

# Leon County Sustainable Demonstration Center

Leon County Facilities Management & Construction  
Tallahassee, FL

## 100% CONSTRUCTION DOCUMENTS Bid Package No. 2 - HVAC



<p style="text-align: center; font-weight: bold; font-size: 1.2em;">SITE LOCATION PLAN</p> <p style="text-align: center;">ZILAH ROAD (60' R/W)</p> <p style="text-align: center;">PAUL RUSSELL ROAD</p> <p style="text-align: center;">PHOTOVOLTAIC ARRAY</p> <p style="text-align: center;">AGRICULTURAL CENTER BUILDING 818 PAUL RUSSELL ROAD TALLAHASSEE, FL 32301</p> <p style="text-align: center;">TANKS</p> <p style="text-align: center;">GEOHERMAL VERTICAL BORE WELL FIELD</p> <p style="text-align: center;">GARDEN AREA</p> <div style="text-align: center; border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>KEY PLAN</b> N.T.S. NORTH</p> </div>	<p style="text-align: center; font-weight: bold; font-size: 1.2em;">INDEX OF DRAWINGS</p> <p><b>GENERAL</b></p> <p>CS-1 COVER SHEET</p> <hr/> <p><b>MECHANICAL</b></p> <p>M0.1 GENERAL NOTES, LEGEND, AND SCHEDULES – MECHANICAL</p> <p>M1.0 SITE PLAN – MECHANICAL</p> <p>MD1.1 DEMOLITION FLOOR PLAN – MECHANICAL</p> <p>M1.1 RENOVATION FLOOR PLAN – MECHANICAL</p> <p>M5.1 DETAILS – MECHANICAL</p>
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Leon County - Sustainable Demonstration Center

10522 Drawn By: REM/KAS  
Project Code Checked By: RLC/RRB

12 SEPTEMBER 2011  
Date

100% Construction Documents

Revisions

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COVER SHEET  
BID PACKAGE 2

Tallahassee Florida  
**CS-1**

GROUND-COUPLED HEAT PUMP SCHEDULE									
SCHEDULE TYPE		GCHP-2	GCHP-3	GCHP-4	GCHP-5	GCHP-6	GCHP-7	GCHP-8	GCHP-9
UNIT NOMINAL SIZE		18	48	36	18	18	18	36	18
TOTAL SUPPLY AIRFLOW	CFM	530	1,400	1,100	530	530	530	1,100	530
OUTSIDE AIR QUANTITY	CFM	90	75	130	90	50	60	90	90
COOLING DATA									
TOTAL COOLING CAPACITY	MBTUH	17.6	43.6	37.5	17.6	17.6	17.6	37.5	17.6
SENSIBLE COOLING CAPACITY	MBTUH	13.5	35.3	29.6	13.5	13.5	13.5	29.6	13.5
TOTAL HEAT OF REJECTION	MBTUH	21.7	53.8	46.2	21.7	21.7	21.7	46.2	21.7
AIR ENTERING COOLING COIL	Fdb-Fwb	80.0-66.0	78.0-64.0	80.0-66.0	80.0-66.0	80.0-66.0	80.0-66.0	80.0-66.0	80.0-66.0
AIR LEAVING COOLING COIL	Fdb-Fwb	56.1-54.7	54.4-53.0	54.7-54.4	56.1-54.7	56.1-54.7	56.1-54.7	54.7-54.4	56.1-54.7
CONDENSER WATER FLOW	GPM	5.0	12.0	9.0	5.0	5.0	5.0	9.0	5.0
FLUID ENTERING AND LEAVING TEMP.	F-F	95.0-104.2	95.0-104.6	95.0-105.8	95.0-104.2	95.0-104.2	95.0-104.2	95.0-105.8	95.0-104.2
FLUID PRESSURE DROP	FT. H2O	8.6	15.6	10.3	8.6	8.6	8.6	10.3	8.6
EER @ ISO STANDARD 13256-1		17.3	15.8	17.3	17.3	17.3	17.3	17.3	17.3
HEATING DATA									
TOTAL HEATING CAPACITY	MBTUH	18.1	50.2	40.0	18.1	18.1	18.1	40.0	18.1
HEAT OF ABSORPTION	MBTUH	15.2	41.4	33.2	15.2	15.2	15.2	33.2	15.2
HEATING COIL ENTERING AND LEAVING	Fdb-Fdb	60.0-91.1	63.0-95.8	60.0-93.2	60.0-91.1	60.0-91.1	60.0-91.1	60.0-93.2	60.0-91.1
FLUID ENTERING AND LEAVING TEMP.	F-F	60.0-52.5	60.0-52.6	60.0-51.7	60.0-52.5	60.0-52.5	60.0-52.5	60.0-51.7	60.0-52.5
COP @ ISO STANDARD 13256-1		5.1	4.6	5.1	5.1	5.1	5.1	5.1	5.1
UNIT DATA									
BLOWER MOTOR HORSEPOWER (NOTE 1)	HP	1/6	1/2	1/2	1/6	1/6	1/6	1/2	1/6
EXT. STATIC PRESSURE (INCL. FILTER)	IN.-H2O	0.64	0.60	0.75	0.64	0.64	0.64	0.75	0.64
RUNOUT PIPE SIZE	IN.	1	1-1/4	1-1/4	1	1	1	1-1/4	1
CONDENSATE DRAIN SIZE	IN.	3/4	1	1	3/4	3/4	3/4	1	3/4
ELECTRICAL CHARACTERISTICS	V/PH	208/1	208/1	208/1	208/1	208/1	208/1	208/1	208/1
MINIMUM CIRCUIT AMPACITY	AMPS	12.5	31.5	25.9	12.5	12.5	12.5	25.9	12.5
MAXIMUM OVERLOAD PROTECTION	AMPS	20	50	40	20	20	20	40	20
UNIT OPERATING WEIGHT	LBS.	250	350	275	250	250	250	275	250
REFRIGERANT TYPE		R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
DETAIL REFERENCE		F/M5.1	F/M5.1	F/M5.1	F/M5.1	F/M5.1	F/M5.1	F/M5.1	F/M5.1
NOTES:									
1. INTERLOCK UNIT COMPRESSORS WITH CONDENSER WATER PUMP SUCH THAT PUMP IS INITIATED UPON CALL FOR OPERATION BY ANY GROUND-COUPLE HEAT PUMP. PROVIDE LOW-VOLTAGE WIRING AND RELAYS AS NECESSARY.									
2. PROVIDE 3-WAY CONTROL VALVE INTERLOCKED WITH UNIT OPERATION TO OPEN WHEN COMPRESSOR IS ON.									
3. PROVIDE DESUPERHEATER HEAT RECOVERY SYSTEM AND CIRCULATING PUMP WITH THE FOLLOWING UNITS: GCHP-8.									

GEOHERMAL PIPE HEADER VAULT SPECIFICATION		PUMP SCHEDULE	
REFERENCE DETAIL	H/M5.1	PUMP DESIGNATION	CWP-1
COMPOSITE STEEL/CONCRETE VAULT THE VAULT SHALL BE A COMPOSITE STEEL AND CONCRETE STRUCTURE CONSTRUCTED AS SHOWN. VAULT SHALL BE SHIPPED FROM FACTORY PREFORMED FOR A CONCRETE POUR WITH ALL REINFORCEMENT RODS, MANIFOLDS, VALVES AND PIPING SECURED IN PLACE. THE VAULT WEIGHT BY ITSELF SHALL OVERCOME ALL BUOYANCY FORCES WITHOUT ANY ADDITIONAL ANCHORING.		SERVICE	GEOHERMAL CW LOOP
STRUCTURE: THE INTERIOR SHELL SHALL CONSIST OF A HEAVY-DUTY STEEL FRAME AND BASE WHERE ALL JOINTS HAVE A CONTINUOUS WELD. THE BASE FRAME AND CROSS BRACING SHALL BE CONSTRUCTED OF 1/4" x 3" x 8" SQUARE STEEL TUBING WITH CROSS BRACING SPACED MAX. 2 FT. O.C. WITH 1/2" x 3" x 8" SQUARE STEEL TUBING. THE SIDEWALL AND CEILING FRAMES AND ALL CROSS BRACING CONSTRUCTED OF 1/2" x 3" x 3" ANGLE IRON WITH CROSS BRACING SPACED MAX. 2 FT. O.C. THE STEEL INTERIOR WALLS/CEILING, STAINLESS STEEL FLOOR AND STAINLESS STEEL SUMP PUMP PIT SHALL BE CONSTRUCTED OF 12 GAGE SHEET TREATED WITH EPOXY COATING ON INTERIOR SIDE. ALL INTERIOR SHEET STEEL SHALL HAVE CONTINUOUS WELD ON SEAMS AND A 2" WELD EVERY 12" AT SUPPORT FRAMING AND EXTERIOR FORM WALLS. #5 REINFORCEMENT RODS SHALL BE PLACED ON A 12" SPACING FOR SIDEWALLS AND #6 REINFORCEMENT RODS SHALL BE PLACED ON A 12" x 12" GRID SPACING FOR THE CEILING. ALL STEEL PIPE SLEEVES SHALL BE SCHEDULE 40 AND HAVE A CONTINUOUS WELD ON INTERIOR SIDE. ALL REINFORCEMENT RODS SHALL BE LOCATED 3" WITHIN THE CONCRETE FROM THE INTERIOR SIDE AND WELDED TO STEEL FRAMING EVERY 2 FEET OR LESS. THE OUTER SHELL OF THE WALLS AND CEILING SHALL CONSIST OF 8" THICK 4,000 PSI CONCRETE THAT IS POURED BY THE CONTRACTOR ON-SITE AND VIBRATED INTO PLACE. THE MANHOLE SHALL BE CONSTRUCTED OF 1/2" SHEET STEEL WITH A 3" FLANGE THAT IS ANCHORED INTO CEILING CONCRETE AND WELDED TO CEILING FRAME; ALL MANHOLE WELDS BEING CONTINUOUS. THE MANHOLE COVER SHALL BE CONSTRUCTED OF 1/2" STEEL TREAD PLATE WITH FRAMING CONSTRUCTED OF 1/2" x 3" x 3" ANGLE IRON. THE MANHOLE STAND'S SUPPORT CHANNEL SHALL RUN CONTINUOUS BETWEEN CIRCUITS AND BE CONSTRUCTED OF 1/2" x 3" x 3" ANGLE IRON WITH 1/8" - 1" TUBE SUPPORTS EVERY 3 FEET WELDED TO THE FLOOR.		CAPACITY	GPM
MANIFOLDS: HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS, JOINED TOGETHER WITH HEAT FUSION, SHALL BE USED FOR ALL CIRCUIT AND MAIN HEADER PIPING. ALL HDPE PIPE AND HEAT FUSED MATERIALS SHALL BE MANUFACTURED FROM HIGH-DENSITY, HIGH MOLECULAR WEIGHT PE 3408 POLYETHYLENE COMPOUND THAT MEETS OR EXCEEDS ASTM D 3350 CELL CLASSIFICATION 345646C, AND IS LISTED BY THE PLASTIC PIPE INSTITUTE IN PPI TR-4. ALL 3" AND LARGER HDPE PIPING SHALL BE DR15.5 AND ALL 2" AND SMALLER HDPE PIPING SHALL BE DR11. ALL CIRCUITS 2" AND GREATER SHALL INCLUDE BUTTERFLY VALVES CONSTRUCTED OF LUG TYPE LEVER WITH CAST IRON BODY, ALUMINUM-BRONZE DISC, EPDM SEAT, 416 STAINLESS STEEL STEM, RATED AT 200 PSI. ALL CIRCUIT SETTER FLOW BALANCING VALVES SHALL HAVE A FIXED PORT VENTURE ORIFICE, HAVE BLOW-OUT PROOF STEM, FLOW MEASUREMENT FUNCTION INDEPENDENT OF BALL POSITION, INSTALL IN ANY POSITION, AND SERVE AS A SERVICE SHUTOFF WITH A TAMPER RESISTANT MEMORY STOP TO ACCURATELY RESET TO BALANCING CIRCUITS SMALLER THAN 2" AND ALL FILL PORTS SHALL BE BALL VALVES WITH FULL PORT OPENING WITH BLOW OUT PROOF STEM, 600 PSI NON-SHOCK COLD WDG. THE VAULT SHALL COME FROM THE FACTORY WITH THE HDPE MANIFOLD MOUNTED IN PLACE AND ALL MAIN AND CIRCUIT PIPING STUBBED OUT OF VAULT HOUSING.		STATIC HEAD	FT.
KEYED ENTRY: MANHOLE COVER OF THE VAULT FASTENED WITH FOUR STAINLESS STEEL PENTAGON HEAD BOLTS REQUIRING A SPECIAL SOCKET KEY FOR REMOVAL. TWO SOCKET KEYS SHALL BE INCLUDED.		TOTAL DYNAMIC HEAD	FT.
SEALS: ALL HDPE PIPE PENETRATIONS IN THE VAULT SHALL UTILIZE A LINK-SEAL - EPDM MODULAR HYDROSTATIC SEAL TO WATER PROOF AND ANCHOR THE PIPE. THE MANHOLE COVER AND STAINLESS STEEL SUMP PIT SHALL UTILIZE EPDM GASKETS FOR SEALS WHERE BOLTED CONNECTIONS ARE MADE.		EFFICIENCY	%
VENTILATION: VAULT SHALL COME WITH ITS OWN VENTILATION BLOWER AND 8" FLEXIBLE DUCTING. THE BLOWER SHALL BE INDUSTRIAL GRADE MADE WITH HEAVY DUTY METAL CONSTRUCTION. THE BLOWER SHALL BE ALOHA MODEL 39008 RATED FOR 60HZ, 120V - 1.4A. THE BLOWER SHALL PROVIDE 1,200 CFM, CONNECTED TO 20 FT OF 8" INDUSTRIAL GRADE FLEXIBLE DUCTING UP TO THE TOP OF THE MANHOLE ENTRY. THE BLOWER SHALL BE CEILING MOUNTED AT THE OPPOSITE END OF THE MANHOLE WITHIN THE VAULT. THE BLOWER SHALL BE SWITCHED WITH THE LIGHTS.		SHUT-OFF HEAD	FT.
ELECTRICAL: THE ELECTRICAL SERVICE REQUIRED FOR THE VAULT IS 60 HZ, 120V, 20A WITH GFCI BREAKER. THE VAULT SHALL HAVE ALL REQUIRED ELECTRICAL CONDUIT AND BOXES CEILING MOUNTED WITH 1" CONDUIT EXITING THE VAULT. ALL OUTLETS, LIGHT FIXTURE(S), SWITCH AND WEATHERPROOF COVERS SHALL BE INCLUDED WITH THE VAULT. THE VAULT IS TO BE FIELD WIRED BY A LICENSED ELECTRICIAN IN THE STATE OF INSTALLATION. THE ELECTRICAL COMPONENTS SHALL INCLUDE:		SPEED	RPM
1. LIGHT FIXTURE(S): SEALED GLASS LENS WITH ALUMINUM GUARD AND ALUMINUM CEILING MOUNTED BASE. THE FIXTURE SHALL BE SUITABLE FOR DAMP LOCATIONS AND USES A 100 W BULB.		MOTOR HORSEPOWER	HP - BHP
2. SWITCH: THE SWITCH SHALL BE A 120V - 20A HEAVY DUTY DOUBLE POLE THAT WILL POWER THE LIGHTS AS WELL THE VENTILATION OUTLET.		ELECTRICAL CHARACTERISTICS	V/PH
3. OUTLETS: THE TWO OUTLETS USED SHALL BE 120V - 20A HEAVY DUTY DUPLEX. THE UTILITY OUTLET SHALL BE WIRED CONTINUOUS POWER FOR SUMP PUMP AND SERVICING EQUIPMENT. THE VENTILATION OUTLET SHALL BE SWITCHED WITH THE LIGHTS FOR THE BLOWER.		MOTOR WINDING	FULL
		IMPELLER DIAMETER	IN.
		PUMP SEAL	MECHANICAL
		MANUFACTURER	TACO
		MODEL NUMBER	1911
		DETAIL REFERENCE	B/M5.1
		NOTES:	
		1. INTERLOCK GROUND-COUPLED HEAT PUMP COMPRESSORS WITH CONDENSER WATER PUMP SUCH THAT PUMP IS INITIATED UPON CALL FOR OPERATION BY ANY UNIT. PROVIDE LOW-VOLTAGE WIRING AND RELAYS AS NECESSARY.	
		2. VENTILATION RATES FOR SPACES WITH INTERMITTENT OCCUPANCY (PEAK OCCUPANCY LESS THAN THREE HOURS) HAVE BEEN REDUCED ON AVERAGE OCCUPANCY DURING THE OCCUPIED PERIOD, BUT NOT LESS THAN HALF OF THAT REQUIRED DURING PEAK OCCUPANCY.	
		3. VENTILATION RATES CALCULATED PER REQUIREMENTS OF ASHRAE STANDARD 62.1-2004.	
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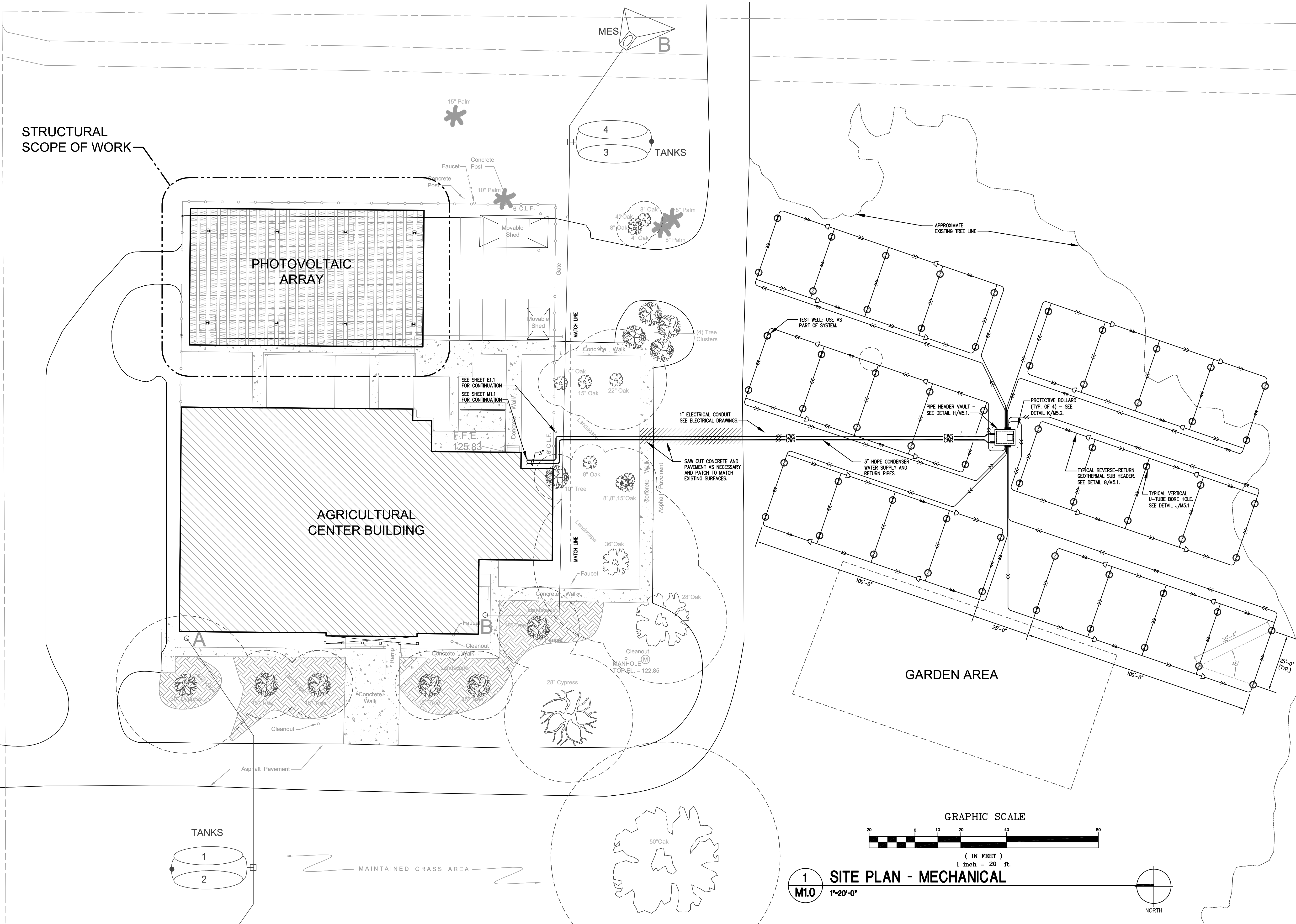
Revisions

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ZILAH ROAD (60' R/W)

STRUCTURAL SCOPE OF WORK

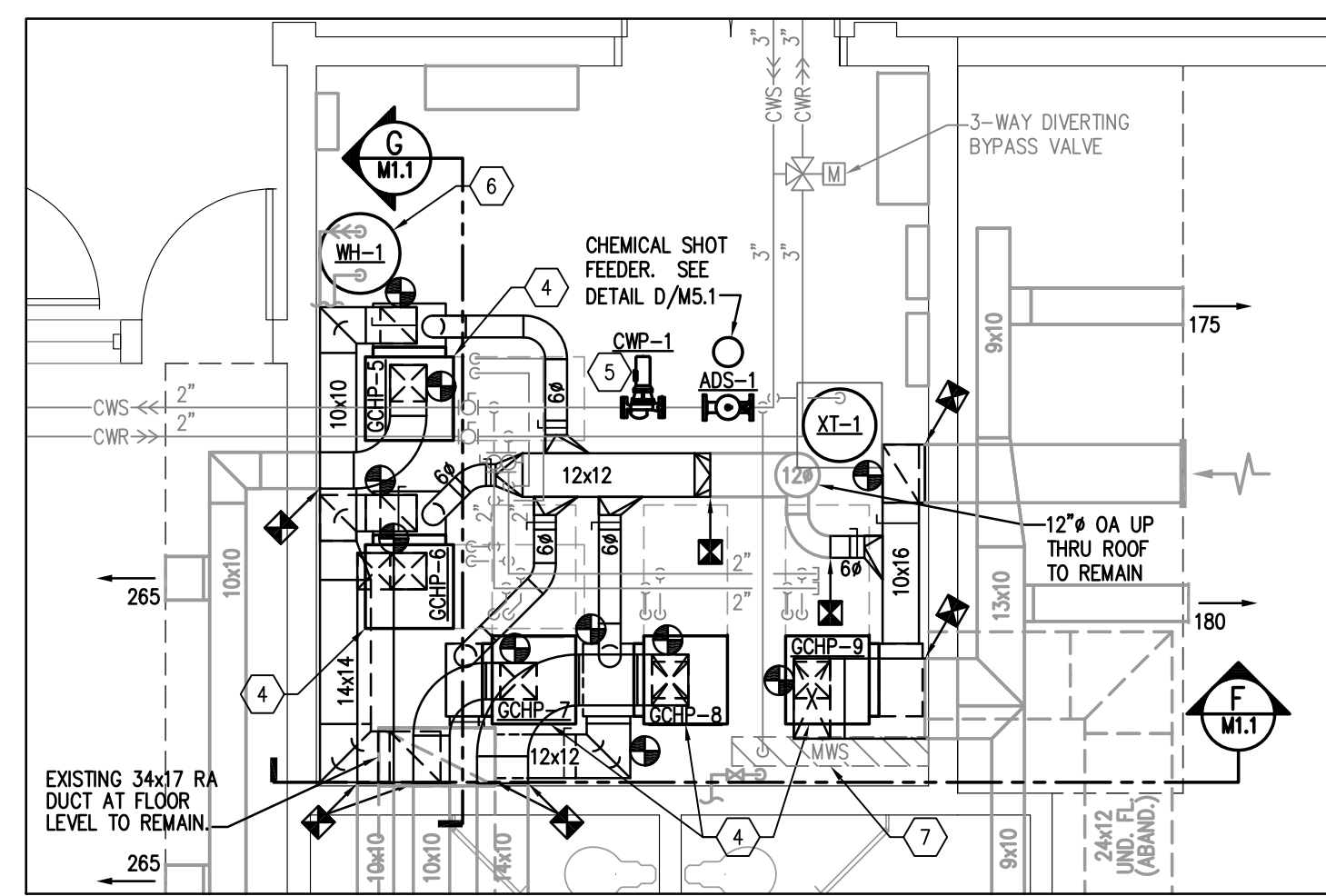
PAUL RUSSELL ROAD



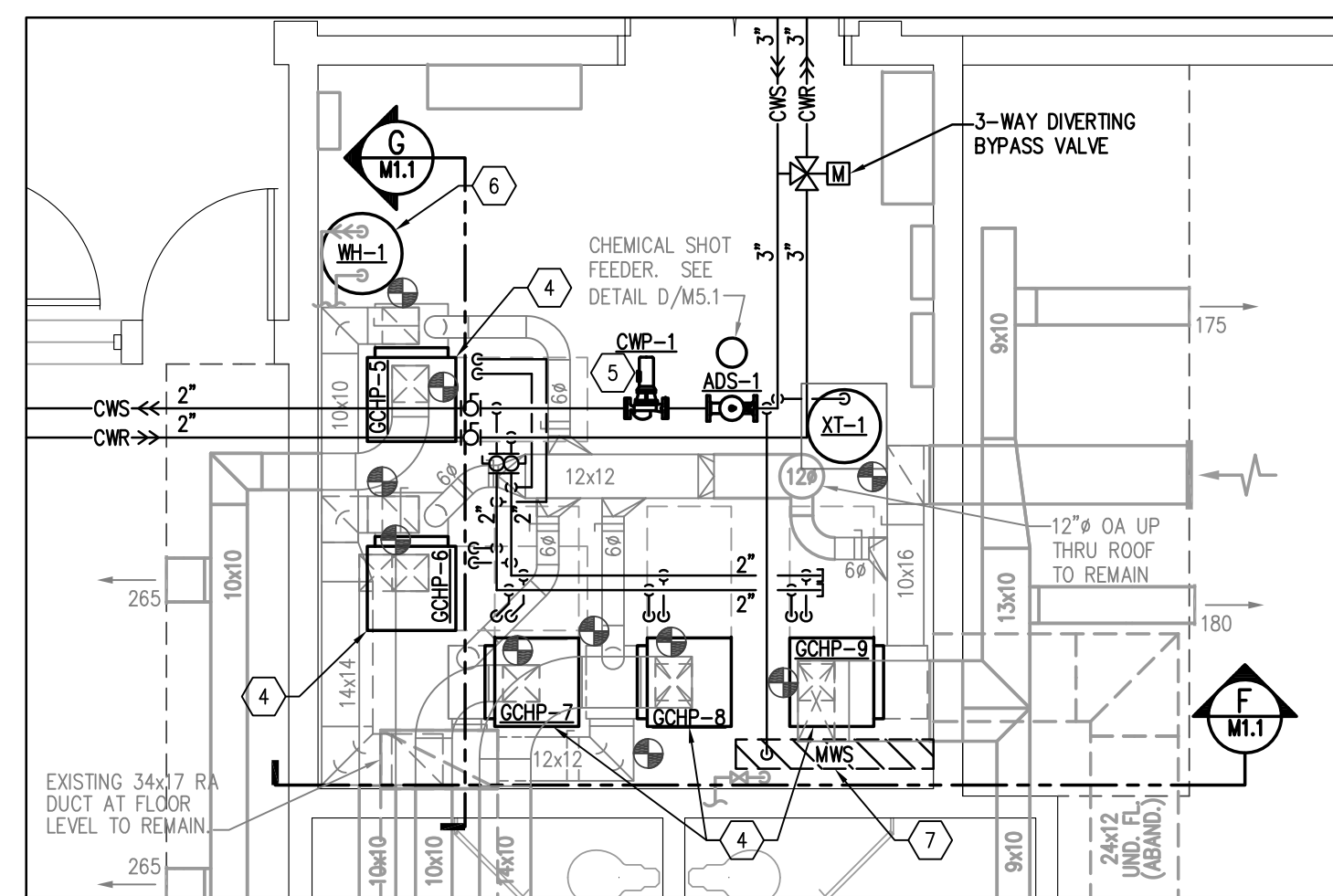
**1 SITE PLAN - MECHANICAL**  
 M1.0 1"-20'-0"

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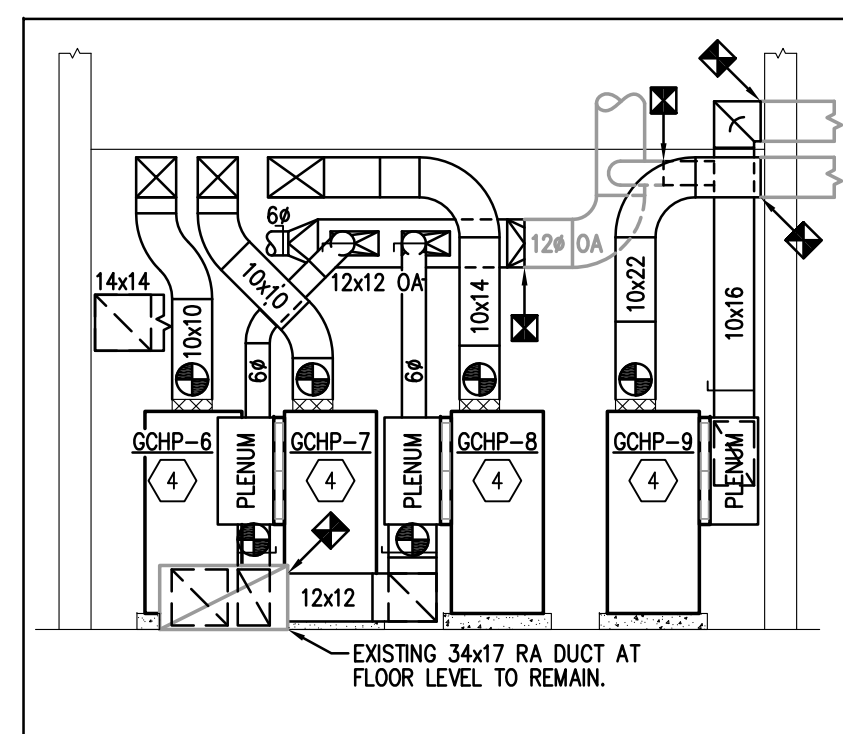




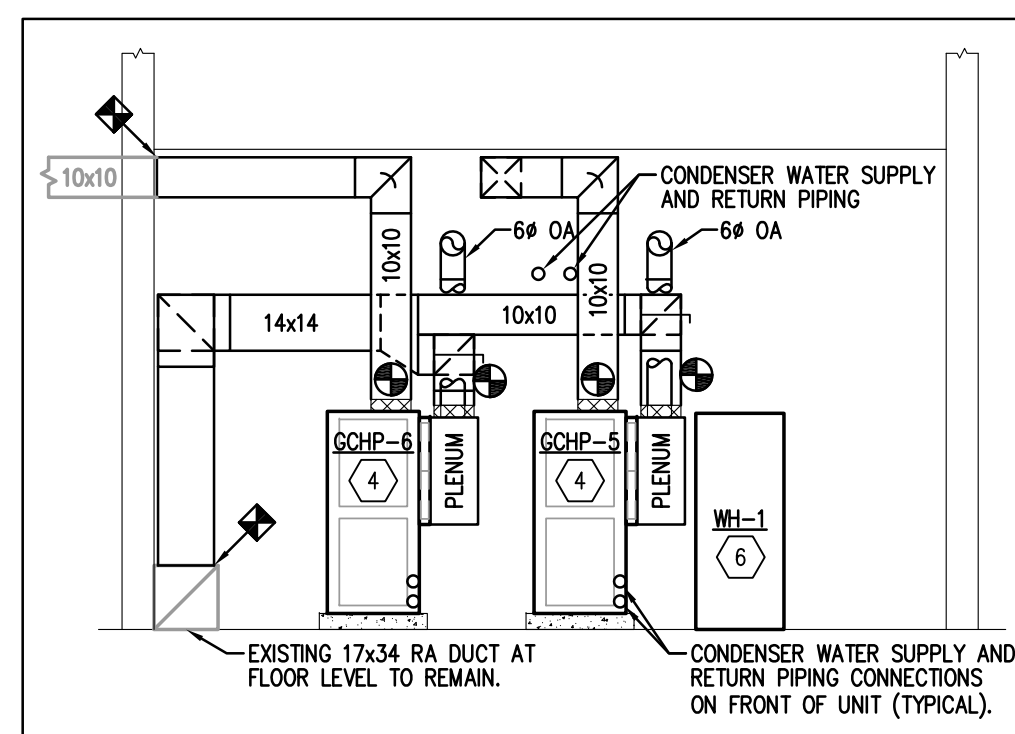
**D ENLARGED PLAN - DUCT**



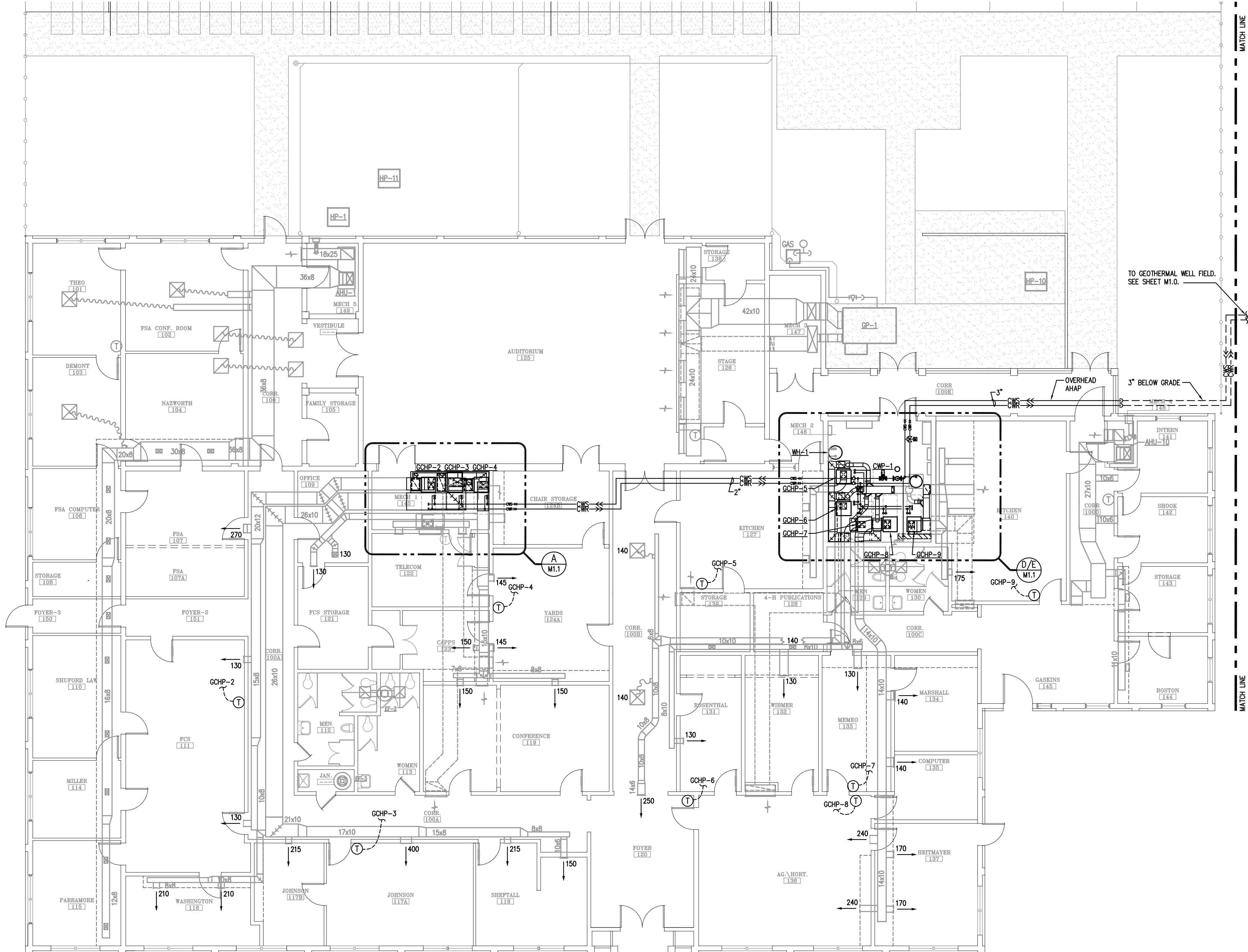
**E ENLARGED PLAN - PIPING**  
 M1.1 1/4"=1'-0"



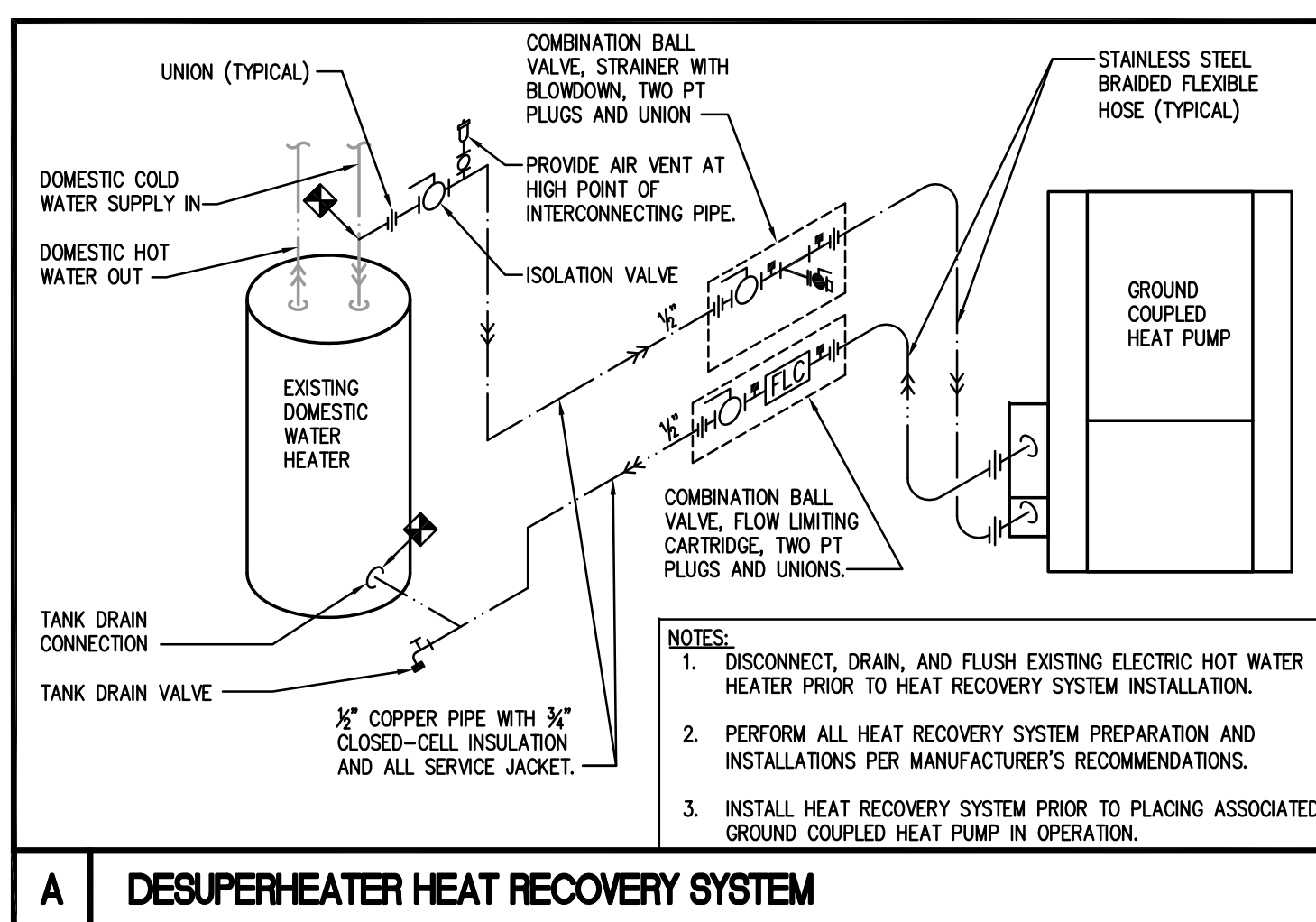
**F SECTION**  
 M1.1 1/4"=1'-0"



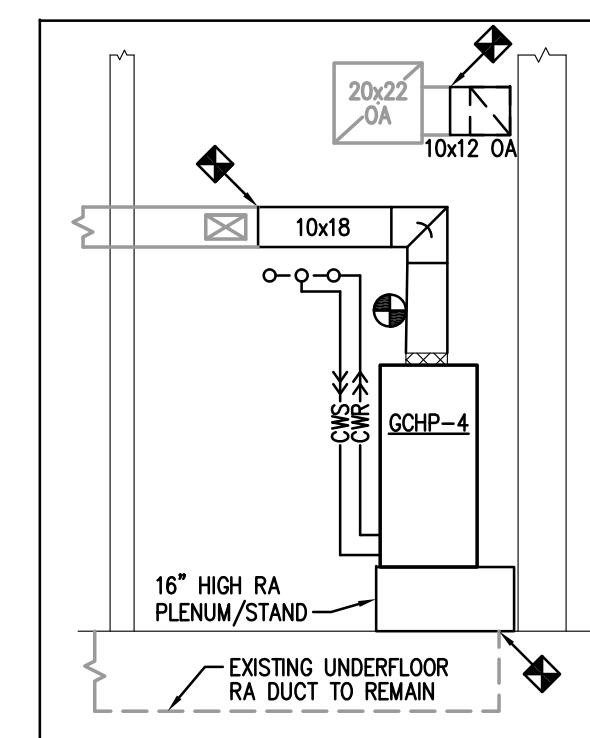
**M1.1 SECTION**  
 M1.1 1/4"=1'-0"



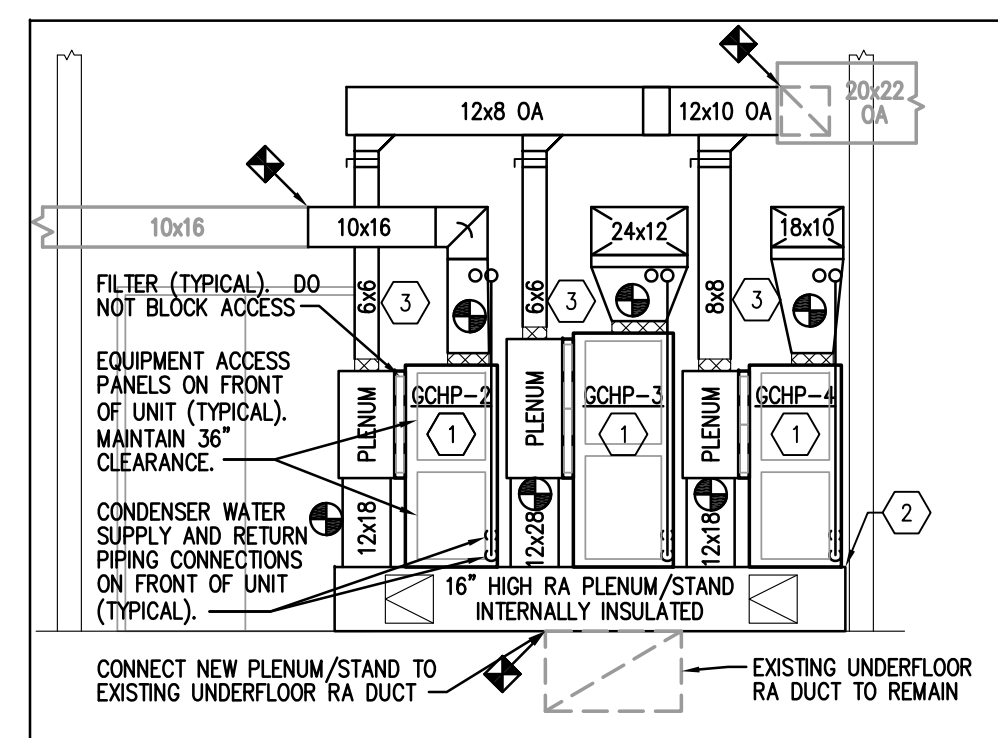
**1 FLOOR PLAN - HVAC**  
 M1.1 1/8"=1'-0"



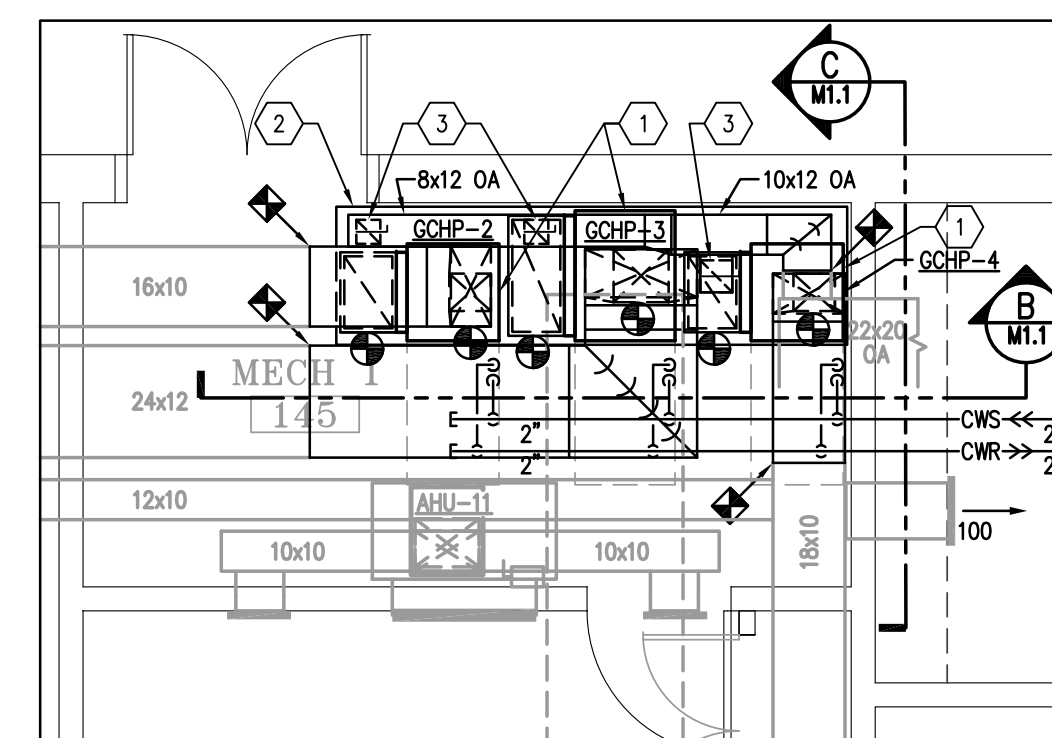
**A DESUPERHEATER HEAT RECOVERY SYSTEM**



**C SECTION**  
 M1.1 1/4"=1'-0"



**B SECTION**  
 M1.1 1/4"=1'-0"



**A ENLARGED PLAN**  
 M1.1 1/4"=1'-0"

- GENERAL HVAC NOTES**
- EXISTING DUCTWORK SHOWN ON FLOOR PLANS IS BASED ON PREVIOUS BUILDING CONSTRUCTION DOCUMENTS AND IS PROVIDED FOR REFERENCE USE ONLY. FIELD VERIFY EXACT LOCATIONS, SIZES, AND CONDITIONS OF EXISTING DUCTWORK.
- RENOVATION KEY NOTES**
- PROVIDE NEW GROUND-COUPLED HEAT PUMP INSTALLED ON TOP OF NEW RETURN PLENUM STAND. CONNECT TO EXISTING SUPPLY AIR DUCT. RECONNECT TO EXISTING CONDENSATE PUMP AND PIPING. SEE DETAIL E/M5.1.
  - PROVIDE NEW RETURN AIR PLENUM AND SUPPORT STAND FOR UNITS. CONNECT TO EXISTING UNDER-FLOOR RETURN AIR DUCT.
  - CONNECT NEW OA DUCT TO RA PLENUM/STAND AT EACH GROUND COUPLED HEAT PUMP. PROVIDE TAKEOFF FITTING WITH BALANCING DAMPER AND FLEX DUCT CONNECTION.
  - PROVIDE NEW GROUND-COUPLED HEAT PUMP INSTALLED ON FLOOR. CONNECT TO EXISTING DUCTS AS INDICATED. RECONNECT TO EXISTING CONDENSATE PUMP AND PIPING. SEE DETAIL E/M5.1.
  - SUSPEND NEW CONDENSATE WATER PUMP OVERHEAD AHAP FROM EXISTING STRUCTURE. SEE DETAIL A/M1.1.
  - EXISTING WATER HEATER. CONNECT TO DESUPERHEATER HEAT RECOVERY SYSTEM. SEE DETAIL A/M1.1.
  - NEW MAKE-UP WATER STATION FOR CONDENSATE WATER. EXTEND AND CONNECT TO EXISTING DOMESTIC WATER PIPING. SEE DETAIL C/M5.1.

- Revisions
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