

CENTRAL ELEMENTARY GEOTHERMAL

LINCOLN ELEMENTARY SCHOOL DISTRICT #27

304 8th ST., LINCOLN, IL 62656

BID DOCUMENTS
10/25/2022

ARCHITECT

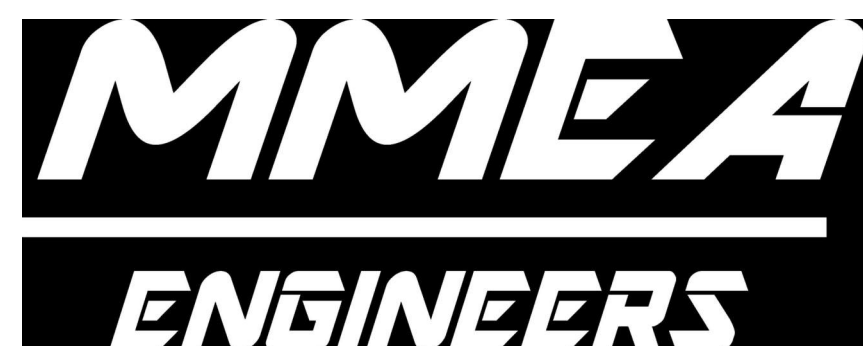


Middleton Associates, Inc.
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Normal, IL 61761
T: 309.452.1271



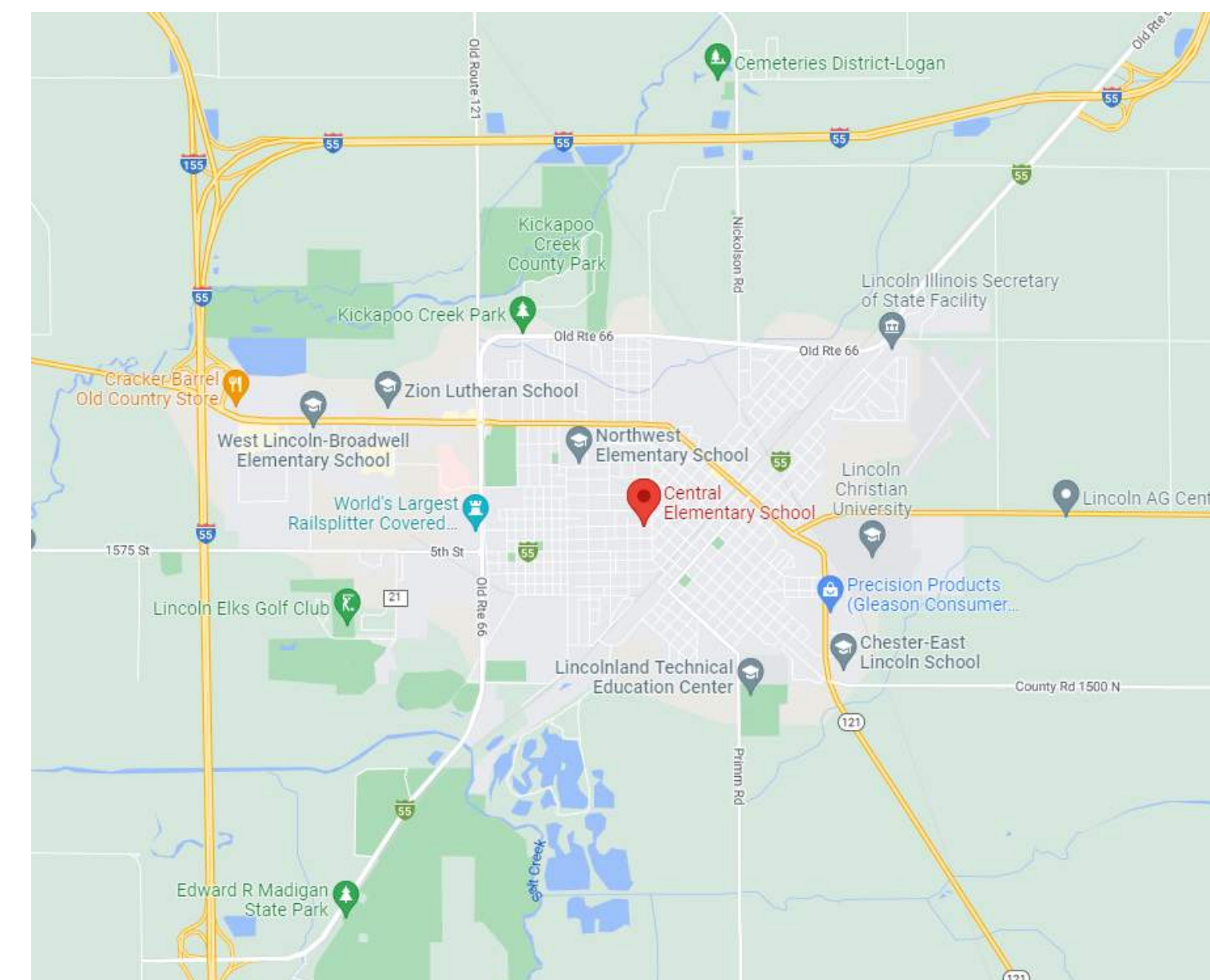
Design Mavens Architecture PLLC
1702 W. College Ave
Normal, IL 61761
T: 309.304.3048

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MMEA Engineers
203 Eastland Dr.
Jefferson City, mO 65101
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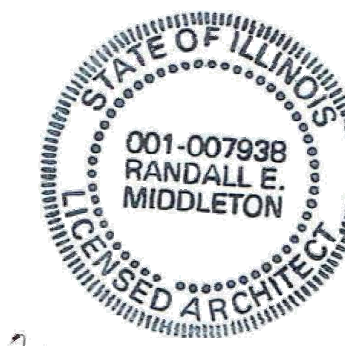
LOCATION MAP



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I HEREBY CERTIFY THAT THE PLANS AND SPECIFICATIONS DATED OCTOBER 25, 2022 FOR CENTRAL ELEMENTARY SCHOOL, 304 8TH ST. LINCOLN, IL 62656 FOR LINCOLN ELEMENTARY SCHOOL DISTRICT NO. 27, UNIT DISTRICT OFFICE, WERE PREPARED WITH MY SUPERVISION USING THE INTERNATIONAL BUILDING CODE & ILLINOIS ADMINISTRATIVE CODE 185 AND TO THE BEST OF MY KNOWLEDGE, COMPLY WITH THE HEALTH/LIFE SAFETY CODE AS PREPARED AND PROVIDED BY THE STATE OF ILLINOIS BOARD OF EDUCATION. I HAVE PREPARED, OR CAUSED TO BE PREPARED UNDER MY DIRECT SUPERVISION, THE ATTACHED PLANS AND SPECIFICATIONS AND STATE THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND TO THE EXTENT OF MY CONTRACTUAL OBLIGATION, THEY COMPLY WITH THE ENVIRONMENTAL BARRIERS ACT (ILL. REV. STAT. 1985, CH. III-1/2 PARS. 3711 ET. SEQ. AS AMENDED) AND THE ILLINOIS ACCESSIBILITY CODE, 71 ILLINOIS ADMINISTRATIVE CODE 400.



Expiration Date
11/30/22

Randall E. Middleton

PROJECT NOTE: ALL NEW MATERIALS EMPLOYED IN THE WORK SHALL BE ASBESTOS FREE AND PCB FREE. CONTRACTOR SHALL SUBMIT CERTIFICATION OF SUSPECT ITEMS UPON REQUEST, AND FOR THE OVERALL PROJECT AT THE CONCLUSION OF THE WORK.



COVER SHEET
CENTRAL ELEMENTARY GEOTHERMAL
LINCOLN ELEMENTARY SCHOOL DISTRICT #27
304 8th ST., LINCOLN, IL 62656

REVISIONS		
#	DATE	DESCRIPTION

PROJECT # 25821422
ISSUED DATE 10/25/2022

SHEET
G100

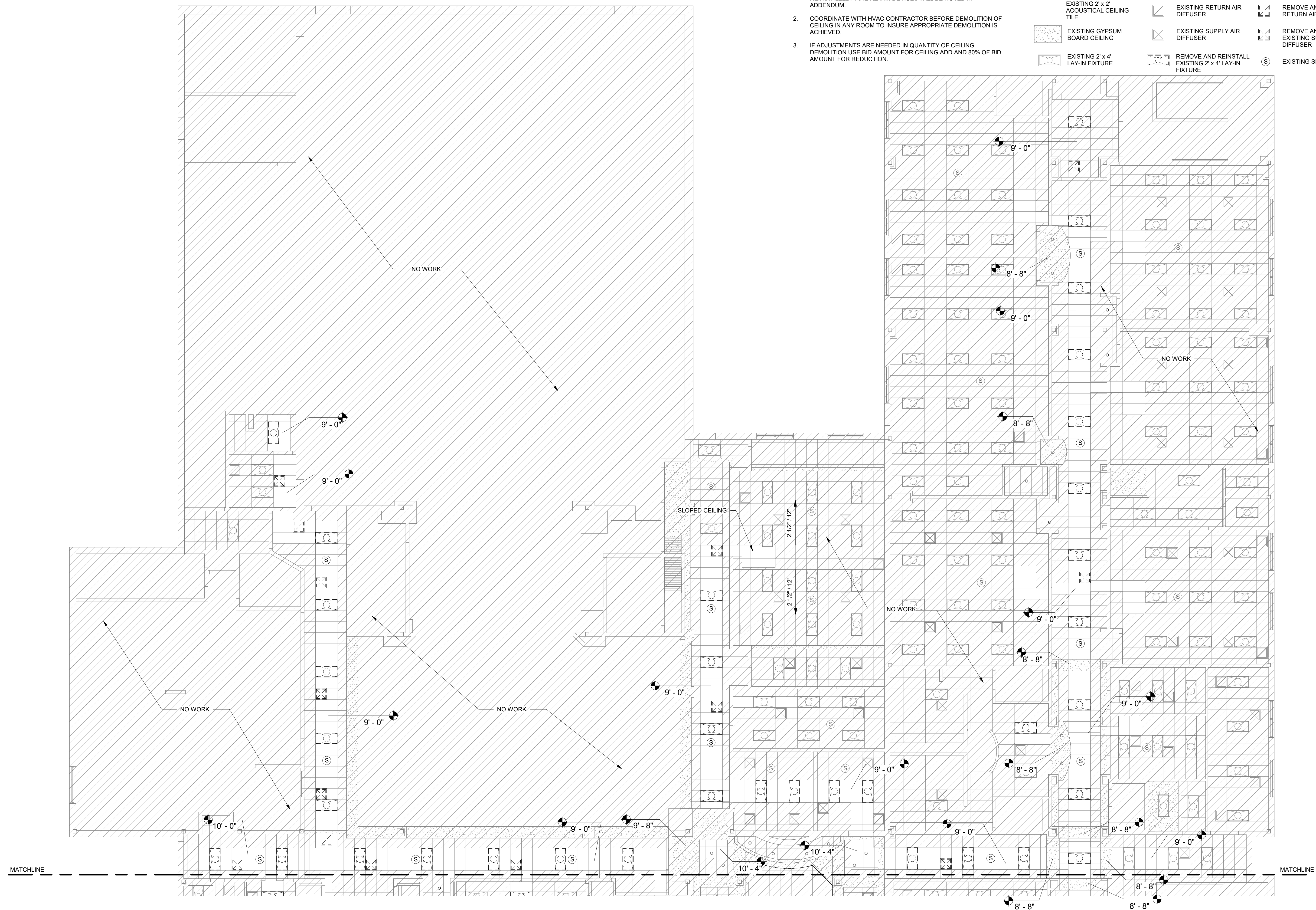
BID DOCUMENTS

GENERAL NOTES

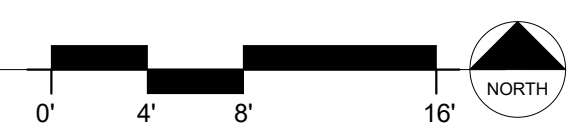
1. ALL TRADES: SEE SPECIFICATION SECTION 010100 SUMMARY OF WORK FOR QUANTITIES OF LIGHT FIXTURES, SPEAKERS, EMERGENCY LIGHTS, AND AIR DIFFUSERS TO BE REMOVED AND REINSTALLED. FIRE ALARM DEVICES WILL BE NOTED IN ADDENDUM.
2. COORDINATE WITH HVAC CONTRACTOR BEFORE DEMOLITION OF CEILING IN ANY ROOM TO INSURE APPROPRIATE DEMOLITION IS ACHIEVED.
3. IF ADJUSTMENTS ARE NEEDED IN QUANTITY OF CEILING DEMOLITION USE BID AMOUNT FOR CEILING ADD AND 80% OF BID AMOUNT FOR REDUCTION.

REFLECTED CEILING PLAN LEGEND

- EXISTING 2' x 4' ACOUSTICAL CEILING TILE
- EXISTING 2' x 2' ACOUSTICAL CEILING TILE
- EXISTING GYPSUM BOARD CEILING
- EXISTING 2' x 4' LAY-IN FIXTURE
- EXISTING RECESSED CAN LIGHT
- EXISTING RETURN AIR DIFFUSER
- EXISTING SUPPLY AIR DIFFUSER
- REMOVE AND REINSTALL EXISTING 2' x 4' LAY-IN FIXTURE
- 8'-0" EXISTING CEILING HEIGHT ABOVE FLOOR
- REMOVE AND REINSTALL RETURN AIR DIFFUSER
- REMOVE AND REINSTALL EXISTING SUPPLY AIR DIFFUSER
- EXISTING SMOKE DETECTOR



1 FIRST FLOOR REFLECTED CEILING PLAN - NORTH
1/8" = 1'-0"



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 DESIGN FIRM REG# 184-008472

CIVIL ENGINEER
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FIRST FLOOR REFLECTED CEILING PLAN - NORTH
 CENTRAL ELEMENTARY GEOTHERMAL
 LINCOLN ELEMENTARY SCHOOL DISTRICT #27
 304 8th ST., LINCOLN, IL 62656

REVISIONS		
#	DATE	DESCRIPTION

PROJECT # 25821422
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 SHEET
A801
 OF SHEETS

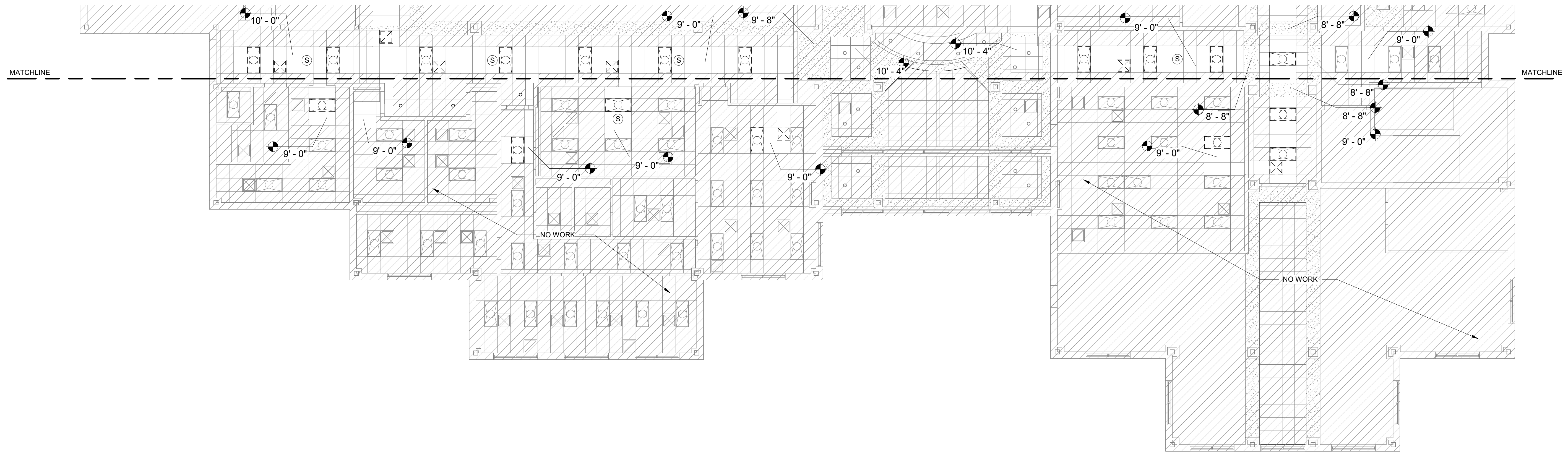
BID DOCUMENTS

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- EXISTING SMOKE DETECTOR



1 FIRST FLOOR REFLECTED CEILING PLAN - SOUTH
1/8" = 1'-0"



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DESIGN FIRM REG# 184-008472

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FIRST FLOOR REFL'D CEILING PLAN - SOUTH

CENTRAL ELEMENTARY GEOTHERMAL

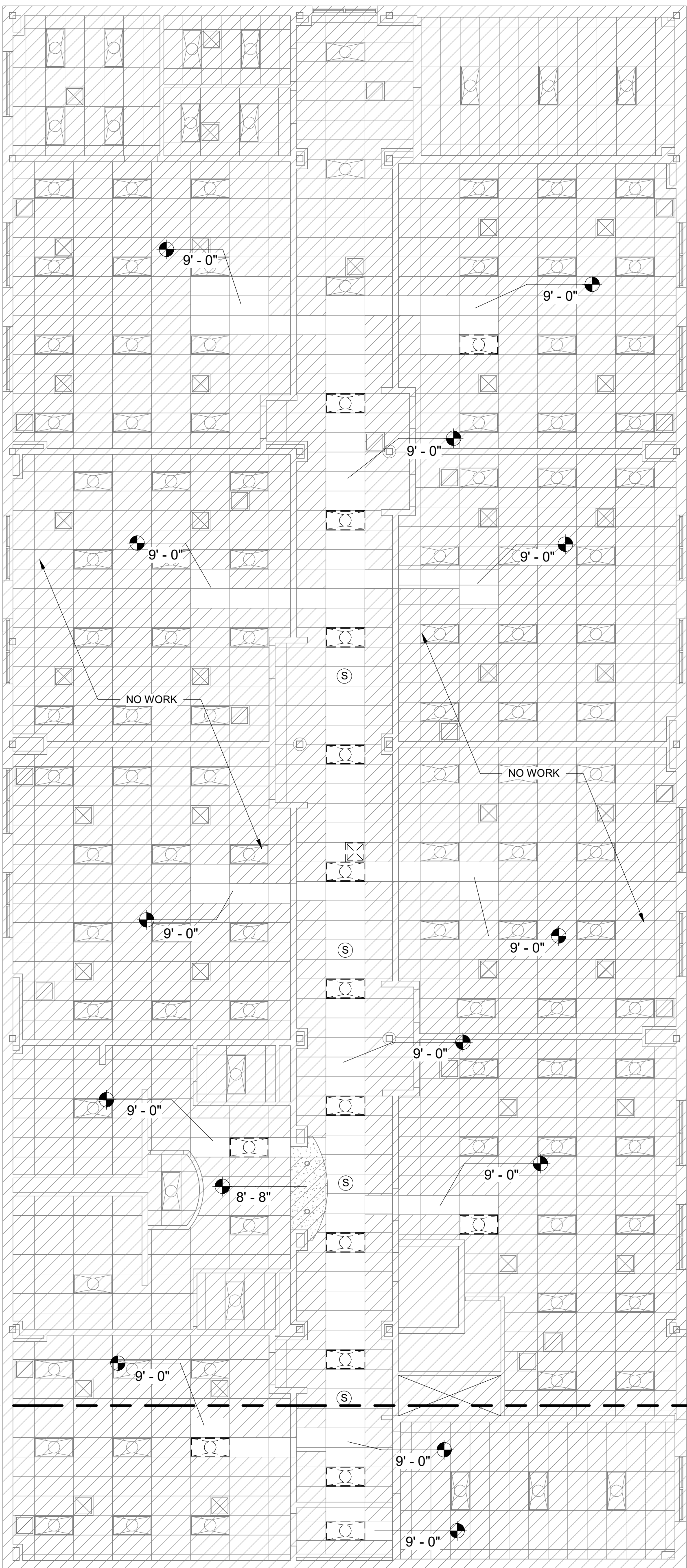
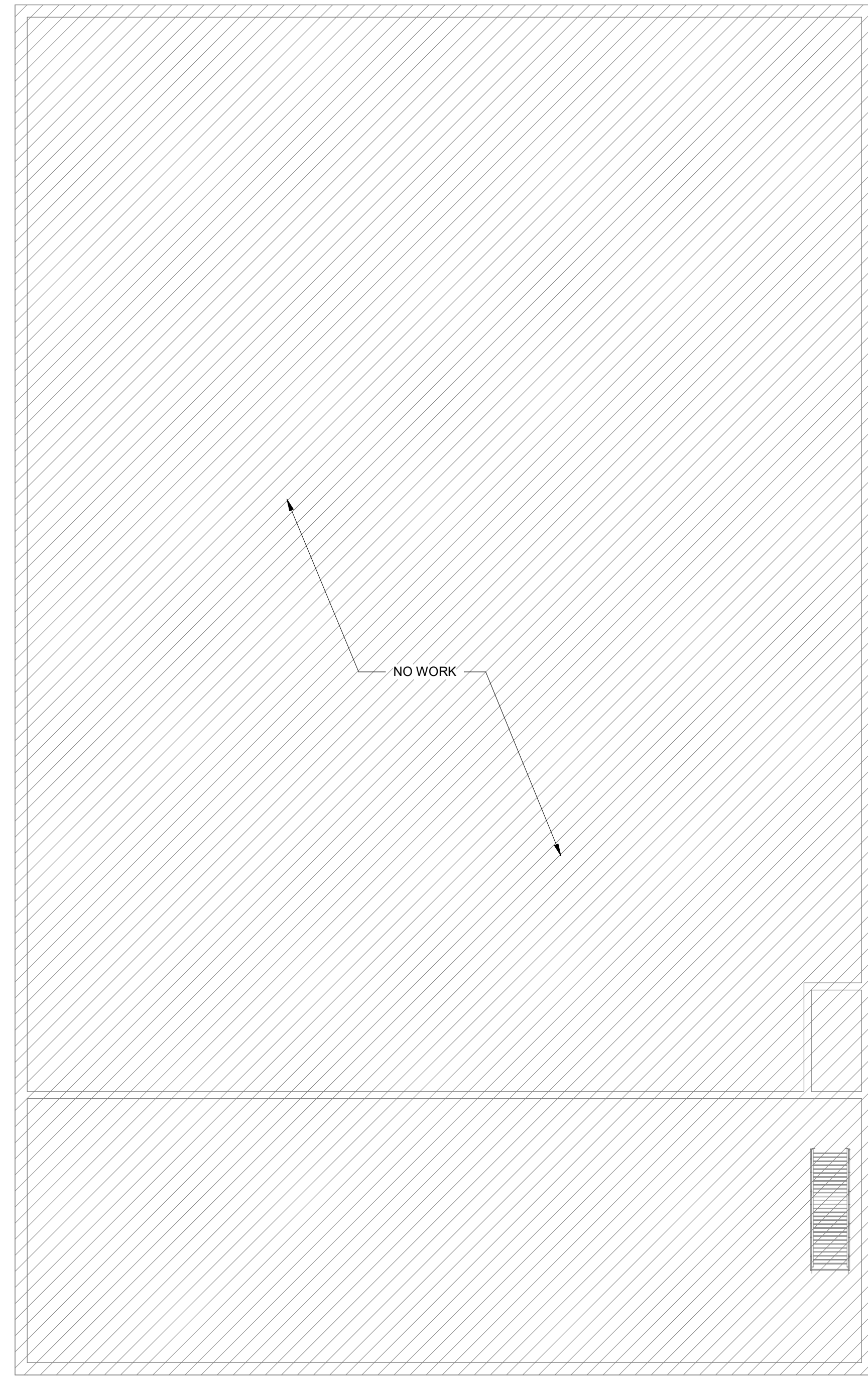
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304 8th ST., LINCOLN, IL 62656

REVISIONS		
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PROJECT #	25821422
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SHEET	A802
OF SHEETS	

BID DOCUMENTS



REFLECTED CEILING PLAN LEGEND

- EXISTING 2' x 4' ACOUSTICAL CEILING TILE
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- EXISTING GYPSUM BOARD CEILING
- EXISTING 2' x 4' LAY-IN FIXTURE
- EXISTING RECESSED CAN LIGHT
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- REMOVE AND REINSTALL EXISTING SUPPLY AIR DIFFUSER
- EXISTING SMOKE DETECTOR

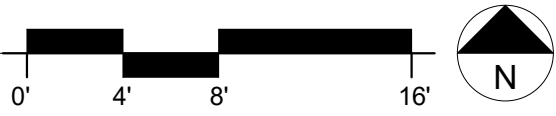
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MATCHLINE

MATCHLINE

1 SECOND FLOOR REFLECTED CEILING PLAN
1/8" = 1'-0"



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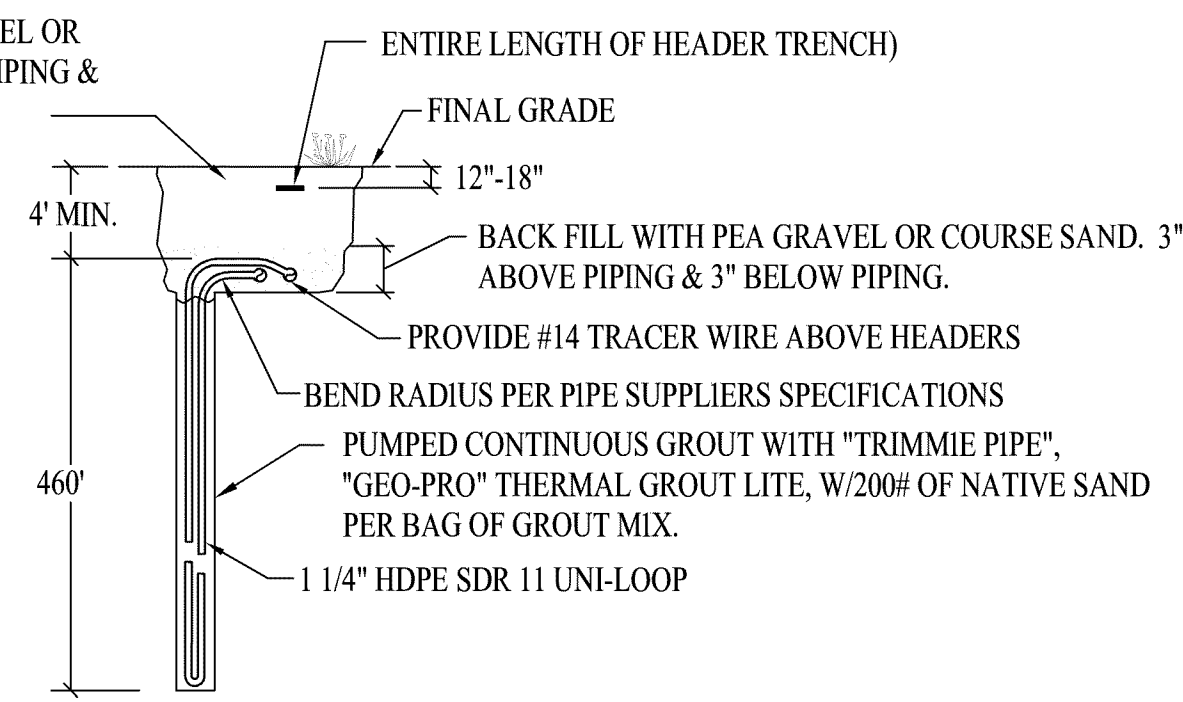
SECOND FLOOR REFLECTED CEILING PLAN
CENTRAL ELEMENTARY GEOTHERMAL
LINCOLN ELEMENTARY SCHOOL DISTRICT #27
304 8th ST., LINCOLN, IL 62656

REVISIONS		
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PROJECT #	25821422
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SHEET	A803
OF	SHEETS

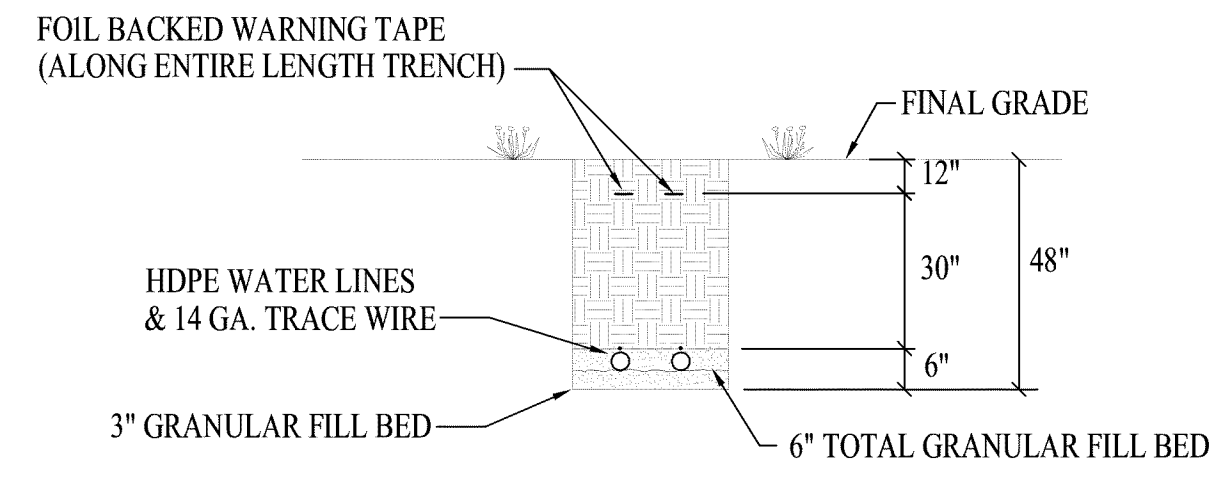
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BACK FILL WITH PEA GRAVEL OR COURSE SAND. 3" ABOVE PIPING & 3" BELOW PIPING.



02 VERTICAL U-BEND WELL DETAIL

SCALE: NONE

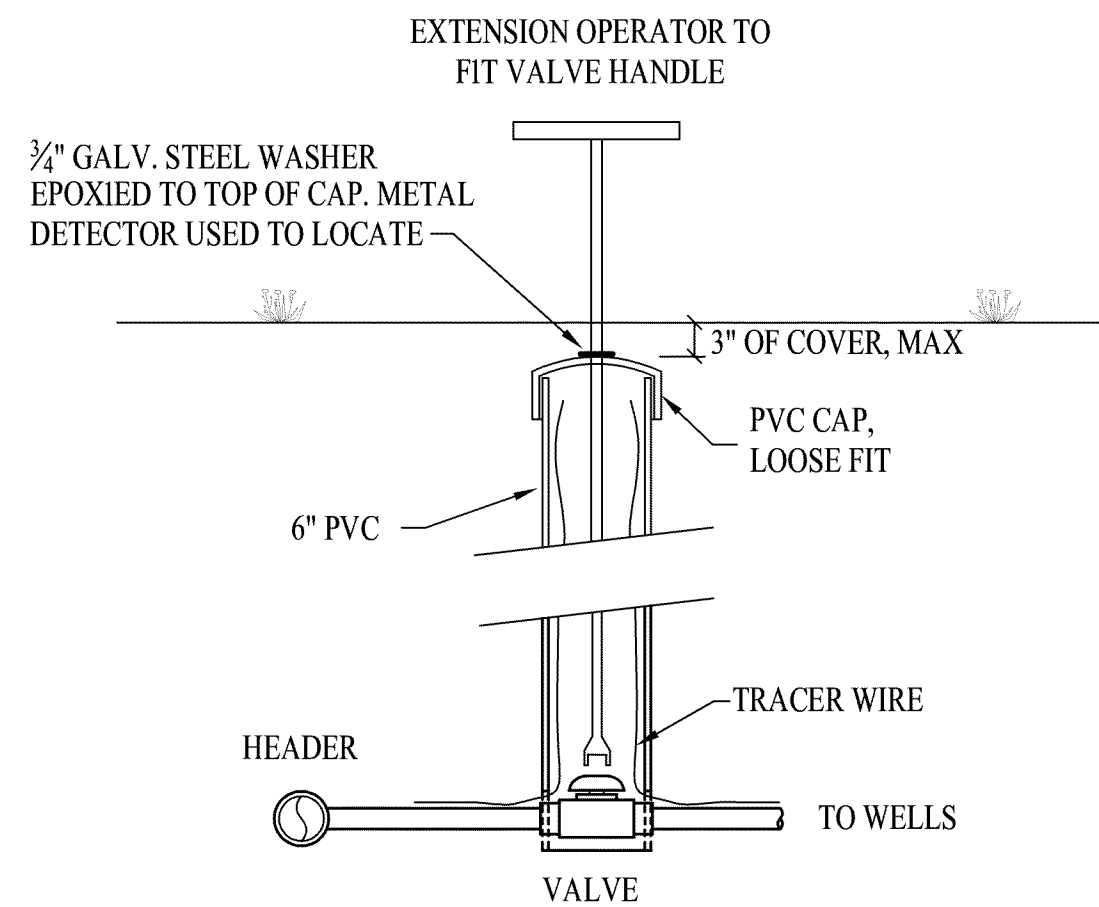


NOTE:

ALL NON-METAL LINES TO BE TRACED WITH 14 GA. WIRE (TYPICAL). TERMINATE WIRE AT ACCESSIBLE VALVE PIT.

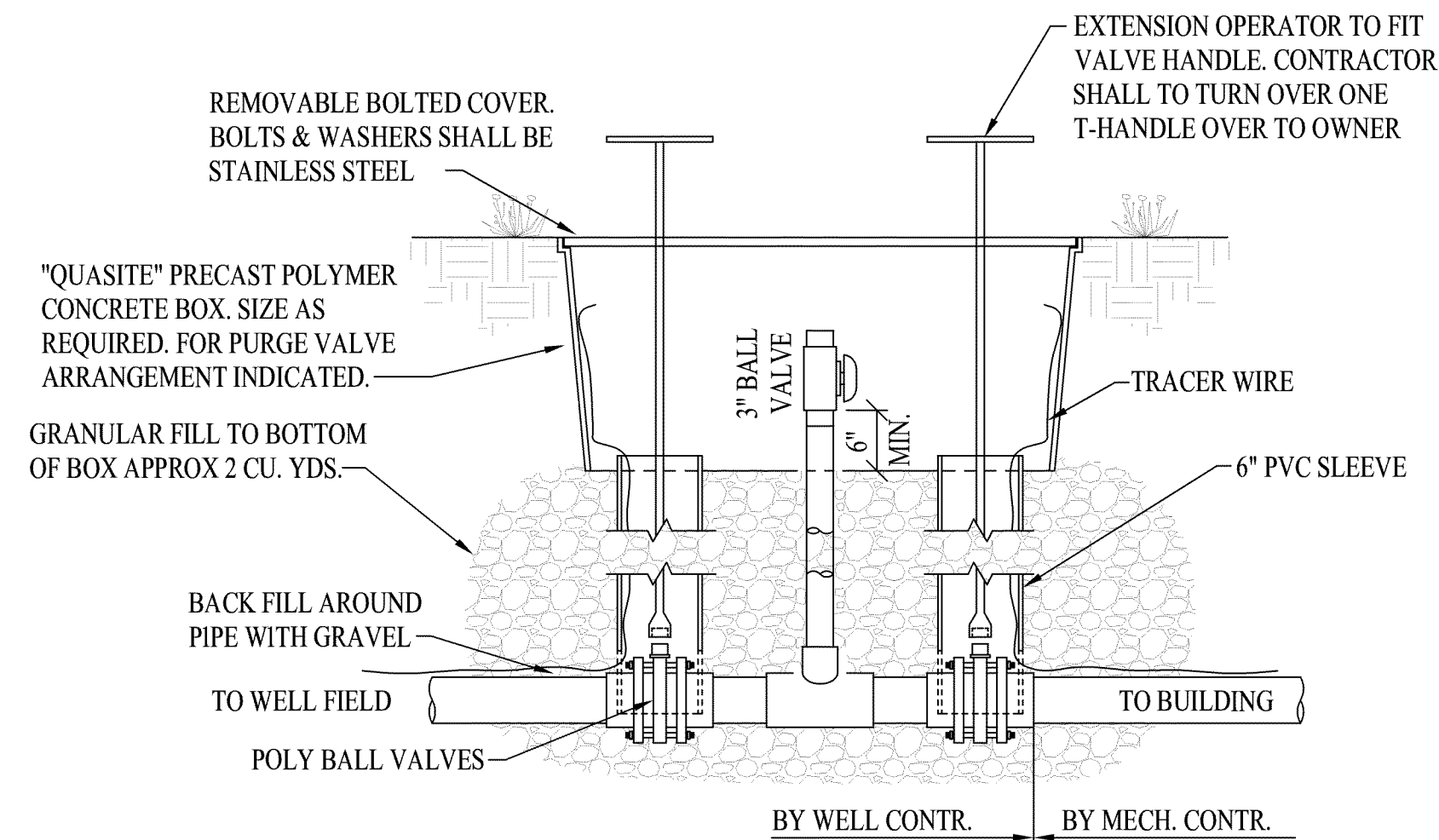
03 SECTION DETAIL

SCALE: NONE



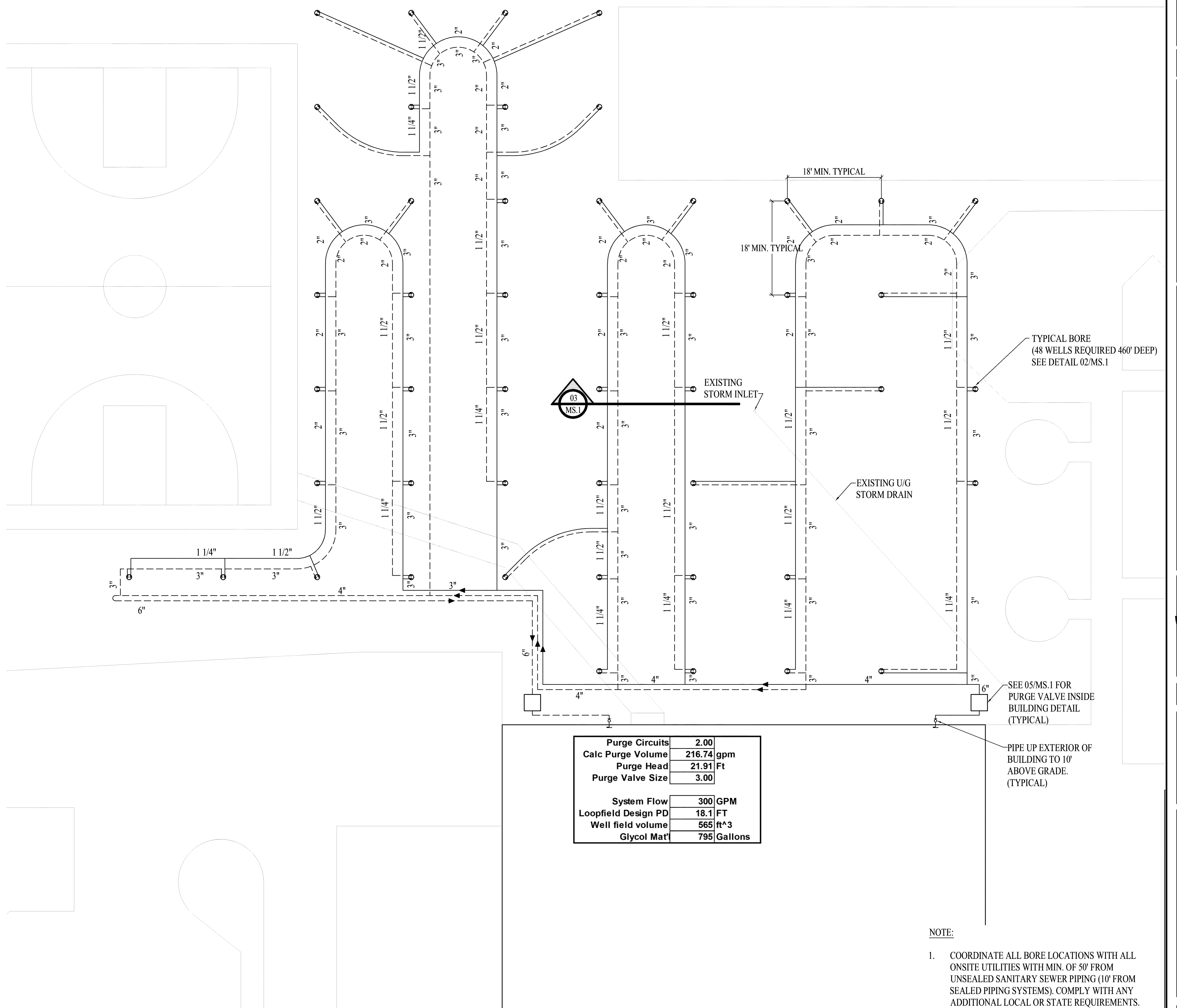
04 WELL FIELD ISOLATION VALVE DETAIL

SCALE: NONE



05 PURGE VALVE PIT DETAIL

SCALE: NONE

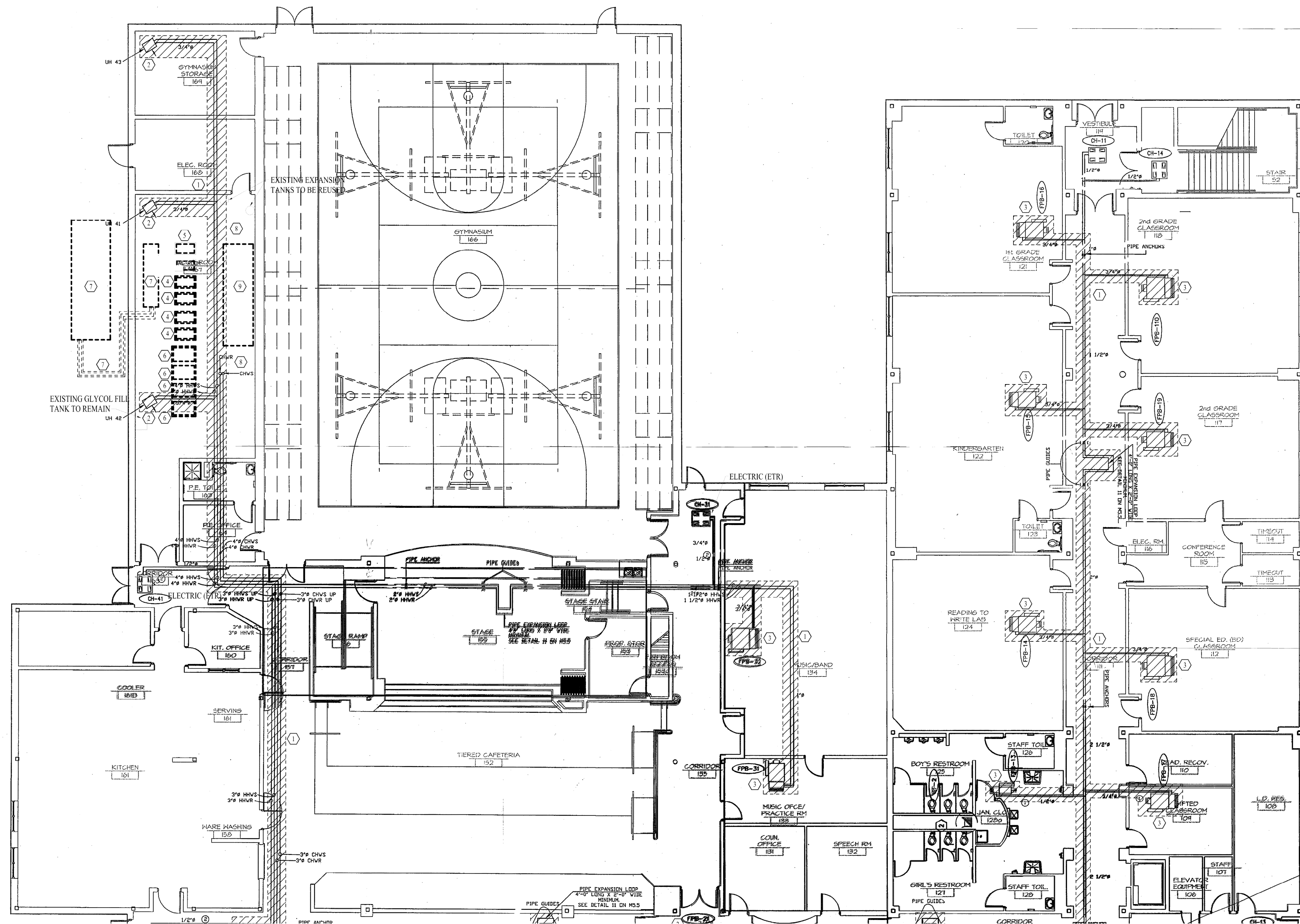


NOTE:

- COORDINATE ALL BORE LOCATIONS WITH ALL ONSITE UTILITIES WITH MIN. OF 50' FROM UNSEALED SANITARY SEWER PIPING (10' FROM SEALED PIPING SYSTEMS). COMPLY WITH ANY ADDITIONAL LOCAL OR STATE REQUIREMENTS.

NO.	DATE	REVISIONS	REMARKS

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GENERAL NOTES:

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2. UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN. NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.
3. MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

NOTES:

- 1 DEMO HW/CW PIPING. HANGERS TO REMAIN FOR REUSE @ 3' MAINS. (TYPICAL).
- 2 REMOVE EXISTING UNIT HEATER INCLUDING ALL HW PIPING, CONTROLS, POWER, AND HANGERS.
- 3 REMOVE EXISTING VAV BOX INCLUDING EXISTING HW PIPING, CONTROLS, POWER, AND PRIMARY AIR DUCT BACK TO MAIN. EXISTING SUPPORTS, SECONDARY AIR DUCTS AND DIFFUSERS TO REMAIN FOR REUSE.
- 4 REMOVE EXISTING PUMP INCLUDING ALL PIPING, CONTROLS, AND POWER.
- 5 REMOVE EXISTING PUMP INCLUDING ALL PIPING AND CONTROLS. EXISTING EQUIPMENT PAN AND POWER TO REMAIN FOR REUSE.
- 6 REMOVE EXISTING BOILER INCLUDING ALL PIPING, CONTROLS, AND POWER.
- 7 REMOVE EXISTING AIR COOLED CHILLER INCLUDING REMOTE EVAPORATOR, PIPING, CONTROLS, AND POWER.
- 8 REMOVE THE SYSTEMS FOR HEATING HOT WATER AND CHILLED WATER FROM THE MECHANICAL ROOM INCLUDING PIPING, HYDRONIC ACCESSORIES, CONTROLS, SUPPORTS, AND POWER EXCEPT FOR ITEMS NOTED TO REMAIN FOR REUSE.
- 9 REMOVE EXISTING AHU INCLUDING HW PIPING, CW PIPING, AND CONTROLS. EXISTING DUCTWORK AND POWER TO REMAIN FOR REUSE.

CHWS
CHWR
HHWS
HHWR
UP
PL

01 FIRST FLOOR NORTH
MECHANICAL/ELECTRICAL DEMOLITION PLAN
SCALE: 1"=18"

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LINCOLN ELEMENTARY SCHOOL DISTRICT #27
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WAYNE ANTHONY STROPE
062-1838 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
Expires 11/30/2023

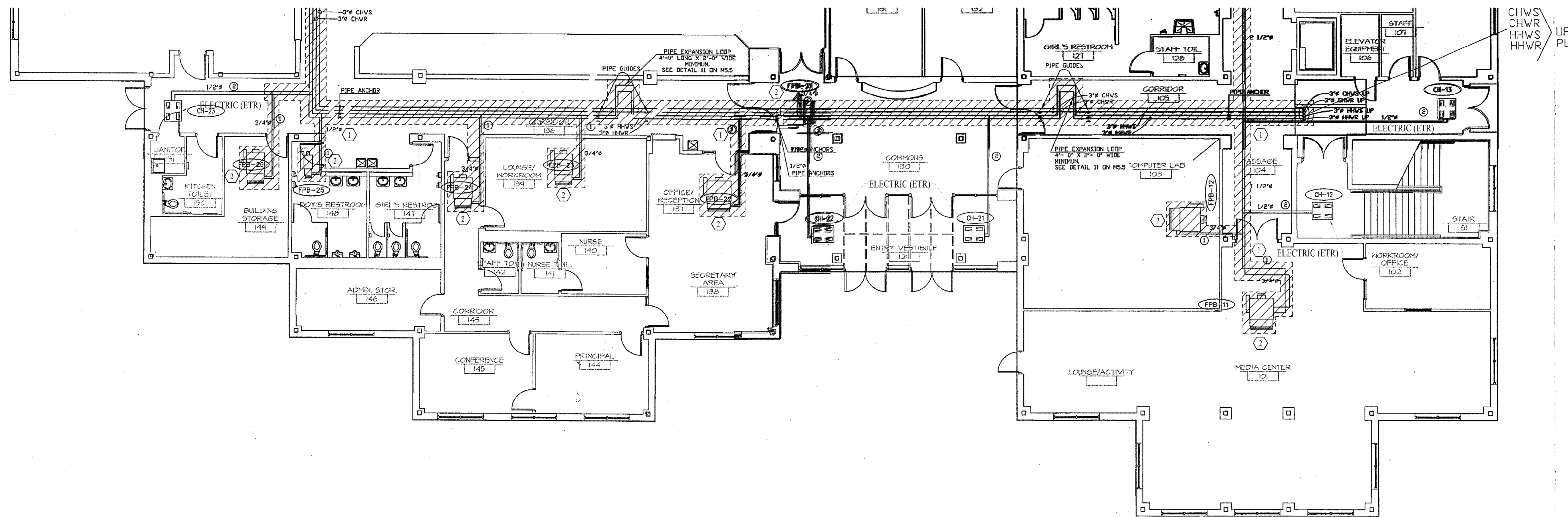
WAYNE A. STROPE
062.068121

NO.	DATE	REVISIONS	REMARKS

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SHEET
ME1

BID DOCUMENTS



01 FIRST FLOOR SOUTH
MECHANICAL/ELECTRICAL DEMOLITION PLAN
SCALE: 1"=18"

GENERAL NOTES:

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- UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN. NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.
- MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

NOTES:

- DEMO HW/CH PIPING. HANGERS TO REMAIN FOR REUSE @ 3" MAINS. (TYPICAL).
- REMOVE EXISTING VAV BOX INCLUDING EXISTING HW PIPING, CONTROLS, POWER, AND PRIMARY AIR DUCT BACK TO MAIN. EXISTING SUPPORTS, SECONDARY AIR DUCTS AND DIFFUSERS TO REMAIN FOR REUSE.

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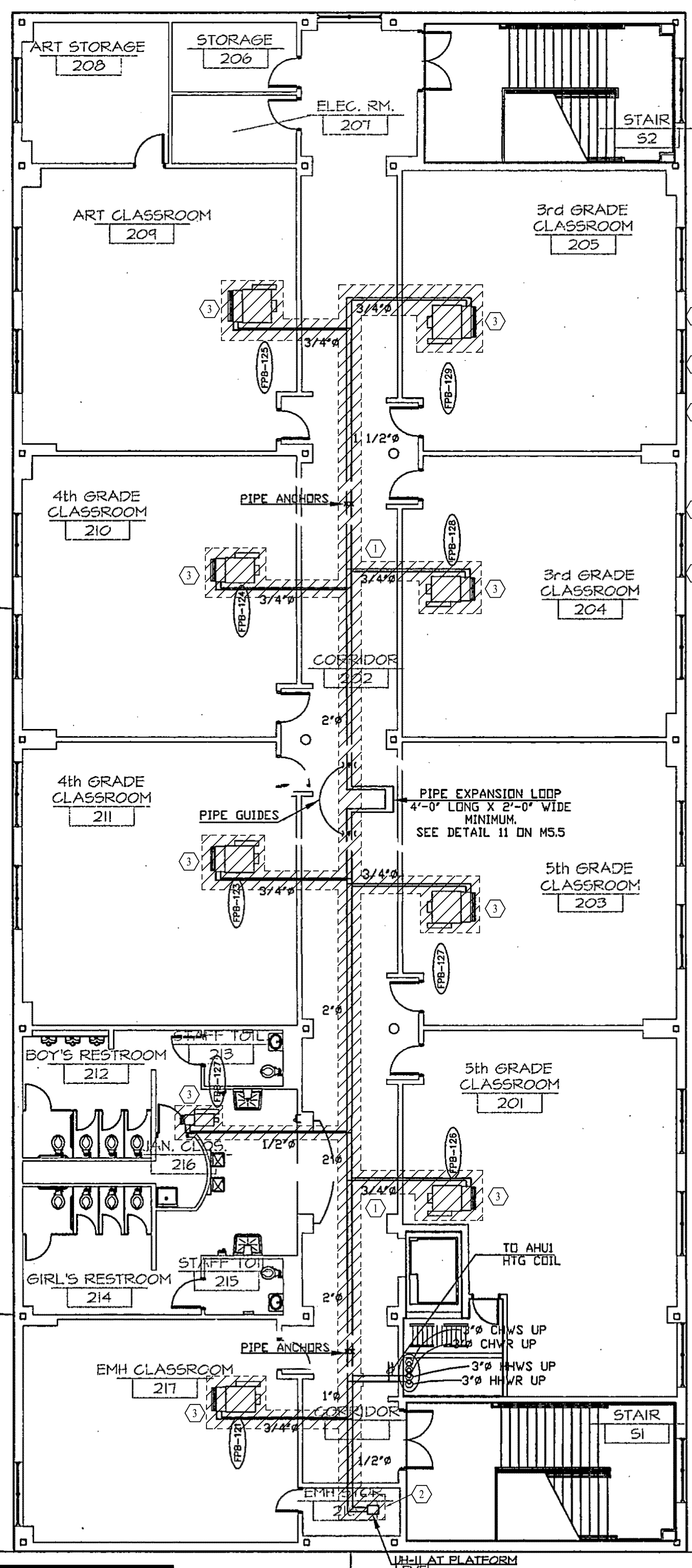
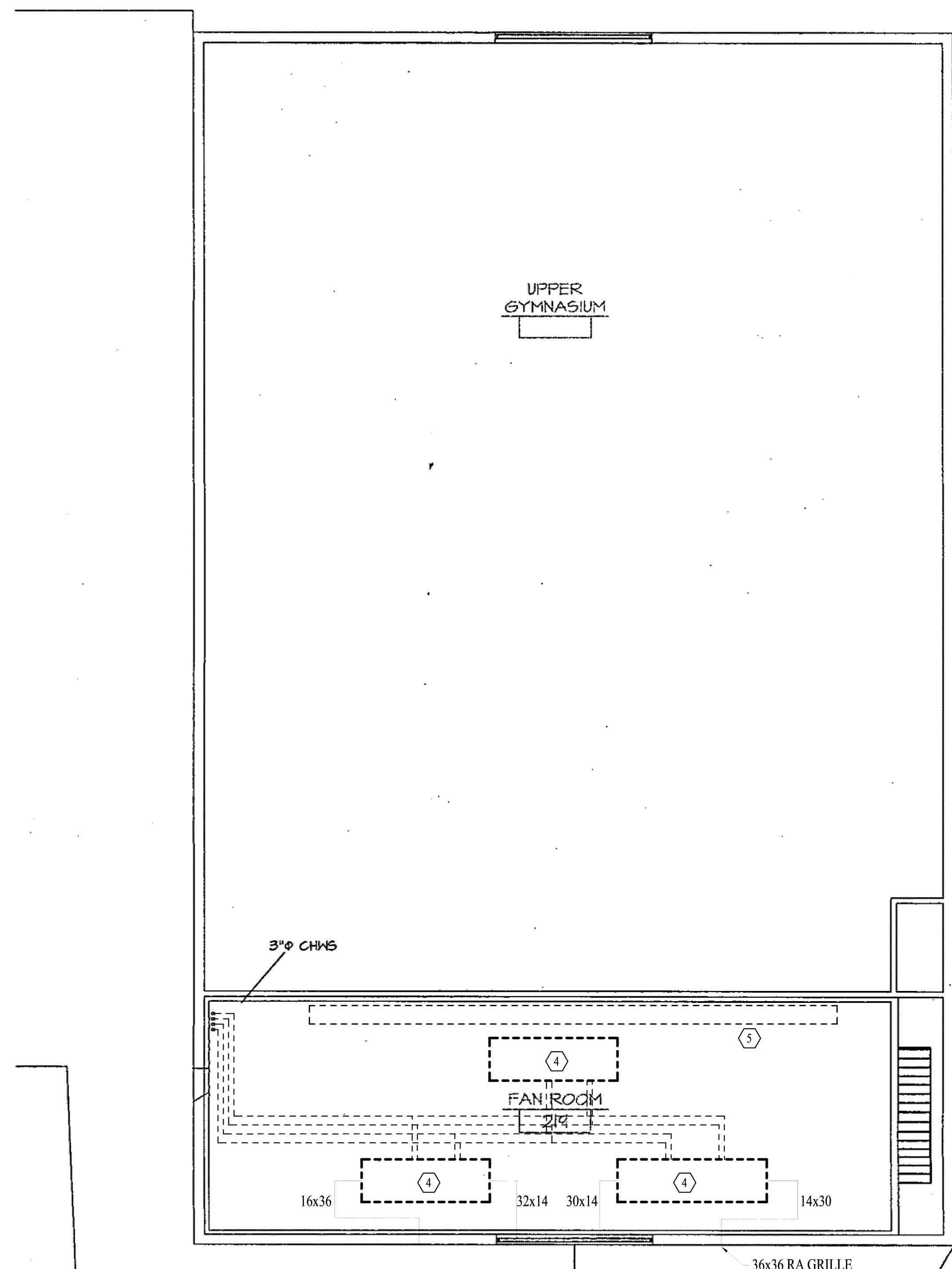
WAYNE ANTHONY STROPE
062-1888 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
Expires 11/30/2023

WAYNE A. STROPE
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SHEET ME2



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- REMOVE EXISTING UNIT HEATER INCLUDING ALL HW PIPING, CONTROLS, POWER, AND HANGERS.
- REMOVE EXISTING VAV BOX INCLUDING EXISTING HW PIPING, CONTROLS, POWER, AND PRIMARY AIR DUCT BACK TO MAIN. EXISTING SUPPORTS, SECONDARY AIR DUCTS AND DIFFUSERS TO REMAIN FOR REUSE.
- REMOVE EXISTING AHU INCLUDING HW PIPING, CW PIPING, AND CONTROLS. EXISTING DUCTWORK AND POWER TO REMAIN FOR REUSE.
- REMOVE AHU-5 SA DUCTWORK IN ROOM 219. LEAVE THE THREE 24"x24" RUNS INTO GYM FOR REUSE.

01 SECOND FLOOR HVAC DEMOLITION PLAN
SCALE: 1"=1/8"

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OF ILLINOIS
Expires 11/30/2023

WAYNE A. STROPE
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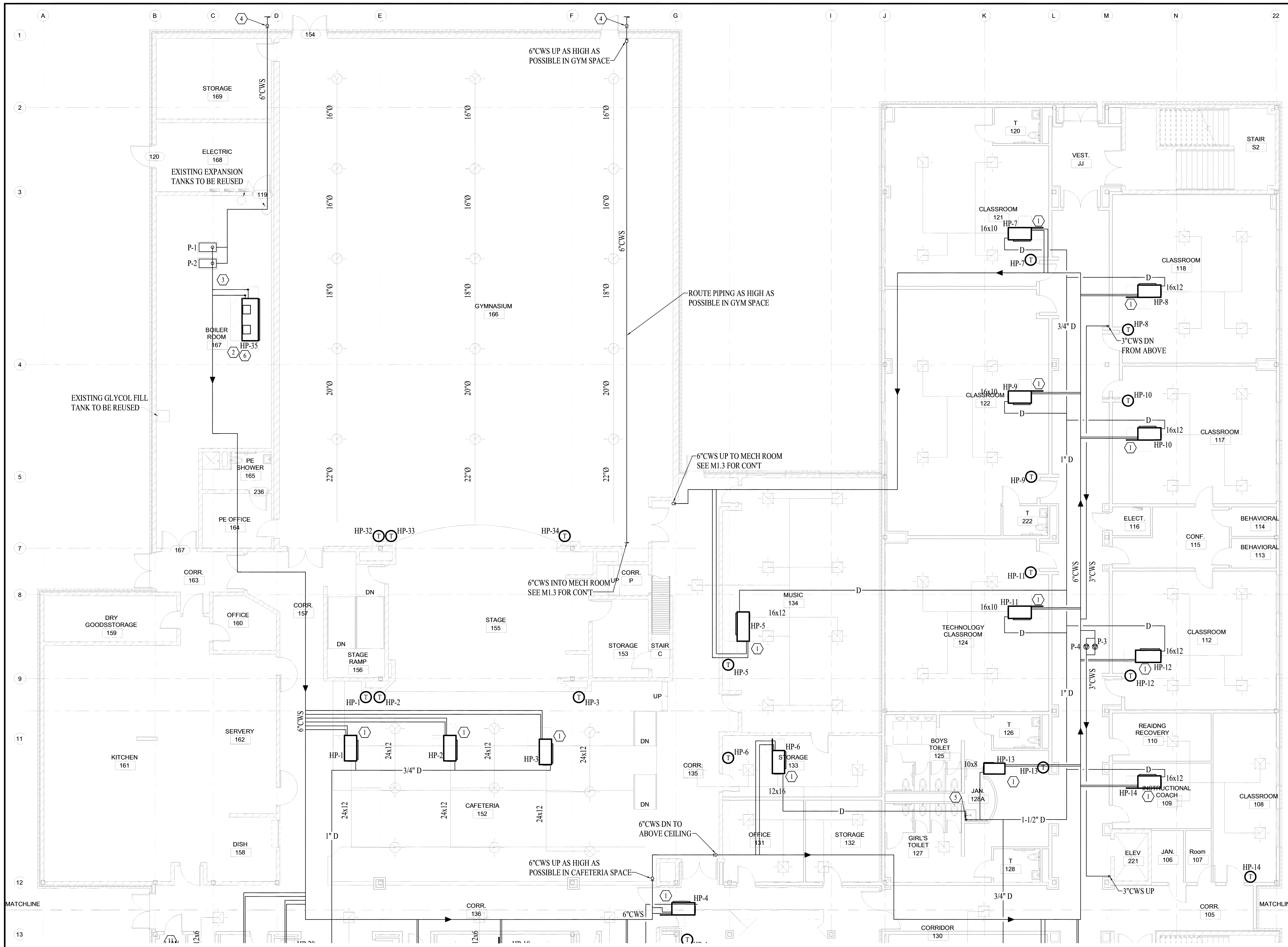
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ME3



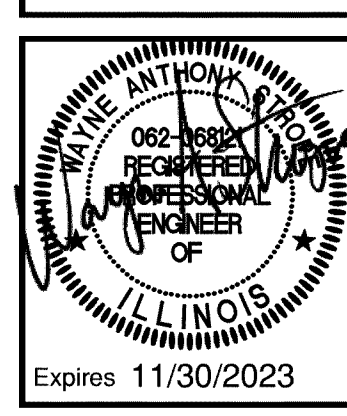
- 2 GENERAL NOTES:**
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- NOTES:**
- MOUNT HEAT PUMPS ON SUPPORTS FROM REMOVED VAV BOXES. MODIFY SUPPORTS AS REQUIRED FOR HEAT PUMPS. CONNECT HEAT PUMP SA TO EXISTING SA DUCT SERVING THE SPACE.
 - CONNECT TO EXISTING RA AND SA DUCT FROM REMOVED AHU-4.
 - SEE GEOTHERMAL SYSTEM PIPING DIAGRAM FOR FURTHER DETAILS ON PIPING SYSTEM COMPONENTS.
 - ENTER BUILDING APPROXIMATELY 10'-0" ABOVE FINISHED FLOOR. INSULATE PIPING AND PROVIDE PAINTABLE SHEET METAL ENCLOSURE AROUND EXPOSED PIPING.
 - 1-1/2" CONDENSATE DRAIN WALL TO MOP SINK.
 - TIE INTO EXISTING ABANDONED CONDENSATE DRAIN.

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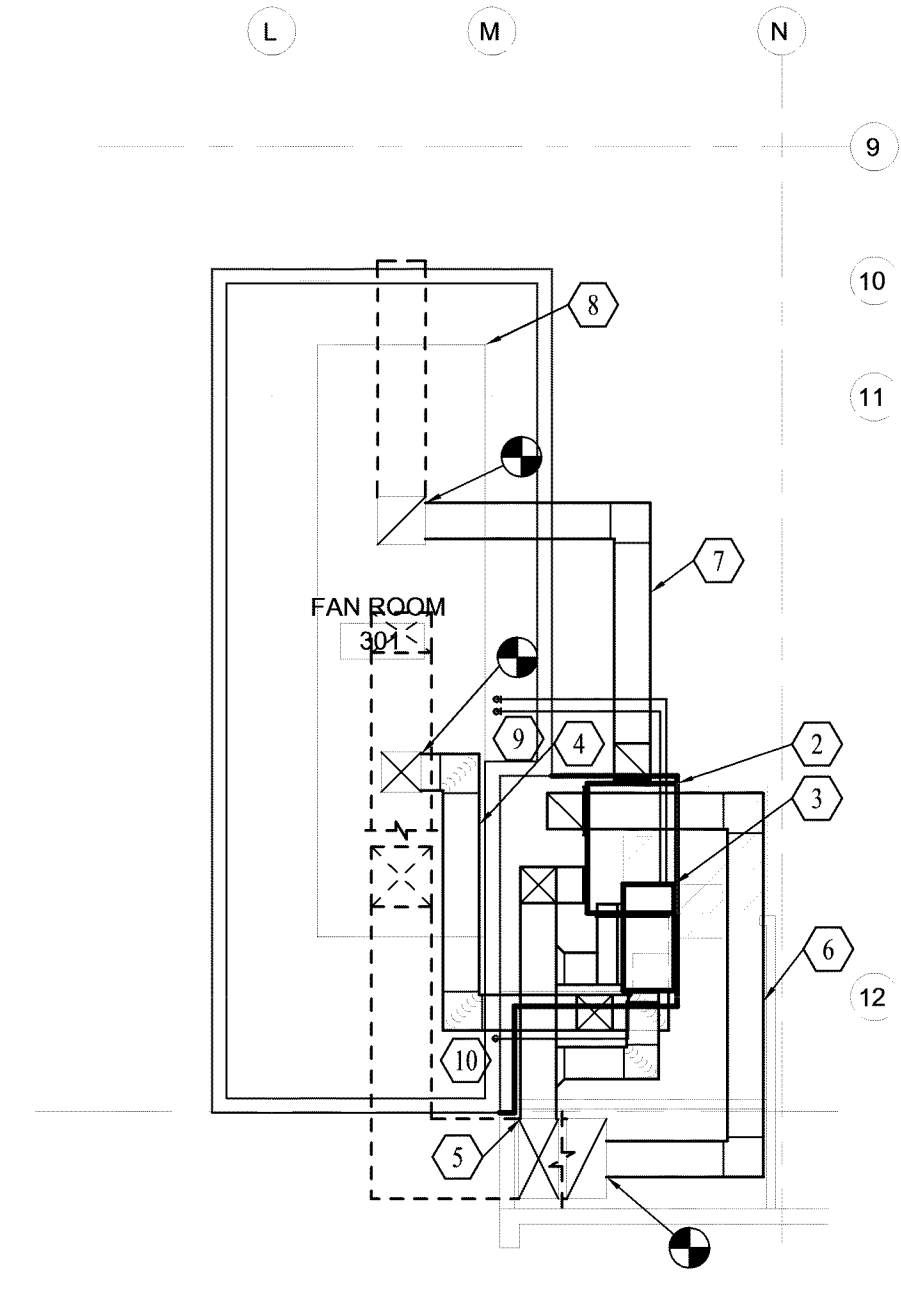
NO.	DATE	REVISIONS	REMARKS

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PROJECT NO. 25821422
 ISSUE DATE 10/25/2022
 SHEET M1.1

01 FIRST FLOOR NORTH MECHANICAL RENOVATION PLAN
 SCALE: 1"=18"

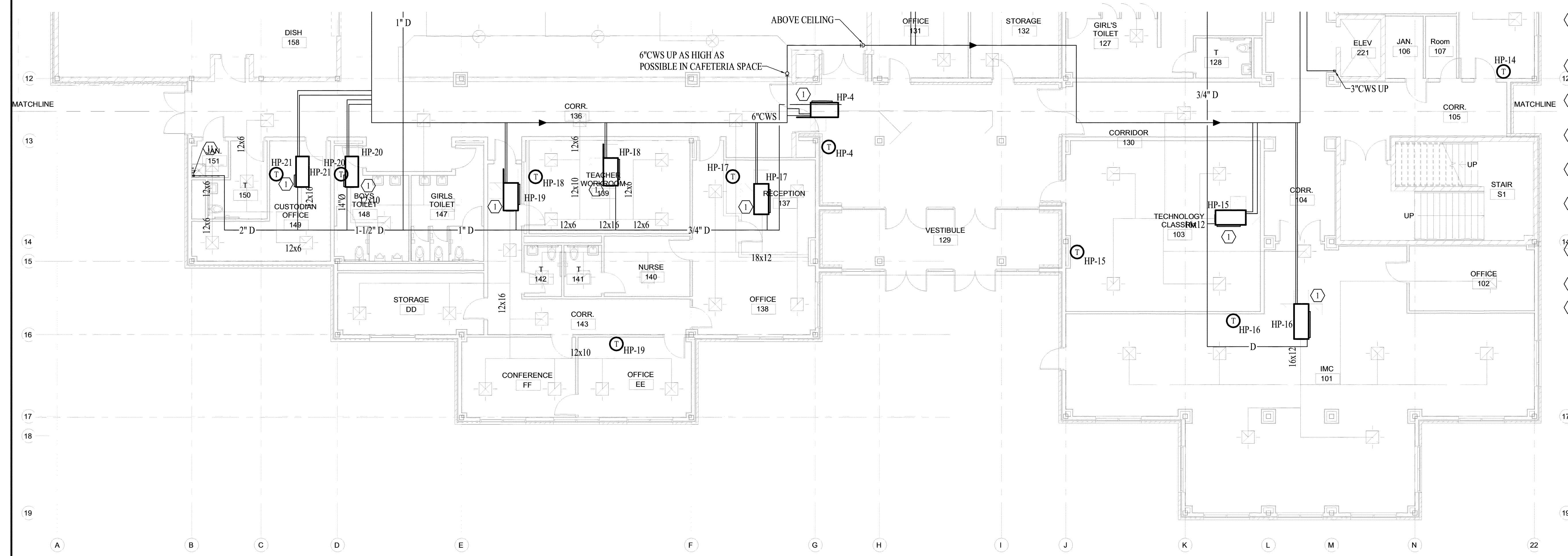
NO.	DATE	REVISIONS	REMARKS



01 THIRD FLOOR MECHANICAL RENOVATION PLAN
 SCALE: 1"=1/8"

- GENERAL NOTES:**
- DRAWINGS (PLANS, DETAILS AND SCHEMATICS ARE DIAGRAMMATIC IN NATURE AND INDICATE GENERAL LOCATION AND ARRANGEMENT OF NEW AND EXISTING MAJOR EQUIPMENT AND PIPING SYSTEMS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT, PIPING AND PIPING COMPONENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL TIE-IN POINT LOCATIONS BETWEEN NEW AND EXISTING PIPING SYSTEMS EQUIPMENT AND UTILITIES.
 - UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN. NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.
 - MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

- NOTES:**
- MOUNT HEAT PUMPS ON SUPPORTS FROM REMOVED VAV BOXES. MODIFY SUPPORTS AS REQUIRED FOR HEAT PUMPS. CONNECT HEAT PUMP SA TO EXISTING SA DUCT SERVING THE SPACE.
 - ERU-3 MOUNTED ON CONCRETE ENCLOSURE ABOVE ELEVATOR.
 - HP-36 HUNG FROM STRUCTURE ABOVE ERU-3. SEE OA/HP DETAIL FOR CONNECTION INFORMATION.
 - 18"x18" OA DUCT FROM EXISTING OA DUCT TO ERU-3 OA INTAKE.
 - 18"x18" OA DUCT FROM ERU-3 OUTLET TO EXISTING SA DUCT.
 - 18"x18" EA DUCT FROM EXISTING RA DUCT TO ERU-3 EA INLET.
 - 18"x18" FROM ERU-3 EA OUTLET TO EXISTING RELIEF HOOD DUCT.
 - DISCONNECT EXISTING AHU AND ABANDON IN PLACE. UTILIZE 480V POWER CIRCUIT FOR ERU-3.
 - SUPPLY AND RETURN PIPING FROM BELOW.
 - CONDENSATE DRAIN DOWN.
 - 2" CONDENSATE DRAIN WALL TO MOP SINK.



01 FIRST FLOOR SOUTH MECHANICAL RENOVATION PLAN
 SCALE: 1"=1/8"

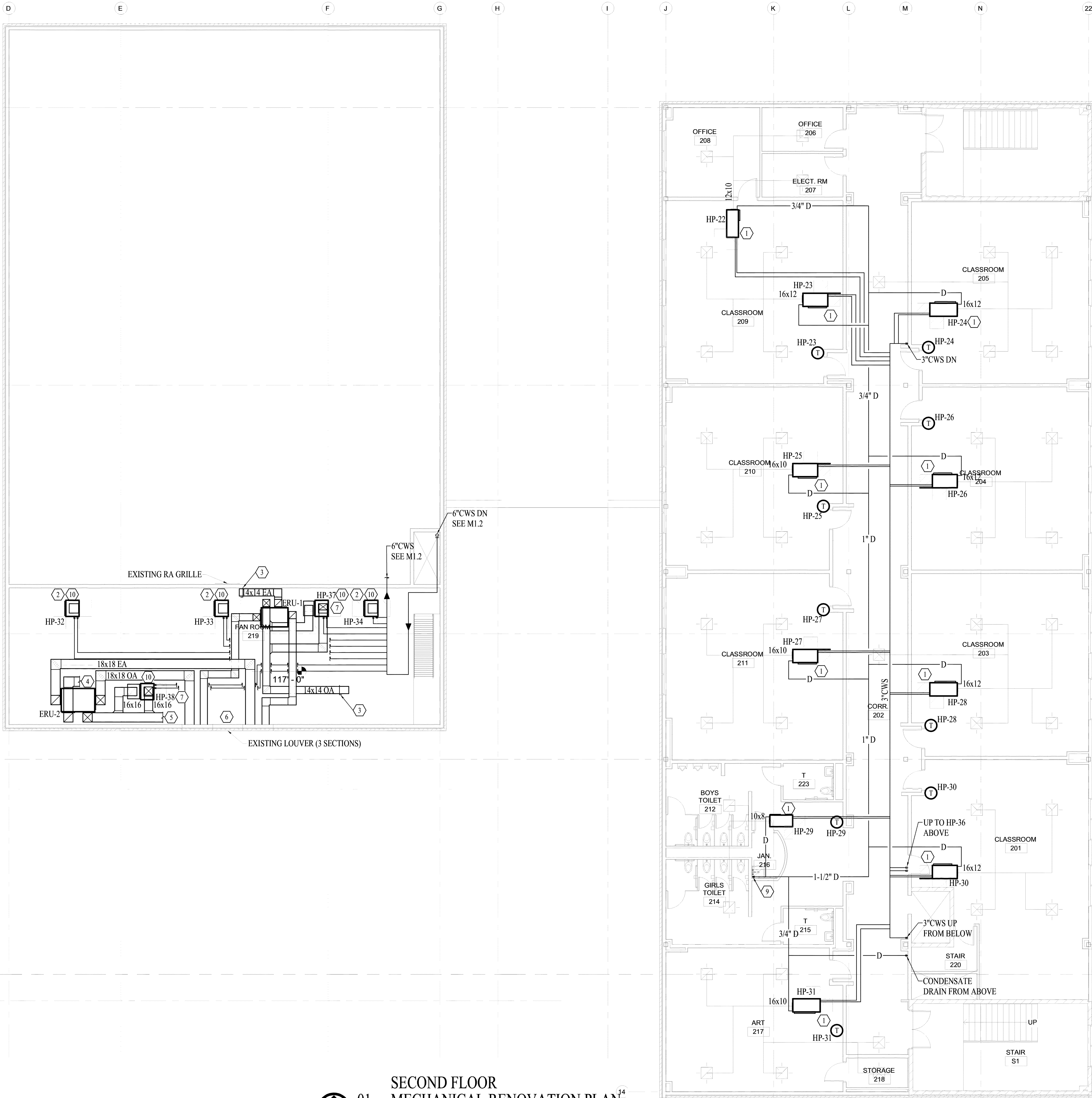
NO.	DATE	REVISIONS	REMARKS

GENERAL NOTES:

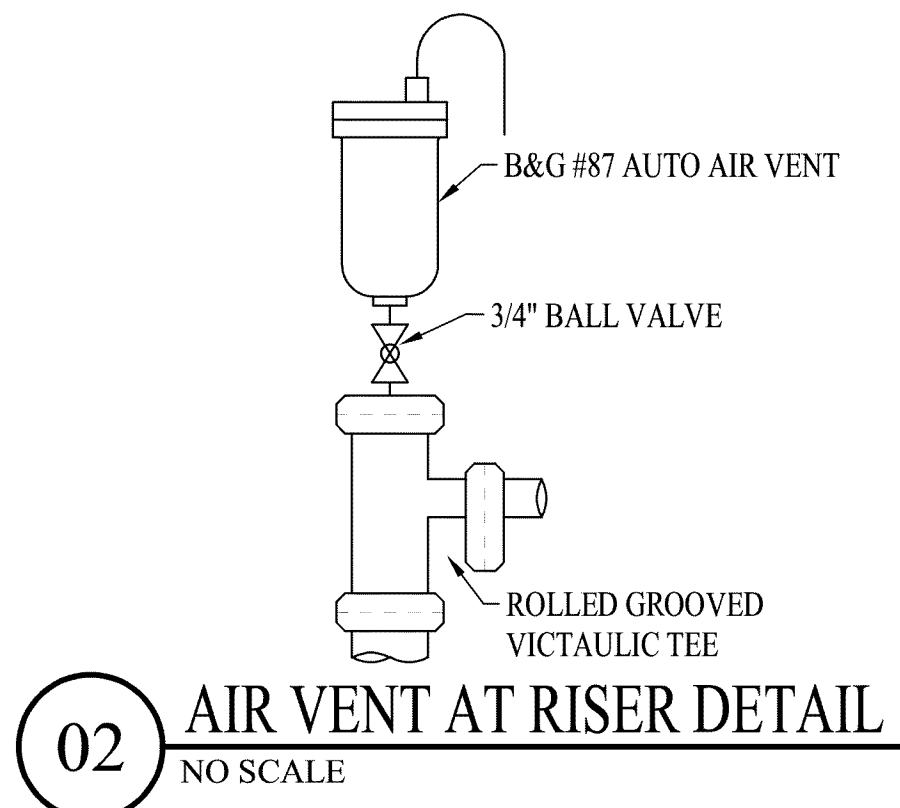
- DRAWINGS (PLANS, DETAILS AND SCHEMATICS ARE DIAGRAMMATIC IN NATURE AND INDICATE GENERAL LOCATION AND ARRANGEMENT OF NEW AND EXISTING MAJOR EQUIPMENT AND PIPING SYSTEMS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT, PIPING AND PIPING COMPONENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL TIE-IN POINT LOCATIONS BETWEEN NEW AND EXISTING PIPING SYSTEMS EQUIPMENT AND UTILITIES.
- UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN. NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.
- MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

NOTES:

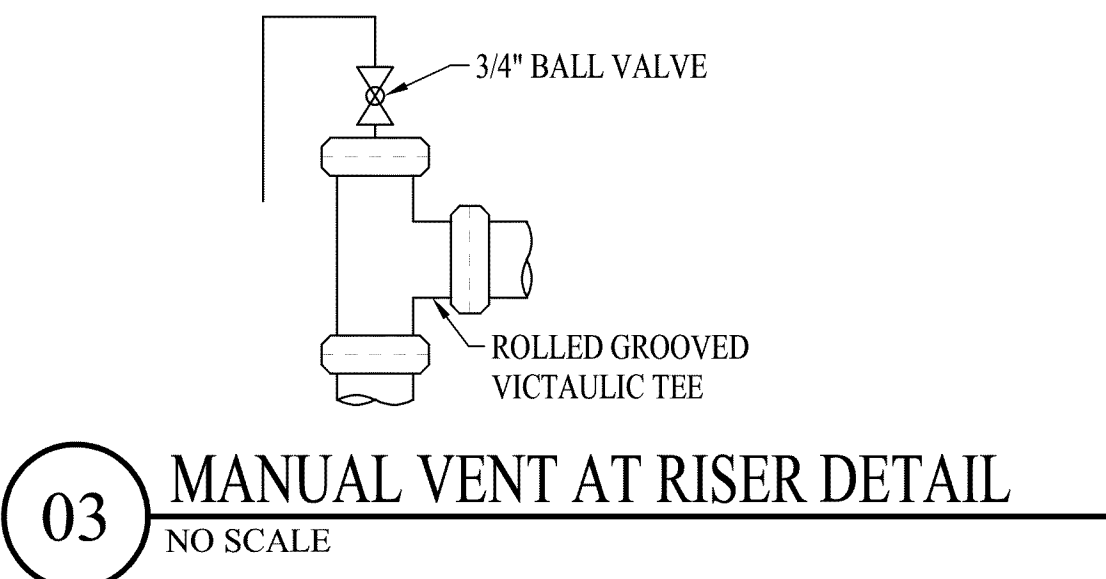
- MOUNT HEAT PUMPS ON SUPPORTS FROM REMOVED VAV BOXES. MODIFY SUPPORTS AS REQUIRED FOR HEAT PUMPS. CONNECT HEAT PUMP SA TO EXISTING SA DUCT SERVING THE SPACE.
- CONNECT HEAT PUMP SA TO EXISTING 24"x24" SA DUCT AT WALL OF MECHANICAL ROOM.
- MVD SET @ 1050 CFM WITH UNIT RUNNING @ MAX SPEED.
- CONNECT NEW 18"x18" EA FROM ERU-2 EA INLET TO EXISTING RA FROM REMOVED AHU-S 2 AND 3.
- CONNECT NEW 18"x18" OA FROM ERU-2 OA OUTLET TO EXISTING SA FROM REMOVED AHU-S 2 AND 3.
- UTILIZE EXISTING 3 ZONE LOUVER FOR EA AND OA. UTILIZE WEST SIDE FOR OA AND EAST SIDE FOR EA FROM ERU-1 AND ERU-2.
- SEE HP/OA DETAIL FOR FURTHER CONNECTION INFORMATION.
- PROVIDE PAINTABLE 16 GAUGE SHEET METAL ENCLOSURE AROUND EXPOSED PIPING.
- 1-1/2" CONDENSATE DRAIN WALL TO MOP SINK.
- TIE INTO EXISTING ABANDONED CONDENSATE DRAIN.



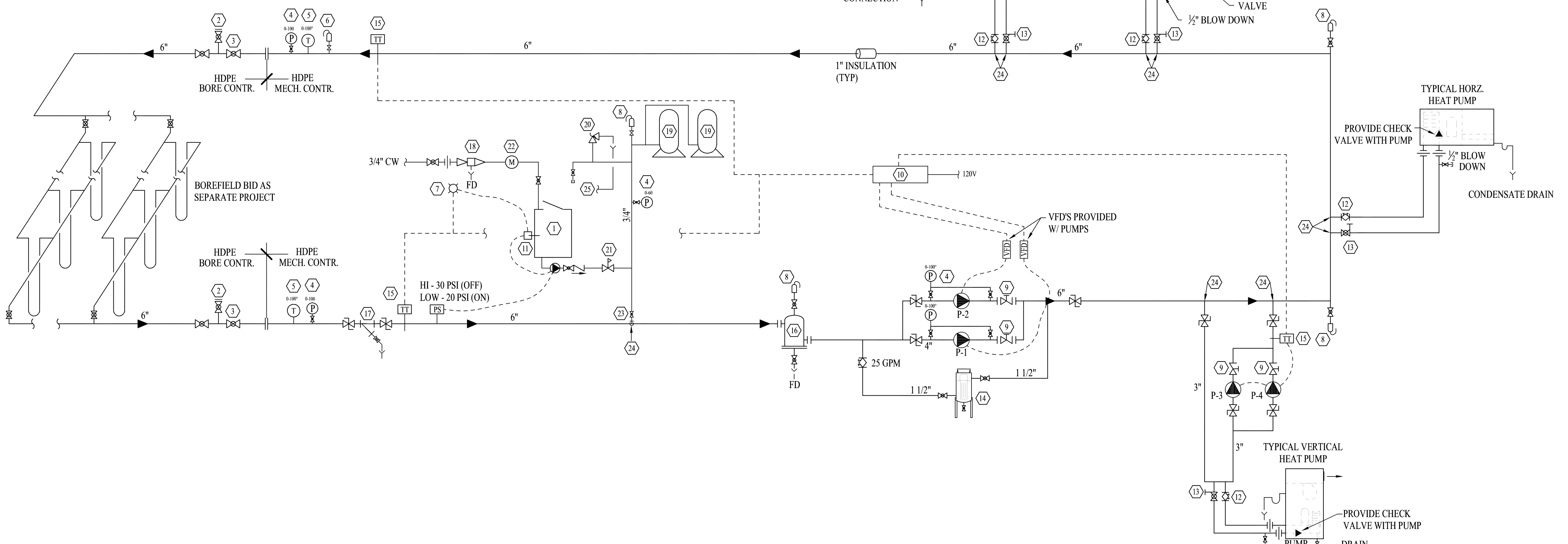
01 SECOND FLOOR MECHANICAL RENOVATION PLAN
 SCALE: 1"=18"



02 AIR VENT AT RISER DETAIL
NO SCALE



03 MANUAL VENT AT RISER DETAIL
NO SCALE



GENERAL NOTES:

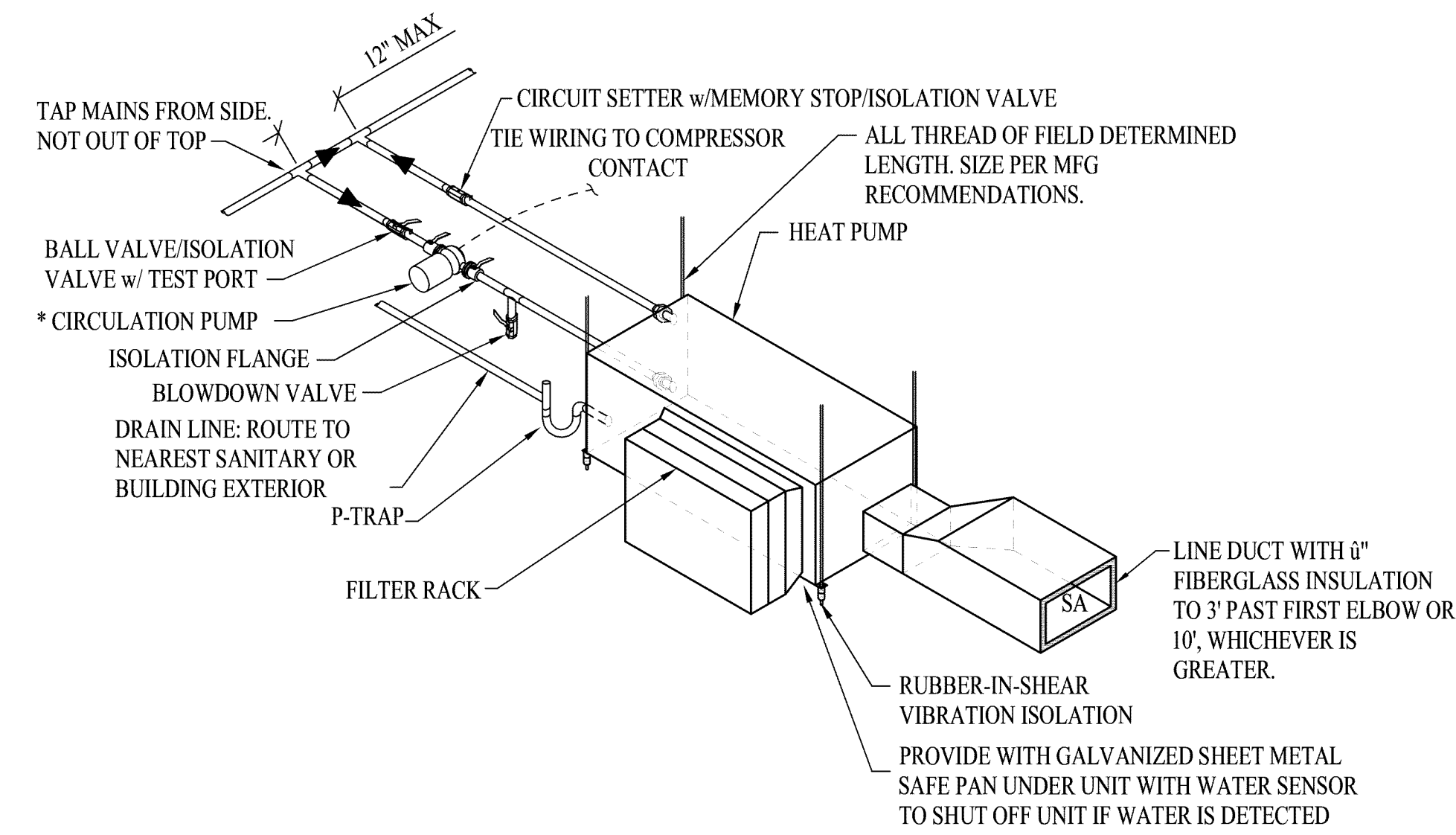
- PIPE FLUSHING AND CLEANING PROCEDURE:**
THE CLOSED LOOP SYSTEM WATER PIPING MUST BE THOROUGHLY CLEANED AND FLUSHED TO REMOVE DIRT, CHIPS, AND OTHER FOREIGN MATERIALS PRIOR TO CONNECTING THE HEAT PUMPS TO PIPING SYSTEM. COUPLE THE HEAT PUMP SUPPLY & RETURN PIPING CROSS CONNECTIONS AND FILL LOOP WITH A SOLUTION CONSISTING OF 1% TO 2% OF LIQUID TRISODIUM PHOSPHATE DETERGENT AND FRESH CLEAN WATER. REPAIR LEAKS AS REQUIRED. USE VALVES TO BYPASS HEAT REJECTOR AND SUPPLEMENTARY WATER HEATER (WHERE APPLICABLE). FLUSH SYSTEM FOR A MINIMUM OF TWO HOURS MONITORING SYSTEM BLOW DOWN UNTIL WATER RUNS CLEAR. ONCE CLEAN, STOP THE PUMP AND CLEAN ALL SYSTEM STRAINERS. REMOVE TEMPORARY CROSS CONNECTION AND CONNECT LOOP SUPPLY AND RETURN PIPING TO HEAT PUMP UNITS.
- ANTI-FREEZE SOLUTION BY INTERIOR BUILDING CONTRACTOR (FOR INTERIOR & EXTERIOR PIPING):**
AFTER COMPLETION OF THE PIPE FLUSHING AND CLEANING PROCEDURES SPECIFIED ABOVE, SYSTEM SHALL BE FILLED WITH A SOLUTION OF 20% PROPYLENE GLYCOL AND 80% WATER BY VOLUME. PROPYLENE GLYCOL SHALL BE DOWFROST HD PHOSPHATE-BASED INDUSTRIALLY INHIBITED HEAT TRANSFER FLUID OR APPROVED EQUAL. DESIGN FREEZING POINT OF MIXED SOLUTION SHALL BE APPROX. 19.0 DEG. F. USING A HAND HELD OPTIC REFRACTOMETER INSTRUMENT, THE CONTRACTOR SHALL TEST, ADJUST AND RECORD FINAL FREEZING POINT OF MIXED SOLUTION OF PROPYLENE GLYCOL. SUBMIT "FREEZING POINT OF SOLUTION" TEST RESULTS TO ENGINEER FOR REVIEW AND APPROVAL.
- CHEMICAL TREATMENT:**
 - GENERAL:** CHEMICALS SHALL BE SPECIALLY FORMULATED TO PREVENT ACCUMULATION OF SCALE AND CORROSION IN CLOSED LOOP PIPING SYSTEMS AND CONNECTED EQUIPMENT. CHEMICAL FORMULATION DEVELOPED SHALL BE BASED ON A LABORATORY ANALYSIS OF THE SYSTEM MAKE-UP WATER SUPPLY CHEMISTRY.
 - CORROSION INHIBITOR:** PROVIDE SODIUM NITRITE/BORATE, MOLYBDATE-BASED INHIBITOR OR OTHER APPROVED PROPRIETARY FORMULATION SUITABLE FOR WATER MAKE-UP QUALITY AND QUANTITY REQUIRED. INHIBITOR FORMULATION SHALL INCLUDE ADEQUATE BUFFER TO MAINTAIN A SYSTEM pH RANGE OF 8.0 TO 10.5. INTRODUCE INHIBITOR COMPOUNDS INTO SYSTEM MANUALLY THROUGH THE BY-PASS TYPE SHOT FEEDER/FILTER ASSEMBLY PROVIDED IN THE SYSTEM.
 - CORROSION INHIBITOR PERFORMANCE:** INHIBITOR PROVIDED SHALL PROTECT VARIOUS WETTED MATERIALS OF CONSTRUCTION INCLUDING FERROUS, RED & YELLOW METALS & MAINTAIN THE SYSTEM ESSENTIALLY FREE OF SCALE, CORROSION AND FOULING. CORROSION RATES OF THE FOLLOWING METALS SHALL NOT EXCEED THE PENETRATION SPECIFIED IN MILS/YEAR; FERROUS, 0-2.0; BRASS, 0-1.0; COPPER, 0-1.0 INHIBITOR SHALL REMAIN STABLE THROUGH THE SYSTEM OPERATING TEMPERATURE RANGE. HEAT EXCHANGE FOULING AND CAPACITY REDUCTION SHALL NOT EXCEED THAT ALLOWED BY A FOULING FACTOR OF 0.0005.

NOTES:

- EXISTING GLYCOL FILL TANK. FILL WITH 20% PROP GLYCOL AND DE-IONIZED WATER.
- DURING STARTUP, CONTRACTOR TO TEMPORARILY INSTALL B&G MODEL 107A AIR VENT ON RISE TO ASSURE ALL AIR IS REMOVED FROM SYSTEM.
- CONTRACTOR TO PURGE BUILDING AND WELL FIELD PIPING SYSTEMS WITH EXTERNAL PUMP AND SEPARATION TANK ASSEMBLY PRIOR TO SYSTEM OPERATION. SEE PURGE AND FILL INSTRUCTIONS THIS SHEET.
- 4-1/2" DIAL PRESSURE GAUGE WITH 1/2" BALL GAUGE VALVE. PROVIDE PSI DIAL RANGE AS INDICATED BY PRESSURE GAUGE SYMBOL IN DIAGRAM. TRERICE MODEL NO. 620B345FSL250, OR EQUAL.
- 4-1/2" DIAL TYPE "UNIVERSAL ANGLE" THERMOMETER WITH SEPARATE WELL. PROVIDE °F TEMPERATURE DIAL RANGE AS INDICATED BY THERMOMETER SYMBOL IN DIAGRAM. TRERICE MODEL NO. Y80742B31, OR EQUAL.
- B&G AUTOMATIC AIR VENT MODEL NO. 87 OR APPROVED EQUAL. SEE DETAIL 02/M3.1. INSTALL AT HIGH POINTS IN SYSTEM.
- LOW SYSTEM VOLUME ALARM LIGHT. COMMUNICATE ALARM TO BAS.
- B&G AUTOMATIC AIR VENT MODEL NO. 87 OR APPROVED EQUAL. INSTALL AT SYSTEM HIGH POINTS.
- LINE SIZE, TRI DUTY VALVE. SET FLOW WITH BOTH PUMPS RUNNING IN PARALLEL AT 60 HZ. SEE PUMP SCHEDULE FOR FLOW REQUIREMENTS.
- ELECTRONIC LOOP WATER CONTROLLER. SEE SHEET M4.2 FOR SEQUENCE OF OPERATIONS.
- LOW LEVEL FLOAT SWITCH. INTERLOCK WITH SYSTEM FILL PUMP TO SHUT PUMP OFF AS WELL AS ACTIVATING ALARM LIGHT.
- LINE SIZE, B&G CIRCUIT SETTERS, OR EQUAL BY ARMSTRONG. SEE PLANS FOR LINE SIZES AND BALANCING INFORMATION.
- BALL VALVE WITH "PETES PLUG" PRESSURE & TEMPERATURE TEST PORT WITH 1/8" Ø SIZE PROBE ACCEPTANCE PORT.
- FIVE (5) GALLON CHEMICAL BYPASS FEEDER AND FILTER ASSEMBLY. NEPTUNE DBFC-5 OR EQUAL WITH CARTRIDGE FILTERS.
- ELECTRONIC TEMP TRANSDUCER IN WELL, 0-110F, CONNECTED TO BUILDING AUTOMATION SYSTEM.
- B&G ROLAIRTROL MODEL #RL-6 OR APPROVED EQUAL AIR SEPARATOR WITH STRAINER WITH BALL VALVE BLOW DOWN VALVE.
- LINED SIZED STEAM STRAINER (30 MESH OR LESS) REMOVE START UP STRAINER SCREEN AFTER SYSTEM IS UP AND RUNNING FOR ONE MONTH.
- 3/4" REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTER ASSEMBLY. WATTS NO. 009-QT, OR EQUAL.
- EXISTING EXPANSION TANK.
- PRESSURE RELIEF VALVE SET @ 80 PSI.
- 3/4" PRESSURE REDUCING VALVE, B&G MODEL NO. B7-12 S ET @ 30 PSIG.
- BADGER "RECORDALL" RCGL-25, LOW FLOW, ODOMETER TYPE, METER.
- 3/4" BALL VALVE. NOTE: TAG VALVES WITH THE FOLLOWING INSTRUCTIONS "THIS VALVE SHALL REMAIN IN THE OPEN POSITION WHENEVER SYSTEM IS OPERATING".
- CONNECT TO SIDE OF 6" HORIZONTAL MAIN. (TYPICAL OF ALL CONNECTIONS TO THE MAINS.)
- ROUTE FULL SIZE PRESSURE RELIEF PIPING TO NEAREST FLOOR DRAIN.

01 GEOTHERMAL SYSTEM PIPING DIAGRAM
NO SCALE

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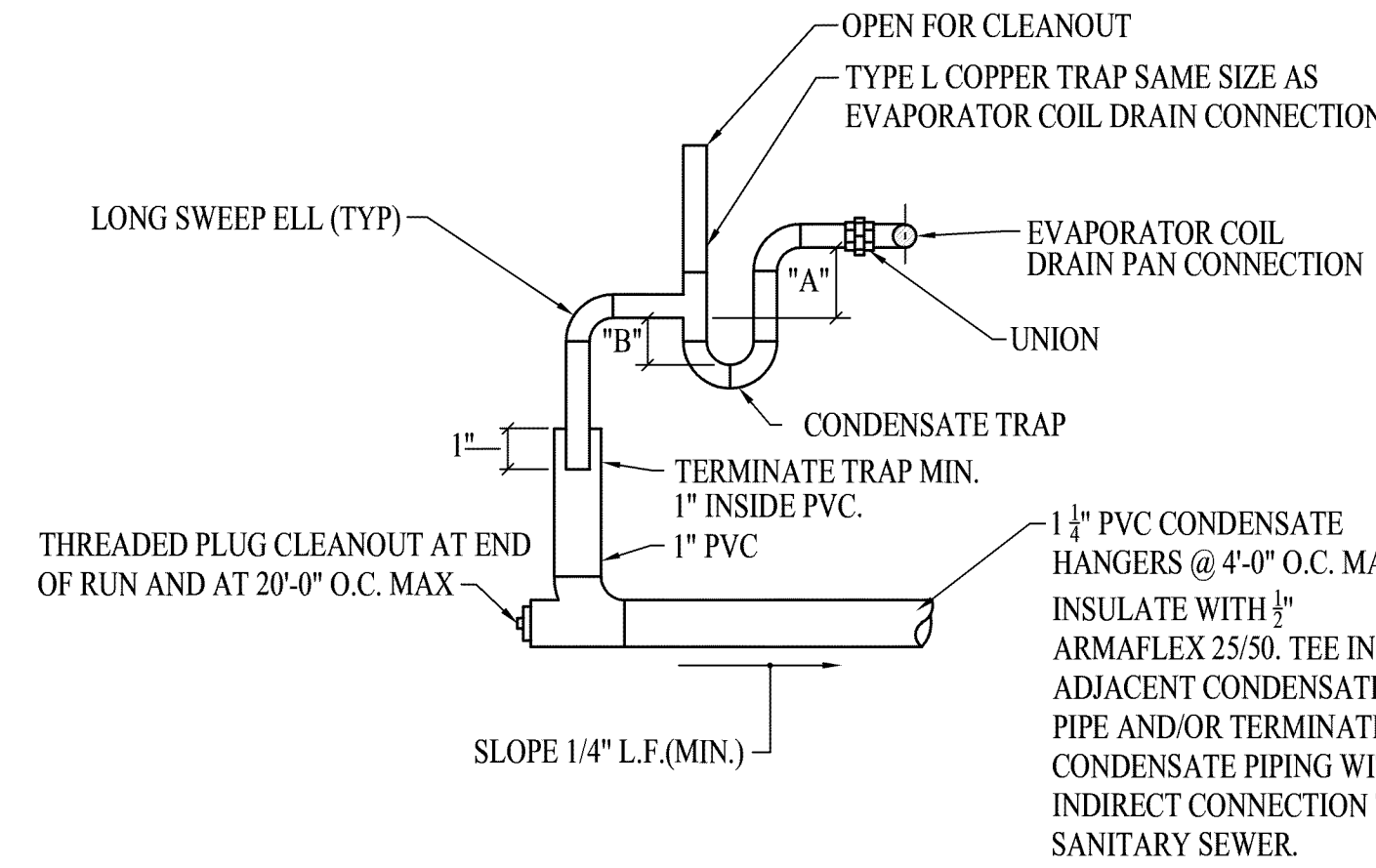


* IF CIRCULATION PUMP IS NOT PROVIDED WITHIN THE HEAT PUMP, PLACE IT IN THE SUPPLY LINE TO HP AFTER THE BLOWDOWN VALVE. MOUNT PUMP PER MANUFACTURER'S INSTRUCTIONS

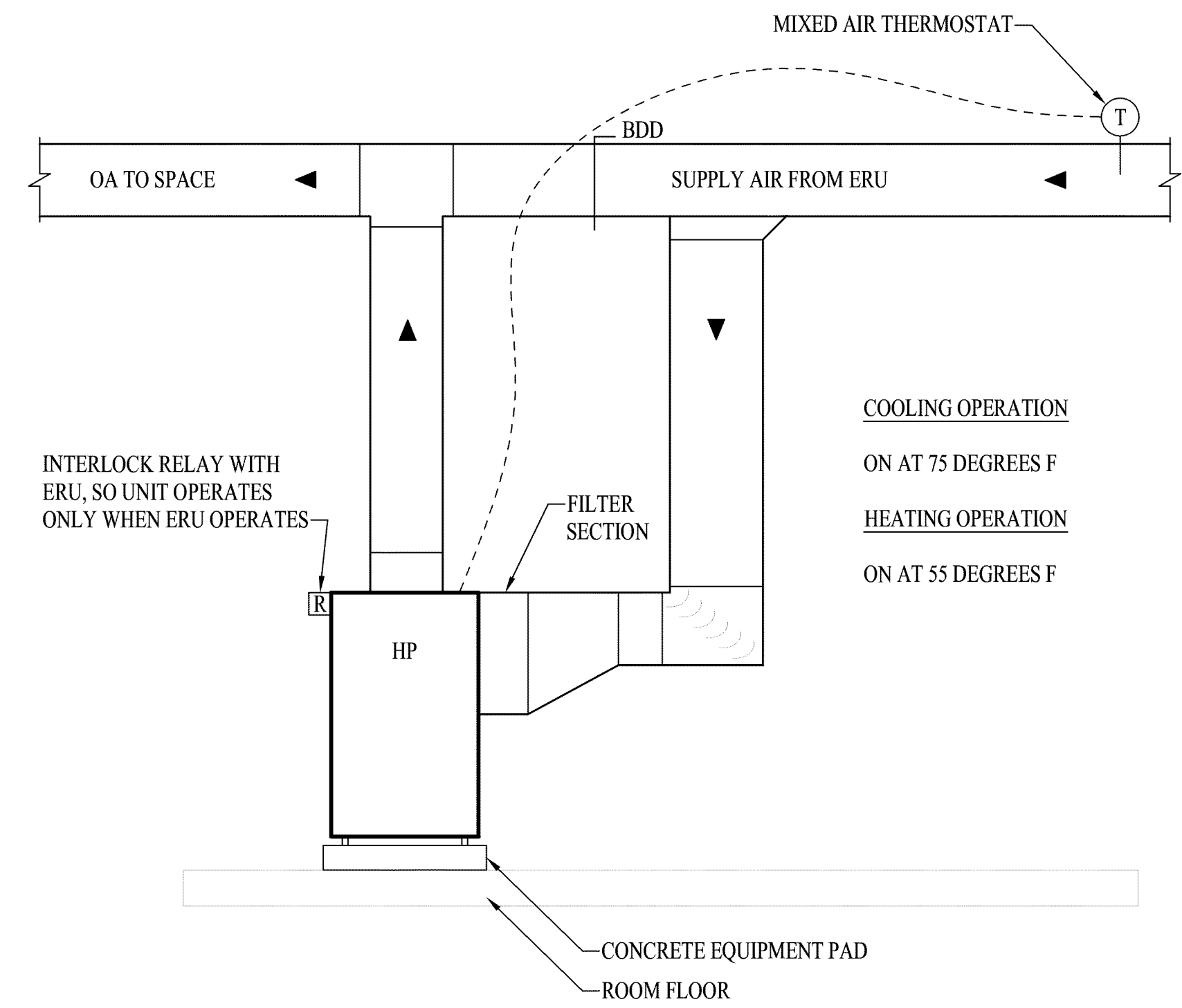
06 HORIZONTAL HEAT PUMP CONNECTION DETAIL
NO SCALE

FAN / COIL CONFIGURATION	DIM. "A"	DIM. "B"
BLOW THROUGH COIL	1"	FAN DISCHARGE STATIC PRESSURE + 1"
DRAW THROUGH COIL	FAN SUCTION STATIC PRESSURE + 1"	2 1/2"

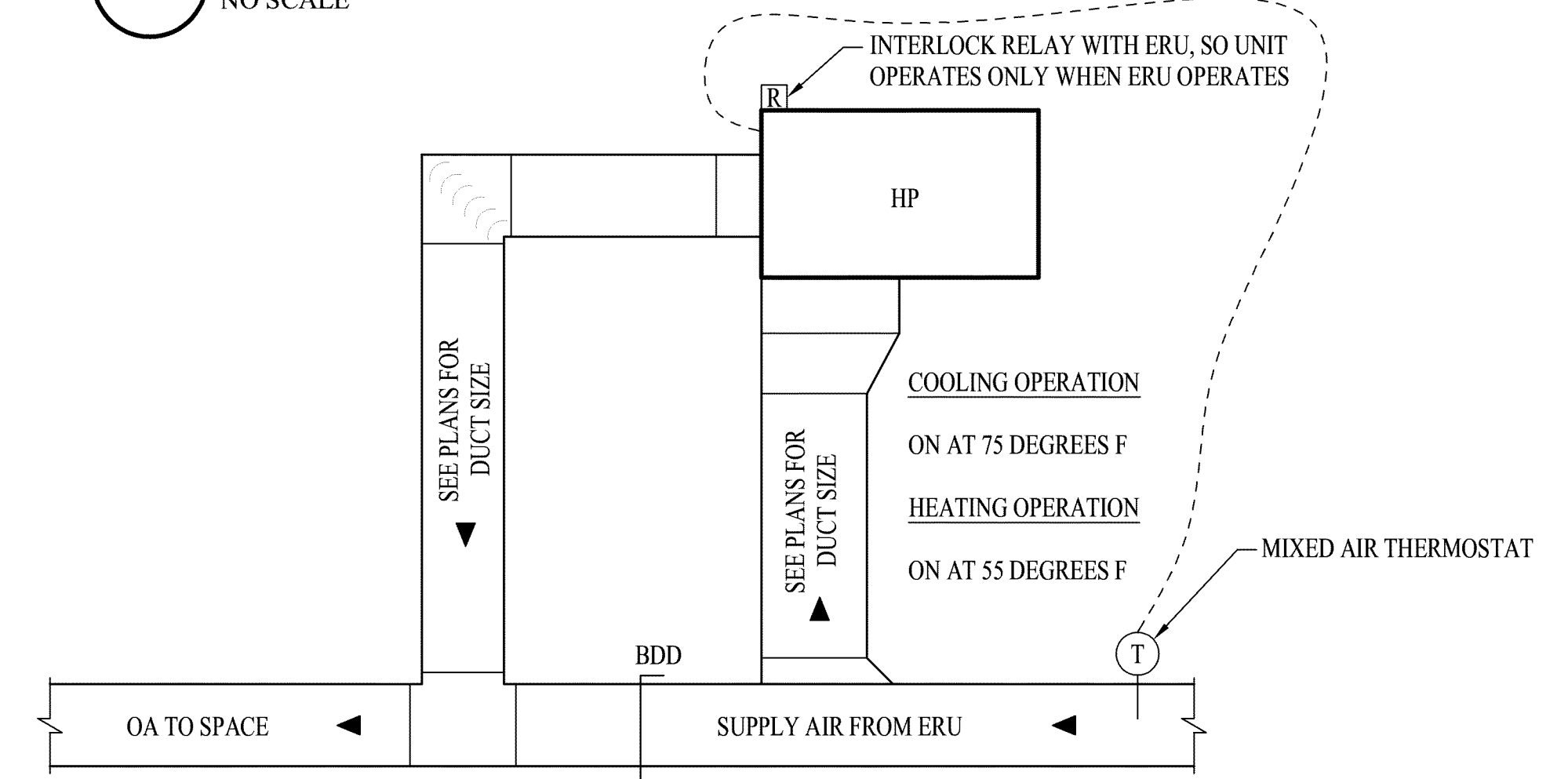
NOTES:
1. "A" OR "B" DIMENSION SHALL NOT BE LESS THAN 1".
2. DRAIN PIPING SIZED PER MFR'S. SPECS.



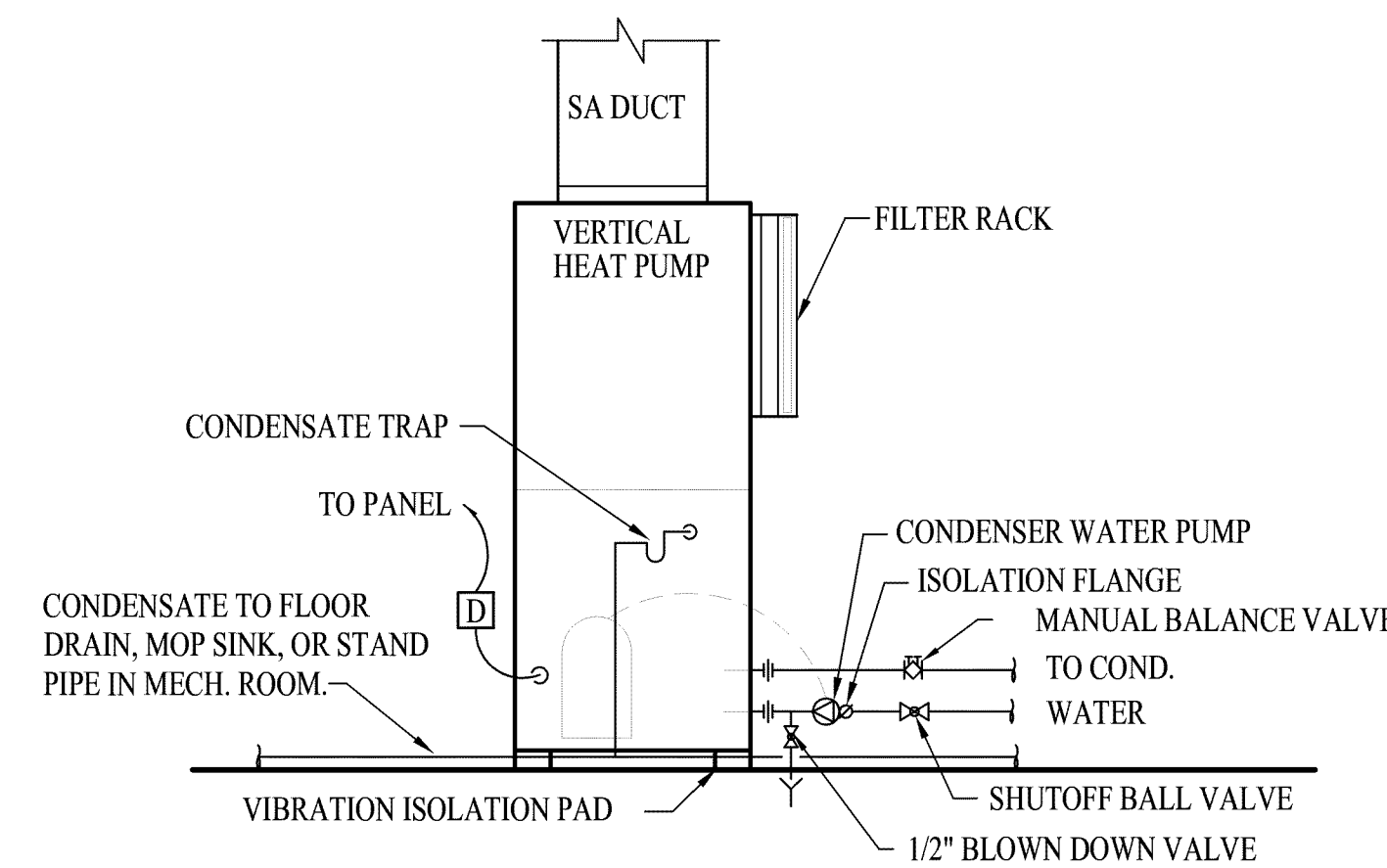
04 HVAC CONDENSATE DRAIN / TRAP DETAIL
NO SCALE



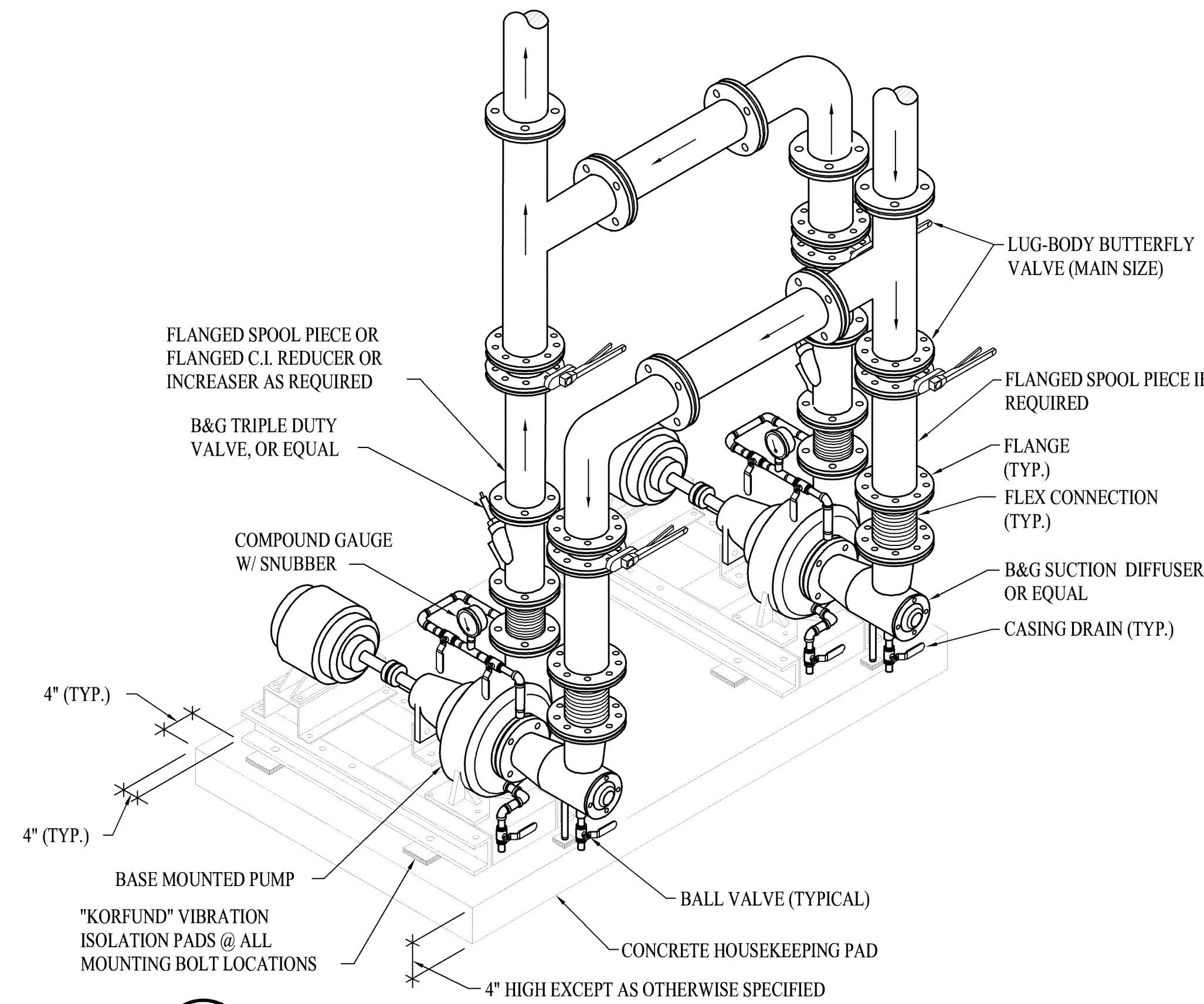
01 OUTSIDE AIR VERTICAL HEAT PUMP DETAIL
NO SCALE



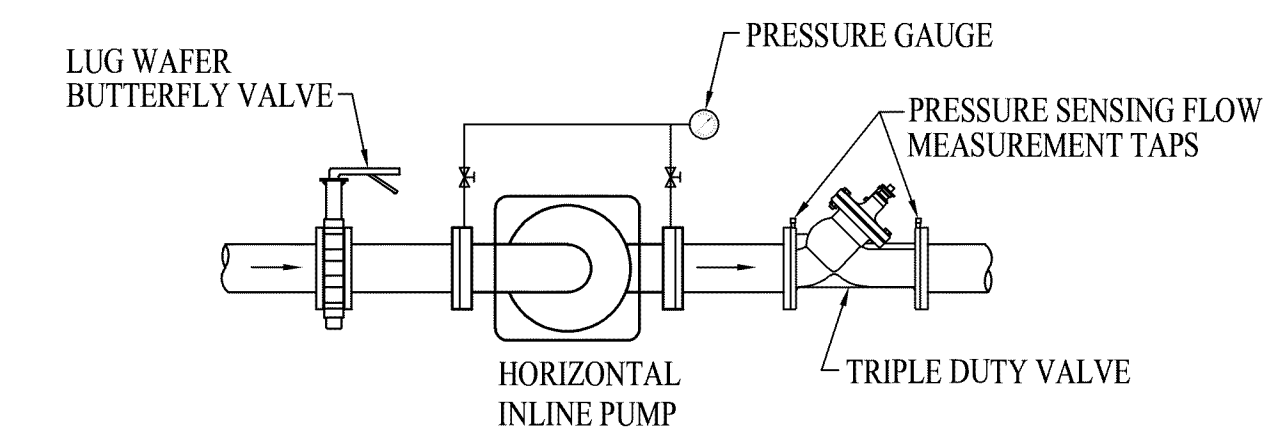
02 OUTSIDE AIR HORIZONTAL HEAT PUMP DETAIL
NO SCALE



07 VERTICAL HEAT PUMP DETAIL
NO SCALE



05 BASE MOUNTED DUAL PUMP DETAIL
NO SCALE



03 HORIZONTAL INLINE PUMP DETAIL
NO SCALE

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WAYNE ANTHONY STROPE
062-16838
REGISTERED PROFESSIONAL ENGINEER
OF ILLINOIS
Expires 11/30/2023

WAYNE A. STROPE
062.068121

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PROJECT NO.
25821422
ISSUE DATE
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SHEET

HEAT PUMP SCHEDULE																									
MARK	MANUFACTURER	MODEL NUMBER	CONFIGURATION POS. / ORIN.	S.A. (CFM)	ESP (IN W.C.)	COOLING			HEATING			WATER FLOW (GPM)	H.P. WPD (FT)	PUMP HEAD (FT)	GRUNDFOS PUMP MODEL	WATER PIPING SIZE	FILTER		ELECTRICAL				MARK	NOTES	
						CAPACITY (MBH)	EWT (°F)	EER	CAP. TOTAL (BTH)	EWT (°F)	COP						QTY	SIZE	VOLTS	Ø	MCA (AMPS)	MAX FUSE			
																									TOTAL
HP-1	WATER FURNACE	NBH049	HORIZONTAL	1550	0.50	50.85	33.3	85	16.7	43.4	45	4.1	9.0	5.3	14.0	UP 26-64F	1-1/4	2	20x20/20x22	208	3	21.5	35	HP-1	1,2,3,4,5,6,7,8,9,10,12,13
HP-2	WATER FURNACE	NBH049	HORIZONTAL	1550	0.50	50.85	33.3	85	16.7	43.4	45	4.1	9.0	5.3	14.0	UP 26-64F	1-1/4	2	20x20/20x22	208	3	21.5	35	HP-2	1,2,3,4,5,6,7,8,9,10,12,13
HP-3	WATER FURNACE	NBH049	HORIZONTAL	1550	0.50	50.85	33.3	85	16.7	43.4	45	4.1	9.0	5.3	14.0	UP 26-64F	1-1/4	2	20x20/20x22	208	3	21.5	35	HP-3	1,2,3,4,5,6,7,8,9,10,12,13
HP-4	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-4	1,2,3,4,5,6,7,8,9,10,12,13
HP-5	WATER FURNACE	NBH064	HORIZONTAL	1800	0.50	64.3	43.9	85	15.3	57.3	45	4.3	12.0	8.2	17.0	UP 26-64F	1-1/2	2	20x25/20x22	208	3	27.6	40	HP-5	1,2,3,4,5,6,7,8,9,10,12,13
HP-6	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-6	1,2,3,4,5,6,7,8,9,10,12,13
HP-7	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-7	1,2,3,4,5,6,7,8,9,10,12,13
HP-8	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-8	1,2,3,4,5,6,7,8,9,10,12,13
HP-9	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-9	1,2,3,4,5,6,7,8,9,10,12,13
HP-10	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-10	1,2,3,4,5,6,7,8,9,10,12,13
HP-11	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-11	1,2,3,4,5,6,7,8,9,10,12,13
HP-12	WATER FURNACE	NBH049	HORIZONTAL	1550	0.50	50.85	33.3	85	16.7	43.4	45	4.1	9.0	5.3	14.0	UP 26-64F	1-1/4	2	20x20/20x22	208	3	21.5	35	HP-12	1,2,3,4,5,6,7,8,9,10,12,13
HP-13	WATER FURNACE	NBH012	HORIZONTAL	400	0.5	13.55	9.3	85	15.5	10.5	45	3.7	2.5	2.3	11.0	UP 26-64F	3/4	1	16x16	208	1	6.7	15	HP-13	1,2,3,4,5,6,12,13
HP-14	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-14	1,2,3,4,5,6,7,8,9,10,12,13
HP-15	WATER FURNACE	NBH049	HORIZONTAL	1550	0.50	50.85	33.3	85	16.7	43.4	45	4.1	9.0	5.3	14.0	UP 26-64F	1-1/4	2	20x20/20x22	208	3	21.5	35	HP-15	1,2,3,4,5,6,7,8,9,10,12,13
HP-16	WATER FURNACE	NBH064	HORIZONTAL	1800	0.50	64.3	43.9	85	15.3	57.3	45	4.3	12.0	8.2	17.0	UP 26-64F	1-1/2	2	20x25/20x22	208	3	27.6	40	HP-16	1,2,3,4,5,6,7,8,9,10,12,13
HP-17	WATER FURNACE	NBH049	HORIZONTAL	1550	0.50	50.85	33.3	85	16.7	43.4	45	4.1	9.0	5.3	14.0	UP 26-64F	1-1/4	2	20x20/20x22	208	3	21.5	35	HP-17	1,2,3,4,5,6,7,8,9,10,12,13
HP-18	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-18	1,2,3,4,5,6,7,8,9,10,12,13
HP-19	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-19	1,2,3,4,5,6,7,8,9,10,12,13
HP-20	WATER FURNACE	NBH018	HORIZONTAL	600	0.5	17.05	11.4	85	15.6	16.7	45	3.8	4.0	6.7	15.0	UP 26-64F	1	1	18x29	208	1	14.5	20	HP-20	1,2,3,4,5,6,7,8,9,10,12,13
HP-21	WATER FURNACE	NBH018	HORIZONTAL	600	0.5	17.05	11.4	85	15.6	16.7	45	3.8	4.0	6.7	15.0	UP 26-64F	1	1	18x29	208	1	14.5	20	HP-21	1,2,3,4,5,6,7,8,9,10,12,13
HP-22	WATER FURNACE	NBH018	HORIZONTAL	600	0.5	17.05	11.4	85	15.6	16.7	45	3.8	4.0	6.7	15.0	UP 26-64F	1	1	18x29	208	1	14.5	20	HP-22	1,2,3,4,5,6,7,8,9,10,12,13
HP-23	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-23	1,2,3,4,5,6,7,8,9,10,12,13
HP-24	WATER FURNACE	NBH049	HORIZONTAL	1550	0.50	50.85	33.3	85	16.7	43.4	45	4.1	9.0	5.3	14.0	UP 26-64F	1-1/4	2	20x20/20x22	208	3	21.5	35	HP-24	1,2,3,4,5,6,7,8,9,10,12,13
HP-25	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-25	1,2,3,4,5,6,7,8,9,10,12,13
HP-26	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-26	1,2,3,4,5,6,7,8,9,10,12,13
HP-27	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-27	1,2,3,4,5,6,7,8,9,10,12,13
HP-28	WATER FURNACE	NBH049	HORIZONTAL	1550	0.50	50.85	33.3	85	16.7	43.4	45	4.1	9.0	5.3	14.0	UP 26-64F	1-1/4	2	20x20/20x22	208	3	21.5	35	HP-28	1,2,3,4,5,6,7,8,9,10,12,13
HP-29	WATER FURNACE	NBH012	HORIZONTAL	400	0.5	13.55	9.3	85	15.5	10.5	45	3.7	2.5	2.3	11.0	UP 26-64F	3/4	1	16x16	208	1	6.7	15	HP-29	1,2,3,4,5,6,12,13
HP-30	WATER FURNACE	NBH038	HORIZONTAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-30	1,2,3,4,5,6,7,8,9,10,12,13
HP-31	WATER FURNACE	NBH049	HORIZONTAL	1550	0.50	50.85	33.3	85	16.7	43.4	45	4.1	9.0	5.3	14.0	UP 26-64F	1-1/4	2	20x20/20x22	208	3	21.5	35	HP-31	1,2,3,4,5,6,7,8,9,10,12,13
HP-32	WATER FURNACE	NBH072	VERTICAL	2200	0.5	69.85	50.5	85	14.1	67.0	45	4.0	15.0	10.0	18.0	UP 43-75F	1-1/2	2	20x25/20x22	480	3	14.6	20	HP-32	1,2,3,4,5,6,7,8,9,10,12,13
HP-33	WATER FURNACE	NBH072	VERTICAL	2200	0.5	69.85	50.5	85	14.1	67.0	45	4.0	15.0	10.0	18.0	UP 43-75F	1-1/2	2	20x25/20x22	480	3	14.6	20	HP-33	1,2,3,4,5,6,7,8,9,10,12,13
HP-34	WATER FURNACE	NBH072	VERTICAL	2200	0.5	69.85	50.5	85	14.1	67.0	45	4.0	15.0	10.0	18.0	UP 43-75F	1-1/2	2	20x25/20x22	480	3	14.6	20	HP-34	1,2,3,4,5,6,7,8,9,10,12,13
HP-35	WATER FURNACE	NLV160	VERTICAL	5000	0.50	147.9	105.9	85	14.3	108.2	45	3.5	28.0	5.9	14.0	UP 43-75F	2	2	40x42	480	3	28.7	30	HP-35	1,2,3,4,5,6,7,8,9,11,12,13
HP-36	WATER FURNACE	NBH049	HORIZONTAL	1550	0.50	50.85	33.3	85	16.7	43.4	45	4.1	9.0	5.3	14.0	UP 26-64F	1-1/4	2	20x20/20x22	480	3	12.1	15	HP-36	1,2,3,4,5,6,7,8,9,10,12,13
HP-37	WATER FURNACE	NBV038	VERTICAL	1250	0.50	39.25	29.0	85	16.3	31.8	45	4.4	7.0	4.9	13.0	UP 26-64F	1-1/4	1	20x37	208	1	23.2	35	HP-37	1,2,3,4,5,6,7,8,9,10,12,13
HP-38	WATER FURNACE	NBV049	VERTICAL	1550	0.50	50.85	33.3	85	16.7	43.4	45	4.1	9.0	5.3	14.0	UP 26-64F	1-1/4	2	20x20/20x22	208	3	21.5	35	HP-38	1,2,3,4,5,6,7,8,9,10,12,13

NOTES:

- RATINGS ARE BASED ON (COOLING) 80/67; (HEATING) 68.
- HEATPUMPS TO BE PROVIDED WITH FACTORY WIRED AND INSTALLED CIRCULATORS.
- WET ROTOR CIRCULATORS CAN BE INSTALLED IN BORTH VERTICAL AND HORIZONTAL LINES. THE PUMP SHALL BE INSTALLED WITH MOTOR SHAFT POSITIONED HORIZONTALLY. UNDER NO CIRCUMSTANCES SHOULD THE PUMP BE INSTALLED WITH THE SHAFT VERTICAL OR WHERE THE SHAFT FALLS BELOW THE HORIZONTAL PLANE. FOR FURTHER INFORMATION ON THE WET ROTOR CIRCULATORS, SEE INSTRUCTIONS THAT CAME WITH THEM
- PROVIDE ALL UNITS WITH 2" MERV 8 FILTERS.
- INSTALLING CONTRACTOR SHALL PROVIDE 5 YEAR LABOR WARRANTY FOR UNIT COMPRESSOR AND REFRIGERANT SYSTEM.
- PROVIDE FACTORY INSTALLED DISCONNECT SWITCH
- ECM MOTOR
- PROVIDE AS TWO SPEED HEAT PUMPS
- PROVIDE WITH 2-STAGE BACNET THERMOSTAT WITH TEMPERATURE CONTROL AND HUMIDITY CONTROL FOR FIELD INSTALLATION.
- PROVIDE WITH HOT GAS REHEAT DEHUMIDIFICATION CONTROLLED BY SPACE HUMIDISTAT.
- PROVIDE WITH HOT GAS REHEAT DEHUMIDIFICATION CONTROLLED BY SPACE HUMIDISTAT AND HOT GAS BYPASS
- BALL VALVES SHALL BE FULL PORT AND INSTALLED SO THAT HEATPUMP CAN BE REMOVED WHEN VALVES ARE SHUT.
- BALANCE VALVES SHALL BE SELECTED FOR A MAX PRESSURE DROP OF 5' AT INDICATED OPERATING FLOW RATES.

MECHANICAL SYMBOL SCHEDULE	
ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON THE DRAWINGS	
	TIE TO EXISTING (CONNECTION POINT)
	WASTE PIPING
	VENT PIPING
	DOMESTIC COLD WATER PIPING
	DOMESTIC HOT WATER SUPPLY PIPING
	DOMESTIC HOT WATER RETURN
	NATURAL GAS
	DRAIN LINE
	UNION - FLANGE - STRAINER
	GATE VALVE - CHECK VALVE
	BALL VALVE - PLUG COCK
	CALIBRATED BALANCING VALVE W/ PORTS
	TRIPLE DUTY VALVE - PRESSURE REDUCING REGULATING VALVE
	BUTTERFLY VALVE - THREE WAY CONTROL VALVE
	PRESSURE RELIEF VALVE
	SOLENOID VALVE - GAUGE VALVE
	PRESSURE GAUGE
	THERMOMETER (BULB OR DIAL TYPE)
	PUMP
	STEAM TRAP
	TEST PORT - PETES PLUG
	MANUAL VOLUME DAMPER (VD)
	MOTORIZED DAMPER
	FIRE DAMPER (FD)
	SMOKE DAMPER (SD)
	SMOKE FIRE DAMPER (SFD)
	THERMOSTAT - HUMIDISTAT (ZONE SUBSCRIPT)
	CO: SENSOR
	TEMPERATURE CONTROL
	TEMPERATURE SENSOR

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 Expires 11/30/2023

REVISIONS

NO.	DATE	REMARKS

THE CONTRACTOR SHALL VERIFY CONDITIONS & DIMENSIONS ON THE JOB. INFORMATION SHOWN ON ANY PART OF THE DRAWINGS SHALL APPLY TO THE WORK UNLESS SET FORTH OTHERWISE.

PROJECT NO. 25821422
 ISSUE DATE 10/25/2022
 SHEET M4.1

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DUCT INSULATION SCHEDULE								
DUCT SYSTEM	DUCT LINER			EXTERNAL INSULATION				
	(Y/N)	THICK. (IN.)	DENSITY P.C.F.	(Y/N)	TYPE (IN.)	THICK. (IN.)	VAPOR BARRIER (Y/N)	FIELD APPLIED JACKET
INTERIOR RECTANGULAR								
SUPPLY AIR	Y	1/2	1 1/2	N	-	-	-	NONE
RETURN AIR	Y	1/2	1 1/2	N	-	-	-	NONE
FRESH AIR	Y	1/2	1 1/2	N	-	-	-	NONE
BUILDING EXHAUST AIR	Y	1/2	1 1/2	N	-	-	-	NONE
INTERIOR ROUND OR OVAL								
SUPPLY AIR	N	-	-	Y	F.G	1 1/2	Y	NONE
RETURN AIR	N	-	-	Y	F.G	1 1/2	Y	NONE
FRESH AIR	N	-	-	Y	F.G	1 1/2	Y	NONE
BUILDING EXHAUST AIR	N	-	-	Y	F.G	1 1/2	Y	NONE

PIPING MATERIAL SCHEDULE																		
PIPING						FITTINGS			OPERATING		FIELD TEST			INSULATION				
SYSTEM	SIZE	MATERIAL	SCH	ASTM	JOINTS	MAT.	SCH	JOINTS	PRESS (PSI)	TEMP (*F)	PRESS (PSI)	TYPE	TIME	THICKNESS	JACKET	TYPE		
MAKE-UP WATER	ALL	CP	L	B 88	SJ	CP	L	SJ	65	45-65	150	PNEU	1 HR	1"	--	FG		
HEAT PUMP LOOP INTERIOR (CLOSED)	<=2"	CP	L	B 88	SJ	CP	L	SJ	65	45-65	150	PNEU	1 HR	1"	--	FG		
HEAT PUMP LOOP INTERIOR (CLOSED)	>2"	BLK	10	A 135	VIC	DI	150#	VIC	65	45-65	150	PNEU	1 HR	1"	--	FG		
HEAT PUMP LOOP EXTERIOR (CLOSED)	ALL	HDPE	SDR 11	D 3350	F	HDPE	SDR-11	F	65	40-180	150	PNEU	1 HR	--	--	--		
HVAC CONDENSATE DRAIN PIPING	ALL	CP	L	B 88	SJ	CP	L	SJ	N/A	N/A	150	PNEU	1 HR	1"	--	FG		

PIPING MATERIAL LEGEND

ACR - COPPER (CLEAN AND CAPPED)
 BLK - BLACK STEEL PIPE
 CI - CAST IRON
 CP - COPPER
 ERW - ELECTRIC RESISTANCE WELD BLACK STEEL
 GLV - GALVANIZED
 HDPE - HIGH DENSITY POLYETHYLENE
 PVC - POLYVINYL CHLORIDE
 SL - SEAMLESS STEEL
 SS - STAINLESS STEEL

FITTING MATERIAL LEGEND

CI - CAST IRON
 CS - CARBON STEEL
 DI - DUCTILE IRON
 FS - 2000 # FORGED STEEL
 STD - STANDARD CS WELD
 XS - EXTRA STRONG

JOINING METHOD LEGEND

BS - BELL & SPIGOT
 CW - CONTINUOUS WELD
 F - FUSED
 LC - LEAD CAULKING
 MJ - MECHANICAL JOINT
 NH - NO-HUB
 S - BRAZED JOINT - SILVER BRAZING ALLOY
 SJ - SOLDER JOINT 95-5 TIN-ANTIMONY
 SW - SOLVENT WELD
 VIC-VICTAULIC WITH ROLLED GROOVE
 THRD - THREADED
 WELD - WELDED

INSULATION TYPE LEGEND

FG - FIBERGLASS
 ARM - ARMAFLEX
 ASJ - ALL SERVICE JACKET
 PVC - PVC JACKET
 A - ALUMINUM JACKET
 *2" INSULATION FOR PIPING > 5"
 **2" INSULATION FOR PIPING >1-1/4"
 ***3" INSULATION FOR PIPING > 5"
 ****INSULATE HORIZONTAL STORM ONLY
 *****3-1/2" INSULATION FOR PIPING >1-1/4"
 *****4-1/2" INSULATION FOR PIPING >5"

PUMP SCHEDULE												
MARK	MANUFACTURER	MODEL	GPM	HEAD FT. H2O	EFF. %	MOTOR			ELECTRICAL			REMARKS
						HP	RPM	VOLTS	Ø	MCA		
P-1	B&G	1510-2AD-ES	150	40	82	3.0	1800	480	3	6		1,2,3
P-2	B&G	1510-2AD-ES	150	40	82	3.0	1800	480	3	6		1,2,3
P-3	B&G	PL-55	45	10	-	2/5	-	120	1	12		4
P-4	B&G	PL-55	45	10	-	2/5	-	120	1	12		4

NOTES:

- ALL PUMP MOTORS SHALL BE PREMIUM EFFICIENCY, INVERTER READY AND HAVE SHAFT GROUNDING RING
- PUMPS P-1 AND P-2 SIZED TO OPERATE IN PARALLEL TO PRODUCE 300 GPM AT 40' HEAD.
- PROVIDE PUMPS WITH VFD'S.
- PUMPS P-3 AND P-4 SIZED TO OPERATE IN PARALLEL TO PRODUCE 90 GPM AT 10' HEAD.

SEQUENCE OF OPERATION

PRIMARY LOOP PUMPS:

STAGE 1: PUMPS P-1 AND P-2 SHALL BE EQUIPPED WITH VFD MOTORS CONTROLLED BY THE DIFFERENTIAL TEMPERATURE ACROSS THE BORE FIELD. THE LEAD PUMP SHALL OPERATE AT ALL TIMES AND SHALL SPEED UP OR SLOW DOWN AS REQUIRED TO MAINTAIN THE DIFFERENTIAL TEMPERATURE ACROSS THE BORE FIELD AT 12 DEG F IN THE SUMMER AND 6 DEG F IN THE WINTER. THE LEAD PUMP SHALL OPERATE AT A MINIMUM SPEED OF 20 HZ. THE CONTROLLER SHALL ALTERNATE P-1 AND P-2 OPERATION EVERY 750 HOURS (ADJUSTABLE) TO PROVIDE EQUAL RUN TIME.

STAGE 2: WHEN THE LEAD PUMP IS OPERATING AT 60 HZ AND CANNOT MAINTAIN THE SPECIFIED DIFFERENTIAL TEMPERATURE ACROSS THE BORE FIELD, THE SECOND PUMP SHALL BE ENERGIZED AND BOTH PUMPS SHALL OPERATE IN PARALLEL AT THE SAME FREQUENCY TO MAINTAIN THE SPECIFIED TEMPERATURE DIFFERENTIAL ACROSS THE BORE FIELD. WITH BOTH PUMPS OPERATING AND IF THE OPERATING SPEED OF THE PUMPS DROPS TO 40 HZ, THEN THE SECOND PUMP SHALL BE DE-ENERGIZED AND THE FIRST PUMP SHALL MODULATE AS DESCRIBED IN STAGE 1 ABOVE.

STAGE 3: WHEN THE LOOP TEMPERATURE RETURNING TO THE BORE FIELD DROPS TO 42F OR EXCEEDS 90F BOTH PUMPS SHALL BE PLACED IN OPERATION AT FULL SPEED UNTIL THE RETURN WATER TEMPERATURE RISES TO 47F OR DROPS TO 85F.

SECONDARY LOOP PUMPS:

SECONDARY LOOP PUMPS P-3 AND P-4 OPERATE AT CONSTANT SPEEDS TO PROVIDE FLOW TO A BRANCH LOOP OFF THE MAIN CONDENSER WATER LOOP. THE LEAD PUMP SHALL OPERATE AT FULL FLOW AT ALL TIMES. THE LAG PUMP SHALL BE ENERGIZED TO RUN BOTH PUMPS ANYTIME THE RETURN WATER TEMPERATURE IN THE LOOP IS BELOW 50 DEG F OR ABOVE 80 DEG F. THE CONTROLLER SHALL ALTERNATE P-3 AND P-4 OPERATION EVERY 750 HOURS (ADJUSTABLE) TO PROVIDE EQUAL RUN TIME.

SAFETIES

PUMP FAILURE - IF THE LEAD PUMP FAILS, A PUMP FAILURE ALARM SHALL BE COMMUNICATED THROUGH THE BAS AND THE OTHER PUMP SHALL BE STARTED. IF BOTH PUMPS FAIL AN ADDITIONAL ALARM SHALL BE COMMUNICATED THROUGH THE BAS.

LOW SYSTEM PRESSURE - IF LOW SYSTEM PRESSURE IS DETECTED AN ALARM SHALL BE COMMUNICATED THROUGH THE BAS.

ENERGY RECOVERY UNIT SCHEDULE													
MARK	MANUFACTURER	MODEL NO.	SUPPLY FAN			EXHAUST FAN			EFFECTIVENESS %	ELECTRICAL			NOTES
			CFM	E.S.P. "H2O	HP	CFM	E.S.P. "H2O	HP		VOLTS	Ø	AMPS	
ERU-1	SEMCO	FV-2000	1050	0.5	0.75	1,050	0.5	0.75	78	480	3	5.8	1,2,3,4,5,6
ERU-2	SEMCO	FV-3000	2250	0.5	1.5	2,000	0.5	1.50	77	480	3	7.8	1,2,3,4,5,6
ERU-3	SEMCO	FV-3000	2250	0.5	1.5	2,000	0.5	1.50	77	480	3	7.8	1,2,3,4,5,6

NOTES:

- PROVIDE WITH A GRAVITY BACKDRAFT DAMPER ON EXHAUST AND MOTORIZED OA DAMPER.
- PROVIDE WITH "AQ FLOW" AIRFLOW MONITORING STATION AND FACTORY INSTALLED DISCONNECT SWITCH.
- PROVIDE WITH STOP/JOG ECONOMIZER AND FROST PROTECTION.
- PROVIDE WITH A SINGLE VFD TO CONTROL BOTH SA AND EA FANS.
- PROVIDE WITH A CO2 SENSOR SHIPPED LOOSE FOR FIELD INSTALLATION.
- PROVIDE WITH INDOOR FILTER RACK ASSEMBLY.

LOW TEMPERATURE ALARM - IF THE TEMPERATURE SENSOR COMING BACK FROM THE BORE FIELD INDICATES A TEMPERATURE LESS THAN 38 DEG F AN ALARM SHALL BE COMMUNICATED THROUGH THE BAS.

HIGH TEMPERATURE ALARM - IF THE TEMPERATURE SENSOR COMING BACK FROM THE BORE FIELD INDICATES A TEMPERATURE GREATER THAN 100 DEG F AN ALARM SHALL BE COMMUNICATED THROUGH THE BAS.

WATER TO AIR HEAT PUMP OPERATION

THE WATER TO AIR HEAT PUMP UNITS SHALL OPERATE BASED ON A LOCAL TEMPERATURE/HUMIDITY SENSOR AND BACNET CONTROLS IN THE HEAT PUMP TO MAINTAIN THE SPACE TEMPERATURE AND HUMIDITY SETPOINT. THE TEMPERATURE SENSOR SHALL BE CONNECTED TO A BAS SYSTEM. THE HEAT PUMP UNIT FAN SHALL RUN WHEN THE UNIT CALLS FOR HEATING, COOLING, OR DEHUMIDIFICATION. THE CONTROLS SHALL MODULATE THE REVERSING VALVE TO HEATING OR COOLING AS REQUIRED, AND SHALL ENERGIZE THE INDIVIDUAL UNIT CIRCULATING PUMP WHENEVER THE COMPRESSOR IS COMMANDED ON. THE HEAT PUMP UNITS ARE PROVIDED WITH HOT GAS REHEAT COILS TO MAINTAIN SPACE RELATIVE HUMIDITY AT 65% (ADJUSTABLE) BASED ON THE SPACE HUMIDISTAT. UNIT OCCUPIED/UNOCCUPIED MODE SHALL BE DETERMINED BY THE BAS SYSTEM. IN UNOCCUPIED MODE THE UNIT SHALL BE SET BACK A MAXIMUM OF TWO DEGREES FROM SETPOINT.

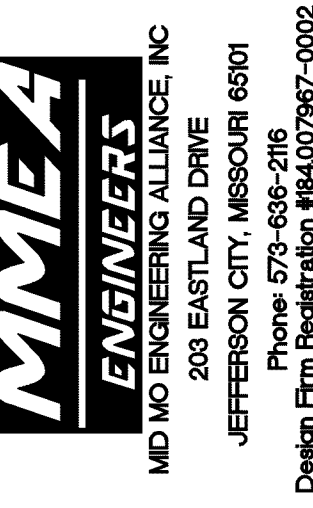
ENERGY RECOVERY UNIT OPERATION

THE ENERGY RECOVERY UNITS SHALL OPERATE TO PULL EXHAUST FROM THE SPACE TO PRETREAT THE REQUIRED OUTSIDE VENTILATION AIR FOR THE SPACES. THE BAS SHALL ENABLE THE ENERGY RECOVERY UNIT TO RUN DURING OCCUPIED TIMES AND BE SHUT OFF DURING UNOCCUPIED TIMES. FACTORY INSTALLED CONTROLS SHALL CONTROL THE ERU OPERATION INCLUDING THE WHEEL ROTATION, ECONOMIZER FUNCTION AND STOP/JOG DEFROST. THE ENERGY RECOVERY UNITS ARE PROVIDED WITH A VFD TO CONTROL THE SUPPLY AND EXHAUST FAN AIRFLOW BASED ON OCCUPANCY DETERMINED BY THE BAS. IN THE OCCUPIED MODE THE UNIT SHALL RUN AT LOW SPEED (30 HZ ON THE VFD) UNLESS THE SPACE CO2 LEVEL REACHES 3000 PPM AT WHICH TIME THE UNIT SHALL BE RAMPED UP TO FULL SPEED (60 HZ ON VFD) UNTIL THE SPACE CO2 LEVEL DROPS TO 1500 PPM. IN UNOCCUPIED MODE THE ERU SHALL REMAIN OFF UNLESS THE SPACE CO2 LEVEL REACHES 3000 PPM AT WHICH TIME IT SHALL RUN AT LOW SPEED AND SHALL TURN OFF WHEN THE SPACE CO2 LEVEL DROPS TO 1500 PPM. IF IN UNOCCUPIED MODE THE SPACE CO2 LEVEL CONTINUES TO RISE WITH THE ERU RUNNING IN LOW SPEED AND REACHES 4000 PPM THE ERU SHALL BE RAMPED UP TO HIGH SPEED UNTIL THE SPACE CO2 LEVEL DROPS TO 2000 PPM. ADDITIONALLY, THE ERU'S HAVE HEATPUMPS CONNECTED TO THE OUTSIDE AIR BEING SUPPLIED TO THE SPACE TO FURTHER CONDITION THAT AIR. SEE THE HPOA DETAIL FOR FURTHER INFORMATION ON THE CONTROL OF THOSE HEATPUMP UNITS.



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Wayne A. Strope
 062.068121

NO.	DATE	REVISIONS	REMARKS

THE CONTRACTOR SHALL VERIFY CONDITIONS & DIMENSIONS ON THE JOB. INFORMATION SHOWN ON ANY PART OF THE DRAWINGS SHALL APPLY TO THE WORK UNLESS SET FORTH OTHERWISE.

PROJECT NO. 25821422
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 SHEET

M4.2



- 2 GENERAL NOTES:**
1. DRAWINGS (PLANS, DETAILS AND SCHEMATICS ARE DIAGRAMMATIC IN NATURE AND INDICATE GENERAL LOCATION AND ARRANGEMENT OF NEW AND EXISTING MAJOR EQUIPMENT AND PIPING SYSTEMS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT, PIPING AND PIPING COMPONENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL TIE-IN POINT LOCATIONS BETWEEN NEW AND EXISTING PIPING SYSTEMS EQUIPMENT AND UTILITIES.
 2. UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN. NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.
 3. MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

- NOTES:**
- 1 2 #12 THHN, #12 CU GRD, 3/4" C BACK TO A 15A, 2P BRKR.
 - 2 2 #8 THHN, #10 CU GRD, 3/4" C BACK TO A 35A, 2P BRKR.
 - 3 3 #8 THHN, #10 CU GRD, 3/4" C BACK TO A 35A, 3P BRKR.
 - 4 3 #8 THHN, #10 CU GRD, 3/4" C BACK TO A 40A, 3P BRKR.
 - 5 3 #12 THHN, #12 CU GRD, 3/4" C CONNECTED TO EXISTING 15A, 480V CIRCUIT WHICH FED REMOVED PUMPS.
 - 6 3 #10 THHN, #10 CU GRD, 3/4" C CONNECTED TO EXISTING 30A, 480V SERVICE FROM REMOVED AHU.
 - 7 4 #3/0 THHN, #6 CU GRD, 2" C TO A NEW 200A, 3P BRKR IN EXISTING PANEL "1DPI" LOCATED IN ELECT. ROOM 116.

01 FIRST FLOOR NORTH
POWER RENOVATION PLAN
SCALE: 1"=1/8"

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LINCOLN ELEMENTARY SCHOOL DISTRICT #27
100 South Maple Street
Lincoln, IL 62656

WAYNE A. STROPE
REGISTERED PROFESSIONAL ENGINEER
OF ILLINOIS
Expires 11/30/2023

WAYNE A. STROPE
062.068121

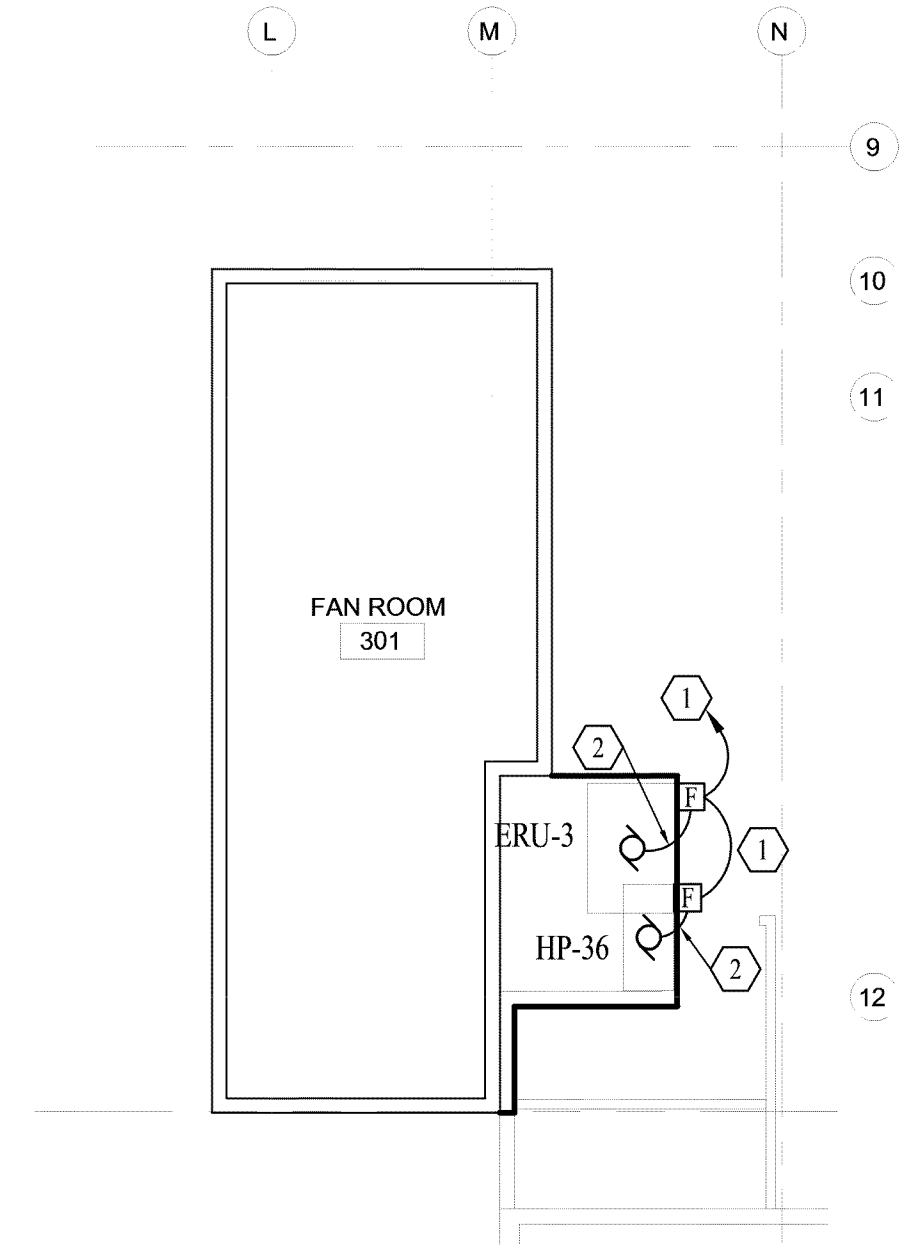
NO.	DATE	REVISIONS	REMARKS

THE CONTRACTOR SHALL VERIFY CONDITIONS & DIMENSIONS ON THE JOB. INFORMATION SHOWN ON ANY PART OF THE DRAWINGS SHALL APPLY TO THE WORK UNLESS SET FORTH OTHERWISE.

PROJECT NO. 25821422
ISSUE DATE 10/25/2022
SHEET E.1.1

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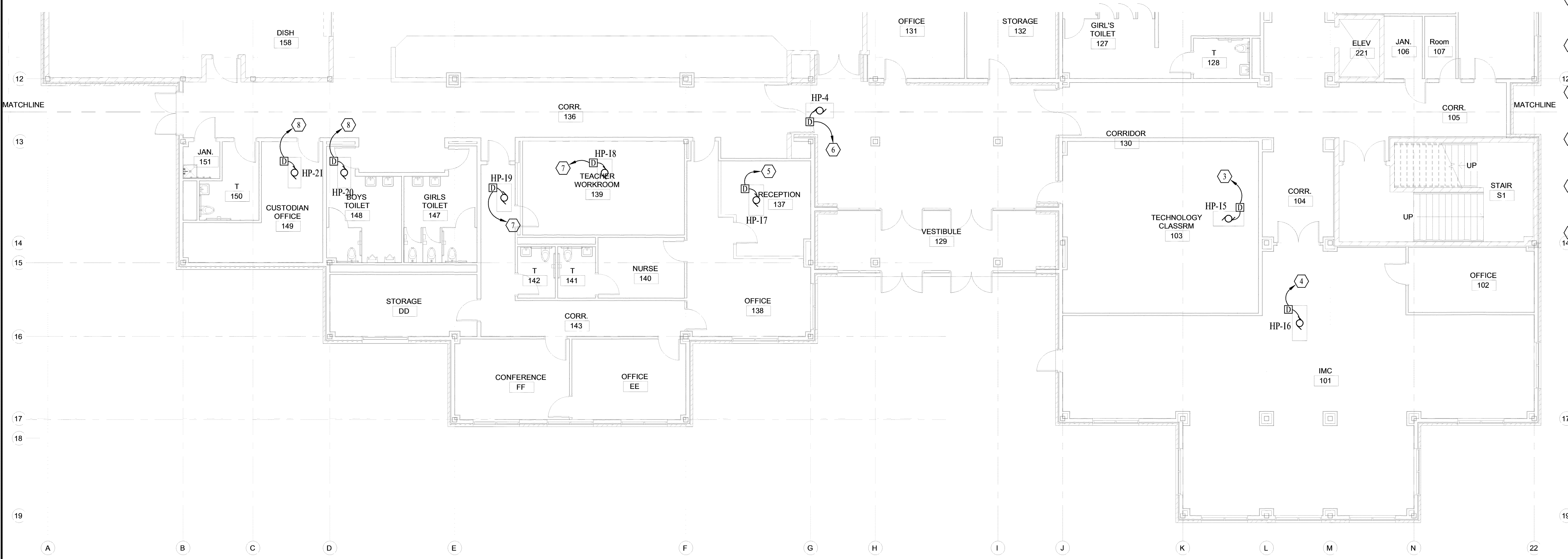
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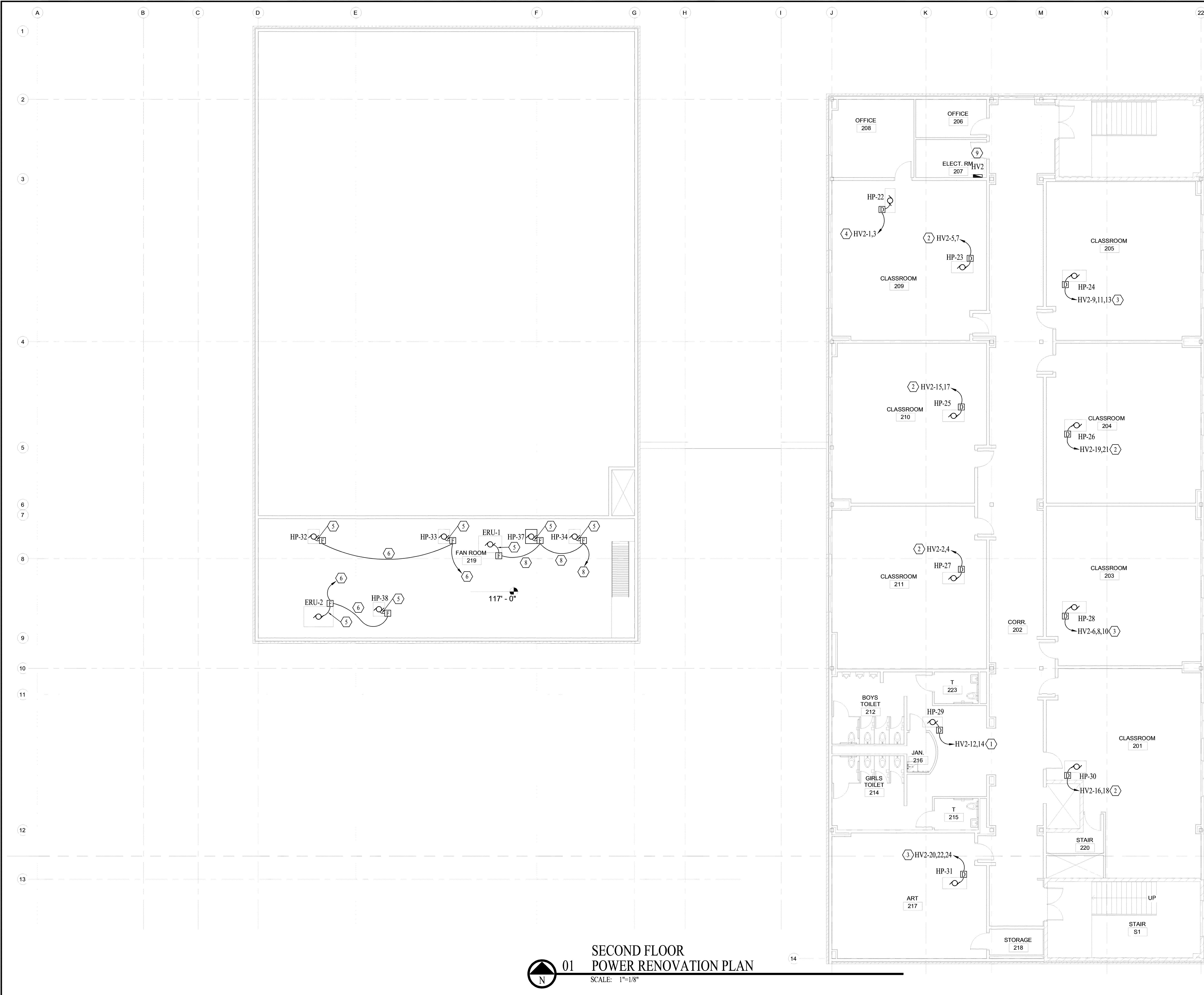
01 THIRD FLOOR POWER RENOVATION PLAN
SCALE: 1"=1/8"

- GENERAL NOTES:**
- DRAWINGS (PLANS, DETAILS AND SCHEMATICS ARE DIAGRAMMATIC IN NATURE AND INDICATE GENERAL LOCATION AND ARRANGEMENT OF NEW AND EXISTING MAJOR EQUIPMENT AND PIPING SYSTEMS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT, PIPING AND PIPING COMPONENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL TIE-IN POINT LOCATIONS BETWEEN NEW AND EXISTING PIPING SYSTEMS EQUIPMENT AND UTILITIES.
 - UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN. NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.
 - MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

- NOTES:**
- 3 #3 THHN, #8 CU GRD, 1-1/4" C CONNECTED TO EXISTING 80A, 480V CIRCUIT WHICH FED AHU-1.
 - 3 #12 THHN, #12 CU GRD, 3/4" C FROM 15A FUSED DISCONNECT.
 - 3 #8 THHN, #10 CU GRD, 3/4" C BACK TO A NEW 35A, 3P BRKR IN EXISTING PANEL 1L1P1 IN ELECT. 116.
 - 3 #8 THHN, #10 CU GRD, 3/4" C BACK TO A NEW 40A, 3P BRKR IN EXISTING PANEL 1L1P1 IN ELECT. 116.
 - 3 #8 THHN, #10 CU GRD, 3/4" C BACK TO A NEW 35A, 3P BRKR IN EXISTING PANEL 1PP2 IN ELECT. ROOM 168.
 - 2 #8 THHN, #10 CU GRD, 3/4" C BACK TO A NEW 35A, 2P BRKR IN EXISTING PANEL 1PP2 IN ELECT. ROOM 168.
 - 2 #8 THHN, #10 CU GRD, 3/4" C BACK TO A NEW 35A, 2P BRKR IN EXISTING PANEL 1TP2 IN ELECT. ROOM 168.
 - 2 #12 THHN, #12 CU GRD, 3/4" C BACK TO A NEW 20A, 2P BRKR IN EXISTING PANEL 1TP2 IN ELECT. ROOM 168.



01 FIRST FLOOR SOUTH POWER RENOVATION PLAN
SCALE: 1"=1/8"



GENERAL NOTES:

- DRAWINGS (PLANS, DETAILS AND SCHEMATICS ARE DIAGRAMMATIC IN NATURE AND INDICATE GENERAL LOCATION AND ARRANGEMENT OF NEW AND EXISTING MAJOR EQUIPMENT AND PIPING SYSTEMS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT, PIPING AND PIPING COMPONENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL TIE-IN POINT LOCATIONS BETWEEN NEW AND EXISTING PIPING SYSTEMS EQUIPMENT AND UTILITIES.
- UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN. NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.
- MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

NOTES:

- 2 #12 THHN, #12 CU GRD, 3/4" C BACK TO A 15A, 2P BRKR.
- 2 #8 THHN, #10 CU GRD, 3/4" C BACK TO A 35A, 2P BRKR.
- 3 #8 THHN, #10 CU GRD, 3/4" C BACK TO A 35A, 3P BRKR.
- 2 #12 THHN, #12 CU GRD, 3/4" C BACK TO A 20A, 2P BRKR.
- 3 #12 THHN, #12 CU GRD, 3/4" C FROM FUSED DISCONNECT TO EQUIPMENT.
- 3 #10 THHN, #10 CU GRD, 3/4" C CONNECTED TO EXISTING 30A, 480V SERVICE FROM REMOVED AHU.
- 3 #8 THHN, #10 CU GRD, 3/4" C CONNECTED TO EXISTING 35A, 480V SERVICE FROM REMOVED AHU.
- 4 #3/0 THHN, #6 CU GRD, 2" C TO A NEW 200A, 3P BRKR IN EXISTING PANEL "2DP1" LOCATED IN ELECT. ROOM 207.

01 SECOND FLOOR POWER RENOVATION PLAN
SCALE: 1"=18"

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ELECTRICAL SYMBOL SCHEDULE

ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON THE DRAWINGS

	HOME RUN CIRCUIT TO PANEL P1, BREAKER SPACES 12,14
	EACH ARROW INDICATES ONE CIRCUIT
	SHORT HATCH MARKS INDICATE # OF PHASE CONDUCTORS
	LONG HATCH MARKS INDICATE # OF NEUTRAL CONDUCTORS
	NO HATCH MARKS INDICATE TWO CONDUCTORS
	ADDITIONALLY, EVERY CIRCUIT TO INCLUDE CODE SIZED GROUND
	TIE TO EXISTING
	RECEPTACLE OUTLET (SINGLEPLEX - DUPLEX - QUADRUPLEX)
	CRITICAL RECEPTACLE OUTLET (SINGLEPLEX - DUPLEX - QUADRUPLEX)
	FLOOR DUPLEX RECEPTACLE - FLOOR QUADRUPLEX RECEPTACLE
	FLOOR SPECIAL POWER - SPECIAL POWER
	GROUND FAULT CIRCUIT INTERRUPT - WEATHER PROOF
	*HARD-WIRED WALL MOUNTED CLOCK
	JUNCTION BOX - PULL BOX - JUNCTION BOX ABOVE CEILING
	CONTACTOR - DISCONNECT - STARTER - FUSED DISCONNECT
	ELECTRIC MOTOR
	ELECTRIC PANEL
	WALL SWITCH SINGLE POLE (THREE POLE - TIMER SWITCH - DIMMER SWITCH)
	LIGHT FIXTURE (CEILING MOUNTED - WALL MOUNTED)
	FLUORESCENT LIGHT FIXTURE (ENCLOSED - STRIP)
	BATTERY PACK WITH EMERGENCY LIGHTS - EMERGENCY EXIT SIGN
	EMERGENCY EXIT WITH DUAL EMERGENCY LIGHTS
	LIGHT FIXTURES WITH EMERGENCY BATTERY PACK
	*J-BOX WITH BLANK FACE PLATE
	*FAX - FLOOR PHONE - WALL MOUNTED PHONE
	*COMPUTER DATA - FLOOR RECESSED COMPUTER DATA - DATA & COMMUNICATION
	INTERCOM
	SPEAKER
	CABLE TV
	CLOSED CIRCUIT TELEVISION
	MAGNETIC DOOR HOLDER
	END OF LINE RESISTOR
	FLOW SWITCH
	AUDIO VISUAL ALARM (NUMBER INDICATES CANDELA POWER)
	VISUAL ALARM (NUMBER INDICATES CANDELA POWER)
	AUDIO ALARM
	MANUAL PULL STATION
	TAMPER SWITCH
	DUCT MOUNTED SMOKE DETECTOR - HEAT DETECTOR - SMOKE DETECTOR
	FIRE ALARM CONTROL PANEL - TELEPHONE DIALER
	INTERLOCK RELAY

* MINIMUM 3/4" CONDUIT WITH JUNCTION BOX AND PULL STRING.

PANEL DESIGNATION: HV2										
PANEL DESCRIPTION: 208 VOLTS, 3Ø, 4W, S/N, 200A MLO, 42 CIRCUIT, WGRD, BAR KIT, SQ D NOOD										
CIRC #	CIRCUIT DESCRIPTION	BRKR AMPS	BRKR POLES	WATTS PER PHASE			BRKR POLES	BRKR AMPS	CIRCUIT DESCRIPTION	CIRC #
				A	B	C				
1	HP-22	20	2	546						
3	*			1204	546			2	35	HP-27
5	HP-23	35	2	1204						4
7	*			1204	645			3	35	HP-28
9	HP-24	35	3	645						8
11	*			645						10
13	*			645				2	15	HP-29
15	HP-25	35	2	1204						14
17	*			1204				2	35	HP-30
19	HP-26	35	2	1204						18
21	*			645				3	35	HP-31
23				1204						20
25				645						22
27										24
29										26
31										28
33										30
35										32
37										34
39										36
41										38
										40
										42
TOTAL VOLT-AMPS (VA) PER PHASE:				6530	7297	5984				
TOTAL CONNECTED LOAD (VA):				19811						
DIVERSITY (VA)										
SIMULTANEOUS LOAD (VA):				19811						
TOTAL AMPS				55						

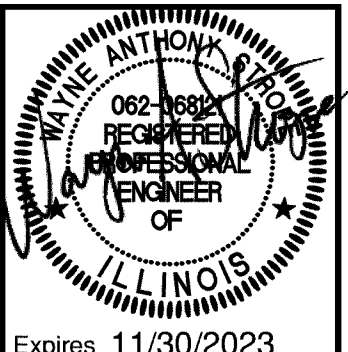
PANEL DESIGNATION: HV1										
PANEL DESCRIPTION: 208 VOLTS, 3Ø, 4W, S/N, 200A MLO, 42 CIRCUIT, WGRD, BAR KIT, SQ D NOOD										
CIRC #	CIRCUIT DESCRIPTION	BRKR AMPS	BRKR POLES	WATTS PER PHASE			BRKR POLES	BRKR AMPS	CIRCUIT DESCRIPTION	CIRC #
				A	B	C				
1	HP-1	35	3	645						2
3	*			1204	645			2	35	HP-8
5	*			1204						4
7	HP-2	35	3	645				2	35	HP-9
9	*			645						8
11	*			1204				2	35	HP-10
13	HP-3	35	3	645						12
15	*			1204	645			2	35	HP-11
17	*			1204						16
19	HP-5	40	3	1800				3	35	HP-12
21	*			645						18
23	*			1800						20
25	HP-6	35	2	1204						22
27	*			437				2	15	HP-13
29	HP-7	35	2	1204				2	35	HP-19
31	*			1204						30
33	PUMP P-3	15	1	1440						32
35	PUMP P-4	15	1	1440						34
37										36
39										38
41										40
										42
TOTAL VOLT-AMPS (VA) PER PHASE:				10437	11440	10673				
TOTAL CONNECTED LOAD (VA):				32550						
DIVERSITY (VA)										
SIMULTANEOUS LOAD (VA):				32550						
TOTAL AMPS				90						



State of Illinois Professional Design Firm Number 184.000267



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