Number  
305  
Checked  
DYNAMIX  
Drawn  
SH  
Location  
4100 WEST THIRD ST  
DAYTON, OH 45428

Date  
1-18-2013  
Project No.  
552-13-303

Drawing No.  
M3

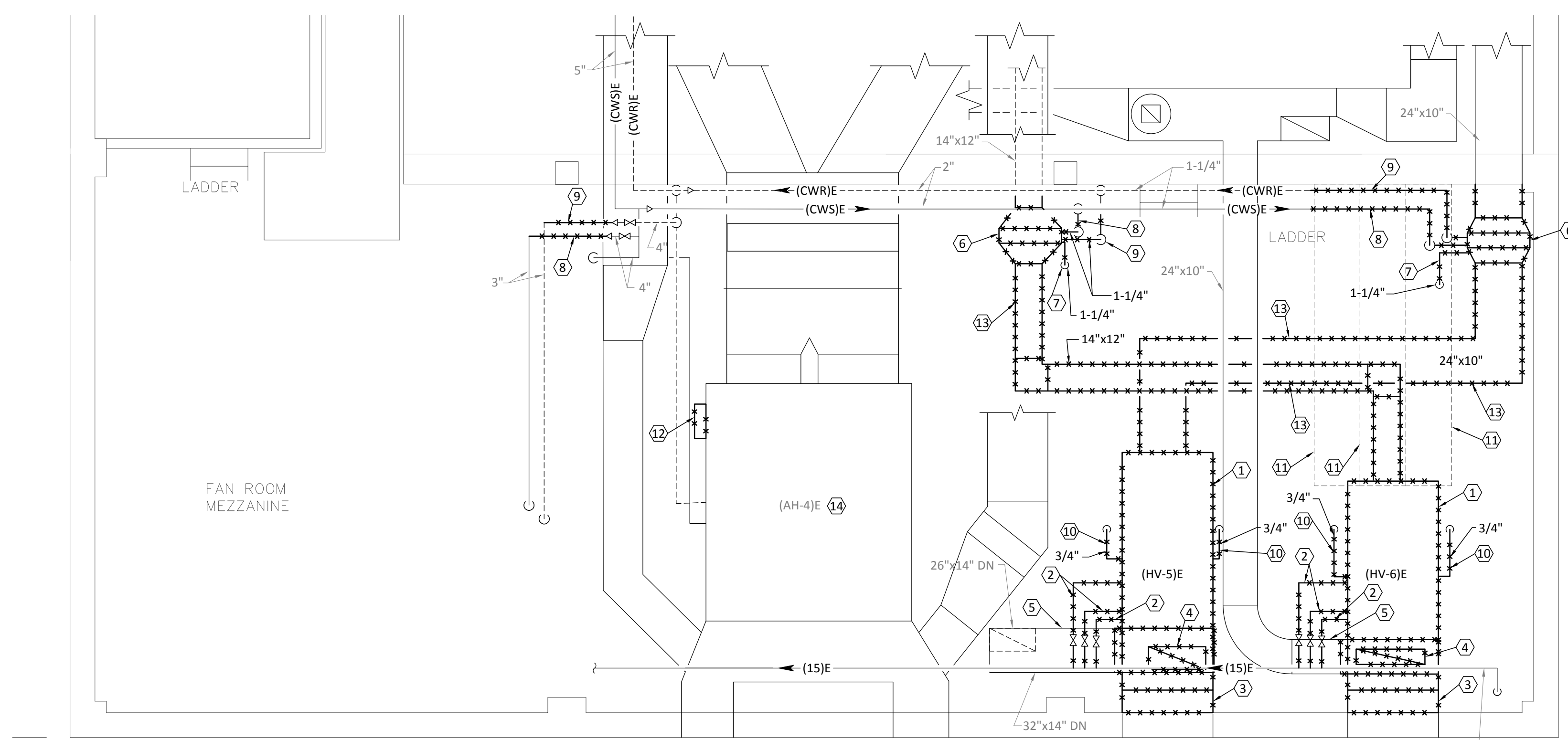


VA Department of  
Veterans Affairs




NORTH

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



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

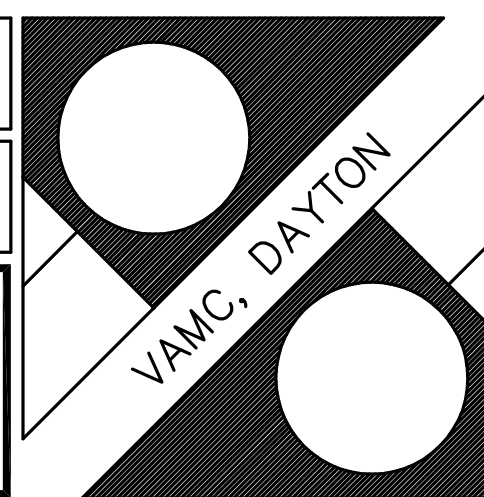
Revisions	Date
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Revised By:

Drawing Title
SECOND FLOOR HVAC DEMOLITION PLAN
Approved: Project Engineer Philip Kirk

Date	1-18-2013
Project No.	552-13-303
Drawing No.	M4

WA  
Department of  
Veterans Affairs

NO.	NAME
M1	
M2	
M2A	STAIR WELL
M2B	MOTOR AND GENERATOR
M3	PROJECTION ROOM
M3A	REWIND ROOM
M4	STORAGE
M4A	STORGE
M5	OFFICE
M6	OFFICE
M7	H.A.C.
M8	MEN
M9	WOMEN
M10	FAN ROOM
M11	STAIR WELL

1.-REMOVE EXISTING AIR HANDLER AND ASSOCIATED STRUCTURAL SUPPORTS. AIR HANDLER WILL HAVE TO BE DISASSEMBLED IN PLACE. PROVIDE ALL LABOR TO DISASSEMBLE AND REMOVE UNIT. BEFORE REMOVING EXISTING AIR HANDLER, DO PRELIMINARY AIRFLOW TESTING OF EXISTING AIR HANDLER AND ALL DIFFUSERS. SUBMIT TO ENGINEER FOR REVIEW BEFORE PURCHASING ANY NEW EQUIPMENT.

- 2.-REMOVE EXISTING SUPPLY DUCTWORK AND ALL SUPPORTS.
- 3.-REMOVE EXISTING RETURN DUCT (LOW) FROM UNIT TO LOUVER.
- 4.-REMOVE EXISTING OUTSIDE AIR DUCT (HIGH) FROM UNIT TO LOUVER.
- 5.-EXISTING FIRE DAMPERS TO REMAIN.
- 6.-REMOVE EXISTING REFRIGERANT PIPING ASSOCIATED WITH EXISTING AIR HANDLER.
- 7.-REMOVE EXISTING CONDENSING UNIT AND ASSOCIATED CONTROLS.
- 8.-PATCH WALL TO MATCH EXISTING.
- 9.-REMOVE EXISTING STEAM PIPING AND ALL ASSOCIATED ACCESSORIES.
- 10.-REMOVE EXISTING UP RACK TO MAIN, CAP AT MAIN.
- 11.-REMOVE AC CONDENSATE DRAIN PIPING BACK TO MAIN - CAP AT MAIN
- 12.-EXISTING 1-1/4" AC CONDENSATE DRAIN DOWN TO FLOOR DRAIN.

A.-ALL ASBESTOS ABATEMENT SHALL BE CONDUCTED IN ACCORDANCE WITH 02 82 11 TRADITIONAL ASBESTOS ABATEMENT SPECIFICATIONS.

- B- ABATE EXISTING ACM CAULK/PUTTY LOCATED ON METAL DUCTS AND EXISTING ACM BRIDGING ENCAPSULANT LOCATED ON FIBERGLASS DUCT INSULATION.
- C- ABATE EXISTING ACM FLEXIBLE EQUIPMENT/DUCT CONNECTIONS.
- D- ABATE EXISTING ACM BRIDGING ENCAPSULANT LOCATED ON FIBERGLASS PIPE INSULATION.
- E- ALL DUCTWORK, PIPING AND FLEXIBLE CONNECTIONS SHOWN TO BE DEMOLISHED ARE TO BE ASSUMED TO BE ASBESTOS CONTAINING.

1.-REMOVE EXISTING AIR HANDLER, ASSOCIATED PIPING AND STRUCTURAL SUPPORTS. AIR HANDLER WILL HAVE TO BE DISASSEMBLED IN PLACE. PROVIDE ALL LABOR AS NECESSARY TO DISASSEMBLE AND REMOVE AIR HANDLER. BEFORE REMOVING EXISTING AIR HANDLER, DO PRELIMINARY AIRFLOW TESTING OF EXISTING AIR HANDLER AND ALL DIFFUSERS. SUBMIT TO ENGINEER FOR REVIEW BEFORE PURCHASING ANY NEW EQUIPMENT.

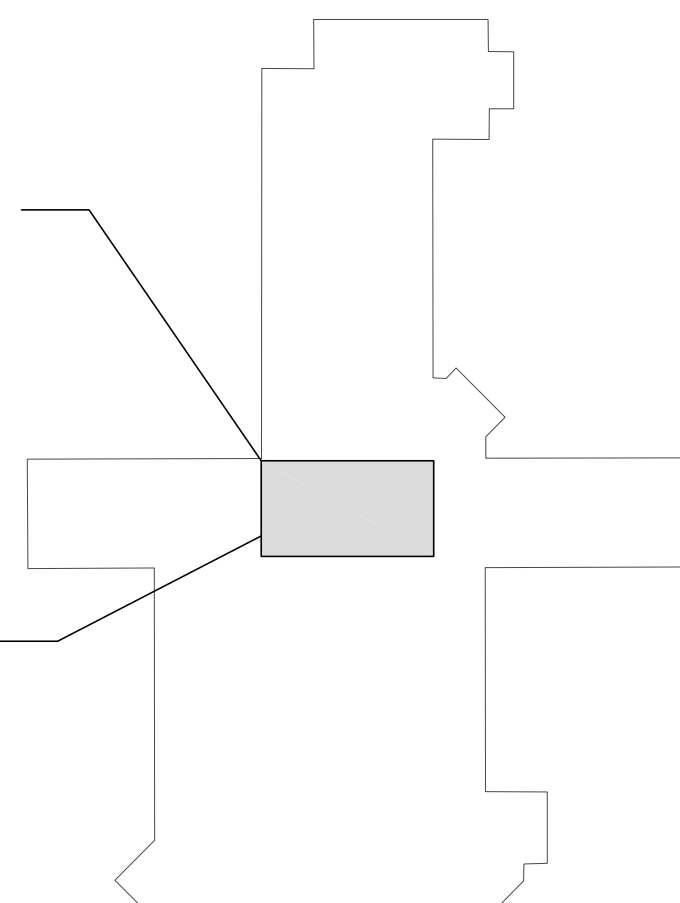
- 2.-REMOVE EXISTING STEAM PIPING BACK TO MAIN. CAP AT MAIN.
- 3.-REMOVE EXISTING O.A. DUCT TO LOUVER.
- 4.-REMOVE EXISTING R.A. DUCT TO LOUVER.
- 5.-EXISTING R.A. SMOKE DETECTOR TO REMAIN.
- 6.-REMOVE EXISTING COOLING COIL.
- 7.-REMOVE AC COOLING COIL CONDENSATE DRAIN BACK TO MAIN. CAP AT MAIN.
- 8.-REMOVE EXISTING CWS PIPING AS SHOWN.
- 9.-REMOVE EXISTING CWR PIPING AS SHOWN.
- 10.-REMOVE EXISTING LPR PIPING.
- 11.-REMOVE MEZZANINE FLOOR GRATING SECTION AS REQUIRED FOR INSTALLATION OF NEW UNIT. SECTIONS ARE ROUGHLY 2'-0"X13'-2". BREAK TACK WELDS AS REQUIRED AFTER INSTALLATION OF NEW UNITS. RE-INSTALL SECTION AND PROVIDE WELDS TO MATCH.
- 12.-EXISTING COMBO DISCONNECT/MOTOR STARTER TO BE REMOVED AND REPLACED WITH NEW VFD.
- 13.-REMOVE EXISTING DUCTWORK.
- 14.-EXISTING AIR HANDLER TO REMAIN. DO PRELIMINARY AIRFLOW TESTING OF EXISTING AIR HANDLER AND ALL DIFFUSERS. SUBMIT TO ENGINEER FOR REVIEW

A.-ALL ASBESTOS ABATEMENT SHALL BE CONDUCTED IN ACCORDANCE WITH 02 82 11 TRADITIONAL ASBESTOS ABATEMENT SPECIFICATIONS.

- B.-ABATE EXISTING ACM CAULK/PUTTY LOCATED ON METAL DUCTS AND EXISTING ACM BRIDGING ENCAPSULANT LOCATED ON FIBERGLASS DUCT INSULATION.
- C.-ABATE EXISTING ACM FLEXIBLE EQUIPMENT/DUCT CONNECTIONS.
- D.-ABATE EXISTING ACM BRIDGING ENCAPSULANT LOCATED ON FIBERGLASS PIPE INSULATION.
- E.- ALL DUCTWORK, PIPING AND FLEXIBLE CONNECTIONS SHOWN TO BE DEMOLISHED ARE TO BE ASSUMED TO BE ASBESTOS CONTAINING.

**SEE "PARTIAL  
MECHANICAL MEZZANINE  
DEMOLITION PLAN"**

**SEE "PARTIAL SECOND  
FLOOR DEMOLITION PLAN"**



## KEY PLAN

A  
B  
C  
D  
E  
F

0 6" three inches = one foot  
0 6" one and one half inches = one foot  
0 6" one inch = one foot  
0 6" three quarters inch = one foot  
0 4" one half inch = one foot  
0 4" three eighths inch = one foot  
0 4" one quarter inch = one foot  
0 16" one eighth inch = one foot

1

2

3

4

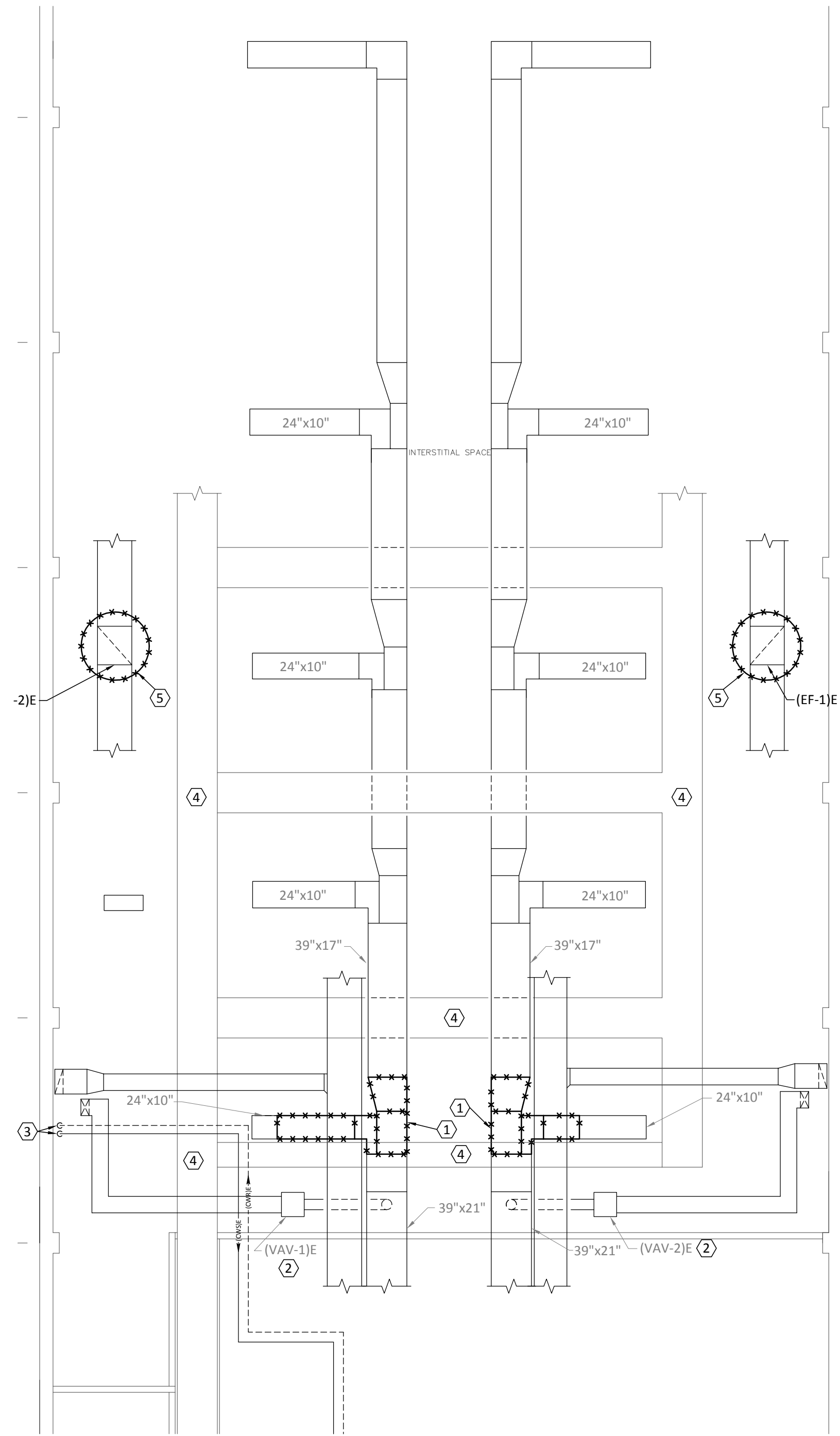
5

6

7

8

9



**PARTIAL AUDITORIUM MEZZANINE DEMOLITION PLAN**  
SCALE: 1/8"=1'-0"

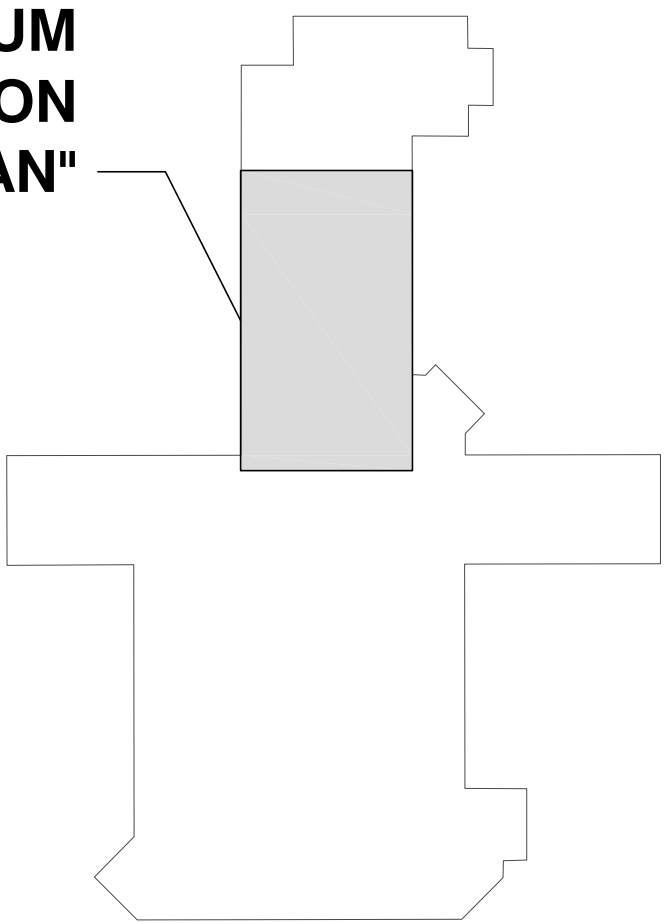
**AUDITORIUM MEZZANINE DEMO PLAN NOTES**

- 1.-REMOVE EXISTING DUCTWORK.
- 2.-EXISTING VAV BOX TO REMAIN.
- 3.-EXISTING CWS AND CWR DOWN TO BASEMENT. SEE "PARTIAL BASEMENT DEMOLITION PLAN" FOR CONTINUATION.
- 4.-EXISTING CATWALK. AREAS OUTSIDE CATWALK CANNOT SUPPORT WORKERS. PROVIDE ADDITIONAL TEMPORARY SCAFFOLDING AS NECESSARY. SUPPORT TEMPORARY SCAFFOLDING FROM BUILDING STRUCTURE OR CATWALK SUPPORT STRUCTURE.
- 5.-REMOVE EXISTING EXHAUST FAN AND ASSOCIATED MOTORIZED DAMPER.

**GENERAL ASBESTOS ABATEMENT NOTES**

- A.-ALL ASBESTOS ABATEMENT SHALL BE CONDUCTED IN ACCORDANCE WITH 02 82 13 TRADITIONAL ASBESTOS ABATEMENT SPECIFICATIONS.
- B.-ABATE EXISTING ACM CAULK/PUTTY LOCATED ON METAL DUCTS AND EXISTING ACM BRIDGING ENCAPSULANT LOCATED ON FIBERGLASS DUCT INSULATION.
- C.- ABATE EXISTING ACM FLEXIBLE EQUIPMENT/DUCT CONNECTIONS.
- D.-ABATE EXISTING ACM BRIDGING ENCAPSULANT LOCATED ON FIBERGLASS PIPE INSULATION.
- E.- ALL DUCTWORK, PIPING AND FLEXIBLE CONNECTIONS SHOWN TO BE DEMOLISHED ARE TO BE ASSUMED TO BE ASBESTOS CONTAINING.

**SEE "PARTIAL AUDITORIUM  
MEZZANINE DEMOLITION  
PLAN"**



**KEY PLAN**

DESIGNER/ENGINEER  
CAD OPERATOR  
CHECKER/REVIEWER

95% OWNER REVIEW  
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Comm. No.: 120053



Professional Seal

Revised By:

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Drawing Title  
MEZZANINE  
HVAC DEMOLITION PLAN

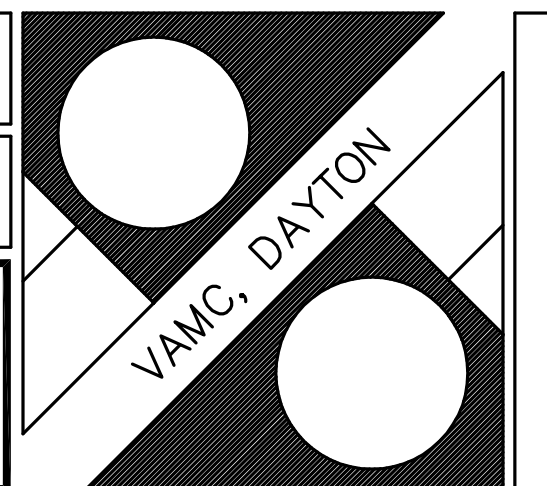
Approved: Project Engineer  
Philip Kirk

Project Title  
REPLACE CONDENSING  
UNITS, B-305

Building Number  
305  
Checked  
DYNAMIX  
Drawn  
SH  
Location  
4100 WEST THIRD ST  
DAYTON, OH 45428

Date  
1-18-2013  
Project No.  
552-13-303

Drawing No.  
M5



VA Department of Veterans Affairs

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PARTIAL BASEMENT FLOOR PLAN NOTES

1.-SEE FIRST FLOOR PLAN FOR CONTINUATION.

2.-5" CWS AND CWR UP TO MEZZANINE ABOVE AUDITORIUM.

3.-PROVIDE NEW INSULATION FOR EXISTING PIPING.

4.-PROVIDE NEW PIPE SUPPORTS AND HANGERS FOR 250' OF EXISTING CWS AND CWR PIPING IN SOUTH WING.

5.-SEE PARTIAL FIRST FLOOR PLAN FOR CONTINUATION.

6.-FIELD VERIFY EXISTING PIPE SIZE. MATCH NEW PIPE SIZE TO EXISTING.

7.-SUSPEND ALL PIPING AND EQUIPMENT IN CRAWL SPACE FROM CEILING STRUCTURE. PROVIDE ASBESTOS ABATEMENT AS NECESSARY.

8.-EXTEND EXISTING SUPPORT PANEL AND MOUNT NEW VFD'S FOR P-1,P-2, P-3, AND P-4. RELOCATE EXISTING CONDUIT AS NECESSARY.

PARTIAL FIRST FLOOR PLAN NOTES

1.-MOUNT CHILLER ON CONCRETE PAD. INSTALL CONCRETE PAD PER DETAIL 5 ON SHEET M1. PAD TO EXTEND 4" FROM EDGE OF UNIT/UNITS ON ALL SIDES.

2.-REMOVE 6" OF TOPSOIL AND REGRADE AS NECESSARY. FURNISH AND INSTALL 6" GRAVEL SURFACE ON BLACK POLYURETHANE PLASTIC IN THIS AREA.

3.-MAINTAIN CLEARANCES AS REQUIRED BY CHILLER MANUFACTURER.

4.-COVER WEATHER-EXPOSED PIPING WITH ALUMINUM JACKET. MOUNT PIPING ON EQUIPMENT SUPPORTS LOCATED AT 5'-0" O.C. AND AT CHANGES IN DIRECTION. SEE PIPING SUPPORT DETAIL FOR EQUIPMENT SUPPORT DESIGN. PROVIDE NEW HEAT TRACE SYSTEM TO PREVENT FREEZING PER SPEC SECTION 22 05 33.

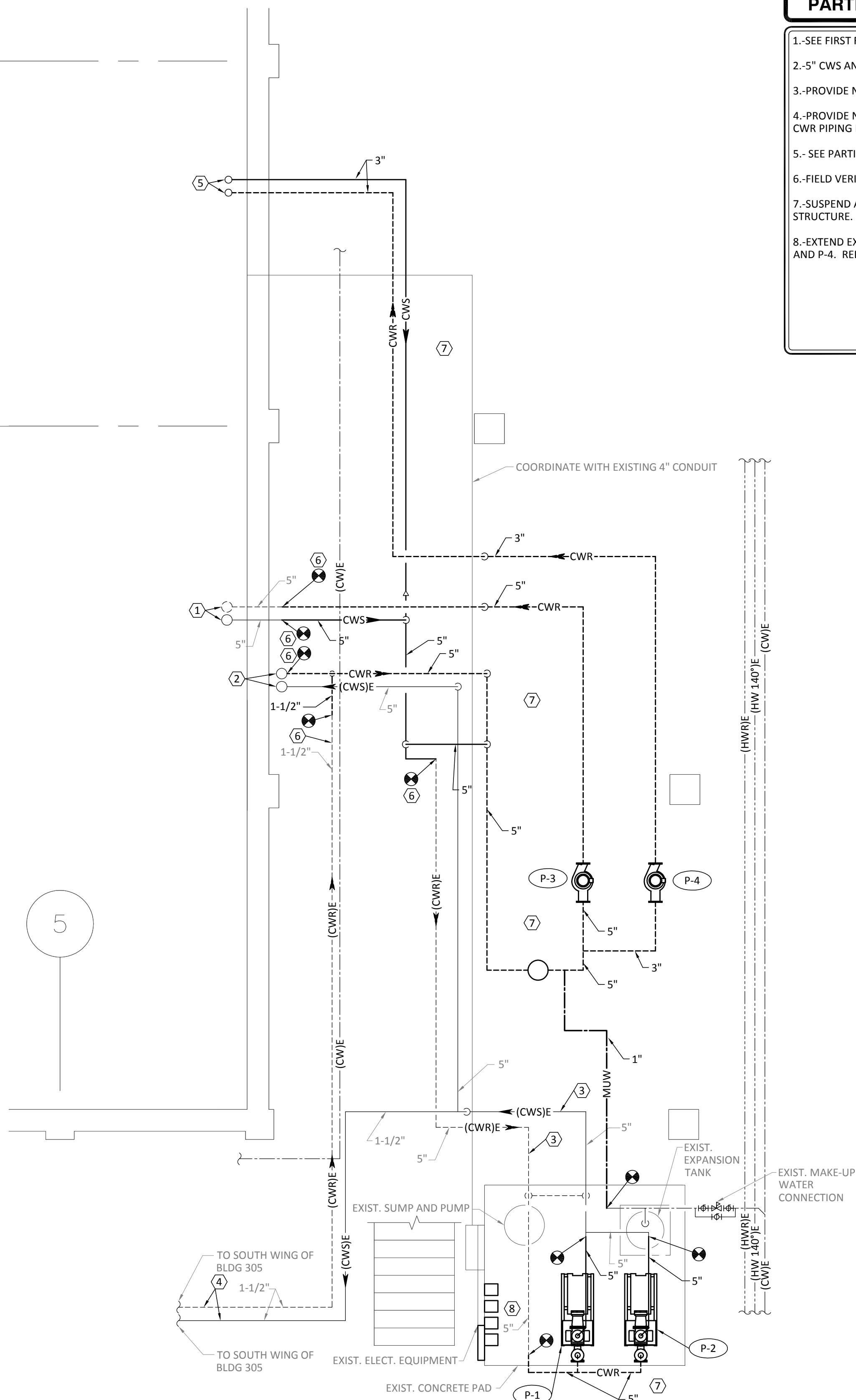
5.-DROP PIPING DOWN INSIDE NEW PIPING WELL. SEE "PARTIAL BASEMENT FLOOR PLAN" FOR CONTINUATION.

6.-PROVIDE PIPING WELL TO MATCH EXISTING WELL. DROP PIPING DOWN INSIDE WELL. COORDINATE EXACT LOCATION WITH EXISTING LANDSCAPING (BUSHES).

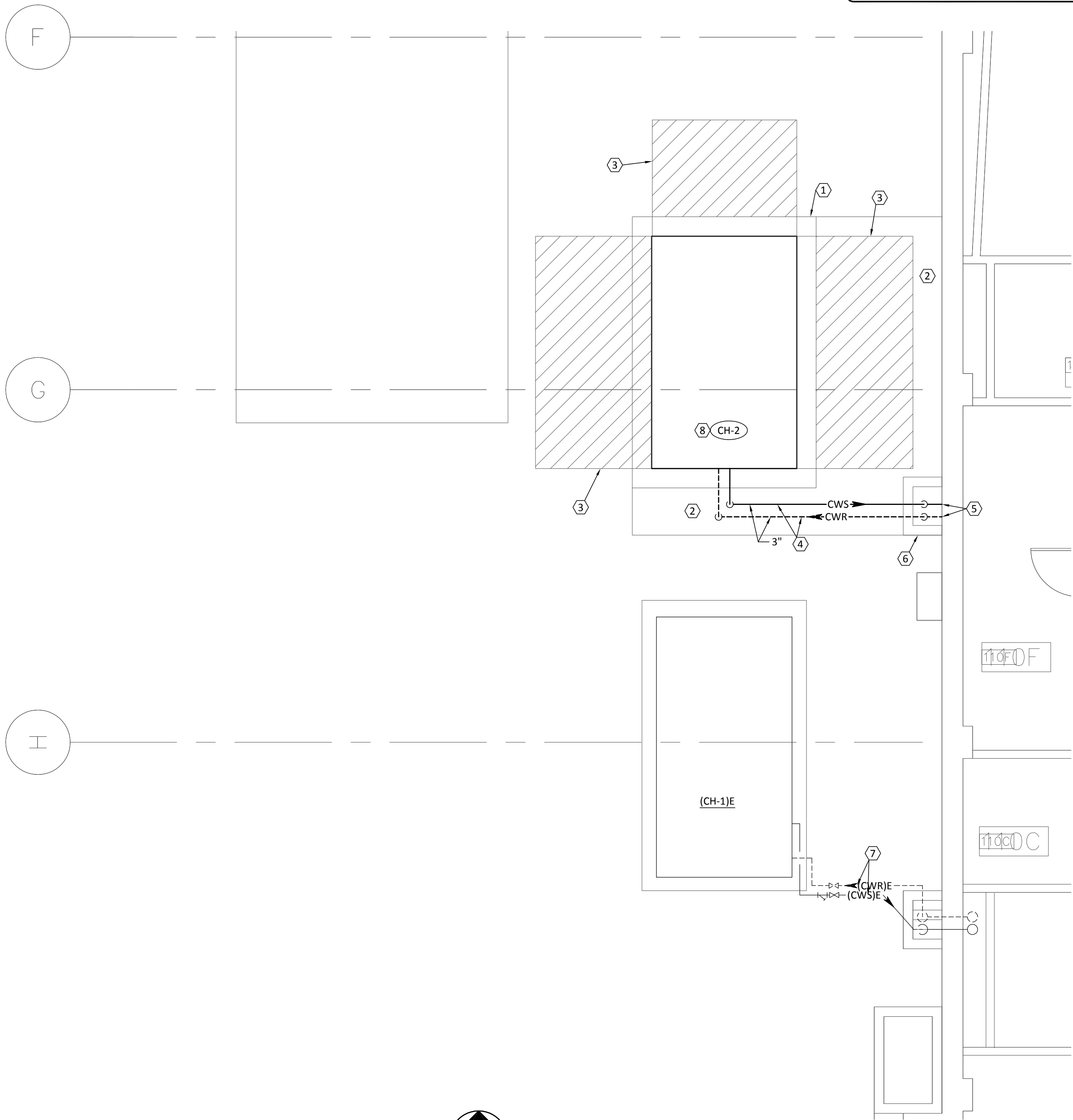
7.-REMOVE EXISTING INSULATION AND JACKET. INSTALL NEW INSULATION WITH ALUMINUM JACKET. PROVIDE NEW HEAT TRACE SYSTEM TO PREVENT FREEZING PER SPEC SECTION 22 05 33.

8.-MODIFY EXISTING BUILDING CONTROL SYSTEM TO INCORPORATE NEW CHILLER.

NO.	NAME
101	VOLUNTARY SERVICE WK RM
102	LOBBY
102	OFFICE
103	OFFICE
104	OFFICE
105	OFFICE
106	OFFICE
107	OFFICE
108	OFFICE
109A	
109B	
109C	ENTRANCE
110	WHEELCHAIR PLATFORM
110A	
110B	MUSIC ROOM
110C	OFFICE
110C	AMERICAN LEGION AUXILIARY
110D	STORAGE
110E	MUSIC ROOM
110F	OFFICE
111	STAGE
111A	
111B	REC. STORAGE
111C	REC. ISSUE OFFICE
111D	
111E	TRANSFORMER ROOM
111F	CREDIT UNION
111N	
112	MEN TOILET
112A	
113	CANTEEN
113A	DISHWASHING ROOM
113B	KITCHEN
113C	
114	REC. STORAGE
114	STORAGE
114A	
115	BOWLING ALLEY
115A	OFFICE
115B	HOBBY STORAGE
116	H.A.C.
117	RECREATION OFFICE
118	HOBBY AREA
118A	STORAGE
119	POST OFFICE LOBBY
119A	POST OFFICE
119B	POST OFFICE
119C	
120	BILLIARD ROOM
120A	OFFICE
121	RETAIL STORE
121A	OFFICE
121B	CHIEF CANTEEN SERVICE
121C	RETAIL STORE
121D	
122	MULTI PURPOSE ROOM
122A	STORAGE
123	WOMEN LOCKER ROOM
124	H.A.C.
125	KITCHEN
126	MEN LOCKER ROOM
126A	MEN
127	WOMEN
128	OFFICE
128A	TOILET
128B	STORAGE ROOM
C-1-1	CORRIDOR
C-1-2	CORRIDOR
C-1-3	CORRIDOR
C-1-4	CORRIDOR



**PARTIAL BASEMENT FLOOR PLAN**  
SCALE: 1/4"=1'-0"



**PARTIAL FIRST FLOOR PLAN**  
SCALE: 1/4"=1'-0"

SEE "PARTIAL FIRST FLOOR PLAN"

SEE "PARTIAL BASEMENT FLOOR PLAN"

KEY PLAN

DESIGNER/ENGINEER  
CAD OPERATOR  
CHECKED/REVIEWER

95% OWNER REVIEW  
ISSUE FOR BID DOCUMENTS

1/18/2013  
1/31/2013

**Dynamix** Engineering Ltd.  
Facility Engineering Consultants  
855 Grandview Avenue, 3rd Floor Columbus, Ohio 43215  
Phone: (614)443-1178 · Fax: (614)443-1594 · Email: dynamix@dynamix-ltd.com  
Comm. No.: 120053

STATE OF OHIO  
MADE BY  
APPROVED  
REGISTERED PROFESSIONAL ENGINEER

Professional Seal

Revised By:

Drawing Title  
FIRST FLOOR  
HVAC NEW WORK PLAN

Approved: Project Engineer  
Philip Kirk

Project Title  
REPLACE CONDENSING  
UNITS, B-305

Building Number  
305

Checked  
DYNAMIX

Drawn  
SH

Location  
4100 WEST THIRD ST  
DAYTON, OH 45428

Date  
1-18-2013  
Project No.  
552-13-303

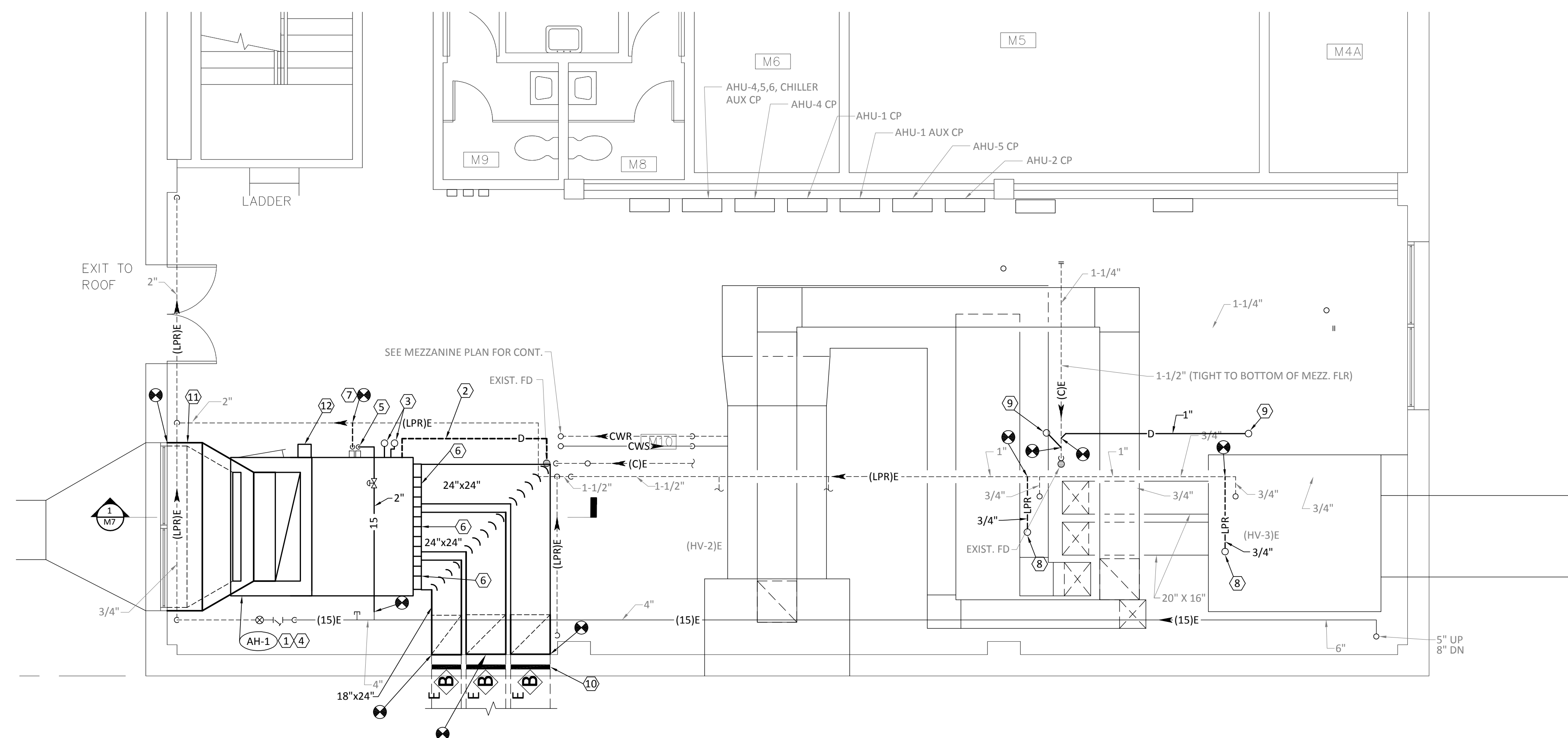
Drawing No.  
M6

VA Department of Veterans Affairs  
VAMC, DAYTON

VA FORM 08-6231, OCT 1978

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three eighths inch = one foot  
three quarters inch = one foot  
one half inch = one foot  
one inch = one foot  
one and one half inches = one foot  
three inches = one foot

ROOM SCHEDULE	
NO.	NAME
M1	
M2	
M2A	STAIR WELL
M2B	MOTOR AND GENERATOR
M3	PROJECTION ROOM
M3A	REWIND ROOM
M4	STORAGE
M4A	STORGE
M5	OFFICE
M6	OFFICE
M7	H.A.C.
M8	MEN
M9	WOMEN
M10	FAN ROOM
M11	STAIR WELL



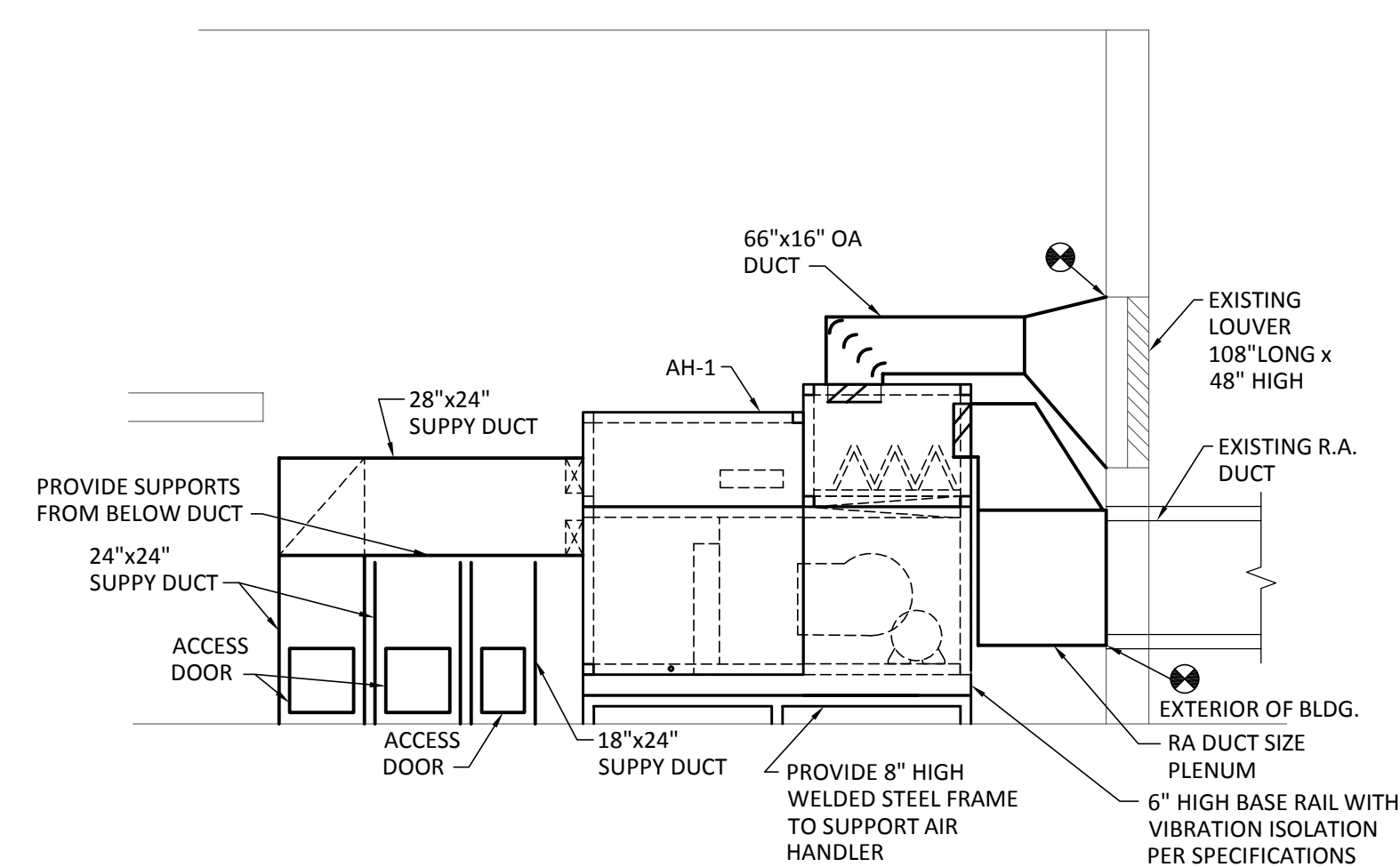
- PARTIAL SECOND FLOOR PLAN NOTES
- 

- 1-MOUNT AIR HANDLER ON 12" HIGH STRUCTURAL SUPPORTS. UNIT SHALL BE ASSEMBLED IN THIS LOCATION CONTRACTOR SHALL INCLUDE IN HIS PRICE ALL LABOR TO COMPLETELY ASSEMBLE UNIT IN THIS LOCATION.
- 2-RUN 1-1/4" CD CONDENSATE DRAIN LINE FROM AIR HANDLER COILING COIL TO FLOOR DRAIN.
- 3- 3" CHILLED WATER SUPPLY AND RETURN UP. SEE MEZZANINE PLAN FOR CONTINUATION.
- 4-MODIFY EXISTING CONTROLS AS NECESSARY FOR NEW AIR HANDLING UNIT.
- 5-STEAM CONNECTION TO AIR HANDLER HEATING COIL. SEE PIPING DIAGRAMS.
- 6-FIELD-CUT DAMPERS AND PROVIDE CONTROLS FOR MULTI-ZONE SYSTEM.
- 7-EXTEND 1" LPR DRAIN LINE FROM HEATING COIL AND CONNECT TO EXISTING LPR LINE ON FLOOR. SEE PIPING DIAGRAMS.
- 8-LPC UP THRU MEZZANINE FLOOR. CUT METAL GRATING AS NECESSARY.
- 9-1" COOLING COIL CONDENSATE DRAIN LINE UP THRU MEZZANINE FLOOR. CUT METAL GRATING AS NECESSARY.
- 10-EXISTING FIRE DAMPER TO REMAIN. CONFIRM OPERATION AND REPLACE FUSIBLE LINK.
- 11-PROVIDE NEW SMOKE DAMPER IN RETURN DUCT.
- 12-UNIT MOUNTED VFD.



### PARTIAL SECOND FLOOR PLAN

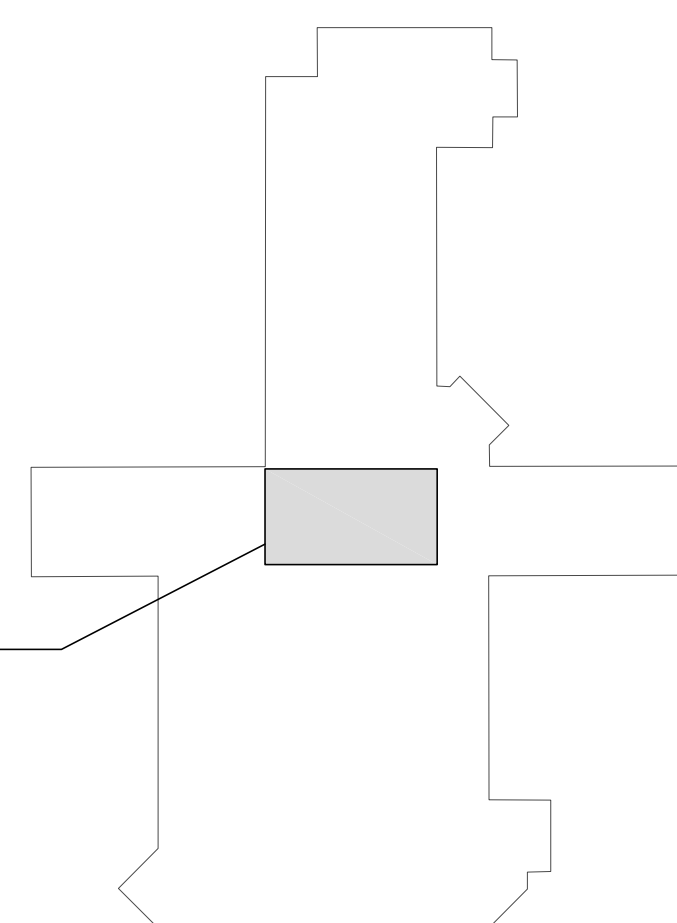
SCALE: 1/4"=1'-0"



## SECTION 1

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

**SEE "PARTIAL SECOND  
FLOOR PLAN"**



## KEY PLAN

DESIGNER/ENGINEER	SH
CAD OPERATOR	SH
QA/QC/CHECKER	SS

95% OWNER REVIEW  
ISSUE FOR BID DOCUMENTS

1/18/2013	
1/31/2013	

***Dynamix*** Engineering Ltd.  
Facility Engineering Consultants  
855 Grandview Avenue, 3rd Floor Columbus, Ohio 43215  
Phone: (614)443-1178 • Fax: (614)443-1594 • Email: [dynamix@dynamix-ltd.com](mailto:dynamix@dynamix-ltd.com)  
Comm. No.: 120053



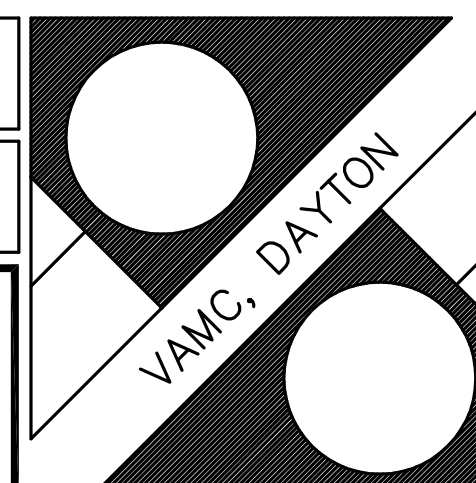
Professional Seal

Revised By:

Drawing Title	SECOND FLOOR HVAC NEW WORK PLAN
Approved: Project Engineer	Philip Kirk

Project Title		
REPLACE CONDENSING UNITS, B-305		
Building Number	Checked	Drawn
305	DYNAMIX	SH
Location 4100 WEST THIRD ST DAYTON, OH 45428		

Date	1-18-2013
Project No.	552-13-303
Drawing No.	M7

Department of  
Veterans Affairs



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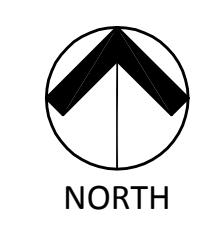
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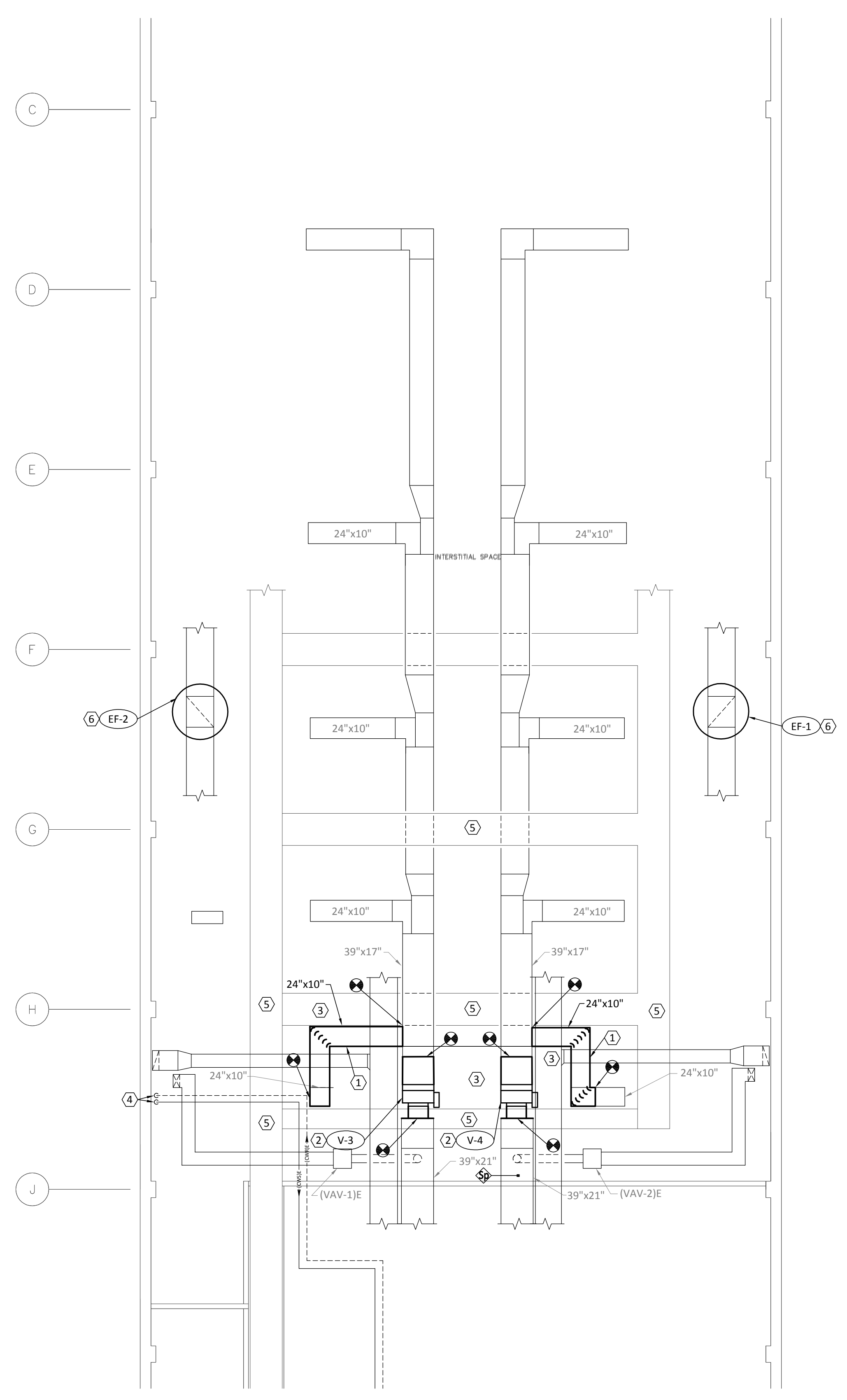
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EF-1 (B)



**PARTIAL AUDITORIUM MEZZANINE PLAN**  
SCALE: 1/8"=1'-0"

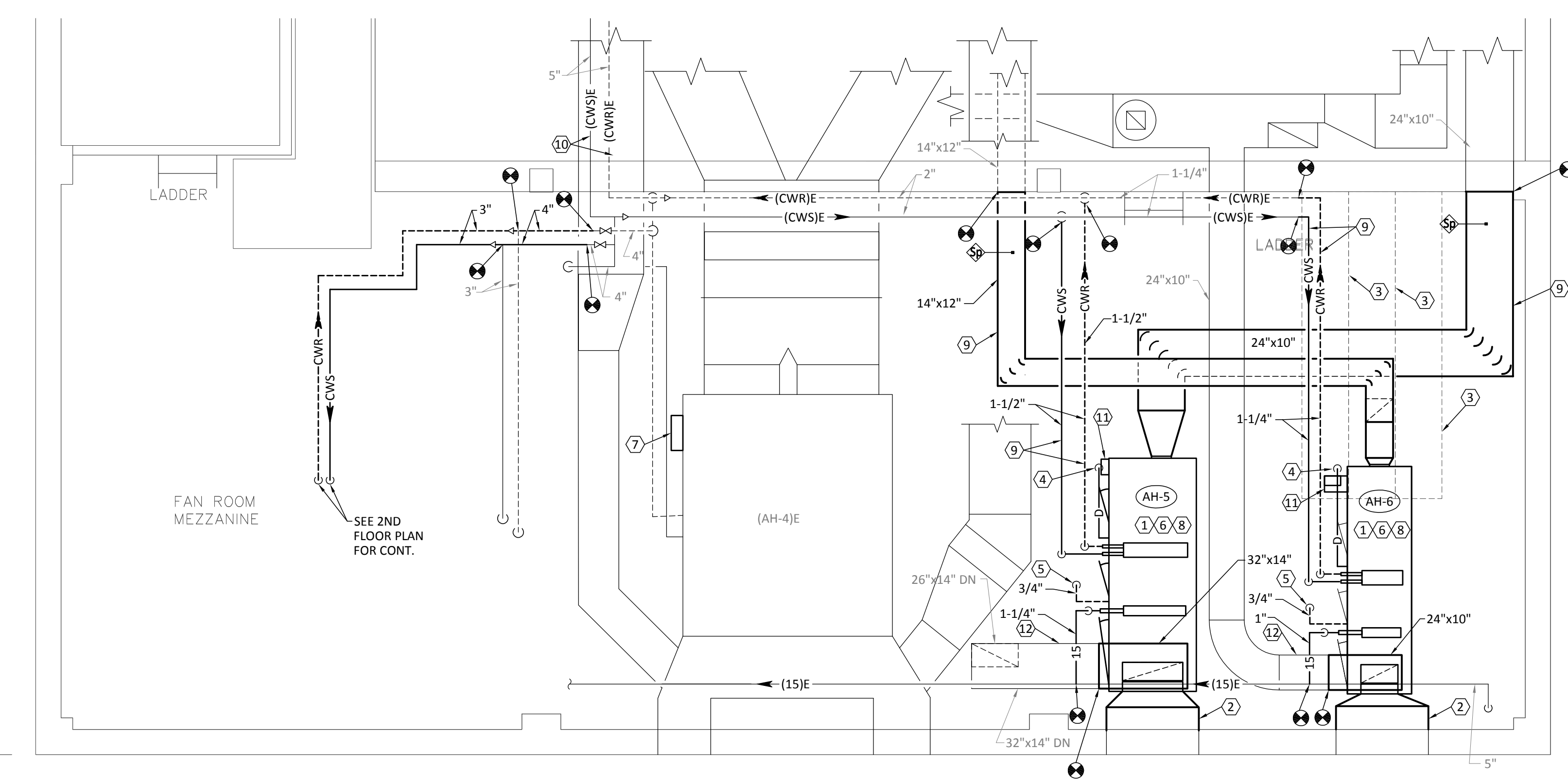


**AUDITORIUM MEZZANINE PLAN NOTES**

- 1.-COORDINATE EXACT LOCATION OF DUCTWORK WITH EXISTING STRUCTURE.
- 2.-MODIFY EXISTING CONTROLS AS NECESSARY FOR NEW VAV BOX.
- 3.-SUPPORT ALL DUCTWORK AND EQUIPMENT IN AUDITORIUM MEZZANINE FROM THE CEILING STRUCTURE.
- 4.-CWS AND CWR DOWN. SEE "PARTIAL BASEMENT FLOOR PLAN" FOR CONTINUATION.
- 5.-EXISTING CATWALK. AREAS OUTSIDE CATWALK CANNOT SUPPORT WORKERS. PROVIDE ADDITIONAL TEMPORARY SCAFFOLDING AS NECESSARY. SUPPORT TEMPORARY SCAFFOLDING FROM BUILDING STRUCTURE OR CATWALK SUPPORT STRUCTURE.
- 6.-PROVIDE ADAPTER CURB TO MATCH EXISTING ROOF CURB. PROVIDE NEW MOTORIZED DAMPER AND ACTUATOR. CONNECT FAN AND DAMPER CONTROLS INTO EXISTING AH-4 CONTROLS.



**PARTIAL MECHANICAL MEZZANINE PLAN**  
SCALE: 1/4"=1'-0"

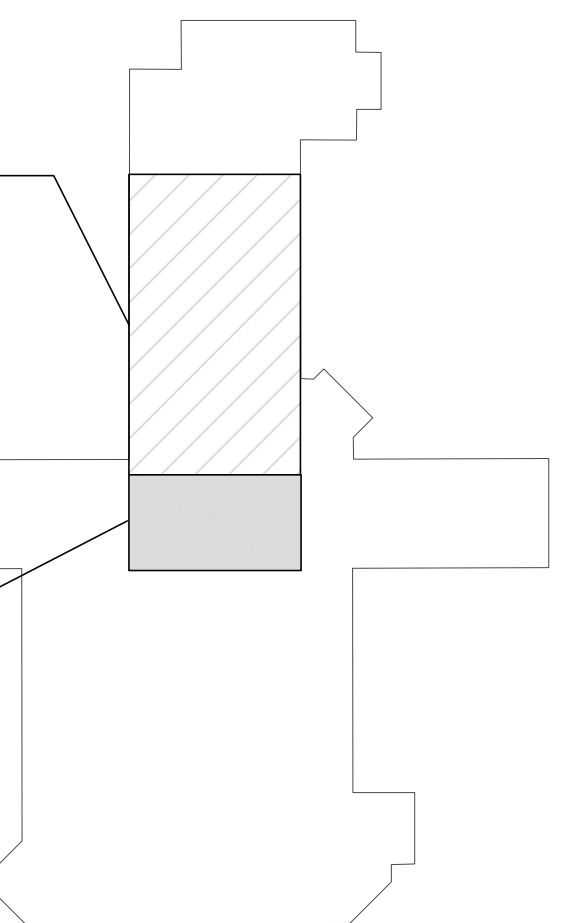


**MECH. MEZZANINE PLAN NOTES**

- 1.-UNIT SHALL BE ASSEMBLED IN THIS LOCATION CONTRACTOR SHALL INCLUDE IN HIS PRICE ALL LABOR TO COMPLETELY ASSEMBLE UNIT IN THIS LOCATION.
- 2.-EXTEND LOUVER SIZE PLENUM FROM EXISTING LOUVER. TRANSITION AND CONNECT PLENUM TO AIR HANDLER RETURN.
- 3.-REMOVE EXISTING METAL GRATING AS NECESSARY TO INSTALL NEW AIR HANDLERS. PROVIDE ALL LABOR AND MATERIALS AS NECESSARY TO FIT UNITS THRU OPENING.
- 4.-EXTEND 1" COOLING COIL CONDENSATE DRAIN LINE FROM UNIT AND DOWN THRU MEZZ. FLOOR.
- 5.-EXTEND LPR DRAIN LINE DOWN THRU MEZZ. FLOOR.
- 6.-SUSPEND AIR HANDLER FROM CEILING STRUCTURE ABOVE. INCLUDE VIBRATION ISOLATION. PROVIDE ADDITIONAL SUPPORT STRUCTURES AS NECESSARY.
- 7.-FURNISH AND INSTALL NEW VFD FOR EXISTING AH-4(E). VFD SHALL BE 208/3/60, 20 HP.
- 8.-MODIFY EXISTING CONTROLS AS NECESSARY FOR NEW AIR HANDLING UNIT AND VFD.
- 9.-SUPPORT ALL NEW DUCTWORK AND PIPING FROM CEILING STRUCTURE. ADD ADDITIONAL SUPPORT STRUCTURES AS NECESSARY.
- 10.-FURNISH AND INSTALL NEW PRESSURE SENSOR FOR P-1 AND P-2 I AT THIS LOCATION.
- 11.-UNIT MOUNTED VFD.
- 12.-EXISTING DUCT SMOKE DETECTOR TO REMAIN.

SEE "PARTIAL AUDITORIUM MEZZANINE PLAN"

SEE "PARTIAL MECHANICAL MEZZANINE PLAN"



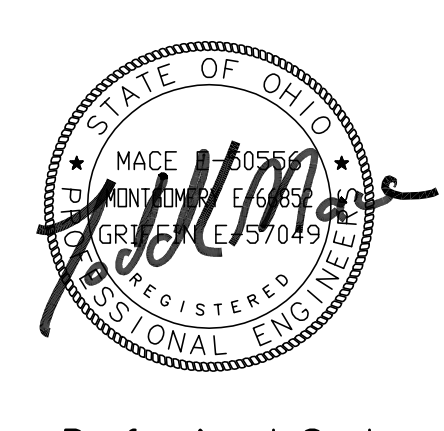
**KEY PLAN**

DESIGNER/ENGINEER  
CAD OPERATOR  
CHECKER

95% OWNER REVIEW  
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855 Grandview Avenue, 3rd Floor Columbus, Ohio 43215  
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Revised By:

Drawing Title  
MEZZANINE  
HVAC NEW WORK PLAN

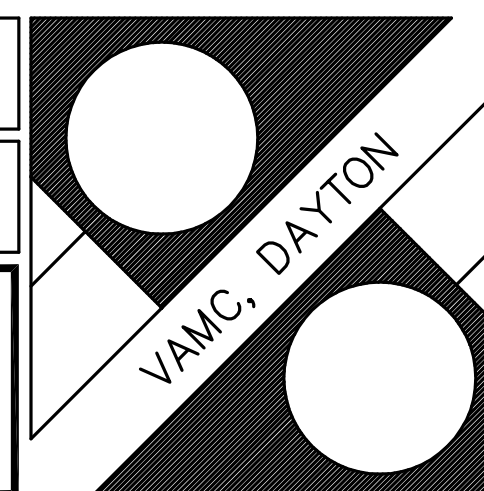
Approved: Project Engineer  
Philip Kirk

Project Title  
REPLACE CONDENSING  
UNITS, B-305

Building Number  
305  
Location 4100 WEST THIRD ST  
DAYTON, OH 45428

Date  
1-18-2013  
Project No.  
552-13-303

Drawing No.  
M8



VA Department of Veterans Affairs

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