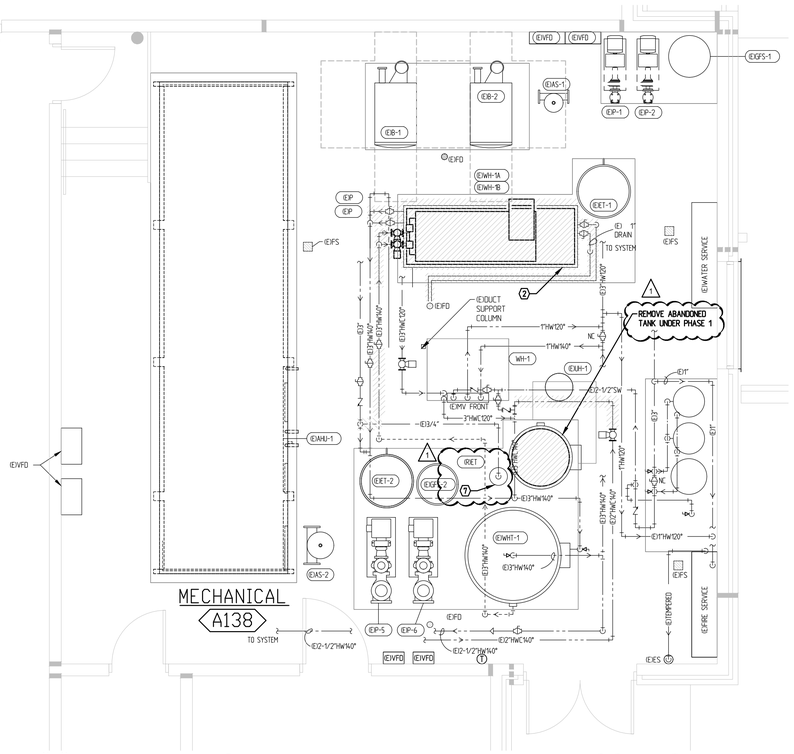
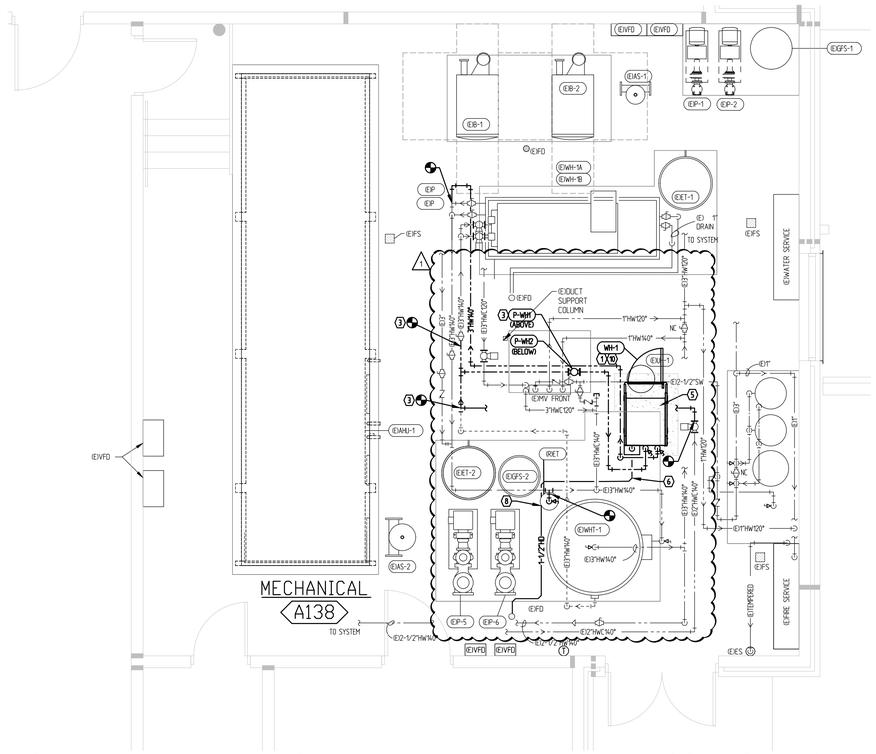


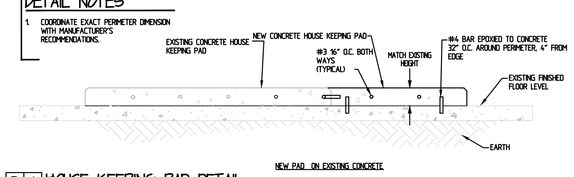
BLDG "A" DEMO FLOOR PLAN – MECHANICAL ROOM – HVAC PIPING PHASE 2
SCALE: 1/4" = 1'-0"



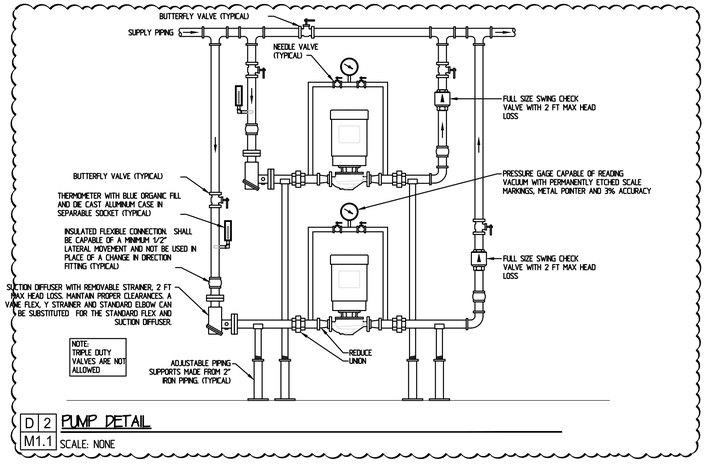
BLDG "A" NEW FLOOR PLAN – MECHANICAL ROOM – HVAC PIPING PHASE 1
SCALE: 1/4" = 1'-0"

DETAIL NOTES

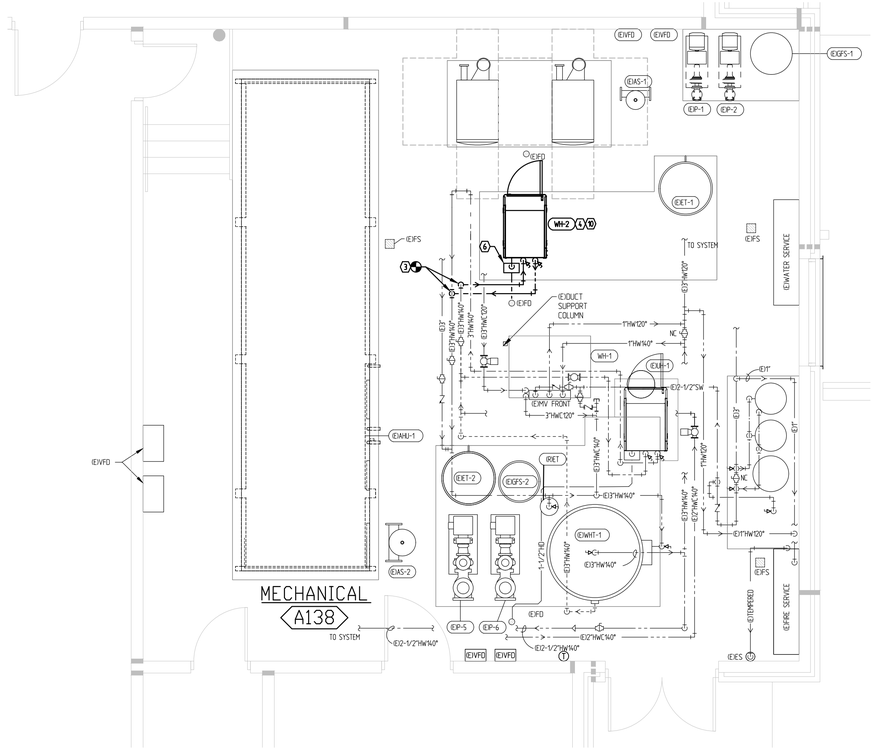
1. COORDINATE EXACT PERIMETER DIMENSION WITH MANUFACTURER'S RECOMMENDATIONS.



D 1 / M1.1 HOUSE KEEPING PAD DETAIL
SCALE: NONE



D 2 / M1.1 PUMP DETAIL
SCALE: NONE



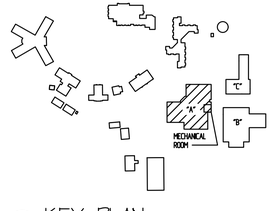
BLDG "A" NEW FLOOR PLAN – MECHANICAL ROOM – HVAC PIPING PHASE 3
SCALE: 1/4" = 1'-0"

KEY NOTES

KEY NOTE SYMBOL = ⑥

KEY NOTES

1. INSTALL WH-1 UNDER PHASE 1
2. DEMO EXISTING WATER HEATERS UNDER PHASE 2. REMOVE ALL ASSOCIATED PIPING, DUCT, CONTROLS AND SUPPORTS. LEAVE EXISTING PIPING AS REQUIRED FOR THE INSTALLATION OF WH-2 UNDER PHASE 3
3. CONNECT NEW WATER HEATERS TO EXISTING HOT WATER PIPING AS REQUIRED. ROUTE NEW 3" PIPING, FITTINGS AND PUMP AS REQUIRED.
4. INSTALL WH-2 UNDER PHASE 3. WH-2 SHALL BE INSTALLED AFTER EXISTING WATER HEATERS ARE REMOVED UNDER PHASE 2
5. EXTEND CONCRETE PAD AND INSTALL WATER HEATER TO ALLOW MIN 3' CLEARANCE TO BACK OF MIXING VALVE.
6. EXTEND WATER HEATER CONDENSATE DRAIN PIPING TO ACID NEUTRALIZATION TANK AND TO NEAREST FLOOR DRAIN. ROUTE PRV RELIEF PIPING TO NEAREST FLOOR DRAIN. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
7. RELOCATE EXISTING EXPANSION TANK TO LOCATION SHOWN.
8. NEW LOCATION OF RELOCATED EXPANSION TANK.
9. MOUNT WATER HEATER ON 8" TALL SUPPORT BRACKETS THAT ARE ANCHORED TO CONCRETE FOUNDATION.



KEY PLAN
SCALE: NONE

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CERTIFICATE OF AUTHORIZATION #CA1800

PROJECT #: 23-095

NEBRASKA CORRECTIONAL CENTER FOR WOMEN - BUILDING A WATER HEATER & NORTH HALL BOILER REPLACEMENT
1107 RECHARGE ROAD
YORK, NE. 68467-8003

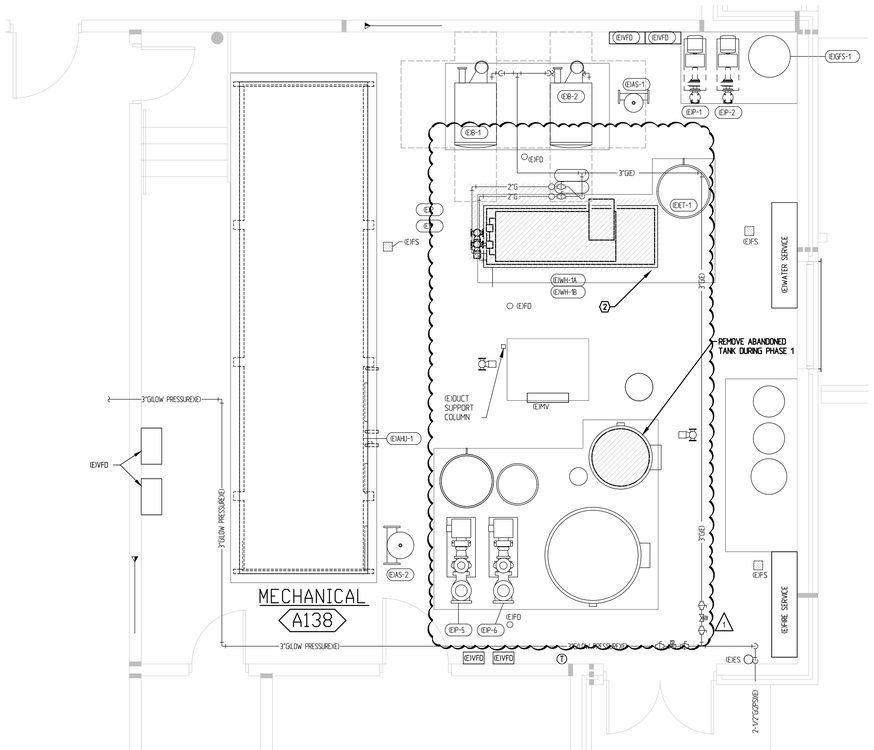
No.	Issued For	Date
1	ADDENDUM #1	12-5-23

DATE: 10/30/2023

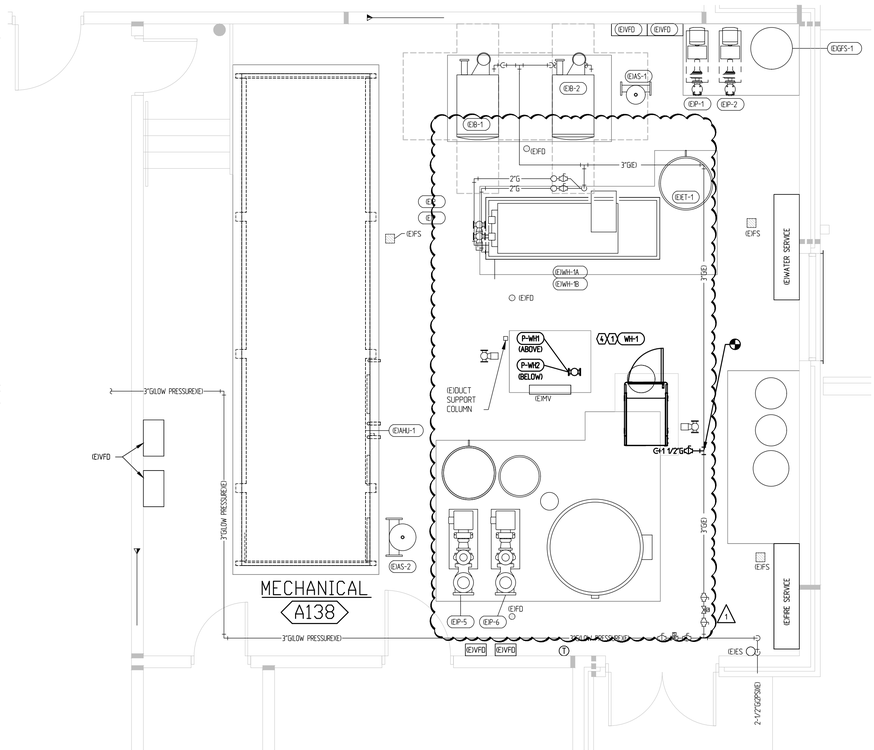
PROFESSIONAL MECHANICAL ENGINEER
KYLE J. WILKINSON
E-12957
12-5-2023
STATE OF NEBRASKA

BLDG "A" NEW AND DEMOLITION FLOOR PLANS MECHANICAL PIPING - MECHANICAL ROOM

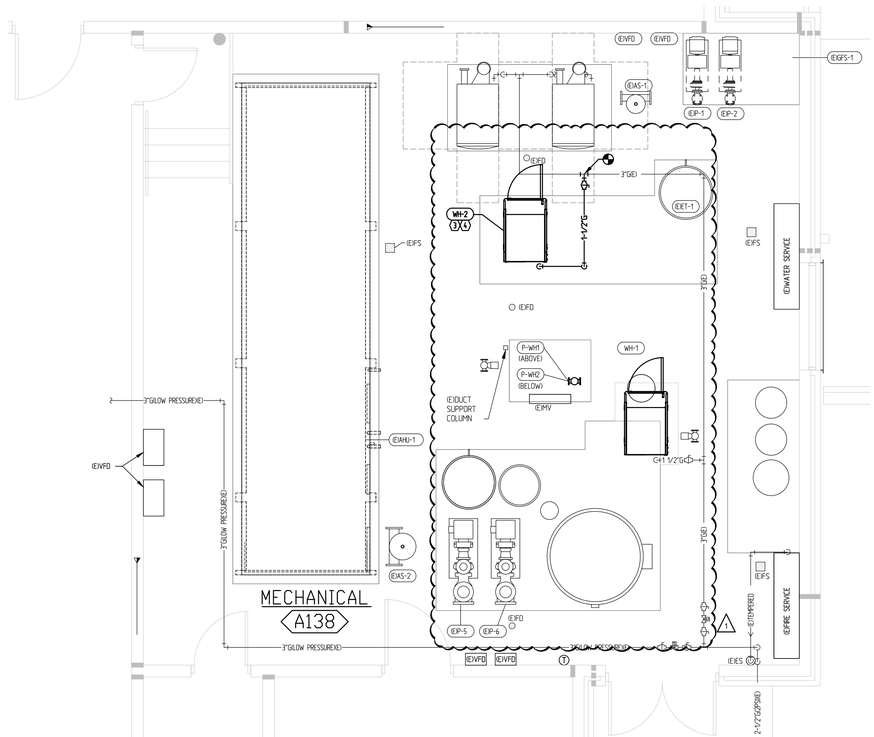
M1.1



BLDG "A" DEMO FLOOR PLAN – MECHANICAL ROOM – GAS PIPING PHASE 2
SCALE: 1/4" = 1'-0"



BLDG "A" NEW FLOOR PLAN – MECHANICAL ROOM – GAS PIPING PHASE 1
SCALE: 1/4" = 1'-0"



BLDG "A" NEW FLOOR PLAN – MECHANICAL ROOM – GAS PIPING PHASE 3
SCALE: 1/4" = 1'-0"

KEY NOTES

KEY NOTE SYMBOL = ⊛

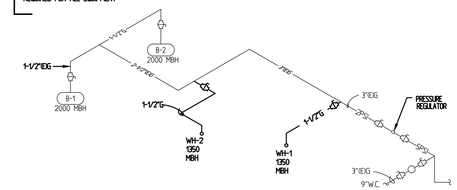
KEY NOTES

1. INSTALL WH-1 UNDER PHASE 1
2. DEMO EXISTING WATER HEATERS UNDER PHASE 2.
3. INSTALL WH-2 UNDER PHASE 3. WH-2 SHALL BE INSTALLED AFTER EXISTING WATER HEATERS ARE REMOVED UNDER PHASE 2
4. PROVIDE UNION, 3 INCH MINIMUM DIRT LEG, SHUT-OFF VALVE AND PRESSURE REGULATOR TO OUTSIDE IF REQUIRED. PROVIDE A UNION ON BOTH SIDES OF REGULATOR MUST BE INSTALLED IN HORIZONTAL POSITION DOWN STREAM OF DIRT LEG.

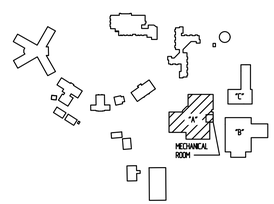
GAS RISER DESIGN CRITERIA

SYSTEM BASED ON

- ADDED GAS LOAD -900 MBH (2,700 NEW, 3,600 DEMO)
- EXISTING AND NEW GAS LOAD 8,590 MBH -900 MBH= 7690 MBH APPROX. 50' LONGEST RUN.
- 2 PSI SYSTEM INLET PRESSURE
- CONTRACTOR TO PROVIDE, INSTALL AND VENT PRESSURE REGULATORS TO OUTSIDE AS REQUIRED FOR ALL EQUIPMENT



R 1 / M1 GAS RISER
SCALE: NONE



KEY PLAN
SCALE: NONE

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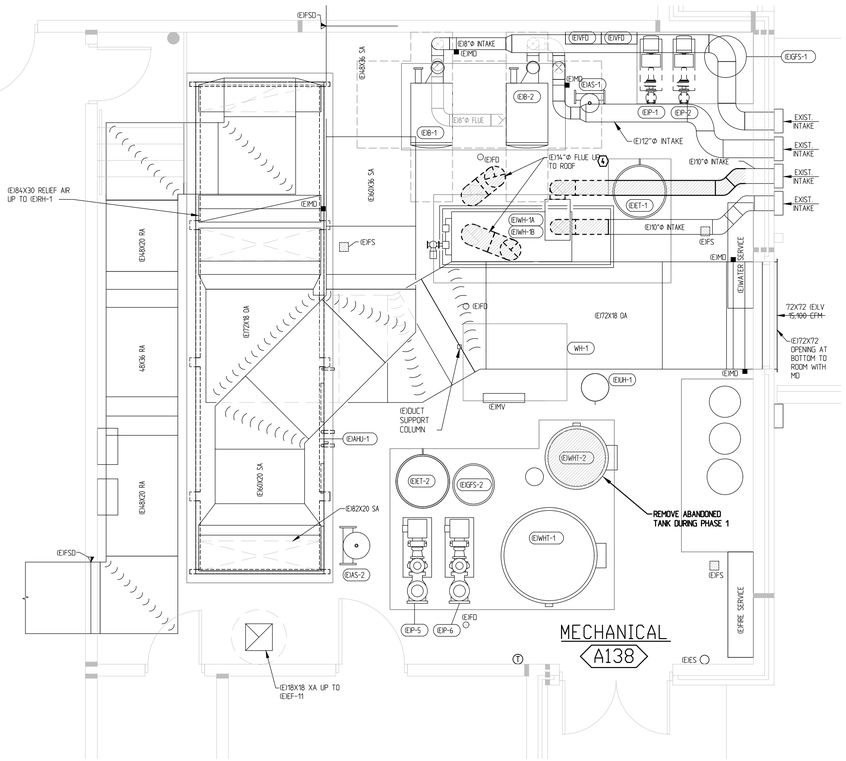
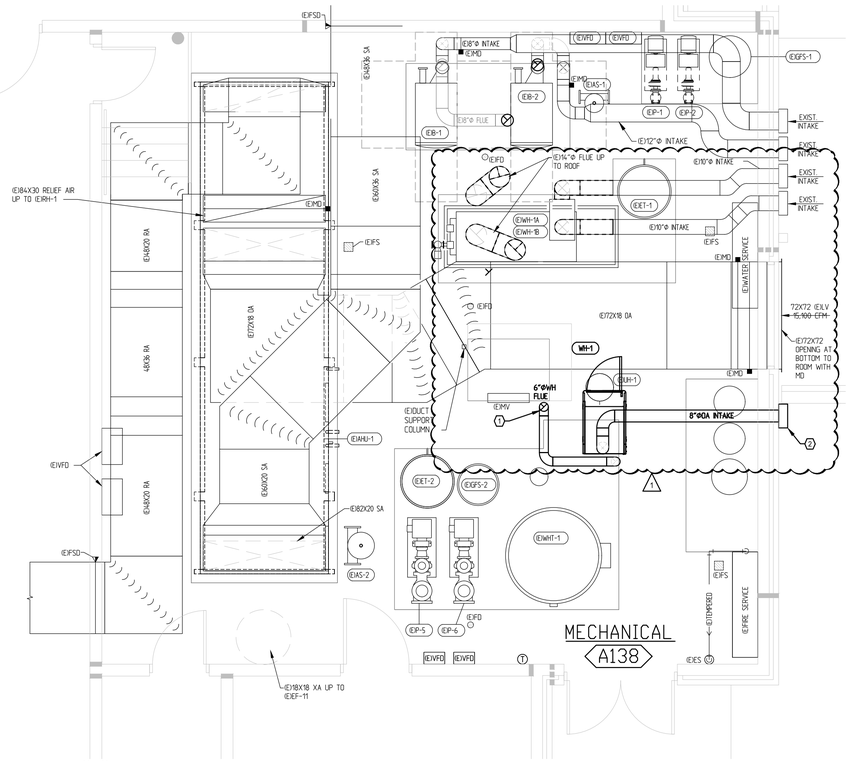
KYLE J. WILKINSON
E-12957
12-5-2023
STATE OF NEBRASKA

BLDG "A" NEW AND DEMOLITION FLOOR PLANS GAS PIPING - MECHANICAL ROOM

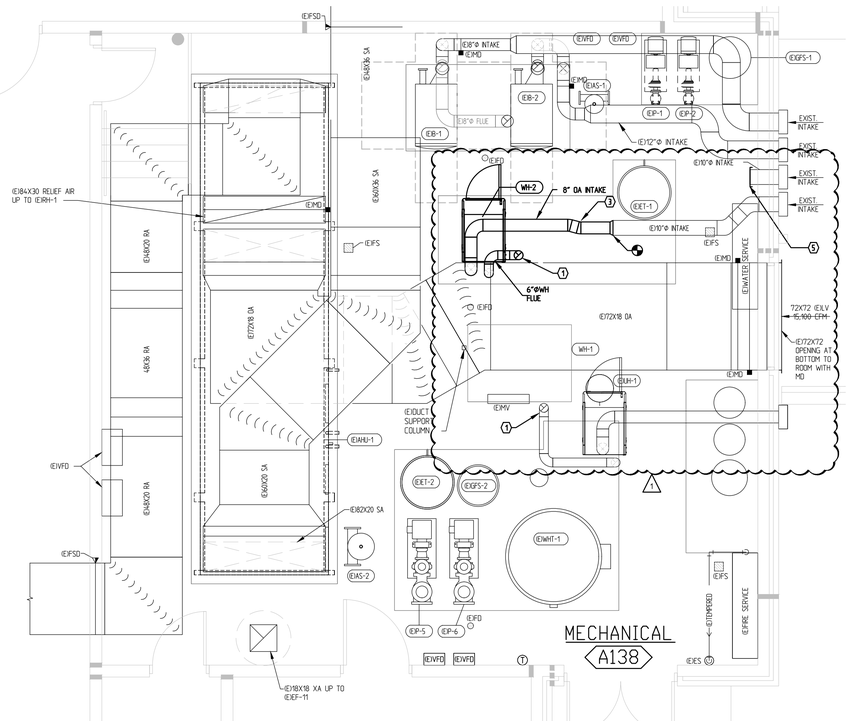
M1.2



BLDG "A" DEMO FLOOR PLAN – MECHANICAL ROOM – HVAC DUCT PHASE 2
SCALE: 1/4" = 1'-0"



BLDG "A" DEMO FLOOR PLAN – MECHANICAL ROOM – HVAC DUCT PHASE 1
SCALE: 1/4" = 1'-0"



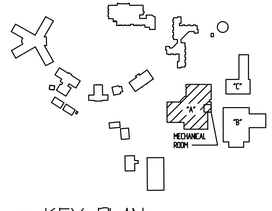
BLDG "A" DEMO FLOOR PLAN – MECHANICAL ROOM – HVAC DUCT PHASE 3
SCALE: 1/4" = 1'-0"

KEY NOTES

KEY NOTE SYMBOL = ⊛

KEY NOTES

1. EXTEND NEW FLUE FROM NEW WATER HEATER AND TERMINATE THOUGH ROOF PER MANUFACTURERS RECOMMENDATIONS. FLASH ROOF AS REQUIRED.
2. EXTEND NEW COMBUSTION AIR DUCT OUT WALL PER MANUFACTURERS RECOMMENDATIONS. SEAL AS REQUIRED.
3. EXTEND NEW COMBUSTION AIR DUCT AND CONNECT TO EXISTING COMBUSTION AIR DUCT AS REQUIRED. OFFSET AS REQUIRED.
4. REMOVE EXISTING WATER HEATER FLUE AND REPAIR ROOF AS REQUIRED COORDINATE WITH NEW FLUE TERMINATION. INSURE ABANDONED ROOF IS REPAIRED BEFORE COMPLETION OF NCCW ROOF REPLACEMENT PROJECT.
5. CAP EXISTING COMBUSTION AIR DUCT.



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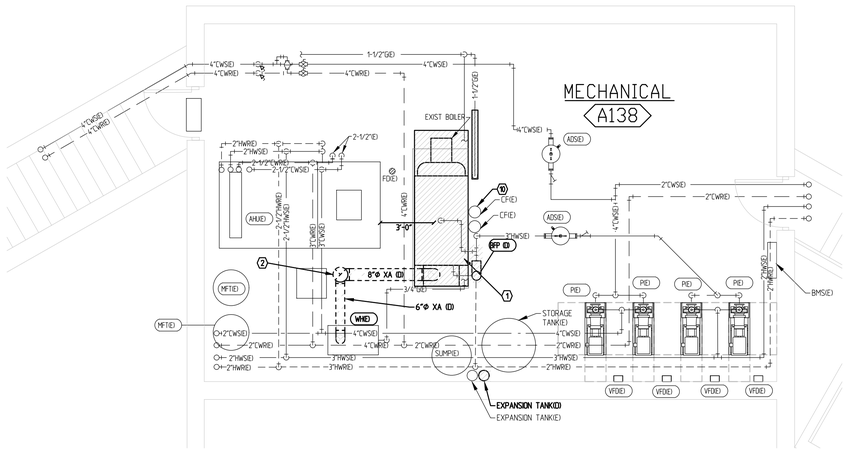
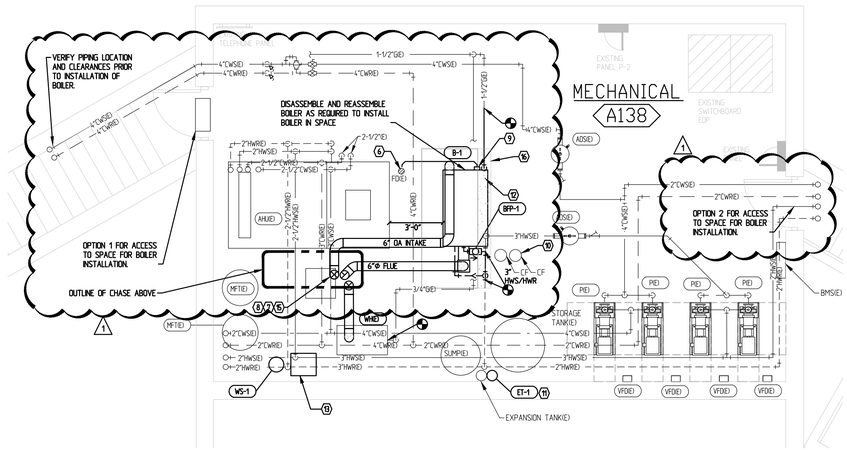
BLDG "A" NEW AND DEMOLITION FLOOR PLANS MECHANICAL DUCT - MECHANICAL ROOM

M1.3



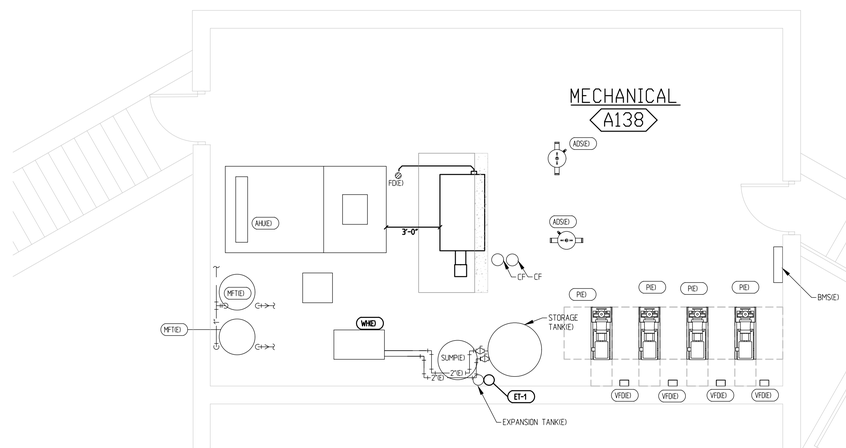
BASEMENT LEVEL MECHANICAL DEMOLITION PLAN – BASE BID
SCALE: 1/4" = 1'-0"



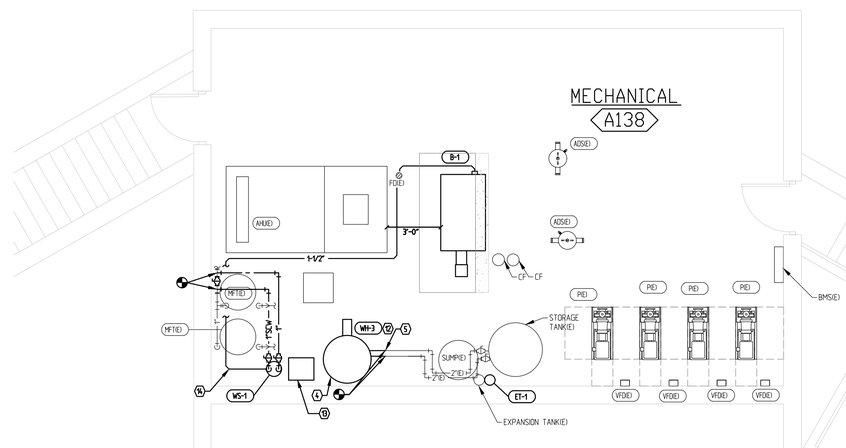
BASEMENT LEVEL MECHANICAL NEW PLAN – BASE BID
SCALE: 1/4" = 1'-0"

BASEMENT LEVEL MECHANICAL DEMOLITION PLAN – ALTERNATE BID
SCALE: 1/4" = 1'-0"

BASEMENT LEVEL MECHANICAL NEW PLAN – ALTERNATE BID
SCALE: 1/4" = 1'-0"



BASEMENT LEVEL DOMESTIC NEW PLAN – BASE BID
SCALE: 1/4" = 1'-0"



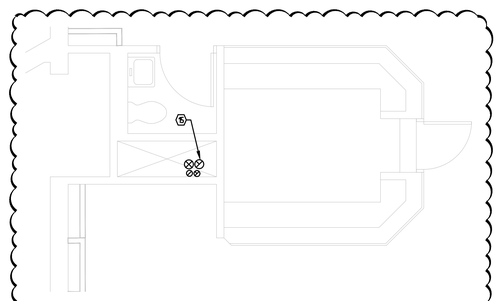
BASEMENT LEVEL DOMESTIC NEW PLAN – ALTERNATE BID
SCALE: 1/4" = 1'-0"

KEY NOTES

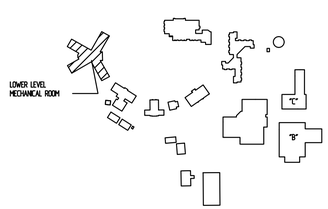
KEY NOTE SYMBOL = ⑥

KEY NOTES

1. REMOVE EXISTING BOILER AND ALL ASSOCIATED PIPING, DUCT, ELECTRICAL, AND CONTROLS AS SHOWN.
2. REMOVE ALL FLUE PIPING FROM EXISTING WATER HEATER AND BOILER UP THOUGH CHASE AND ROOF. PATCH ROOF AS REQUIRED.
3. REMOVE EXISTING WATER HEATER AND DUCT, PIPING, CONTROLS AND SUPPORTS.
4. UNDER ALTERNATE 1, REPLACE EXISTING WATER HEATER AND DISCONNECT AND RECONNECT ALL PIPING AS REQUIRED. CONNECT NEW FLUE/INTAKE TO HEATER PER MANUFACTURER RECOMMENDATIONS.
5. CONNECT NEW WATER HEATER TO EXISTING DOMESTIC PIPING. VERIFY EXACT SIZE AND LOCATION PRIOR TO INSTALLATION.
6. EXTEND 1" DRAIN AND PRV DRAIN TO NEAREST FLOOR DRAIN.
7. EXTEND INTAKE AND EXHAUST PIPING FROM WATER HEATER AND BOILER UP THOUGH ROOF. TERMINATE PER MANUFACTURERS RECOMMENDATIONS. ALL SIZING BASED ON MANUFACTURER RECOMMENDATIONS.
8. INSURE MODIFIED ROOF OPENING IS COORDINATED WITH NCCW ROOF REPLACEMENT PROJECT TO INSURE ROOF WARRANTY IS MAINTAINED.
9. PROVIDE WITH AERCO CONDENSATE NEUTRALIZER KIT. EXTEND FULL SIZE PIPING TO EXISTING FLOOR DRAIN.
10. REMOVE CHEMICAL FEEDERS DURING NEW BOILER INSTALLATION AND THEN REINSTALL AFTER NEW BOILER IS INSTALLED.
11. CONNECT NEW EXPANSION TANK TO EXISTING PIPING. FOR HEATING HOT WATER SYSTEM AS REQUIRED REWORK EXISTING PIPING AS REQUIRED AND CONNECT TO NEW TANK. VERIFY SYSTEM PRESSURE AND SET AS NEEDED.
12. PROVIDE UNION, 3 INCH MINIMUM DIRT LEG, SHUT-OFF VALVE AND PRESSURE REGULATOR TO OUTSIDE IF REQUIRED. PROVIDE A UNION ON BOTH SIDES OF REGULATOR MUST BE INSTALLED IN HORIZONTAL POSITION DOWN STREAM OF DIRT LEG.
13. UNDER ALTERNATE 2, INSTALL NEW WATER SOFTENER TO SERVE HYDRONIC SYSTEMS MAKE UP FEED WATER. REWORK EXISTING WATER PIPING AS REQUIRED. UNIT TO BE PROVIDE WITH INTEGRAL CONTROLLER REQUIRING 120V/1Ø AMP. MOUNT CONTROLLER ON WALL AT EASILY ACCESSIBLE LOCATION.
14. EXTEND WATER SOFTENER FULL SIZE DRAIN TO FLOOR DRAIN.
15. EXTEND INTAKE AND EXHAUST PIPING FROM BOILER UP THROUGH ROOF. TERMINATE PER MANUFACTURERS RECOMMENDATIONS. ALL SIZING AND ROUTING BASED ON MANUFACTURERS RECOMMENDATIONS. CONTRACTOR TO OPEN UP CHASE WALLS TO FACILITATE REMOVE OF EXISTING FLUE AND INSTALLATION OF NEW FLUES/INTAKES). CONTRACTOR TO PATCH AND PAINT WALLS TO MATCH EXISTING CONDITIONS. CONTRACTOR TO INCLUDE ALL ROOF MODIFICATIONS. HOLES AND PATCHING/ FLASHING AS REQUIRED WHILE MAINTAINING ROOF WARRANTY.
16. EXTEND CONCRETE PAD AND INSTALL BOILER TO ALLOW MIN 3' CLEARANCE FROM THE AHU. SEE DETAIL ON SHEET M1.1



FIRST FLOOR CHASE LOCATION
SCALE: 1/4" = 1'-0"



KEY PLAN
SCALE: NONE

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NORTH HALL NEW AND DEMOLITION FLOOR PLANS MECHANICAL - MECHANICAL ROOM

M1.4

FLUSHING & PURGING SPECIFICATIONS & PROCEDURES

NEW PIPING AND SYSTEMS SHALL BE FLUSHED AND PURGED BY A INDEPENDENT 3RD PARTY UNDER THIS CONTRACT.

ALL MAINS, BRANCHES AND ZONES SHALL BE CLEANED AND TREATED BY THE FOLLOWING STEPS.
OWNER / ENGINEER SHALL BE GIVEN 72 HOURS NOTICE PRIOR TO EACH STEP BEING PERFORMED.

SCOPE:
CONTRACTOR RESPONSIBLE TO FLUSH THE HOT WATER HEATING PIPING SYSTEM. THE MECHANICAL CONTRACTOR SHALL FLUSH OUT AND CLEAN NEW PIPING AND RE-FILL SYSTEM WITH WATER, CHEMICAL AND GLYCOL PER CHEMICAL SUPPLIERS RECOMMENDATIONS.

OWNER CHEMICAL SUPPLIER IS ROCHESTER MIDLANDS. CONTACT STEVE MEYER 402-681-6530.

MECHANICAL SCHEDULES

PROVIDE SPECIFIED OR APPROVED EQUAL

PUMPS

MARK	MANUFACTURER	MODEL #	GPM	FEET HEAD	MINIMUM PUMPING NO FLOW EFFICIENCY	PUMP DATA HD	MOL HP	NPSH	FLUID	MOTOR DATA HP	VOLT	PHASE	RPM	TYPE	PUMP TYPE	COUPLING TYPE	SYSTEM SERVED	NOTES
BFP-1	ARMSTRONG	4380 1205	70	60	51%	82'	-	9'	35% PG	3	208	3	3284	PSC	INLINE	DIRECT	NORTH HALL HEATING HOT WATER	1
P-WH1	ARMSTRONG	4380 1503	80	30	70%	45'	-	12.8'	WATER	1	208	3	3818	PSC	INLINE	DIRECT	BLDG A DOMESTIC HOT WATER	1
P-WH2	ARMSTRONG	4380	80	30	70%	45'	-	12.8'	WATER	1	208	3	3818	PSC	INLINE	DIRECT	BLDG A DOMESTIC HOT WATER	1

PUMP SCHEDULE NOTES

1. BRONZE CONSTRUCTION.

DOMESTIC WATER HEATERS

PROVIDE SPECIFIED IN BASE BID. PROVIDE ALTERNATIVE (+ OR -) FOR DIFFERENT MANUFACTURER/MODEL TO MEET SAME REQUIREMENTS.

MARK	MANUFACTURER	MODEL #	STORAGE GALLONS	ELECTRIC HEATER VOLT	PHASE	WATTS	EFFICIENCY %	GAS HEATER TYPE	MBH INPUT	EFFICIENCY %	1ST HR RATING-GALLONS	GALLONS/HOUR RECOVERY AT 100° TEMP. RISE	TEMP. SET POINT	DWH LOCATION	AREAS SERVED	NOTES
WH-1	AERCO (OR EQUALS)	INN1250-N	20	-	-	-	-	NATURAL	1350	96	1448	1428	140°	BLDG A MECHANICAL ROOM	BUILDING	1,2,4,6,8
WH-2	AERCO (OR EQUALS)	INN1250-N	20	-	-	-	-	NATURAL	1350	96	1448	1428	140°	BLDG A MECHANICAL ROOM	BUILDING	1,2,4,6,8
WH-3	BOCK	OT199N-A	99	-	-	-	-	NATURAL	199	94	299	299	140°	NORTH HALL MECHANICAL ROOM	BUILDING	1,2,3, 5,7

DOMESTIC WATER HEATER SCHEDULE NOTES

1. ALL DOMESTIC WATER HEATERS SHALL BE UL LISTED.
2. PROVIDE LISTED PRESSURE AND TEMPERATURE DEVICE, SIZED PER HEATER INPUT, WITH WATER HEATER. PROVIDE WITH AUTOMATIC TEMPERATURE CONTROL. PROVIDE ACID NEUTRALIZATION KIT.
3. VERIFY PH LEVEL OF WATER IN AREA AND PROVIDE MANUFACTURER RECOMMENDED ZYNC COATED ANODE ROD.
4. WATER HEATER REQUIRES 120 VOLT, 1Ø, 20 MOP, 19 F.L.A.
5. WATER HEATER REQUIRES 120 VOLT, 1 PHASE, 20 MOP.
6. PROVIDE INTEGRAL CONTROLLER TO CONTROL WATER HEATERS.
7. WATER HEATER SHALL BE ADDED UNDER ALTERNATIVE 1.
8. PROVIDE BACNET CARD.

WATER SOFTENER

MARK	MANUFACTURER	MODEL #	QNTY	CONTINUOUS GPM	PEAK GPM	PIPE SIZE	EXCHANGE CAPACITY GRAINS	EXCHANGE CAPACITY LB SALT	SOFTENER TANK DIA.	SOFTENER TANK HEIGHT	BRINE TANK SIZE	BRINE TANK HEIGHT	SOFTENER LOCATION	NOTES
WS-1	EASY WATER	SP-1054-1C	1	12	15	1"	48,000	45	10	55	15X17	36	NORTH HALL MECHANICAL ROOM	1,2,3,4,5,6

WATER SOFTENER SCHEDULE NOTES

1. ALL DIMENSIONS IF NOT SPECIFIED ARE IN INCHES.
2. EXCHANGE CAPACITIES BASED ON TREATING WATER CONTAINING 10 GRAIN HARDNESS PER GALLON AND AT 50% OF PEAK FLOW RATE.
3. DIMENSIONS OF TANKS ARE MAXIMUM ALLOWED SIZES.
4. SOFTENER SHALL BE CONTROLLED BY PROGRESS FLOW DUPLEX METERED REGENERATION.
5. PROVIDE ONE (1) SOFTENER TANKS AND ONE (1) BRINE TANK.
6. SOFTENER BRINE TANK SHALL BE FILLED WITH SALT TO ABOVE THE NORMAL WATER LEVEL AT SUBSTANTIAL COMPLETION.

START-UP / TESTING

BEFORE SUBSTANTIAL COMPLETION THE CONTRACTOR/MANUFACTURER'S REPRESENTATIVE MUST START ALL EQUIPMENT SCHEDULED AND SUBMIT DETAILED START-UP SHEETS (TO BE APPROVED BY ENGINEER DURING SUBMITTAL PHASE) TO THE ENGINEER/OWNER FOR REVIEW. UNITS MUST BE FUNCTIONAL TESTED IN ALL SCENARIOS (HEATING, COOLING, DEHUMIDIFICATION, ON, AUTO.). SYSTEM COMPONENTS INCLUDE (BUT NOT LIMITED TO) VALVES, DAMPERS AND SENSORS SHALL ALSO BE TESTED UNDER OPERATIONAL SCENARIOS TO ENSURE PROPER OPERATION.

BEFORE EACH PHASE OF TESTING THE OWNER/ENGINEER SHALL BE GIVEN 72 HOURS NOTICE TO BE ABLE TO OVERSEE TESTING.

DUCT MATERIAL AND INSULATION

DUCT	DUCT LOCATION	SPACE	DUCT CONSTRUCTION MATERIAL	TYPE	CONNECTION	DUCT INSULATION TYPE	MATERIAL TYPE	SKIN TYPE	THICKNESS	DENSITY LB/FT³	MINIMUM INSTALLED "R" VALUE	NOTES
CONDENSING WATER HEATER AND BOILER FLUE	CONCEALED / EXPOSED	SAME FOR ALL CONDITION TYPES	STAINLESS STEEL	CATEGORY IV	INTERLOCKING CONNECTION	-	-	-	-	-	-	1,2,3
COMBUSTION AIR INTAKE	CONCEALED / EXPOSED	SAME FOR ALL CONDITION TYPES	GALVANIZED STEEL	SINGLE WALL	SCREWED	-	-	-	-	-	-	1
NON-CONDENSING FLUE	CONCEALED / EXPOSED	SAME FOR ALL CONDITION TYPES	GALVANIZED STEEL	TYPE B DOUBLE WALL	INTERLOCKING CONNECTION	-	-	-	-	-	-	1

SPACE DEFINITION

- PARTIALLY CONDITIONED SPACE: A SPACE THAT HAS A TEMPERATURE DIFFERENTIAL BETWEEN THE AIR IN DUCT AND THE SURROUNDING GREATER THAN 15°. EXAMPLES INCLUDE: ATTIC SPACE (WITH INSULATION ON ROOF), CRAWL SPACE, GARAGE, MECHANICAL / ELECTRICAL ROOM, NON PLENUM RETURN CEILING SPACE.
- CONDITIONED SPACE: A SPACE THAT HAS A TEMPERATURE DIFFERENTIAL BETWEEN THE AIR IN DUCT AND THE SURROUNDING LESS THAN 15°. EXAMPLES INCLUDE: ABOVE CEILING RETURN PLENUM SPACE, HEATED AND COOLED SPACE.
- UNCONDITIONED SPACE: A SPACE WHOSE TEMPERATURE IS THE SAME AS OUTDOORS OR WORSE (FURTHER FROM ROOM SET POINT) OR IS THE OUTDOORS. EXAMPLES INCLUDING: ATTIC WITH INSULATION AT CEILING, DUCT CHASES.
- EXTERIOR (OUTSIDE): LOCATED OUTSIDE OF THE BUILDING ENVELOPE. EXPOSED TO THE WEATHER.

WHERE DUCT INSULATION IS SPECIFIED:

- ALL DUCTS SHALL BE COMPLETELY INSULATED ON ALL SIDES ENCOMPASSING DUCT SUPPORTS/ HANGERS WITH INSULATION SEALED TO SUPPORTS AS THEY PENETRATE INSULATION.
- ALL SUPPLY AND FRESH AIR DIFFUSERS AND REGISTERS INCLUDING DUCT BOOTS SHALL BE COMPLETELY WRAPPED IN INSULATION DOWN TO THE CEILING TO PREVENT CONDENSATION.
- ALL INSULATION HOLES FROM TESTING AND BALANCING SHALL BE RE-SEALED.
- ALL BALANCING DAMPERS SHALL HAVE THE HANDLES OUTSIDE THE INSULATION, WITH A PROPER STANDOFF/ SHAFT LENGTH TO ALLOW PROPER DAMPER ADJUSTMENT.

DUCT LOCATION DEFINITION

- CONCEALED: ANY NON VISIBLE DUCT. EXAMPLES INCLUDE: MECHANICAL ROOMS, JANITORS ROOMS, ATTICS AND CRAWL SPACES.
- EXPOSED: ANY VISIBLE DUCT IN ANY PUBLIC OR OCCUPIABLE SPACE. EXAMPLES INCLUDE: STORAGE ROOMS, CLOSETS.

DUCT MATERIAL AND INSULATION SCHEDULE NOTES

1. ALL DUCTWORK SHALL BE CONSTRUCTED, REINFORCED AND SUPPORTED ACCORDING TO CURRENT MECHANICAL CODE, SMACNA STANDARDS, AND PER REQUIREMENTS OF CURRENT EDITION OF INTERNATIONAL ENERGY CODES. DUCTS SHALL BE CONSTRUCTED BASED ON THE TOTAL FAN PRESSURE THE DUCTS ARE CONNECTED TO (A MINIMUM OF 2") AND BE TAKEN AS POSITIVE ON THE FAN DISCHARGE SIDE AND NEGATIVE ON THE FAN SUCTION SIDE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE FAN PRESSURES BEFORE BIDDING AND CONSTRUCTION. SINGLE WALL DUCT SHALL BE SEALED WITH EITHER FOIL TAPE OR DUCT SEAL COMPOUND ON ALL JOINTS INCLUDING LONG TRANSVERSE JOINTS. FOR LOW PRESSURE (< 2" W.C.) NON SPIRAL DUCT, ADJUSTABLE 1xRADIUS ELBOWS AND SNAPLOCK PIPE ARE ACCEPTABLE. FOR DUCT MATE/TDC CONNECTIONS FOAM TAPE, PLASTIC CLEATS ARE NOT ACCEPTABLE, BUTYL TAPE, METAL CLEATS AND NUT & BOLTS MUST BE USED.
2. SLOPE DUCT TO THE EXTERIOR AT 1/4" (2" FALL PER FOOT.
3. SILICONE IS NOT ALLOWED TO SEAL JOINTS. PROVIDE MECHANICAL JOINTS WITH A VITON SEAL.

MECHANICAL SCHEDULES

PROVIDE SPECIFIED OR APPROVED EQUAL

HOT WATER BOILER

PROVIDE SPECIFIED IN BASE BID. NO EQUALS

MARK	MANUFACTURER	MODEL #	FUEL	BURNER DATA INPUT MBH	OUTPUT MBH	TURN DOWN	EFFICIENCY	WATER DATA 35% PG GPM	EWT	LWT	FLUE	HEAT EXCHANGER TYPE	MATERIAL	SURFACE AREA	BOILER LOCATION	SYSTEM SERVED	NOTES
B-1	AERCO (NO EQUALS)	MLX-EXT 1100	NAT-GAS	1123	1067	24 : 1	98%	16MIN 99MAX	160	180	CATEGORY III	SECTIONAL	ALUMINUM	-	NORTH HALL MECHANICAL ROOM	HEATING HOT WATER	1 - 5

HOT WATER BOILER SCHEDULE NOTES

1. ALL TEMPERATURES IN DEGREES F. SHALL HAVE MINIMUM 7 MODULES FOR REDUNDANCY.
2. BOILER SHALL MEET ALL APPLICABLE CSD-1 & ASME BOILER AND PRESSURE VESSEL CODE REQUIREMENTS.
3. BOILER REQUIRES 120 VOLT, 1Ø POWER,6.3 FLA, 20 AMP.
4. PROVIDE LOCAL/ REMOTE SWITCH ON BOILER FOR MANUAL OVERRIDE CONTROL.
5. PROVIDE CONDENSATE NEUTRALIZATION TANK.
6. PROVIDE BACNET CARD.

HYDRONIC ACCESSORIES

MARK	PART DESCRIPTION	MANUFACTURER	MODEL #	MAX. WORKING PRESSURE PSIG	MAX. WORKING TEMP °F	CONSTRUCTION	MAX. HEAD LOSS	VOLUME GALLON	DESIGN FLOW GPM	UNIT SIZE (INCHES) DIAMETER	LENGTH	HEIGHT	SYSTEM SERVED	NOTES
TYPICAL	STRAINER	METRAFLEX	BSJ	125	240	BRONZE	2 FT	-	SEE PLANS	-	-	-	HOT WATER SYSTEM	1
TYPICAL	FLANGED STRAINER	METRAFLEX	TF	125	240	IRON BODY	2 FT	-	SEE PLANS	-	-	-	HOT WATER SYSTEM	1
ET-1	FULL ACCEPTANCE BLADDER TYPE EXPANSION TANK	TACO	CA90-125	70	200	STEEL PER ASME VIII, DIV 1	-	23	-	20	-	29 1/8	HOT WATER SYSTEM	-

HYDRONIC ACCESSORIES SCHEDULE NOTES

1. STRAINER SHALL BE LINE SIZE FULL PORT WITH 8:1 STRAINER AREA TO PIPE CIRCUMFERENCE, 5 MESH REMOVABLE SCREEN.

PIPE SUPPORT SCHEDULE

PIPE MATERIAL	1/2" - 1-1/4" MAX. SPACING	ROD SIZE	1-1/2" MAX. SPACING	ROD SIZE	2" MAX. SPACING	ROD SIZE	2-1/2" MAX. SPACING	ROD SIZE	3" MAX. SPACING	ROD SIZE	4" MAX. SPACING	ROD SIZE	6" MAX. SPACING	ROD SIZE	8" MAX. SPACING	ROD SIZE	10" MAX. SPACING	ROD SIZE	12" - UP MAX. SPACING	ROD SIZE	NOTES
STEEL	8'	3/8"	9'	3/8"	10'	3/8"	11'	1/2"	12'	1/2"	12'	5/8"	12'	3/4"	12'	7/8"	12'	7/8"	12'	7/8"	1,2,3
COPPER	6'	3/8"	6'	3/8"	8'	3/8"	10'	1/2"	10'	1/2"	10'	5/8"	10'	3/4"	10'	7/8"	10'	7/8"	10'	7/8"	1,2,3
PVC / CPVC	4'	3/8"	4'	3/8"	4'	3/8"	4'	3/8"	4'	3/8"	4'	1/2"	4'	1/2"	4'	5/8"	4'	3/4"	4'	7/8"	1,2,3
POLYETHYLENE	3'	3/8"	3'	3/8"	3'	3/8"	NA	3/8"	4.5'	3/8"	6'	1/2"	6'	1/2"	6'	5/8"	6'	3/4"	6'	7/8"	1,2,3

PIPE SUPPORT SCHEDULE NOTES

1. PIPING SUPPORT VERTICALLY EVERY 12' OR EVERY LEVEL WHICH EVER IS LESS.
2. SPACING SCHEDULED IS THE MAXIMUM DISTANCE. SUPPORTS CAN BE INSTALLED IN SMALLER INTERVALS AND MAY NEED TO BE IF THE STRUCTURE CAN NOT HANDLE THE LOAD AT THE MAXIMUM SPACING. VERIFY WITH STRUCTURAL. A MINIMUM OF ONE SUPPORT FOR EVERY BRANCH OR PIPE SEGMENT IN EACH DIRECTION CHANGE SHALL BE PROVIDED. TWO (2) HANGERS MUST BE PROVIDED ON ALL LENGTH OF PIPE LONGER THAN 10'.
3. ALL SUPPORTS SHOULD BE ANCHORED SECURELY TO THE STRUCTURE BUT NOT THE PIPING. THE SUPPORT SHOULD ALLOW FREE MOVEMENT CAUSED BY THERMAL EXPANSION. PIPING STRAPS AND CLAMPS THAT HOLD THE PIPING TIGHT TO THE STRUCTURE WILL NOT BE ALLOWED. TYPICAL ACCEPTABLE SUPPORTS INCLUDE BUT ARE NOT LIMITED TO CLEVIS HANGERS, ADJUSTABLE SWIVEL RING SUPPORT, ROLLER HANGER AND DOUBLE BOLT PIPE CLAMP.

PIPE MATERIAL AND INSULATION

PIPE	PIPE SIZE	RELATION TO GRADE	PIPING MATERIAL	FITTING TYPE	MINIMUM SLOPE	VALVES	MUST COMPLY WITH	PIPING INSULATION INSULATION TYPE	MATERIAL TYPE	THICKNESS INCH	DENSITY LBS/FT³	"K VALUE" MIN VALUE	AT TEMP	NOTES
DOMESTIC COLD WATER	1/2" - 1-1/2"	ABOVE	TYPE "L" COPPER	LEAD FREE SOLDER	-	BALL	ASTM B 88	MOLDED SECTION	JACKETED FIBERGLASS	1/2"	3	.22	75°	1,3
DOMESTIC COLD WATER	2" - UP	ABOVE	TYPE "L" COPPER	BRAZED	-	BALL, BUTTERFLY	ASTM B 88	MOLDED SECTION	JACKETED FIBERGLASS	1"	3	.22	75°	1,3
DOMESTIC HOT WATER	1/2" - 1-1/2"	ABOVE	TYPE "L" COPPER	LEAD FREE SOLDER	-	BALL	ASTM B 88	MOLDED SECTION	JACKETED FIBERGLASS	1/2"	3	.22	75°	1,3
DOMESTIC HOT WATER	2" - UP	ABOVE	TYPE "L" COPPER	BRAZED	-	BALL, BUTTERFLY	ASTM B 88	MOLDED SECTION	JACKETED FIBERGLASS	1"	3	.22	75°	1,3
GAS (<5 PSI)	1/2" - 1-1/2"	ABOVE	SCHEDULE 40 BLACK STEEL	THREADED	-	BALL	-	-	-	-	-	-	-	2
GAS (<5 PSI)	2" - UP	ABOVE	SCHEDULE 40 BLACK STEEL	CONTINUOUSLY WELDED	-	BALL	-	-	-	-	-	-	-	2
HEATING HOT WATER	1/2" - 1-1/4"	ABOVE	SCHEDULE 40 BLACK STEEL	THREADED OR VICTAULIC COUPLING	-	BALL, BUTTERFLY	-	MOLDED SECTION	JACKETED FIBERGLASS	1-1/2"	3	.22	75°	1
HEATING HOT WATER	1-1/2" - UP	ABOVE	SCHEDULE 40 BLACK STEEL	VICTAULIC COUPLING	-	BALL, BUTTERFLY	-	MOLDED SECTION	JACKETED FIBERGLASS	2"	3	.22	75°	1
CONDENSING APPLIANCE CONDENSATE DRAIN	ALL	ABOVE	SCHEDULE 40 PVC	PRIMED AND GLUED	1/8" FOOT	-	ASTM B 88	-	-	-	-	-	-	1,4

PIPE MATERIAL AND INSULATION GENERAL NOTES

- INSTALL ALL PIPING ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. ALL INSTALLERS SHALL BE CERTIFIED, WITH DOCUMENTATION SUBMITTED WITH SHOP DRAWINGS.
- ALL PIPING SHALL BE TESTED, CLEANED AND CERTIFIED FOR INTENDED USE. ALL PIPING SYSTEMS SHALL BE PRESSURE TESTED WITH 1-1/2 TIMES THE OPERATING PRESSURE FOR NO LESS THAN 4 HOURS. PIPING TO BE CLEANED AND FLUSHED WITH CRITICAL CONTROL VALVES BYPASSED.
- DIELECTRIC FITTINGS SHALL BE USED AT ALL CONNECTIONS BETWEEN DISSIMILAR METALS. FITTINGS SHALL BE SOFT SOLDERED TO THE PIPING.
- ALL WELDED PIPE AND FUSION WELDED PIPE SHALL BE WELDED BY A CERTIFIED WELDER/ FUSION CONTRACTOR. ALL WELDING SHALL BE DONE BY A CERTIFIED WELDER (CERTIFICATES MUST BE SUBMITTED AND ALL WORK SHALL BE STAMPED. BOLTED FLANGES SHALL BE INSTALLED ON 2" AND LARGER PIPE TO SECTIONALIZE THE SYSTEM INTO WORKABLE SECTIONS. INSULATION SHALL GO AROUND FLANGES.

VALVE SCHEDULE

- CALIBRATED BALANCE VALVES: SHALL BE A BRONZE OR BRASS BALL VALVE WITH A SET SCREW STOP.
- BALL VALVE: SHALL BE NSF RATED FOR POTABLE WATER, BRASS OR BRONZE BODY WITH CHROME PLATED BRONZE BALL.
- BUTTERFLY VALVE: SHALL BE CAST IRON BODY WITH FLANGED ENDS, WAFFER STYLE VALVES ARE NOT ALLOWED.
- GATE VALVE: SHALL BE A BRONZE OR CAST IRON BODY WITH A RISING STEM AND SOLID BRONZE WEDGE.
- GLOBE VALVE: SHALL BE A BRONZE OR CAST IRON BODY WITH A BRONZE DISC.
- ALL VALVES SHALL BE LINE SIZE FULL PORT INSTALLED WITH FULL STEM/HANDLE MOVEMENT. HANDLES SHALL NEVER BE INSTALLED VERTICALLY DOWN.

PIPE MATERIAL AND INSULATION SCHEDULE NOTES

1. INSULATION & ADHESIVE SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS ACCORDING TO ASTM STANDARD AND NFPA 255. INSULATION SHALL BE INSTALLED BY A SKILLED INSTALLER IN A CLEAN WORKMANSHIP LIKE MANNER AFTER THE SYSTEM HAS BEEN PROPERLY TESTED. ALL JOINTS SHALL BE PROPERLY SEALED TO KEEP INTEGRITY OF VAPOR BARRIER INTACT. ALL INSULATION SHALL HAVE PVC JACKETS ON ALL ELBOWS AND THE ENTIRE PIPING SHALL BE JACKETED WITH PVC WHERE EXPOSED IN PUBLICLY ACCESSIBLE AREAS.
2. NO INSULATION IS REQUIRED UNLESS PIPING IS A PLASTIC MATERIAL NOT MEETING 25 / 50 FLAME AND SMOKE RATING IN A RETURN AIR PLENUM (SEE NOTE 1 IF INSULATION IS REQUIRED).
3. CROSS-LINKED POLYETHYLENE (PEX) PIPING WITH CRIMPED FITTINGS IS AN ACCEPTABLE ALTERNATIVE ONLY IF ALLOWED BY LOCAL CODES. INSULATION WILL STILL BE REQUIRED.
4. SCHEDULE 40 PVC DWV PIPING WITH PRIMED AND GLUED FITTINGS IS AN ACCEPTABLE ALTERNATIVE ONLY IF PIPING IS NOT SERVING ANY DRAINS THAT MAY HAVE WATER HOTTER THAN 140° IN IT OR EXPOSED IN ANY KITCHEN AND ALLOWED BY LOCAL CODES. ALL EXPOSED PIPING IN KITCHENS. SHALL BE COPPER. INSTALL INSULATION ON PIPING IN A CEILING PLENUM RETURN ACCORDING TO REQUIREMENTS OF LOCAL JURISDICTION - 1 HOUR FIRE WRAP SHALL BE USED UNLESS LOCAL JURISDICTION ALLOWS ALTERNATIVE PRODUCTS. ALL UNDERGROUND PIPING SHALL BE INSTALLED PER ASTM D2321

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CERTIFICATE OF AUTHORIZATION #CA1800

PROJECT #: 23-095

NEBRASKA CORRECTIONAL CENTER FOR WOMEN - BUILDING A WATER HEATER & NORTH HALL BOILER REPLACEMENT

1107 RECHARGE ROAD
YORK, NE, 68467-8003

No.	Issued For	Date
1	ADDENDUM #1	12-5-23

DATE: 10/30/2023

PROFESSIONAL MECHANICAL ENGINEER
KYLE J. WILKINSON
E-12957
12-5-2023
STATE OF NEBRASKA

SCHEDULES - MECHANICAL

M3.1

SEQUENCE OF OPERATION

GENERAL:
- ALL POINTS AND EQUIPMENT SHALL HAVE THEIR STATUS CLEARLY IDENTIFIED ON THE CONTROLS SCREEN.
- ALL SET POINTS AND PARAMETERS SHALL BE INDEPENDENTLY ADJUSTABLE AND CLEARLY IDENTIFIED AS SET POINTS AND NOT READ ONLY VALUES.
- THE OCCUPANCY MODE (OCCUPIED OR UNOCCUPIED) SHALL BE DETERMINED THROUGH A USER-ADJUSTABLE, GRAPHICAL SEVEN-DAY SCHEDULE WITH A HOLIDAY SCHEDULE.
- NOT ALL POINTS ARE SHOWN/MENTIONED, PROVIDE ALL POINTS REQUIRED FOR PROPER OPERATION/CONTROL.
- ALL SENSORS, EQUIPMENT, VALVE, ETC. LOCATIONS AND SIZES SHALL BE CLOSELY COORDINATED WITH THE MECHANICAL AND HVAC CONTRACTOR PRIOR TO ORDERING AND INSTALLATION.
- PROVIDE INTERFACE TO ALL EQUIPMENT AS WELL AS SENSORS / CONTROLS REQUIRED FOR THE COMPLETE OPERATION OF THE SYSTEMS / EQUIPMENT.
- ALL CONTROL WIRING SHALL BE INSTALLED IN A NEAT AND WORKMANSHIP LIKE MANNER, WITH NO WIRING INSTALLED PARALLEL TO WITHIN 30" OF LINE VOLTAGE ELECTRICAL FOR MORE THAN 24".
- REPLACE ALL OBSOLETE CONTROLLERS, SENSORS, AND THERMOSTATS. REPLACE WITH NEW CONTROLS, SENSORS, AND THERMOSTATS TO MATCH THE BUILDING STANDARD.
- BUILDING CONTROL SYSTEM FROM END IS UP TO DATE AND DOES NOT REQUIRE AN UPGRADE.

CONTROL SYSTEM SHALL BE EXTENSION OF THE EXISTING HONEYWELL SYSTEM. CONTROL CONTRACTOR SHALL BE ENGINEERED CONTROLS INC.

COORDINATION RESPONSIBILITY:

ITEM	INSTALLED BY	PROVIDED BY
CONTROL VALVES	MC	CC
CONTROL DAMPERS	HC	CC
ELECTRICAL METER	EC	CC
ENERGY METERS	MC	CC
THERMAL SENSOR WELLS	MC	CC
VARIABLE FREQUENCY DRIVE	EC	CC
SENSORS	CC	CC

MC = MECHANICAL CONTRACTOR
CC = CONTROL CONTRACTOR
HC = HVAC CONTRACTOR
EC = ELECTRICAL CONTRACTOR

ALARMS:
- ALL MANUFACTURERS ALARMS ARE TO BE REPORTED TO THE BAS WITH EMAILS BEING SENT OUT TO THE RESPECTIVE PARTIES. LIST OF EMAIL ADDRESSES IS TO BE PROVIDED BY OWNER.
- ALARMS SHALL INCLUDE BUT NOT LIMITED TO:
  - EQUIPMENT COMMON ALARMS
  - STATUS / EQUIPMENT FAILURE

TRENDING:
- THE FOLLOWING IS A LIST OF THE MINIMUM AMOUNT OF POINTS THAT SHALL BE TRENDED FOR AT LEAST 13 MONTHS. ALL OTHER POINTS SHALL BE TRENDED FOR 4 WEEKS.
- ALL TRENDS SHALL BE ABLE TO BE SHOWN GRAPHICALLY FOR A USER ADJUSTABLE TIME PERIOD. DATA SHALL BE EXPORTABLE TO MICROSOFT EXCEL.
  - OUTSIDE AIR TEMPERATURE AND RELATIVE HUMIDITY
  - ALARMS - EQUIPMENT, CODE, TIME
  - ALL PRESSURE AND TEMPERATURE SENSORS - EVERY 5 MINUTE INTERVALS MAXIMUM

SEQUENCE OF OPERATION

HEATING MODE

BOILER CIRCULATING PUMPS:
- SHALL TURN ON WHEN THERE IS A CALL FOR HEATING AND THE BOILER IS GOING TO TURN ON.

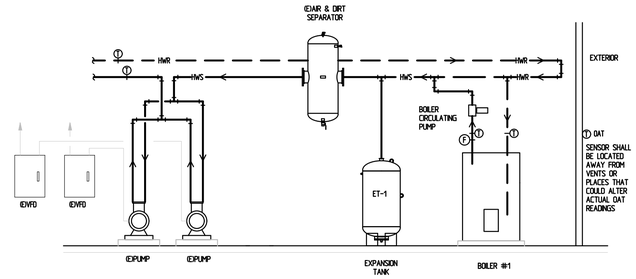
BOILERS:
- SHALL MODULATE BURNERS AS REQUIRED TO MAINTAIN 180° F (ADJ) SUPPLY WATER TEMPERATURE SET POINT WHEN THE OUTSIDE AIR TEMPERATURE (OAT) IS 30°F(ADJ) OR BELOW. SET POINT SHALL BE RESET DOWN BASED ON THE OUTDOOR AIR TEMPERATURE TO 120°F(ADJ) WHEN THE OAT IS 50°F ON A LINEAR SCALE.
- BURNERS SHALL NOT COME ON TILL THE BOILER FLOW SWITCH HAS PROVEN FLOW THROUGH THE BOILER.

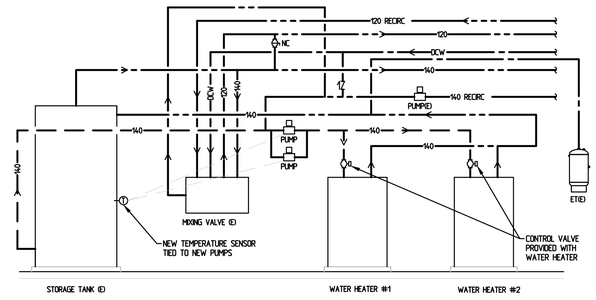
SEQUENCE OF OPERATION

HEATING MODE

WATER HEATERS:
- WATER HEATERS SHALL OPERATE IN LEAD LAG CONFIGURATION TO EQUALIZE RUN TIME.
- WATER HEATER SHALL OPERATE TO MAINTAIN THE STORAGE TANK TEMPERATURE SET POINT.

WATER HEATER CIRCULATION PUMPS:
- PUMPS SHALL OPERATE IN LEAD LAG CONFIGURATION TO EQUALIZE RUN TIME.
- LEAD PUMP SHALL NORMALLY BE OFF AND TURN ON WHEN THE TEMPERATURE OF THE TANK IS BELOW THE TANK SET POINT.
- PUMPS HAVE INTEGRAL SENSORLESS CONTROL FOR CONTROL TO PUMP. ⚠1





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SCHEMATICS - MECHANICAL

M3.2