



HVAC Upgrade for Olbrich Botanical Gardens - Phase I

Contract #7383

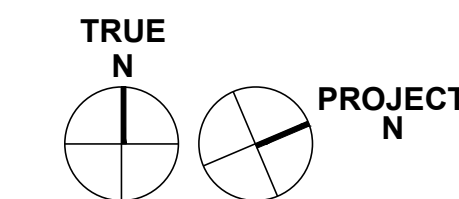
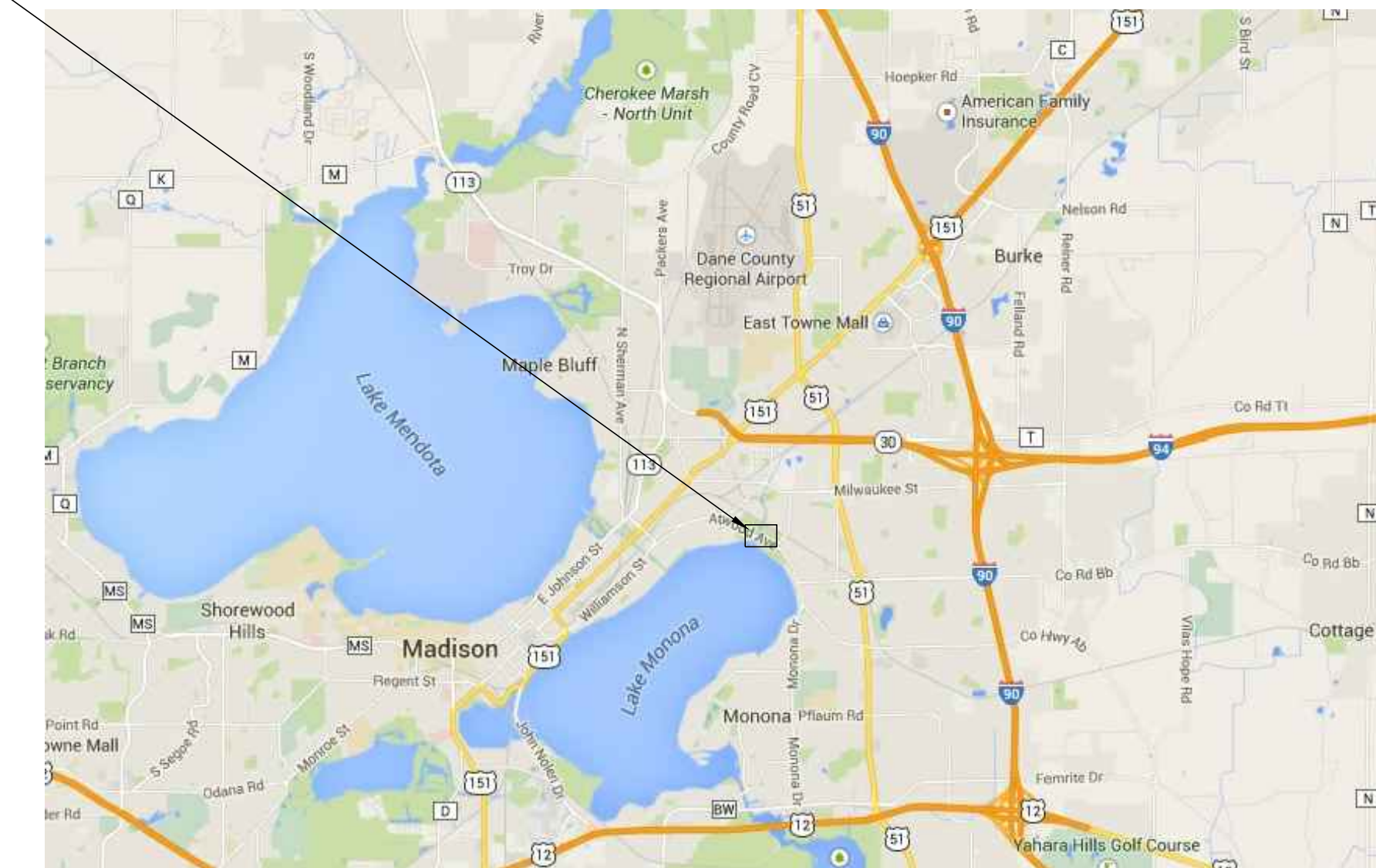
Olbrich Botanical Gardens

3330 Atwood Avenue

Madison, WI 53704

March 6, 2015

SITE LOCATION

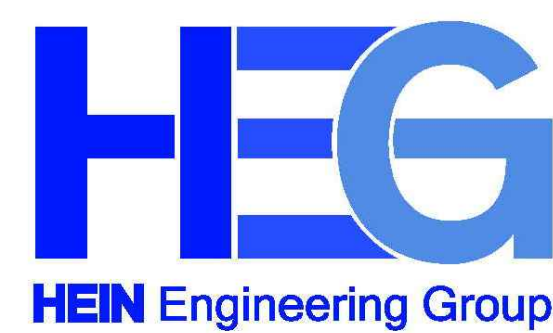


MADISON AREA

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- H1 HVAC PLAN
- H2 HVAC DEMOLITION PLANS
- H3 HVAC ENLARGED PLANS
- H4 HVAC SCHEDULES, DETAILS & SCHEMATICS
- E1 ELECTRICAL PLANS & SCHEDULES

CONSULTING ENGINEERS:

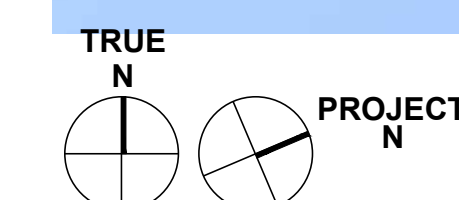
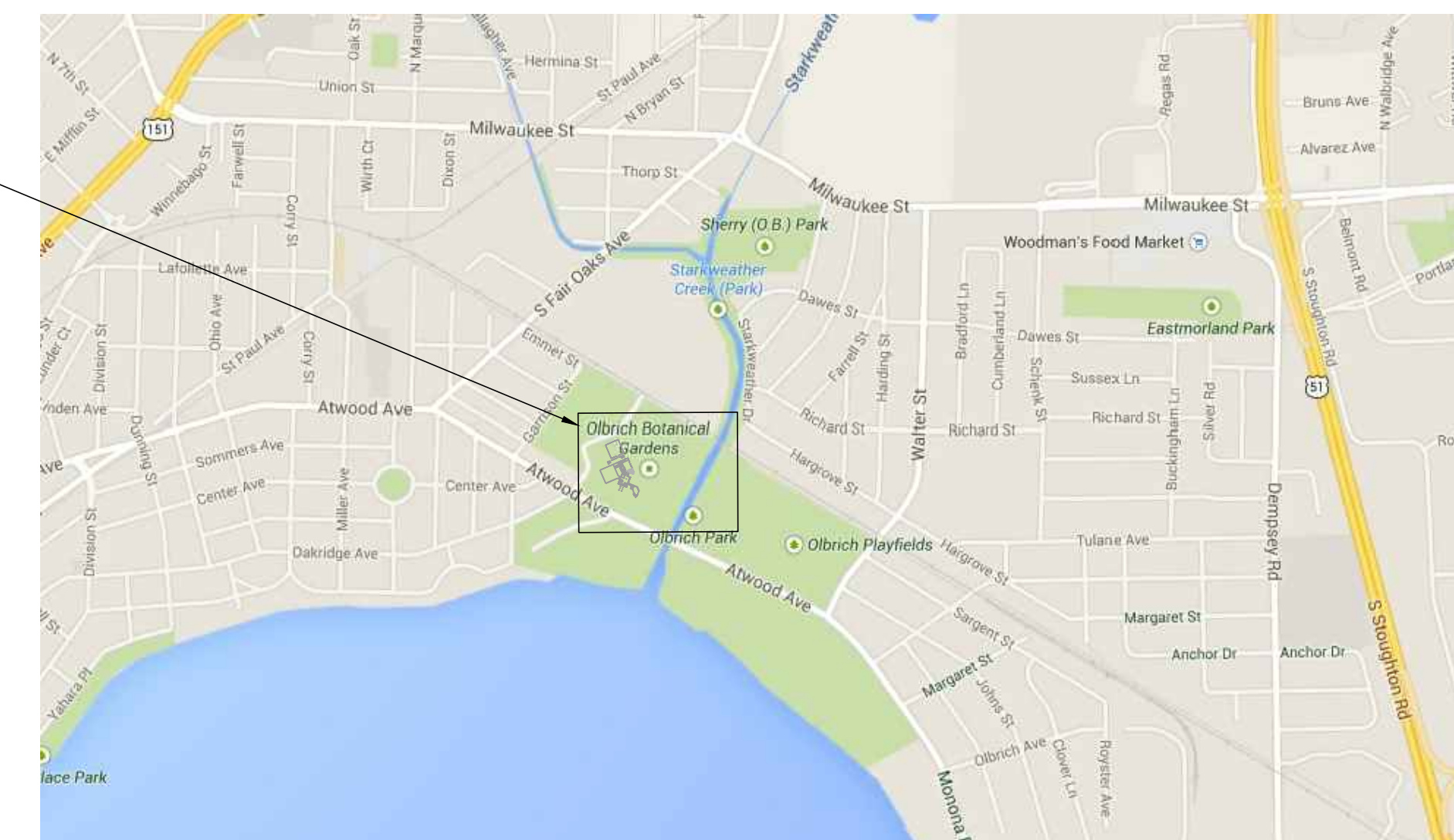


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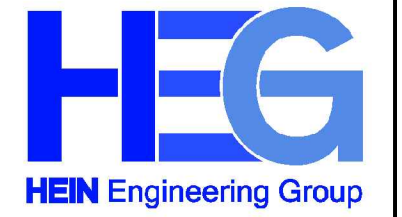
MICHAEL HEIN, PE

PROJECT LOCATION



PROJECT AREA

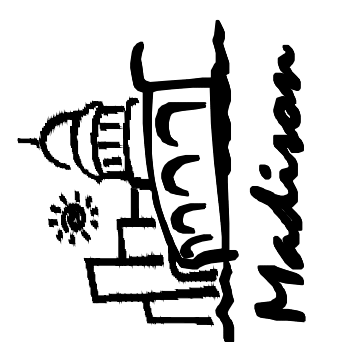
Consultants



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HVAC Upgrade for Olbrich Botanical Gardens - Phase I

3330 Atwood Avenue
Madison, WI 53704



ISSUED FOR:	DATE:	BY:	CHECKED BY:	DATE:
FINAL REVIEW CD'S	1-27-15	JL	MH	
BIDDING DOCUMENTS	3-6-15			

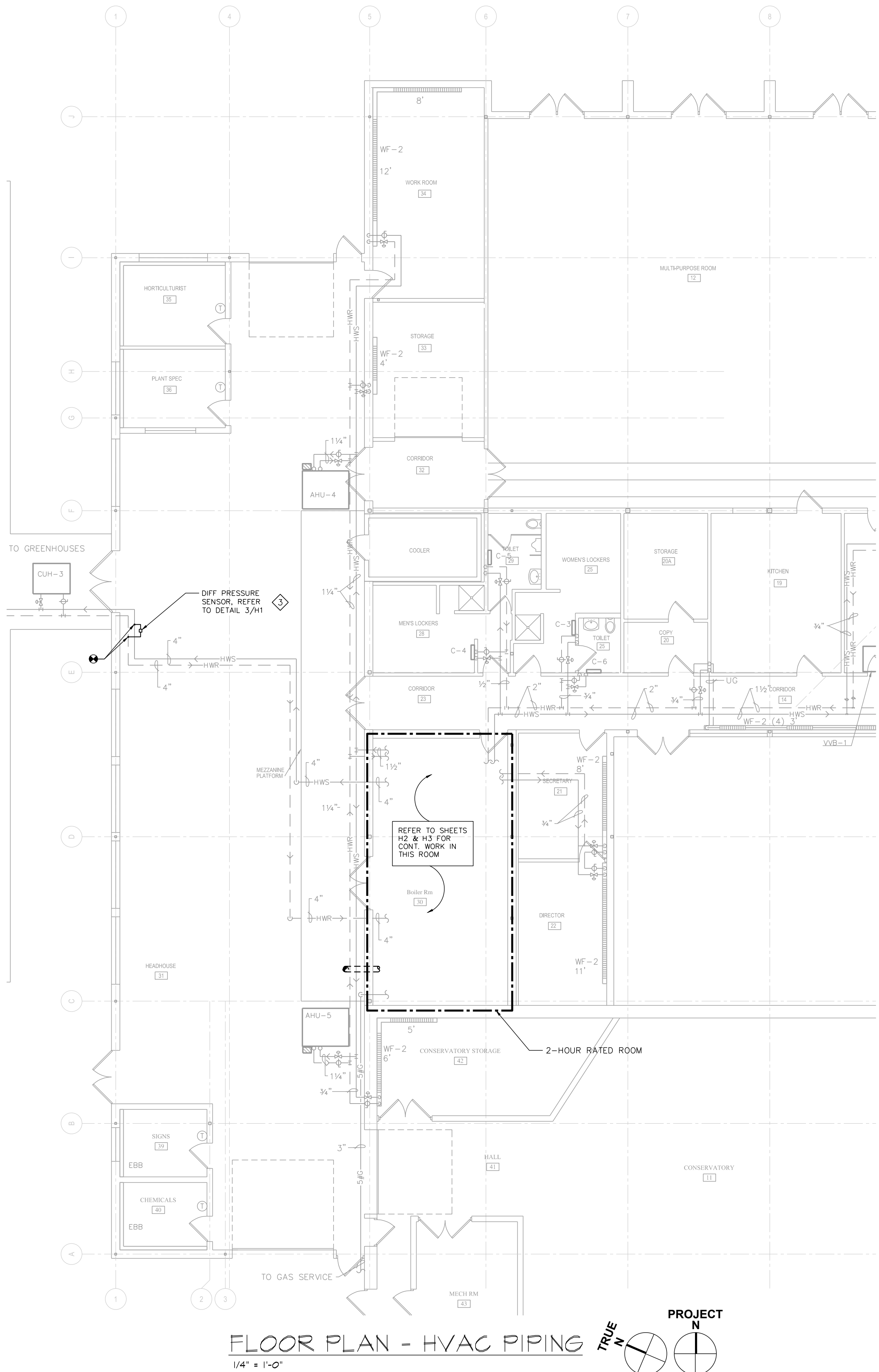
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TS1

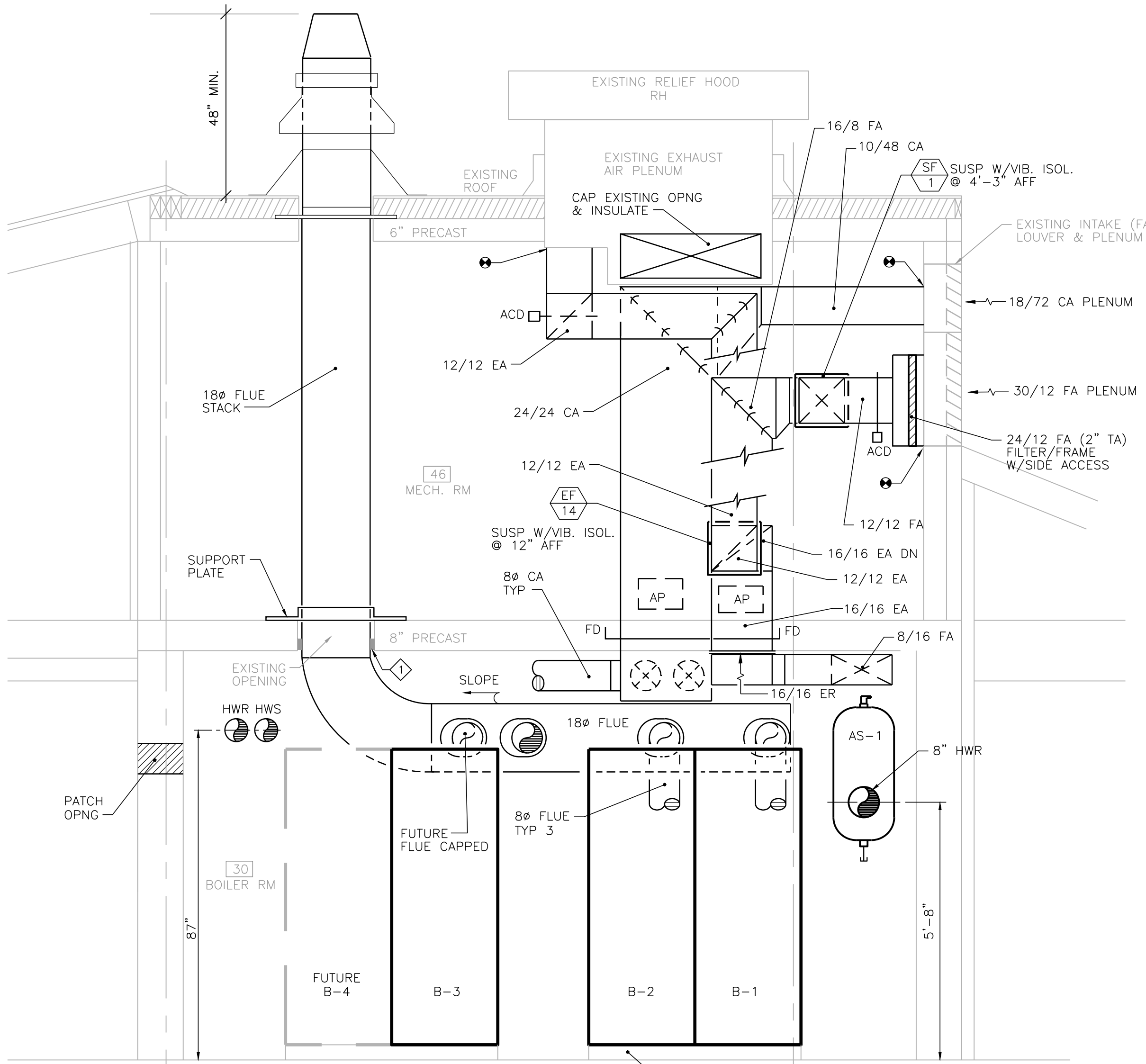
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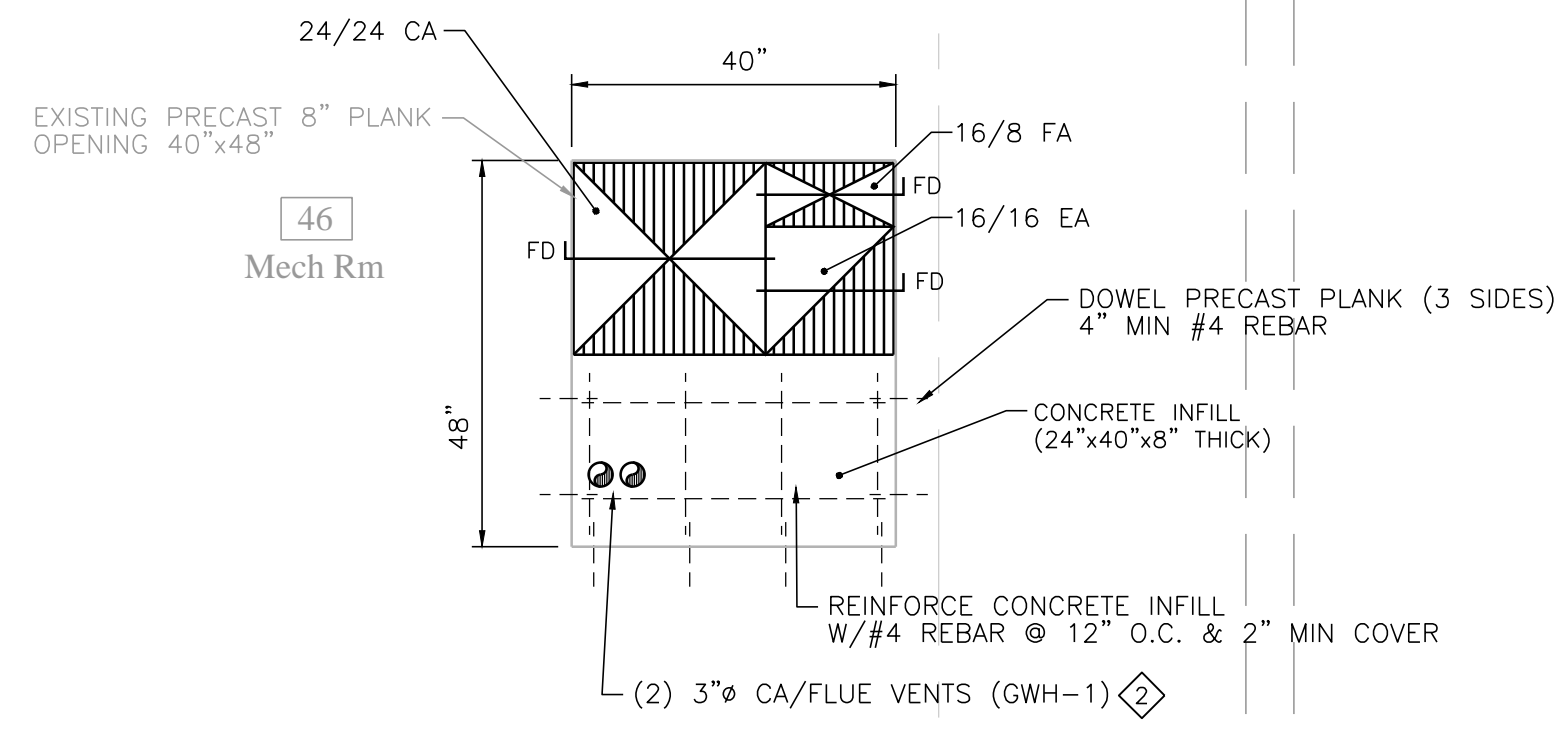
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FLOOR PLAN - HVAC PIPING
1/4" = 1'-0"



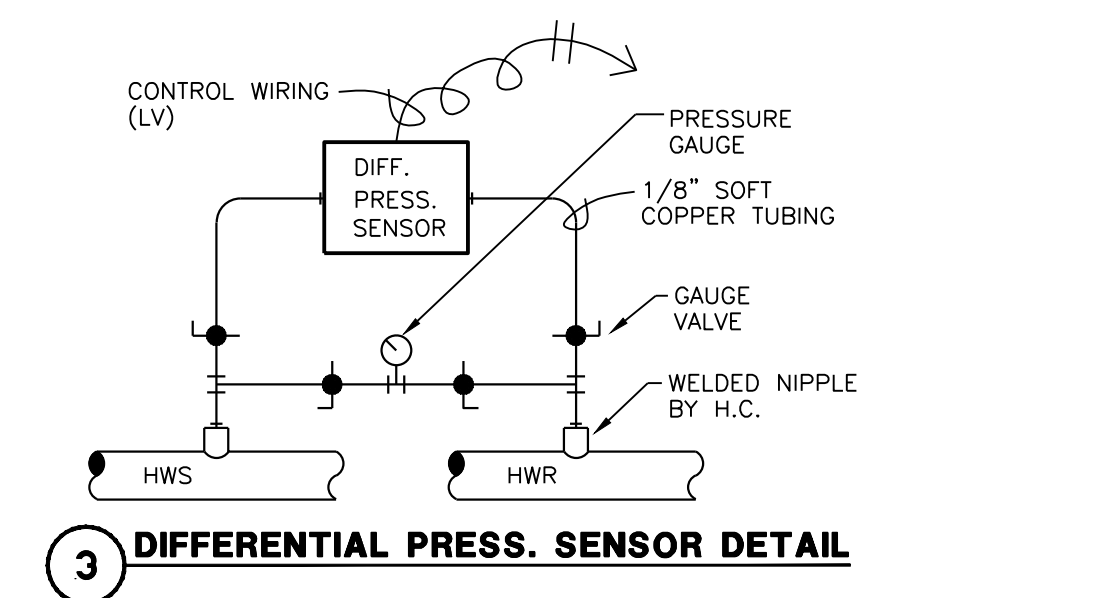
1 BOILER RM / MECH. RM ELEVATION
1/2" = 1'-0"



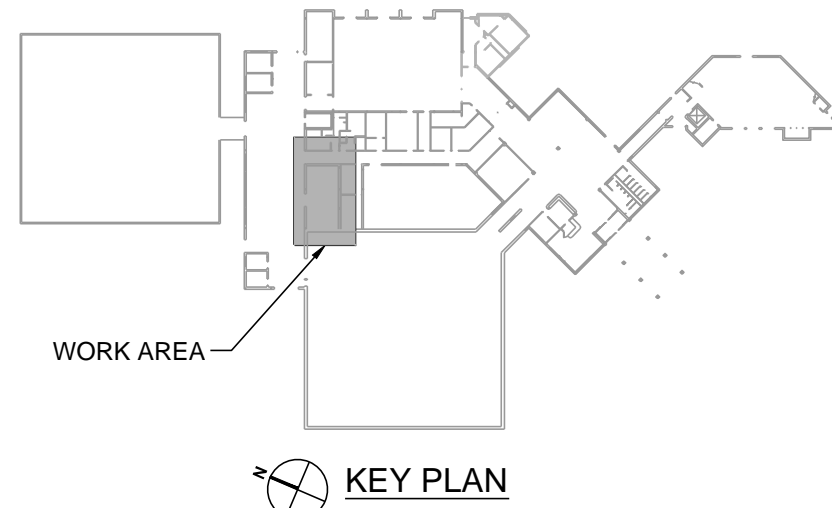
2 CONCRETE INFILL DETAIL
1/2" = 1'-0"

- HVAC GENERAL NOTES:**
- HVAC CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS.
 - COORDINATE AND SCHEDULE ALL WORK WITH THE GENERAL CONTRACTOR AND OWNER PRIOR TO STARTING WORK.
 - HVAC CONTRACTOR IS RESPONSIBLE FOR PATCHING ALL HVAC WORK TO MATCH EXISTING.
 - FIRE PROOF AND CAULK ALL FIRE RATED PENETRATIONS AND ASSEMBLIES.
 - HVAC CONTRACTOR IS RESPONSIBLE FOR PATCHING ALL NEW OPENINGS FOR HVAC WORK TO MATCH EXISTING.
 - REFER TO DIVISION 1 SPECIFICATIONS FOR RESTRICTED WORK SCHEDULE.

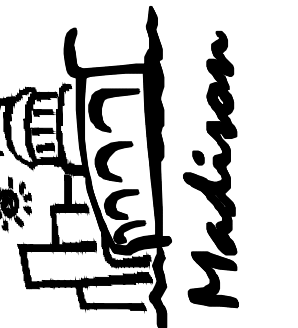
- HVAC PLAN NOTES:**
- COORDINATE FIRE CAULK OPENINGS.
 - PROVIDE FIRE STOP (UL ASSEMBLY 2-HR) SLEEVES FOR 3" CA/FLUE VENTS (PVC) AT CONCRETE SLAB.
 - EXTEND DIFF. PRESSURE SENSOR CONTROL WIRING TO BOILER ROOM 30 TEMPERATURE CONTROL PANEL.



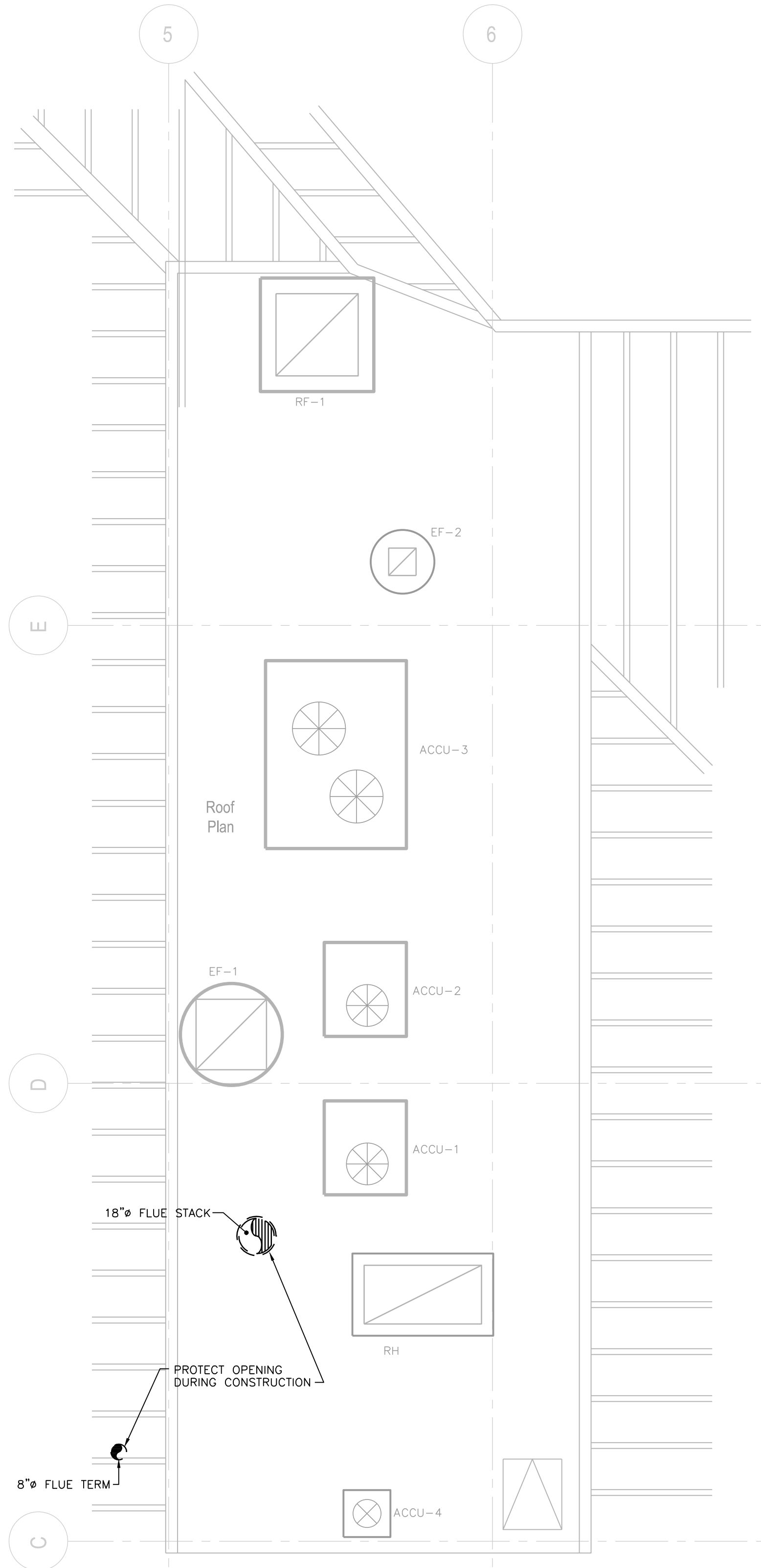
3 DIFFERENTIAL PRESS. SENSOR DETAIL



KEY PLAN

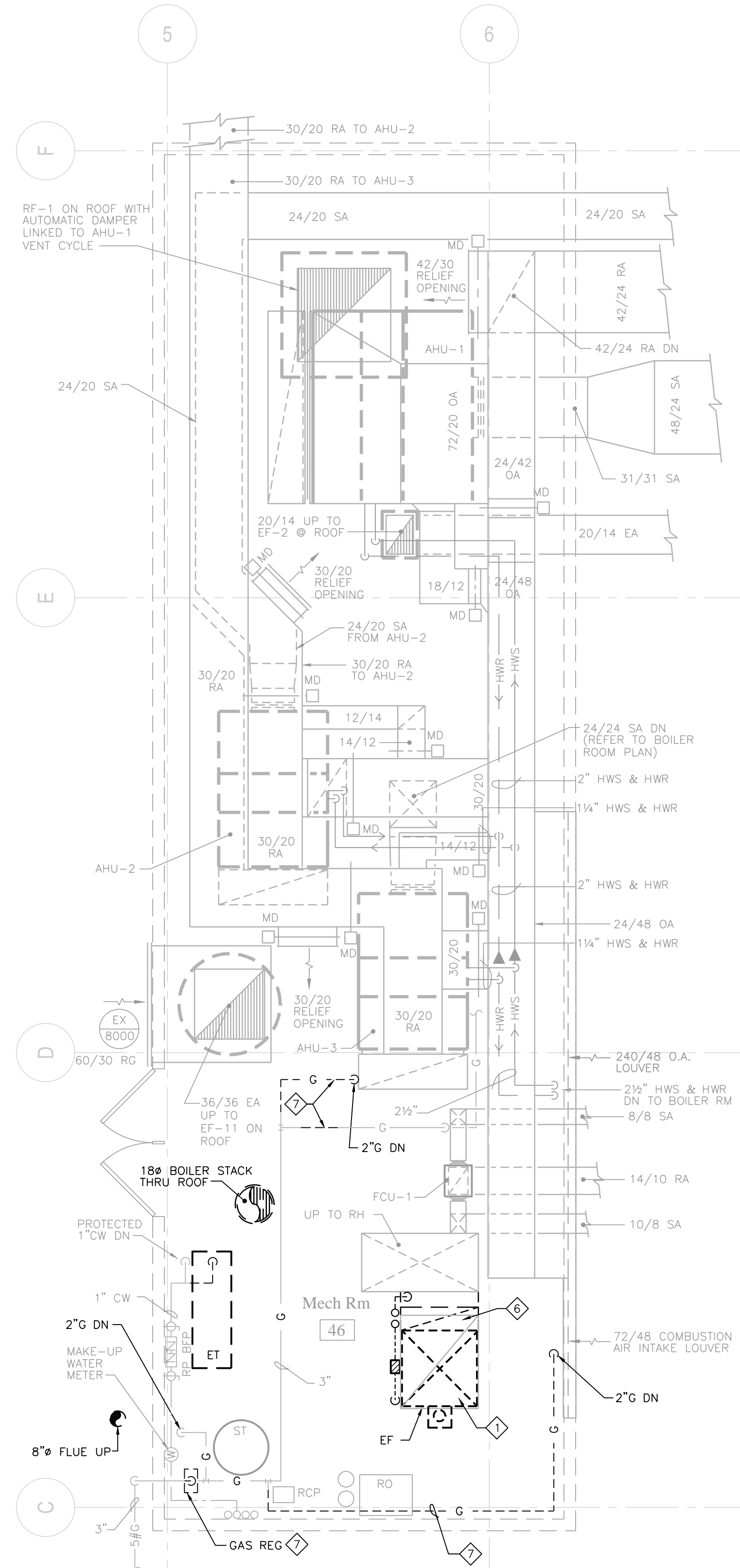
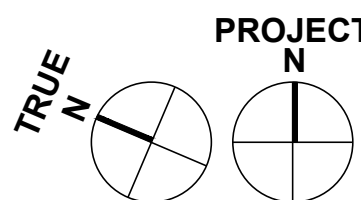


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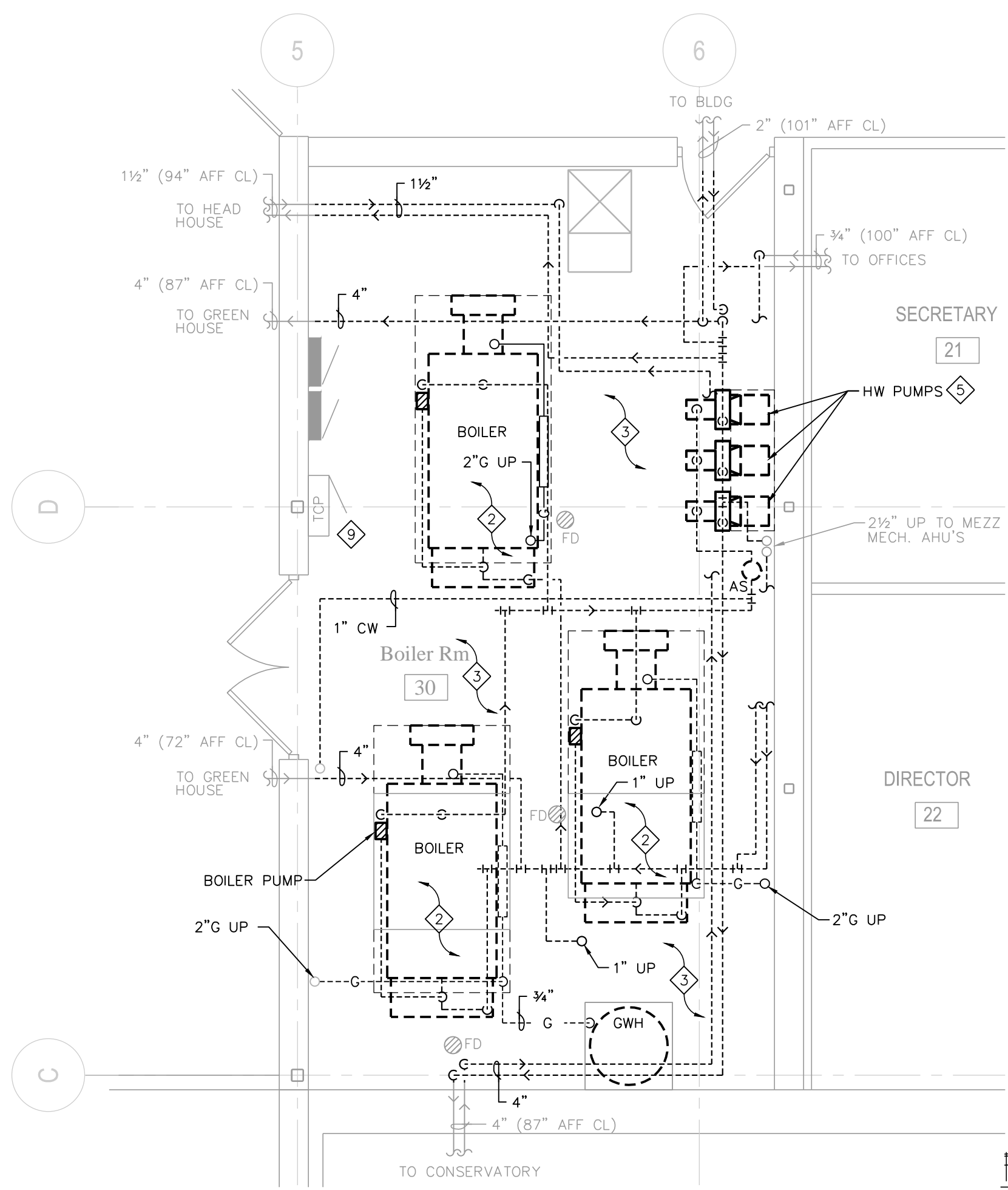
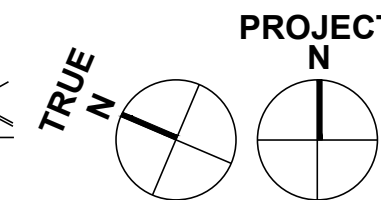
ROOF PLAN - DEMO HVAC

1/4" = 1'-0"



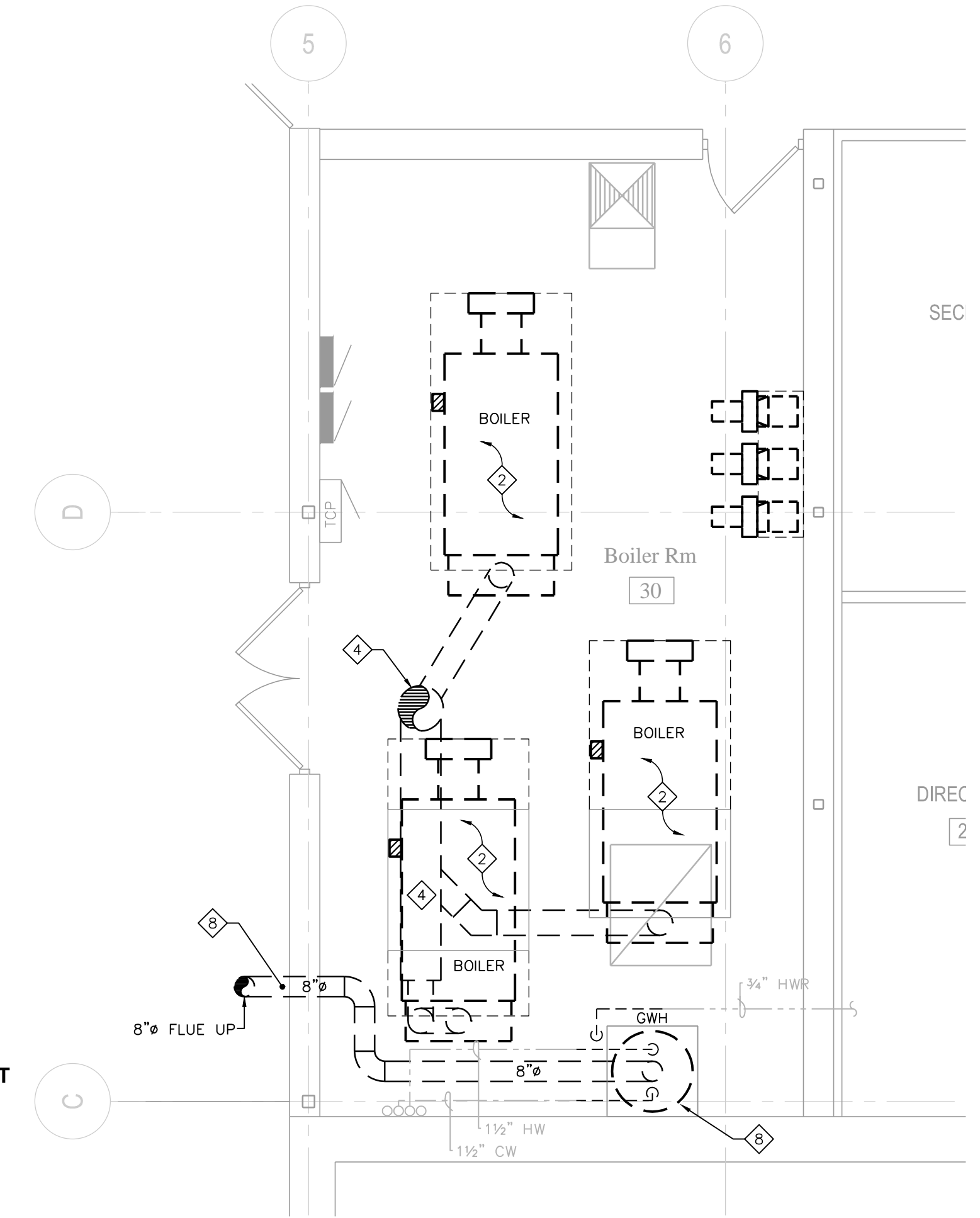
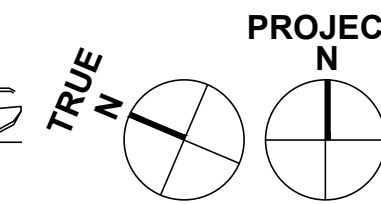
MEZZANINE PLAN - DEMO DUCTWORK

1/4" = 1'-0"



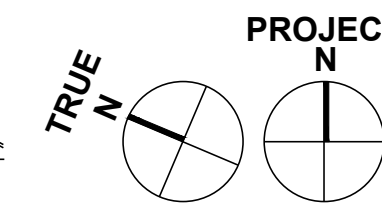
FLOOR PLAN - DEMO HVAC PIPING

1/4" = 1'-0"



FLOOR PLAN - DEMO HVAC DUCTWORK

1/4" = 1'-0"



FLOOR PLAN - DEMO EQUIP PAD

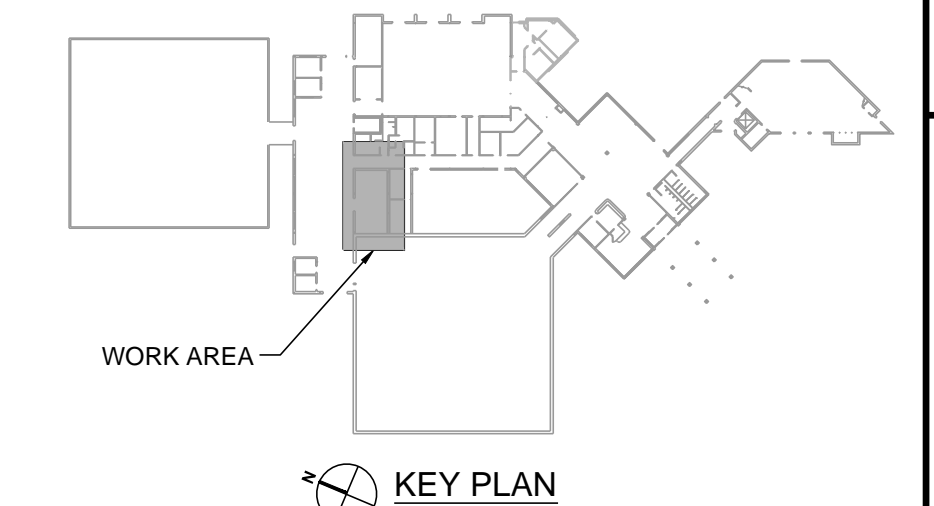
1/4" = 1'-0"

HVAC GENERAL NOTES:

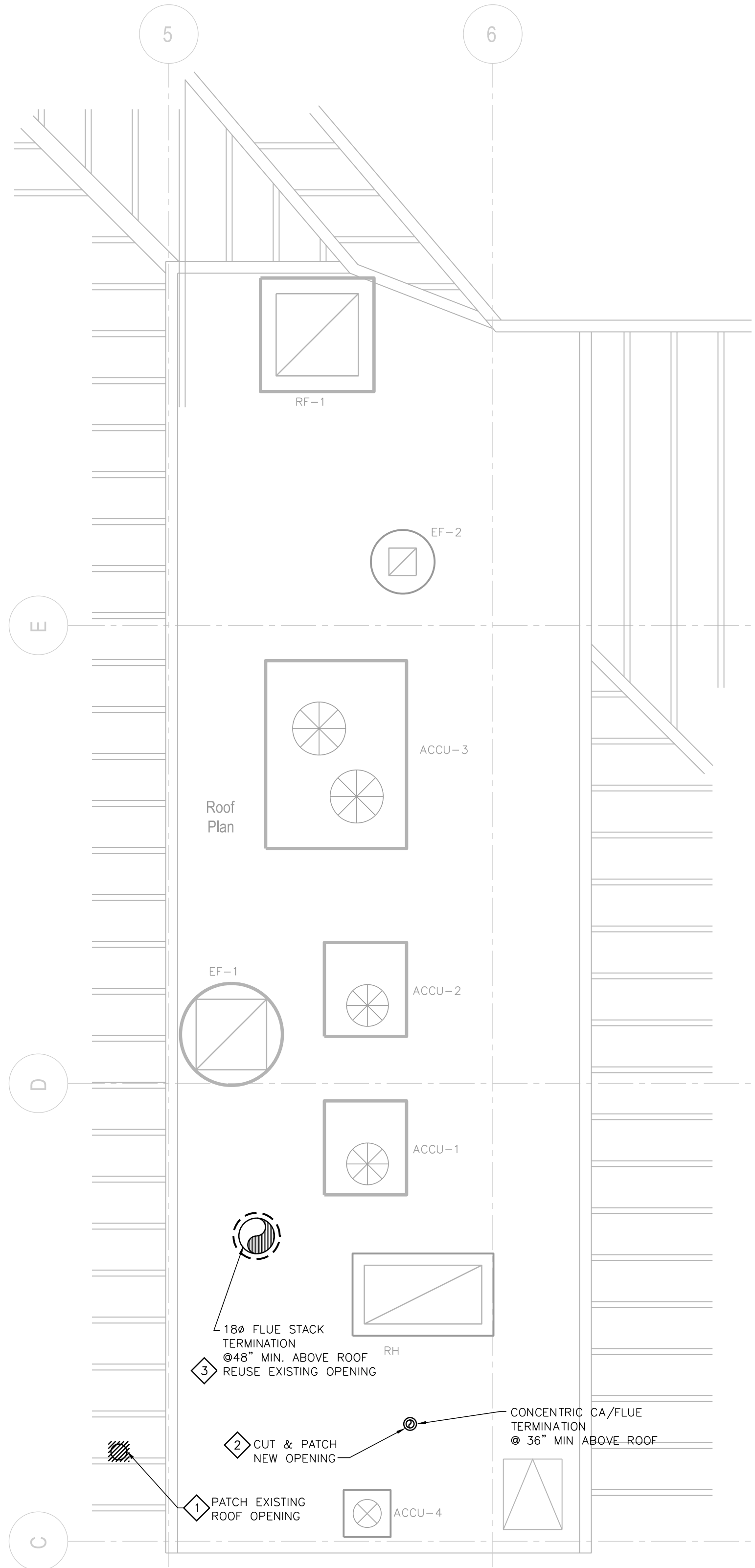
- HVAC CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS. THE DEMOLITION DRAWINGS ARE INTENDED TO BE AN EXPRESSION OF THE DESIGN INTENT AND NOT ALL INCLUSIVE OF DEMOLITION WORK REQUIRED. REFER TO SPECIFICATIONS FOR FURTHER REQUIREMENTS.
- ALL ASBESTOS MATERIALS, IF PRESENT, WILL BE ABATED BY THE OWNER'S ABATEMENT CONTRACTOR. - N.I.C.
- COORDINATE AND SCHEDULE ALL DEMOLITION WORK WITH THE OWNER'S GENERAL CONTRACTOR AND OWNER PRIOR TO STARTING WORK.
- HVAC CONTRACTOR IS RESPONSIBLE FOR PATCHING ALL HVAC WORK TO MATCH EXISTING.
- ARRANGE FOR CUTTING ACCESS OPENING FOR EXISTING EQUIPMENT REMOVAL & NEW EQUIPMENT INSTALLATION.
- PROTECT ROOFING WITH PLYWOOD PANELS FROM DAMAGE BY EQUIPMENT TRAFFIC. COORDINATE ROOF PATCHING WITH OWNER'S ROOFING CONTRACTOR. REFER TO SPECIFICATIONS FOR FURTHER REQUIREMENTS.

HVAC DEMOLITION PLAN NOTES:

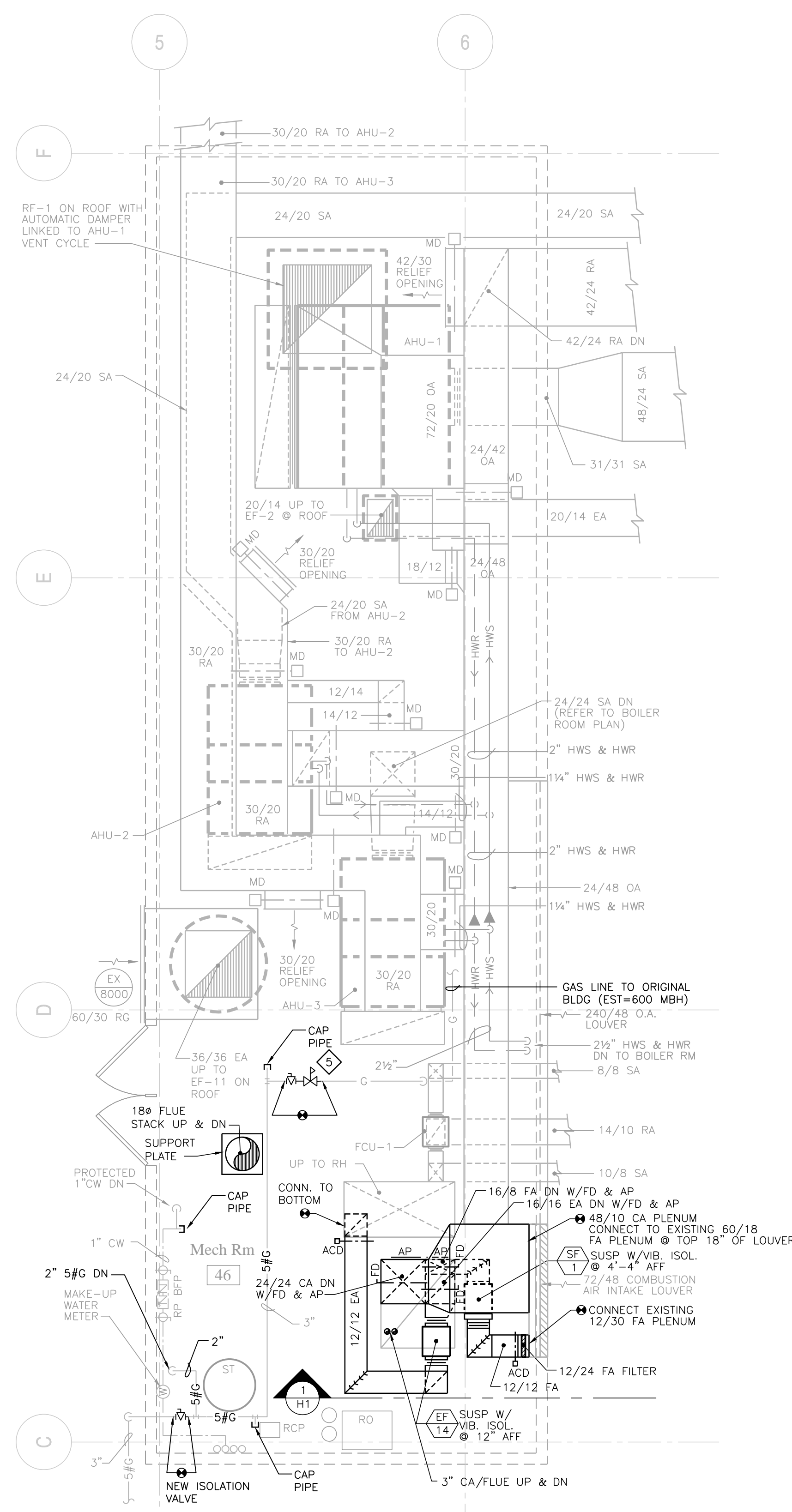
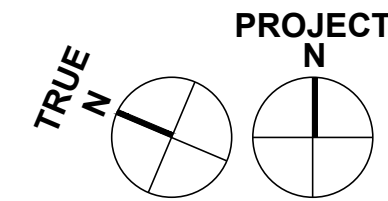
- 1. DISCONNECT AND REMOVE EXISTING EXHAUST FAN. REMOVE ALL BRANCH PIPING, COIL PUMP, VALVES AND RELATED FITTINGS. DISCONNECT AND REMOVE EXISTING DUCTWORK. COORDINATE WORK WITH ELECTRICAL TRADE. PATCH PIPING OPENINGS AT FLOOR.
- 2. DISCONNECT AND REMOVE EXISTING HW BOILERS, HW PIPING CONNECTIONS, MAKE-UP WATER, VENT & GAS CONNECTIONS. COORDINATE DEMOLITION WITH ELECTRICAL CONTRACTOR. REMOVE EXISTING CONCRETE PADS NOT CONFORMING WITH NEW PADS REQUIRED.
- 3. DISCONNECT AND REMOVE EXISTING HOT WATER PIPING, FITTINGS AND RELATED. PROTECT PIPING FOR CONTINUATION WITH NEW PLAN.
- 4. DISCONNECT AND REMOVE EXISTING BREECHING. PROTECT ROOF OPENINGS FOR REUSE WITH NEW PLAN.
- 5. DISCONNECT AND REMOVE EXISTING HW PUMPS. COORDINATE REMOVAL WITH ELECTRICAL CONTRACTOR.
- 6. DISCONNECT AND REMOVE EXISTING COMBUSTION AIR DUCTWORK AND DAMPERS.
- 7. DISCONNECT AND REMOVE EXISTING GAS PIPING, REGULATOR VALVES & RELATED. CAP PIPING REMAINING FOR REUSE WITH NEW PLAN.
- 8. DISCONNECT AND REMOVE EXISTING GAS-WATER HEATER POTABLE WATER CONNECTIONS, GAS PIPING AND FLUE VENT. PROTECT WATER PIPING FOR REUSE WITH NEW PLAN.
- 9. REMOVE EXISTING DDC CONTROLS AND SENSORS SERVING EXISTING EQUIPMENT. SALVAGE FOR REUSE WITH NEW PLAN.



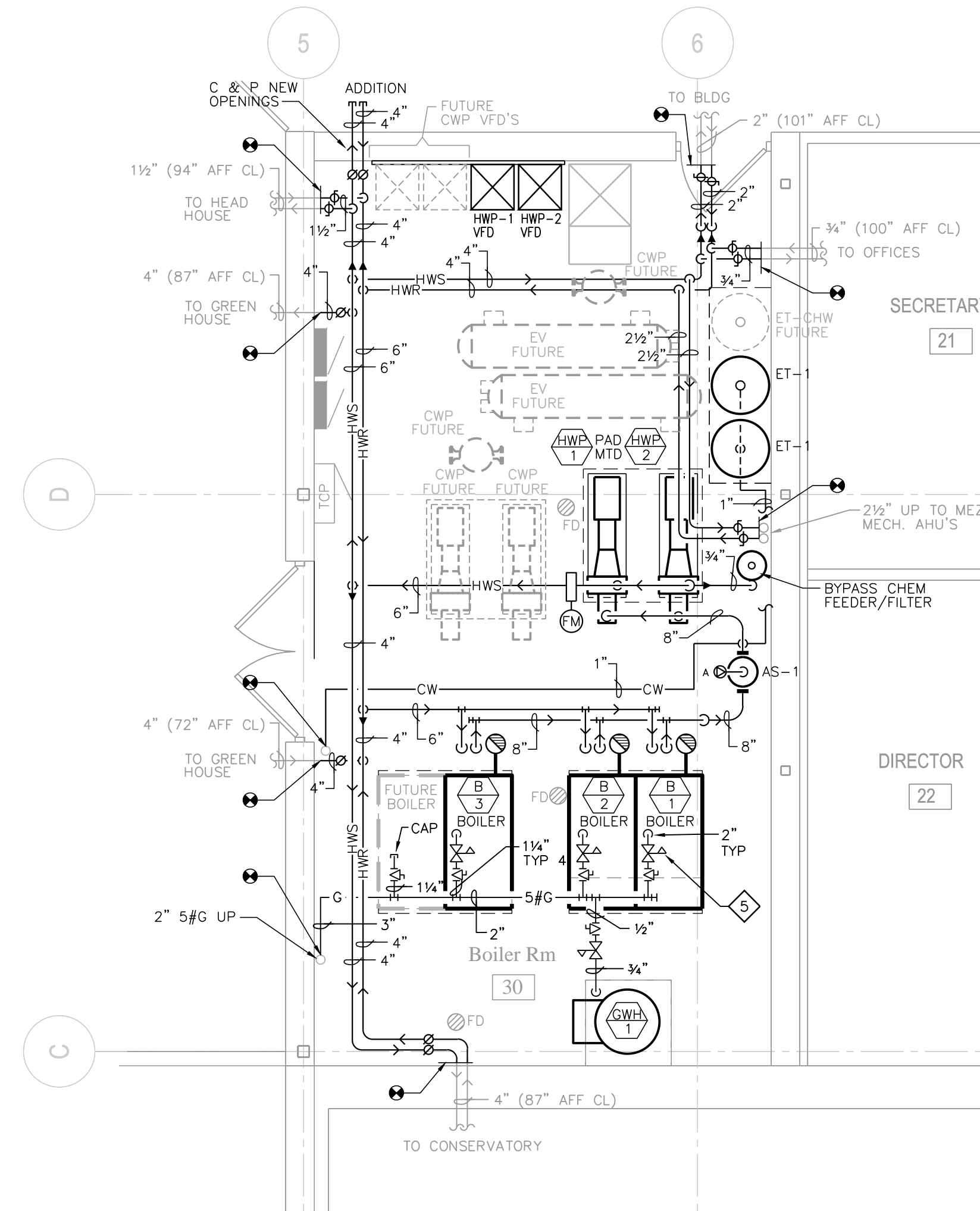
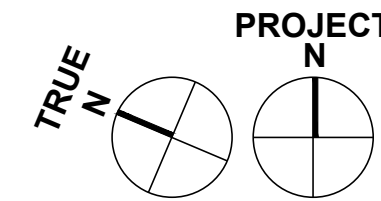
KEY PLAN



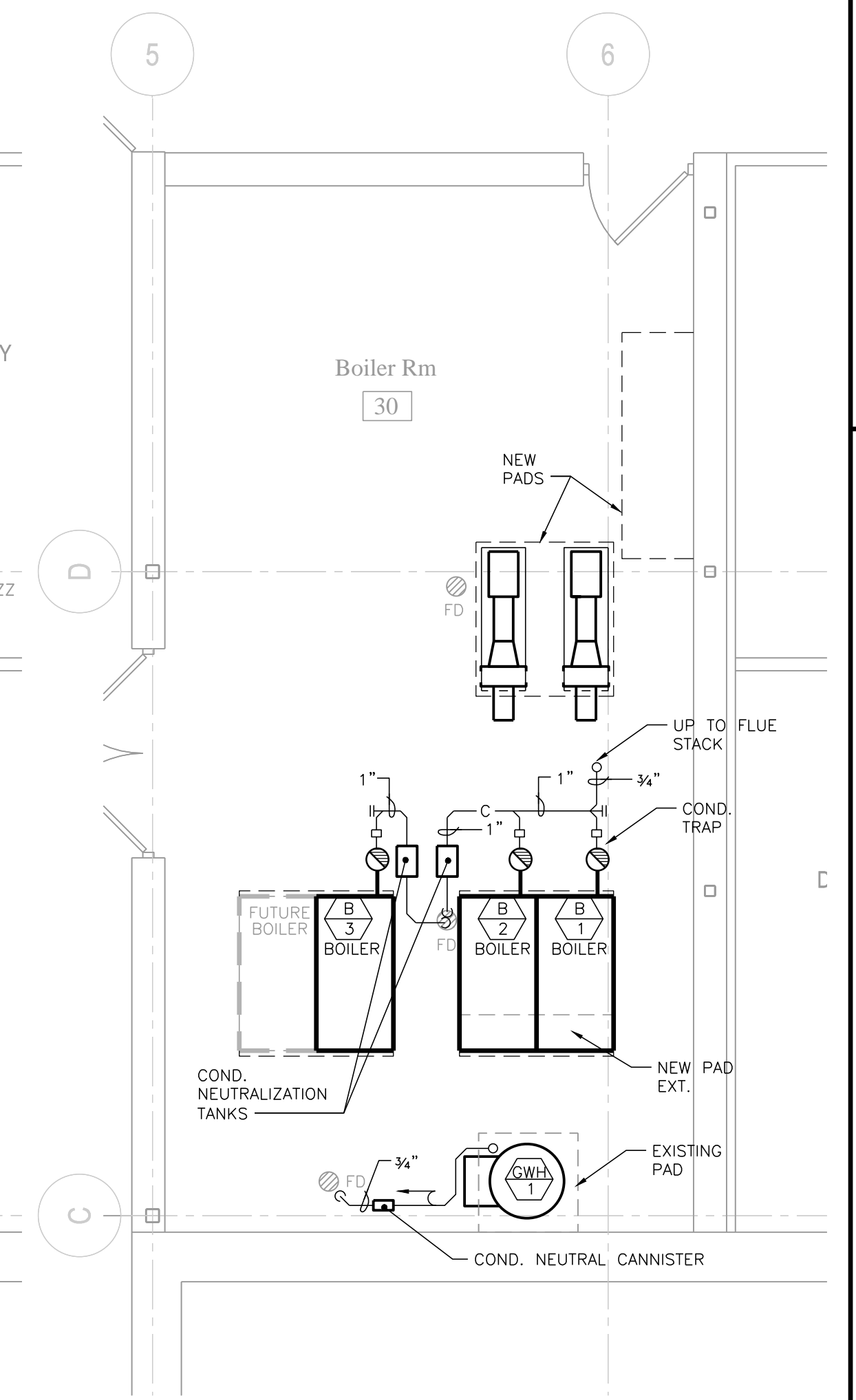
ROOF PLAN - HVAC
1/4" = 1'-0"



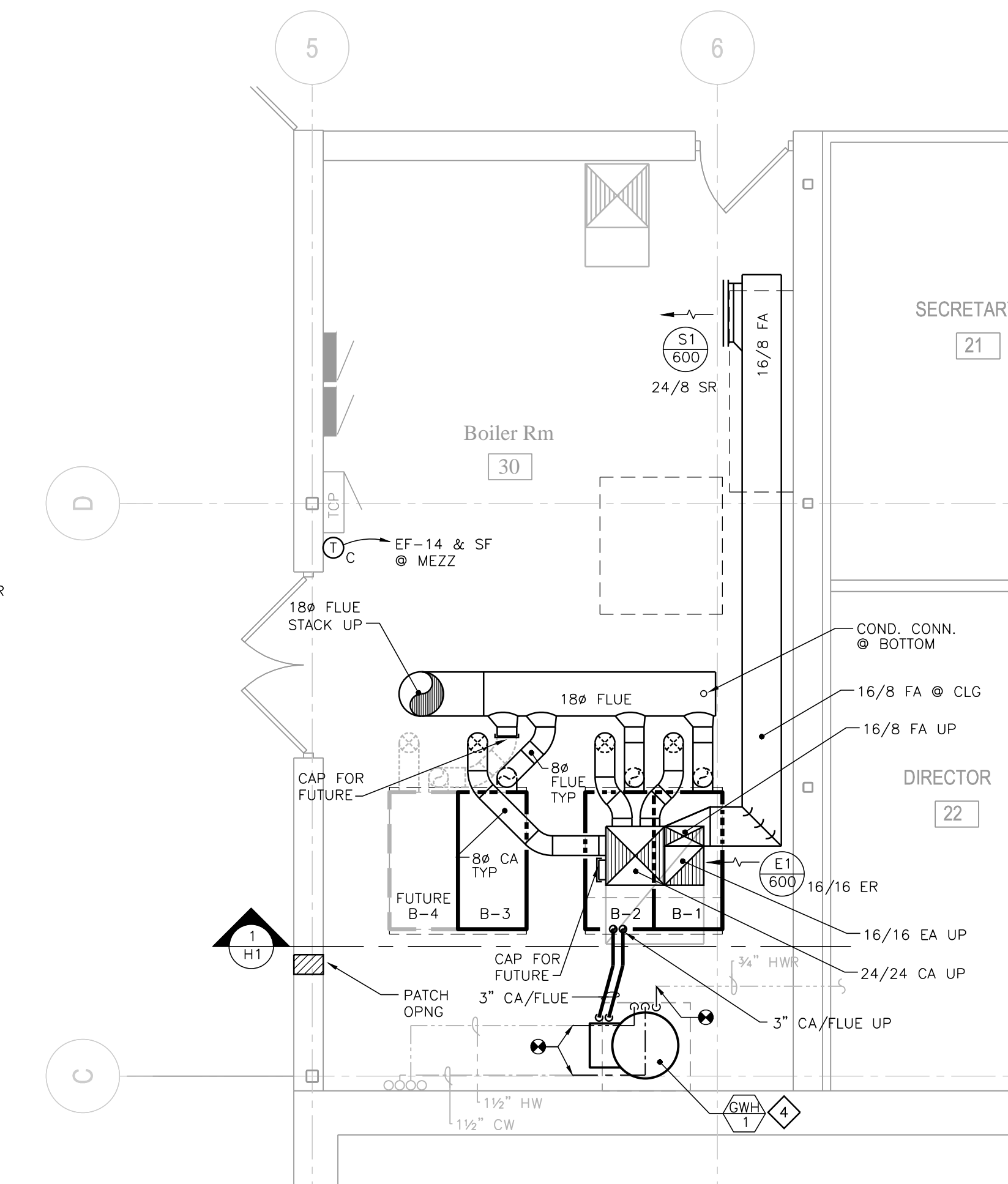
MEZZANINE PLAN - DUCTWORK
1/4" = 1'-0"



FLOOR PLAN - HVAC PIPING
1/4" = 1'-0"



FLOOR PLAN - CONDENSATE & PADS
1/4" = 1'-0"



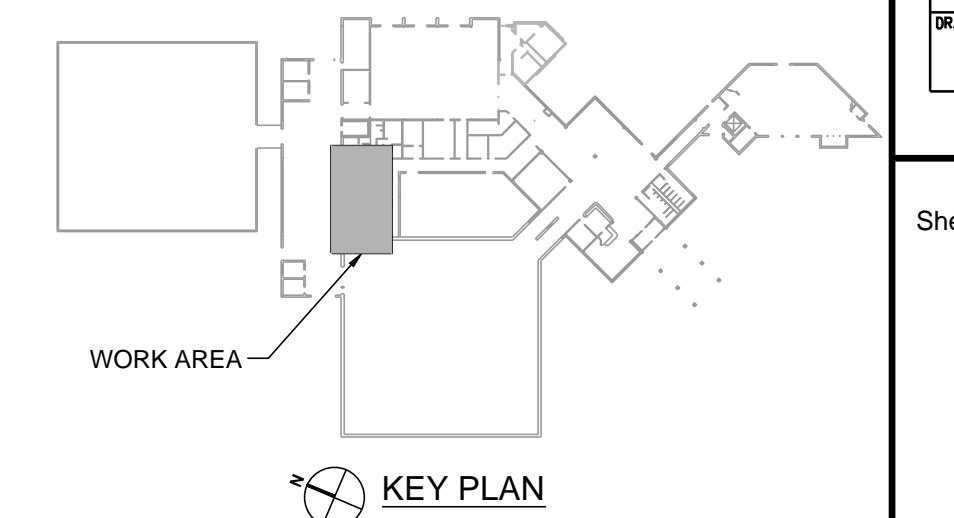
FLOOR PLAN - HVAC DUCTWORK
1/4" = 1'-0"

HVAC GENERAL NOTES:

- HVAC CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS.
- COORDINATE AND SCHEDULE ALL DEMOLITION WORK WITH THE GENERAL CONTRACTOR AND OWNER PRIOR TO STARTING WORK.
- HVAC CONTRACTOR IS RESPONSIBLE FOR PATCHING ALL HVAC WORK TO MATCH ORIGINAL CONDITION.
- FIRE PROOF AND CAULK ALL FIRE RATED PENETRATIONS AND ASSEMBLIES.
- COORDINATE PIPING AND DUCTWORK ROUTING WITH OTHER TRADES.
- REFER TO DIVISION 1 SPECIFICATIONS FOR RESTRICTED WORK SCHEDULE.

HVAC PLAN NOTES:

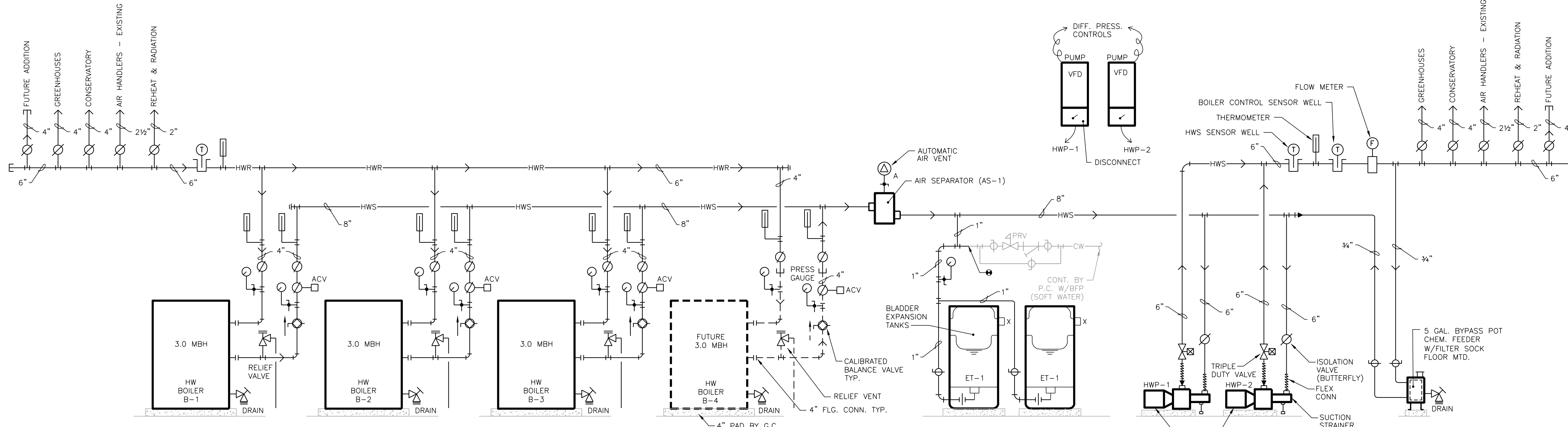
- OWNER'S ROOFING CONTRACTOR WILL PATCH COPPER ROOF OPENING AT OWNER'S EXPENSE. HVAC CONTRACTOR TO PROTECT OPENING DURING CONSTRUCTION.
- CUT & PATCH NEW OPENING IN ROOF FOR PVC CONCENTRIC VENT. OWNER'S ROOFING CONTRACTOR WILL PATCH MEMBRANE RUBBER ROOF AT OWNER'S EXPENSE.
- OWNER'S ROOFING CONTRACTOR WILL FLASH AND SEAL NEW FLUE STACK ROOF OPENING AT OWNER'S EXPENSE.
- RECONNECT NEW GAS-FIRED WATER HEATER TO EXISTING PIPE CONNECTIONS.
- EXTEND GAS PRV VENT TO EXISTING PIPING. EXTEND TO ROOF DISCHARGE.



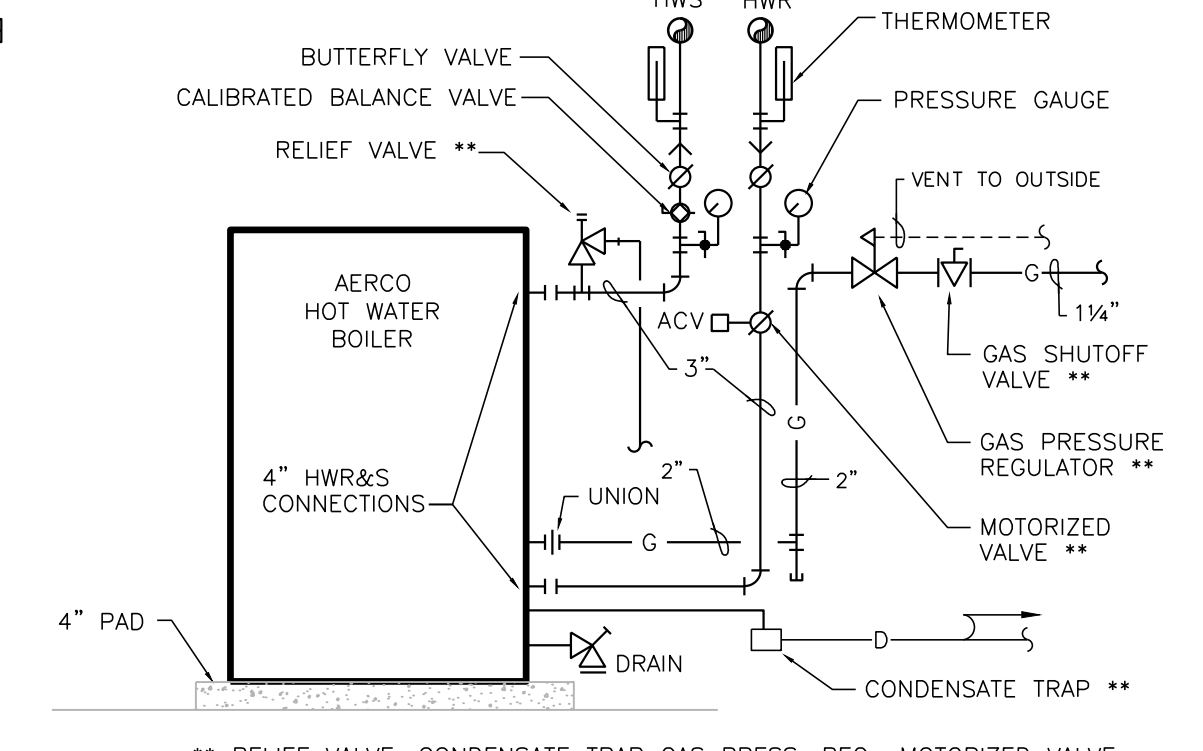
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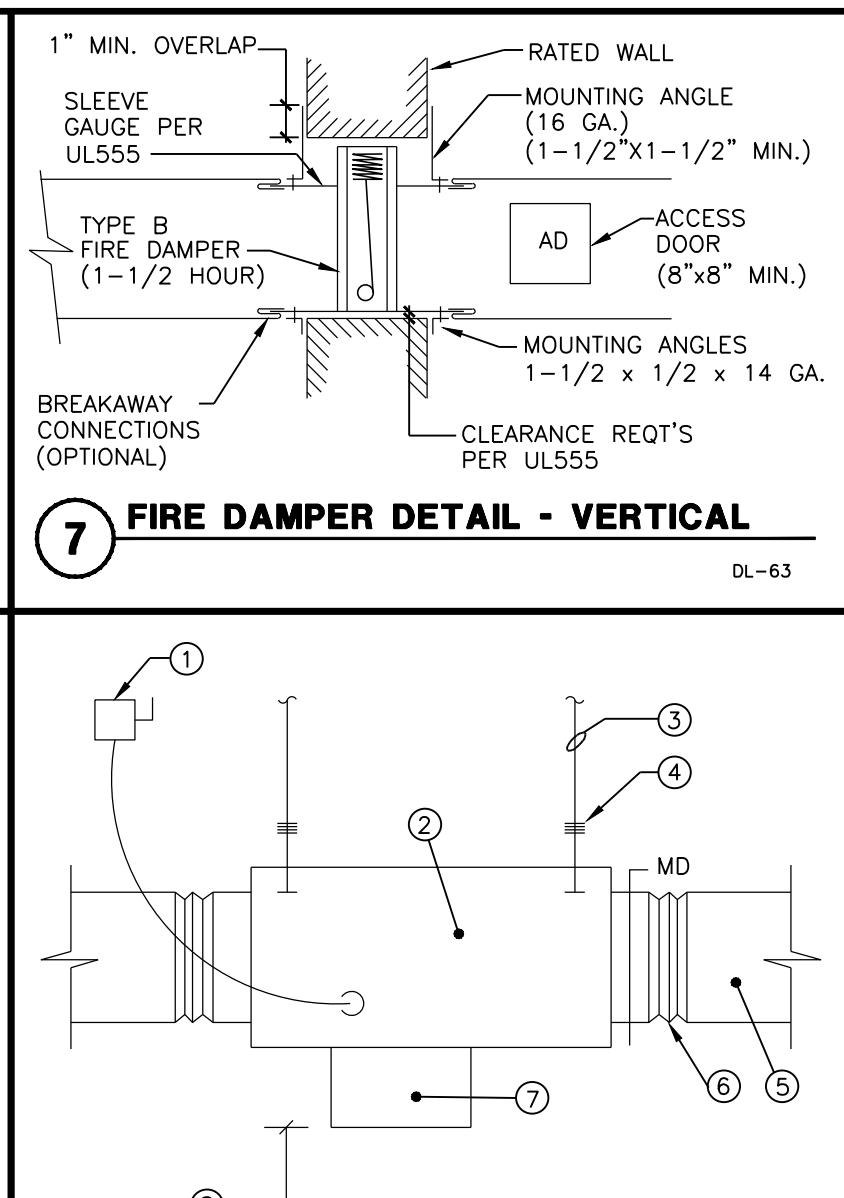
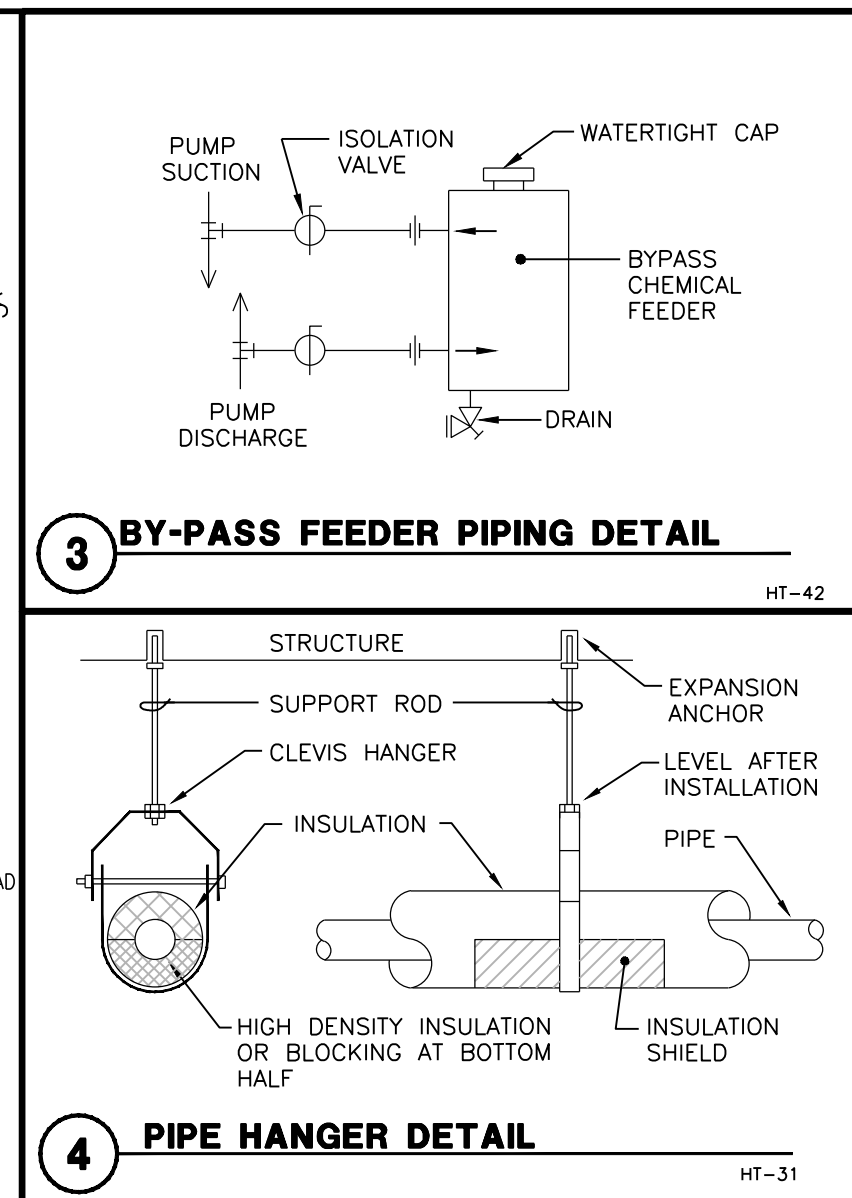
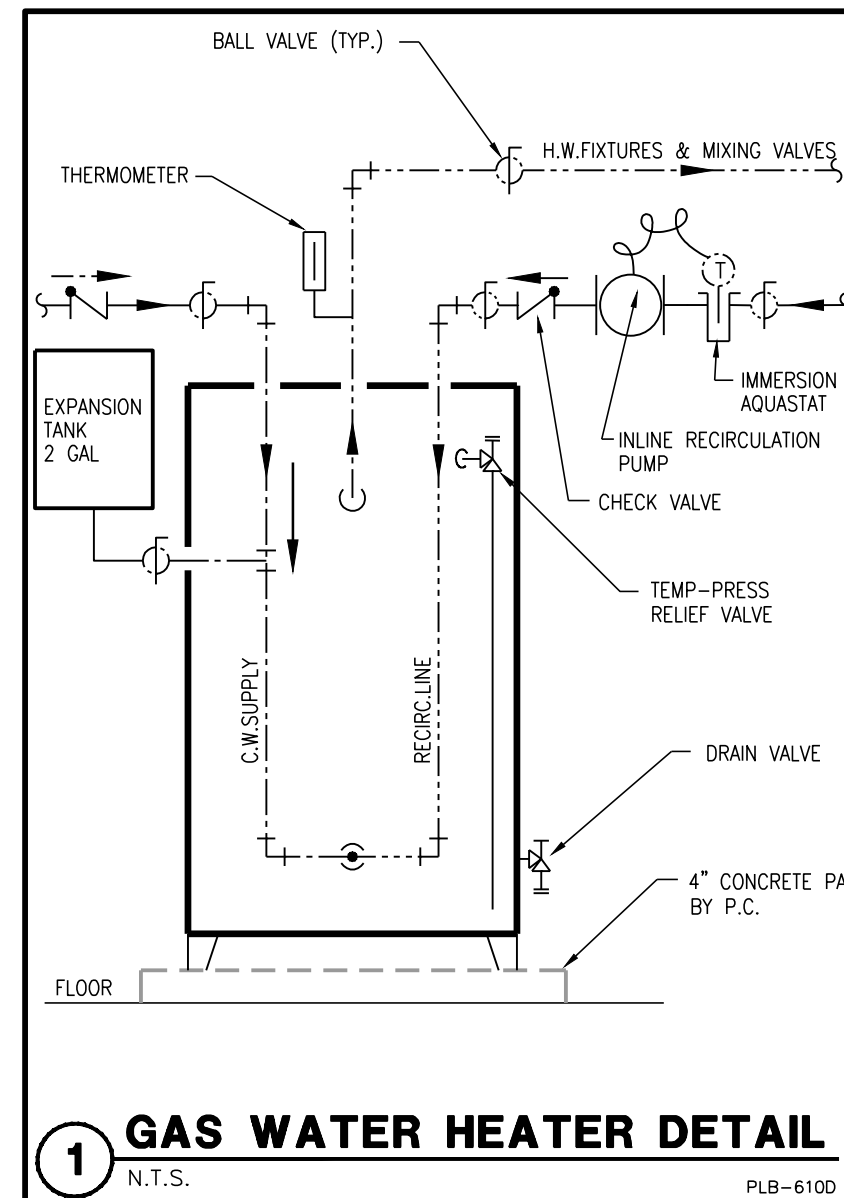
H3



OLBRICH HOT WATER PIPING SCHEMATIC
NTS



AERCO HW BOILER PIPING DETAIL
NTS



EXHAUST FAN SCHEDULE

TAG	EF-14	SF-1
MANUFACTURER	GREENHECK	GREENHECK
MODEL NO.	SO-95-VG	SO-95-VG
AREA SERVED	BOILER ROOM 30	BOILER ROOM 30
CFM	600	600
ESP *WG	0.375	0.50
RPM	1559	1700
MOUNTING	NEOPRENE VIB. HANGERS	NEOPRENE VIB. HANGERS
DRIVE	DIRECT	DIRECT
SONES (INLET/RADIATED)	9.4/8.9	9.4/8.9
ELECTRICAL:		
MOTOR HP (BHP)	1/6	1/6
FAN F.L.A.	3.4	3.4
VOLTAGE/PHASE	115/1	115/1
CONTROL	COOLING STAT	COOLING STAT
REMARKS:	INLINE EF	INLINE EF

NOTE: ALL EF LINE VOLTAGE CONTROLS WIRED BY E.C.
 ① ECM MOTOR WITH UNIT-MOUNTED POTENTIOMETER FOR BALANCING.
 ② NEOPRENE VIBRATION ISOLATION HANGERS.
 ③ NEMA 1 DISCONNECT SWITCH UNIT-MOUNTED.

PUMP SCHEDULE

TAG	HWP-1	HWP-2
MANUFACTURER	B&G	B&G
MODEL NO.	SEB SERIES 4-1510	SEB SERIES 4-1510
TYPE	BASE-MTD.	BASE-MTD.
LOCATION	BOILER	BOILER
SERVICE	HOT WATER SYSTEM	HOT WATER SYSTEM
GPM	800	800
TDH (FT)	70	70
BHP	17.6	17.6
EFFICIENCY (%)	82.2%	82.2%
SUCTION I.D.	6"	6"
OUTLET I.D.	5"	5"
IMPELLER DIA.	9.25"	9.25"
MOTOR:		
HORSEPOWER	20	20
VOLTAGE/PHASE	208/3	208/3
RPM	1750	1750
REMARKS:	HOT WATER SYSTEM PRIMARY PUMP (1)(2)(3)(4)	HOT WATER SYSTEM PRIMARY PUMP (1)(2)(3)(4)

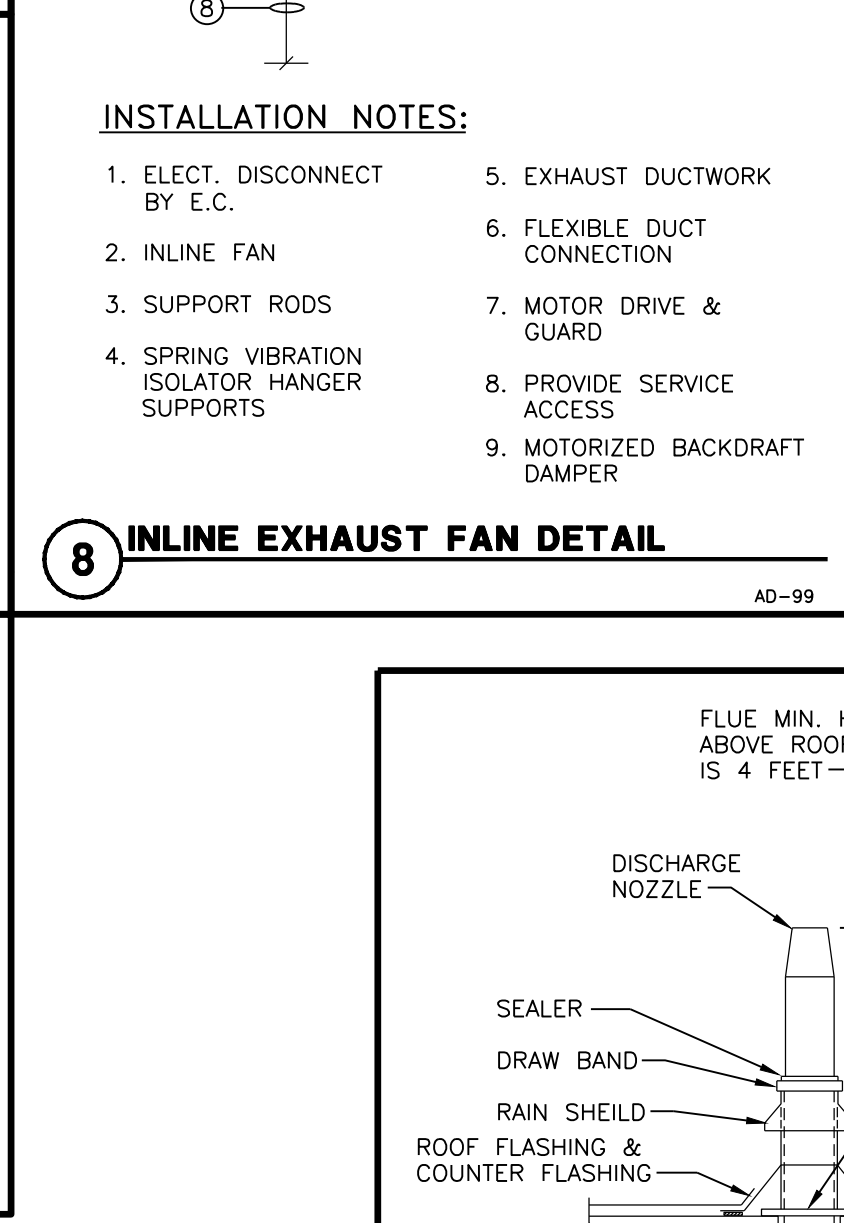
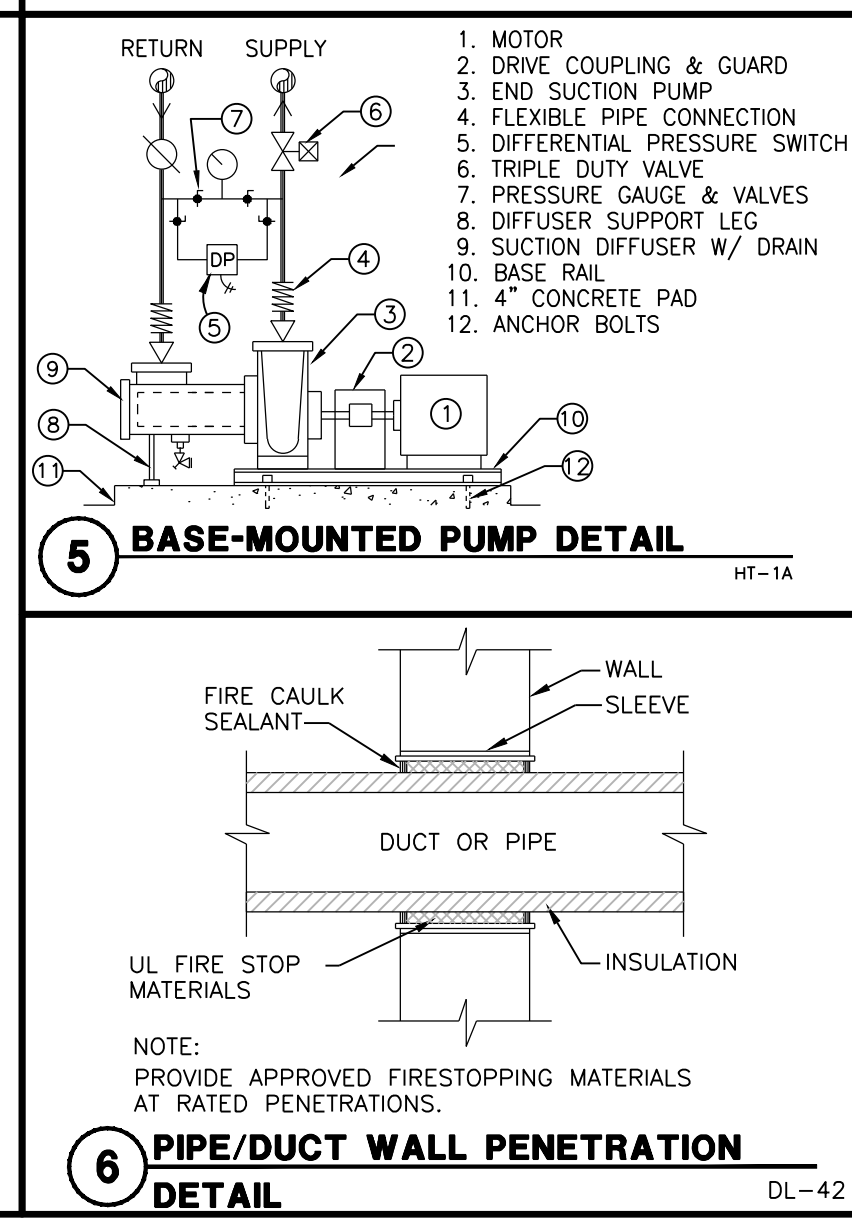
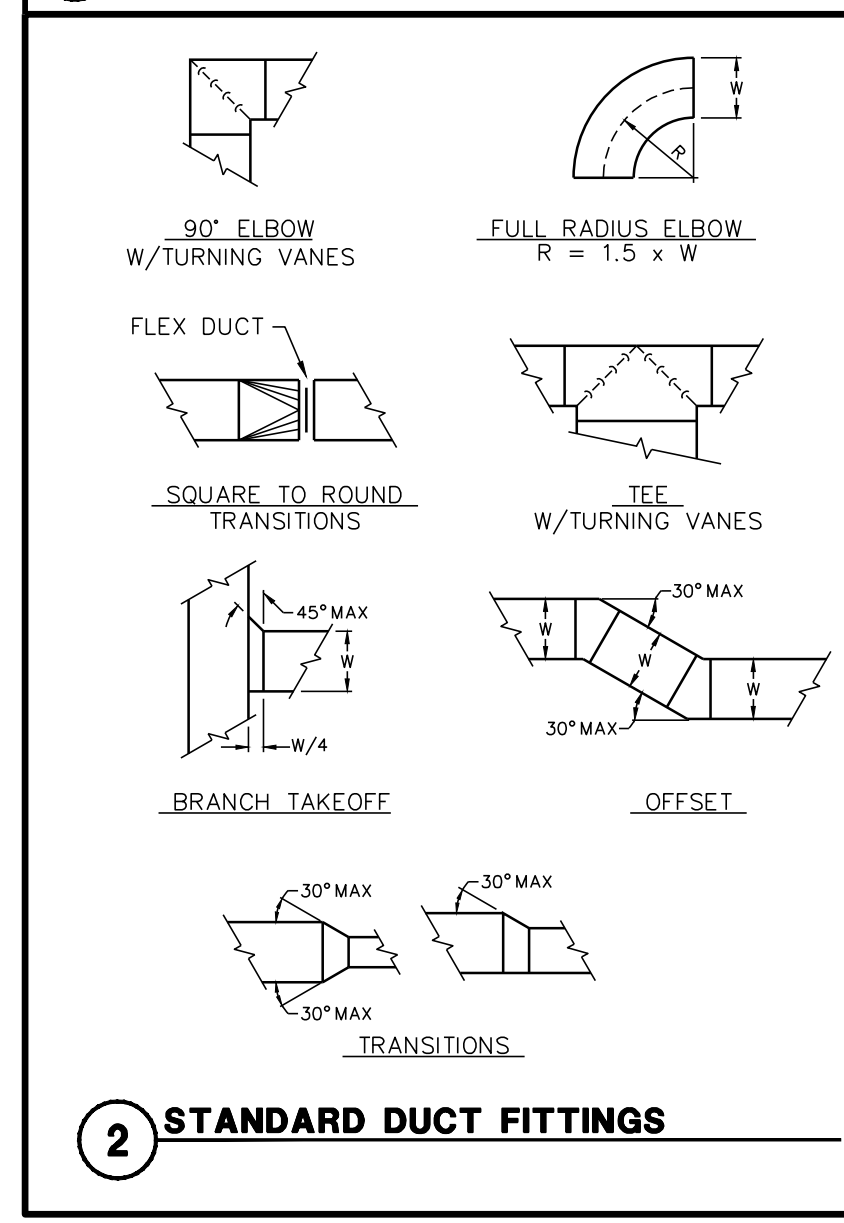
① PROVIDE MODEL 3DS-68 6" STRAIGHT PATTERN TRIPLE-DUTY VALVE
 ② PUMP DISCHARGE & MODEL GG-3 (6" SYSTEM x 6" PUMP) SUCTION DIFFUSER/STRAINER AT PUMP.
 ③ CURRENT CAPACITY: 650 GPM @ 64 FT TDH.
 ④ VFD COMPATIBLE PREMIUM EFFICIENCY MOTOR.
 ⑤ PROVIDE SINGLE-SPHERE FLEXIBLE PIPE CONNECTIONS ON SUCTION AND DISCHARGE EQUAL TO MASON SFEJ SERIES.

HVAC SYMBOL SCHEDULE

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— HWS	PIPING	—	SQUARE/RECTANGULAR SUPPLY DIFFUSER, GRILLE OR REGISTER—HORIZONTAL MOUNT
— HWR	HOT WATER RETURN PIPING	—	SQUARE/RECTANGULAR RETURN/EXHAUST REGISTER OR GRILLE—HORIZONTAL MOUNT
— C	CONDENSATE PIPING	—	SLOT SUPPLY DIFFUSER
— G	NATURAL GAS PIPING	—	VERTICAL SUPPLY DUCT UP
— U	PIPE UP	—	VERTICAL RETURN/EXHAUST DUCT UP
— D	PIPE DOWN	—	VERTICAL SUPPLY DUCT DOWN
— G	GATE VALVE	—	VERTICAL RETURN/EXHAUST DUCT DOWN
— G	GLOBE VALVE	—	VOLUME DAMPER
— B	RETURN/EXHAUST REGISTER OR GRILLE VERT. MOUNT	—	SMOKE DAMPER
— B	BALL VALVE	—	FIRE DAMPER
— B	BUTTERFLY VALVE	—	MOTORIZED BACKDRAFT DAMPER
— A	ANGLE VALVE	—	GRAVITY BACKDRAFT DAMPER
— R	PRESSURE RELIEF VALVE	—	AUTOMATIC CONTROL DAMPER
— D	DRAIN VALVE	—	FLEXIBLE CONNECTION
— S	SWING OR LIFT CHECK VALVE	—	FLOW METER
— S	SPRING LOADED CHECK VALVE	—	ROUND/FLEXIBLE DUCT
— P	PRESSURE REDUCING VALVE	—	ROUND RIGID DUCT
— P	TWO WAY TEMP CONTROL VALVE	—	SQUARE ELBOW W/TURNING VANES
— P	THREE WAY TEMP CONTROL VALVE	—	END CAP OR BLIND FLANGE
— T	TRIPLE DUTY VALVE	—	THERMOMETER
— B	BALANCE VALVE	—	PRESSURE GAUGE
— B	CALIBRATED BALANCING VALVE	—	GAS COCK
— G	Gauge Valve	—	FLEXIBLE CONNECTION
— A	AUTOMATIC CONTROL VALVE	—	DUCT RISE(R) OR DROP(D) TYPE
— M	FLOW METER	—	ANCHOR
— I	INLINE STRAINER	—	T & P TEST WELL
— F	FLANGE	—	A—AUTOMATIC AIR VENT M—MANUAL AIR VENT
— E	END CAP OR BLIND FLANGE	—	REDUCER, CONCENTRIC
— T	THERMOMETER	—	REDUCER, ECCENTRIC
— G	PRESSURE GAUGE	—	IMMERSION WELL
— K	GAS COCK	—	
— W	FLEXIBLE CONNECTION	—	
— R	DUCT RISE(R) OR DROP(D) TYPE	—	
— A	ANCHOR	—	
— T	T & P TEST WELL	—	
— A	A—AUTOMATIC AIR VENT M—MANUAL AIR VENT	—	
— R	REDUCER, CONCENTRIC	—	
— R	REDUCER, ECCENTRIC	—	
— I	IMMERSION WELL	—	

ABBREVIATIONS

ACD	AUTOMATIC CONTROL DAMPER	AS	AIR SEPARATOR
EA	EXHAUST AIR	AH	AIR HANDLING UNIT
FA	FRESH AIR	B	BOILER
SA	SUPPLY AIR	EF	EXHAUST FAN
AFF	ABOVE FINISHED FLOOR	ET	EXPANSION TANK
BOD	BOTTOM OF DUCT	L	LOUVER
OED	OPEN END DUCT	P	PUMP
Ø	ROUND DUCT DIAMETER	SF	SUPPLY FAN
Ø	OVAL DUCT DIMENSIONS	VFD	VARIABLE FREQUENCY DRIVE
PRV	PRESSURE REDUCING VALVE		
TG	TRANSFER GRILLE		
TD	TRANSFER DUCT		



HOT WATER BOILER SCHEDULE

TAG	MANUFACTURER	MODEL NO.	TYPE	FUEL	INPUT MBH	OUTPUT MBH	EFF %	FLUE VENT SIZE	COMB AIR SIZE	COND. WATER CONN.	GAS CONN.	ELECTRICAL	REMARKS
B-1	AERCO	BMK 3000	SEALED-COMBUSTION MODULATING	N. GAS	3000	2670	89	8"	8"	4"	1 1/2"	208V/3	10.0 (1)(2)(3)(4)(5)(6)
B-2	AERCO	BMK 3000	SEALED-COMBUSTION MODULATING	N. GAS	3000	2670	89	8"	8"	4"	1 1/2"	208V/3	10.0 (1)(2)(3)(4)(5)(6)
B-3	AERCO	BMK 3000	SEALED-COMBUSTION MODULATING	N. GAS	3000	2670	89	8"	8"	4"	1 1/2"	208V/3	10.0 (1)(2)(3)(4)(5)(6)

① 50 PSIG PRESSURE RELIEF VALVE
 ② GAS PRESSURE REGULATOR (2#) SUPPLIED WITH UNIT (LOCK-UP STYLE REGULATOR); INSTALLATION BY H.C.
 ③ CONDENSATE TRAPS & NEUTRALIZER TANKS (JUM BOILER WORKS NB-6) SUPPLIED WITH UNIT; INSTALLED BY H.C.
 ④ VERTICAL DIRECT VENT WITH CAT IV GAS TIGHT FLUE VENT.
 ⑤ PROVIDE C-MORE CONTROL SYSTEM & COMMUNICATIONS PROTONODE GATEWAY FOR MODBUS PROTOCOL.
 ⑥ PROVIDE MOTORIZED BUTTERFLY VALVE WITH BELIMO ACTUATOR (24V) AND END SWITCH.
 * EFFICIENCY @ 100% INPUT & 120°F RETURN WATER TEMPERATURE.

DIFFUSERS, REGISTERS AND GRILLES SCHEDULE

TAG	MFR	MODEL	SIZE	MOUNTING	SERVICE	CFM	REMARKS
S1	CARNES	RNSMV	24"x8"	—	SURFACE/DUCT SUPPLY	600	(1)(2) ALUM. SR VERT BL
E1	CARNES	RNAMV	16"x16"	—	SURFACE/CLG EXHAUST	600	(1)(2) ALUM. ER 45° BL

REMARKS:
 ① WHITE FINISH.
 ② OPPOSED BLADE DAMPER.

HOT WATER SPECIALTIES SCHEDULE

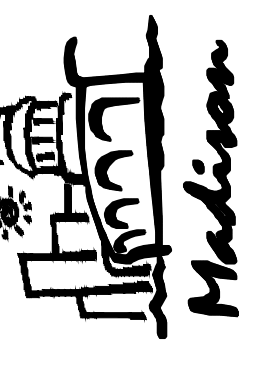
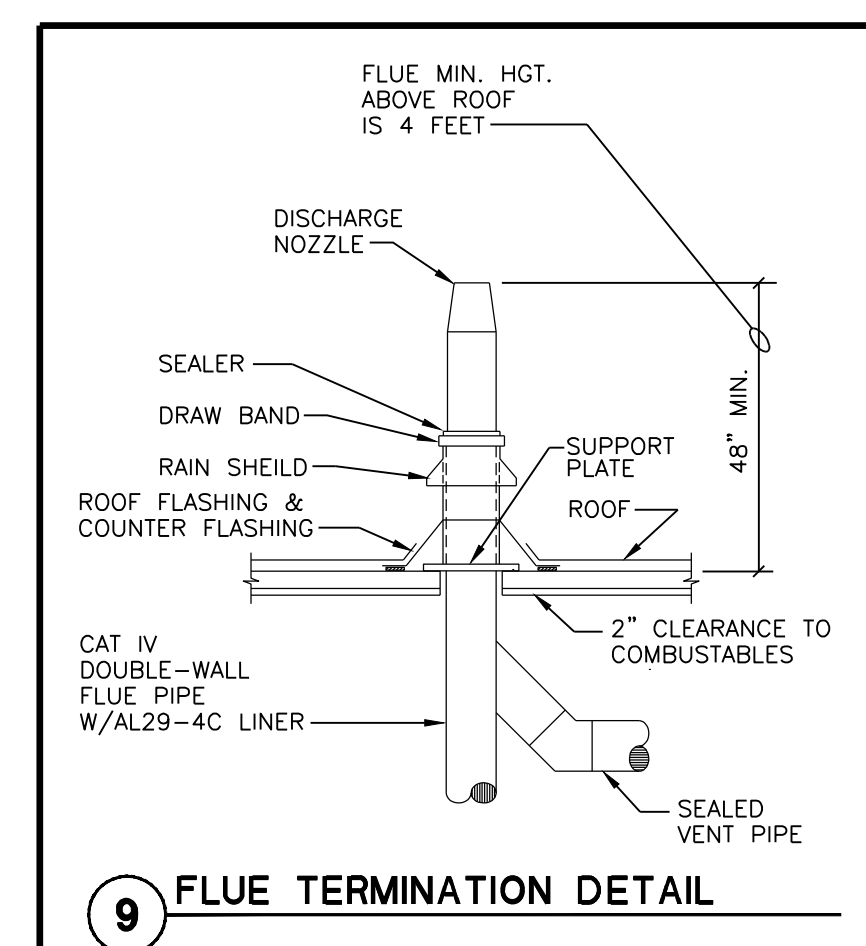
TAG	SERVICE	MANUFACTURER	MODEL NO.	CAPACITY	REMARKS
AIR SEPARATOR - AS1	HOT WATER	SPROTHERM	SENIOR VSR-800-FA	8"Ø FLANGED	W/AUTO AIR VENT & DRAIN
EXPANSION TANKS - ET1	HOT WATER	B & G	B-400LA	106 GAL. TANK (53 GAL. ACCEPT)	1"Ø CONN., 24"Øx689"TH, (2) ASME 125 PSI. (2) REQ'D
BYPASS CHEMICAL FEEDER	HOT WATER	—	BY CHEM TRT SUPPLIER	5 GAL	W/DRAIN V. ISOLATION VALVES & FILTER SOCK (2) REQ'D
CALIBRATED BALANCE VALVES	HOT WATER	B & G	CB SERIES	SEE PLAN	MANUAL BALANCE VALVE
FLOW METER - FM1	HOT WATER	ONICON	F-1210	6"	INSERTION DUAL TURBINE FLOW METER W/TRANSDUCER

① CHARGE EXP. TANK TO 12 PSIG.

GAS-FIRED WATER HEATER SCHEDULE

TAG	MAN.	MODEL NO.	TYPE	STORAGE SIZE GAL	FUEL	INPUT MBH	OUTPUT (GAL) 1st 100°F RISE	EFF %	CA/FLUE VENT SIZE	WATER CONN.	GAS CONN.	ELECTRICAL	REMARKS
GWH-1	HTP	PHOENIX PH199-119	SEALED-COMBUSTION MODULATING	119	N.G.	40-199	335	96.1	3"Ø	1 1/2"	3/4"	115V/1	5.0 (1)(2)(3)

① 3" PVC CONCENTRIC ROOF VENT.
 ② CONDENSATE NEUTRALIZER.
 ③ 2 GALLON EXPANSION TANK.



ISSUED FOR:

DATE:	BY:	CHECKED BY:	JOB NO.
1-27-15	JL	MH	H1207
3-6-15			

FINAL REVIEW CD'S
BIDDING DOCUMENTS

