

MIDLAND PUBLIC SHOOOLS

600 E. Carpenter Street
Midland, MI 48640



H.H. DOW HIGH SCHOOL - BOILER REPLACEMENT

DATE: 04/26/2024 ISSUANCE: BIDS/PERMITS

MECHANICAL:

- M0.0 MECHANICAL GENERAL INFORMATION
- MD1.1 BOILER ROOM – MECHANICAL DEMOLITION PLAN
- M1.1 BOILER ROOM – MECHANICAL PLAN
- M5.0 MECHANICAL DETAILS & SCHEDULES
- M8.0 MECHANICAL TEMPERATURE CONTROL DIAGRAMs

ELECTRICAL:

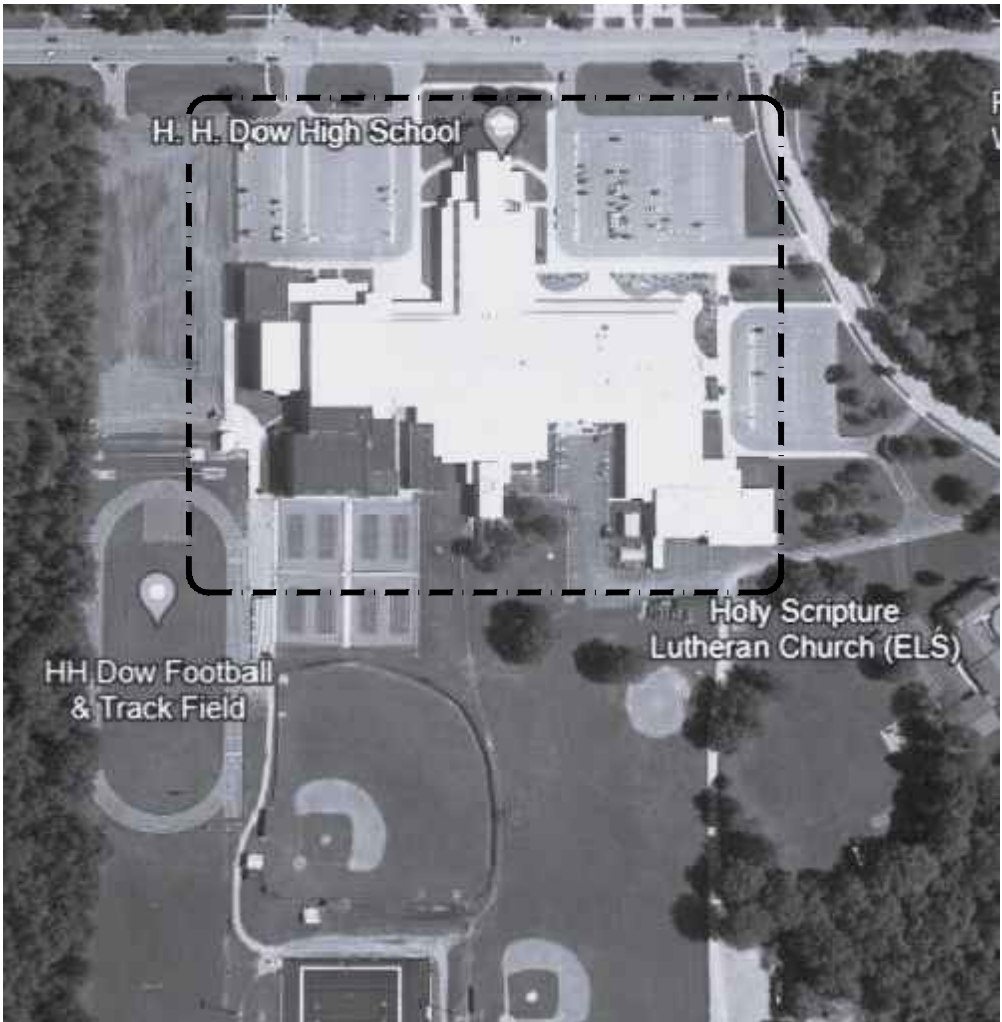
- E0.0 ELECTRICAL GENERAL INFORMATION
- ED1.1 BOILER ROOM – ELECTRICAL DEMOLITION PLAN
- E1.1 BOILER ROOM – ELECTRICAL PLAN
- E5.0 ELECTRICAL DETAILS, DIAGRAMs, & ONE–LINE DIAGRAMs
- E6.0 ELECTRICAL PANEL SCHEDULES

MEP ENGINEERS:



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SES Project # 24 0939 01

LOCATION:
H.H DOW HIGH SCHOOL
3901 N. Saginaw Road
Midland, MI 48640



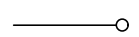
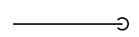
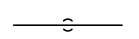

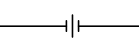
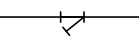
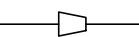
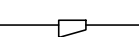
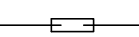
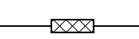

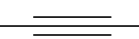
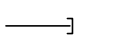
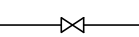
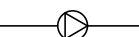
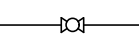
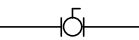
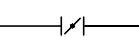
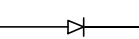


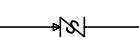
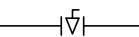
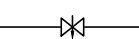


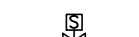
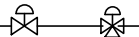




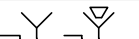
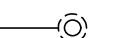
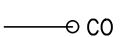
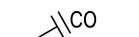


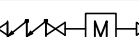
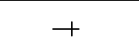



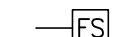
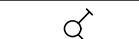
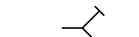
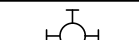
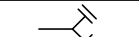




MAP IMAGE

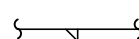
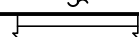
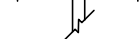

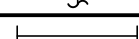

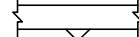
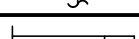

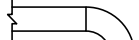




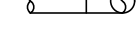
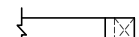

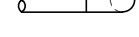


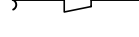
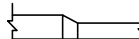
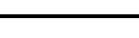
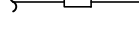
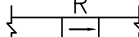
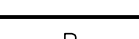

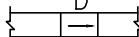
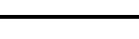
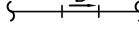
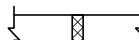




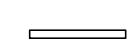

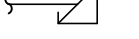
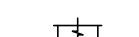





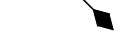
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Date: Apr 26, 2024, 4:43pm Layout: M0.0 Plotted by: yganmand

MECHANICAL ABBREVIATIONS	
ABBREV.	DESCRIPTION
AAV	AUTOMATIC AIR VENT / AIR ADMITTANCE VALVE
AD	ACCESS DOOR
AE	AIR EXTRACTOR
AFF	ABOVE FINISHED FLOOR
APD	AIR PRESSURE DROP
ASR	AUTOMATIC SPRINKLER RISER
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
BWV	BACKWATER VALVE
CAP	CAPACITY
CAV	CONSTANT AIR VOLUME
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CIRC	CIRCULATING
CLG	COOLING
CO	CLEAN OUT
CONT	CONTINUATION OR CONTINUED
CONV	CONVECTOR
CUH	CABINET UNIT HEATER
CV	CONTROL VALVE
DB	DRY BULB TEMPERATURE
DEG	DEGREES
DDC	DIRECT DIGITAL CONTROL
DN	DOWN
DTC	DRAIN TILE CONNECTION
DWH	DOMESTIC WATER HEATER
(E)	EXISTING
EA/EXH	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB TEMPERATURE
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION
ELECT	ELECTRICAL
EMS	ENERGY MANAGEMENT SYSTEM
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB TEMPERATURE
EWG	ELECTRIC WATER COOLER
°F	DEGREES FAHRENHEIT
FA	FACE AREA (COIL) / FREE AREA (LOUVER)
FC	FLEXIBLE CONNECTION
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK
FHV	FIRE HOSE VALVE
FLA	FULL LOAD AMPS
FLR	FLOOR
FPM	FEET PER MINUTE
FFD	FUNNEL FLOOR DRAIN
FFE	FINISHED FLOOR ELEVATION
FS	FLOOR SINK
FT	FEET
FURN	FURNISHED
FV	FACE VELOCITY
FVC	FIRE VALVE CABINET
GAL	GALLON
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HB	HOSE BIBB
HO	HUB OUTLET
HP	HORSEPOWER

MECHANICAL ABBREVIATIONS	
ABBREV.	DESCRIPTION
HR	HOUR
HTG	HEATING
HYD	HYDRANT
HZ	HERTZ
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
INST	INSTALLED
INV	INVERT
ISP	INTERNAL STATIC PRESSURE
IW	INDIRECT WASTE
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LAV	LAVATORY
LBS/HR	POUNDS PER HOUR
LDB	LEAVING DRY BULB TEMPERATURE
LRA	LOCKED ROTOR AMPS
LWB	LEAVING WET BULB TEMPERATURE
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	1000 BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MOD	MOTOR OPERATED DAMPER (AUTOMATIC)
MOP	MAXIMUM OVER-CURRENT PROTECTION
N.C.	NOISE CRITERIA
NIC	NOT IN CONTRACT
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NOM	NOMINAL
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER / CENTER TO CENTER
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
ORS	OVERFLOW ROOF SUMP
OS&Y	OUTSIDE SCREW AND YOKE
PD	PRESSURE DROP (FEET OF WATER)
PRV	PRESSURE REDUCING VALVE
PSIA	POUNDS PER SQUARE INCH – ABSOLUTE
PSIG	POUNDS PER SQUARE INCH – GAUGE
PT	PRESSURE / TEMPERATURE PORT
RA	RETURN AIR
RH	RELATIVE HUMIDITY
REQD	REQUIRED
RELA	RELIEF AIR
RPM	REVOLUTIONS PER MINUTE
RPZ	REDUCED PRESSURE ZONE
RS	ROOF SUMP
SA	SUPPLY AIR
SH	SHOWER
SP	STATIC PRESSURE
SqFt / SF	SQUARE FOOT/SQUARE FEET
SS	SERVICE SINK
TC	TEMPERATURE CONTROL
T & P	TEMPERATURE AND PRESSURE
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE

MECHANICAL ABBREVIATIONS	
ABBREV.	DESCRIPTION
UR	URINAL
VD	VOLUME DAMPER (MANUALLY ADJUSTABLE)
VTR	VENT THRU ROOF
W	WASTE
W&V	WASTE AND VENT
WB	WET BULB TEMPERATURE
WC	WATER CLOSET
WG	WATER GAUGE
WH	WALL HYDRANT







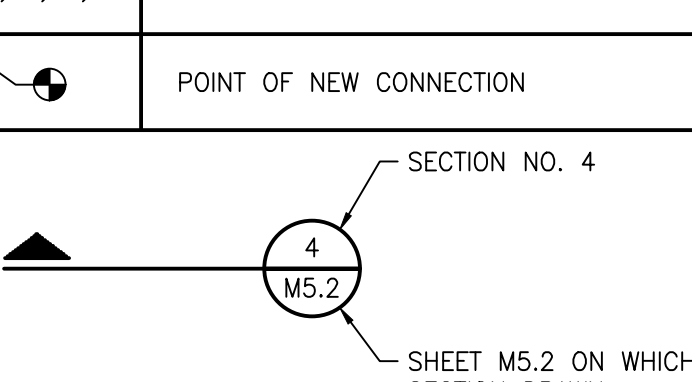
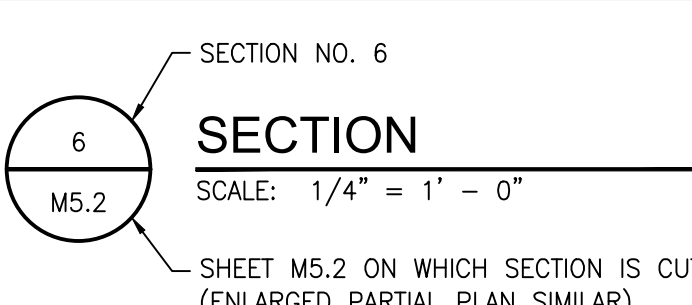
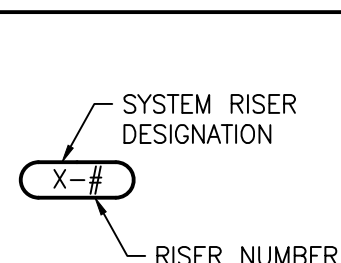
MECHANICAL PIPING SYMBOLS	
ABBREV.	DESCRIPTION
	PIPE ELBOW UP
	PIPE ELBOW DOWN
	PIPE TEE DOWN
	DIRECTION OF FLOW
	UNION
	STRAINER
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	EXPANSION JOINT
	FLEXIBLE CONNECTION
	PIPE ANCHOR
	PIPE GUIDE
	PIPE CAP OR PLUG
	ISOLATION VALVE
	CIRCULATING PUMP
	GLOBE VALVE
	BALL VALVE
	BUTTERFLY VALVE
	BACKWATER VALVE
	ANGLE VALVE
	CHECK VALVE (SWING)
	CHECK VALVE (SPRING)
	PLUG VALVE
	NEEDLE VALVE
	OUTSIDE SCREW AND YOKE VALVE (OS&Y)
	PRESSURE REGULATING VALVE
	SOLENOID VALVE
	CONTROL VALVE (2-WAY / 3-WAY)
	CENTRIFUGAL FAN
	AUTOMATIC GAS SHUT-OFF VALVE
	TRAP (PLAN VIEW)
	FLOOR DRAIN / FUNNEL FLOOR DRAIN (PLAN VIEW)
	FLOOR DRAIN / FUNNEL FLOOR DRAIN (ELEVATION)
	ROOF SUMP
	CLEAN OUT (IN FLOOR)
	CLEAN OUT (IN LINE)
	CLEAN OUT (WALL)
	BACKFLOW PREVENTER
	WATER METER ASSEMBLY
	HOSE BIBB, WALL HYDRANT
	DIRECTION OF PIPE PITCH
	SPRINKLER HEAD (UPRIGHT)
	SPRINKLER HEAD (SIDEWALL)
	FLOW SWITCH
	SIAMESE CONNECTION (YARD)
	SIAMESE CONNECTION (WALL MOUNTED)
	FIRE HYDRANT
	FLOW MEASURING DEVICE
	BALANCING VALVE
	COMBINATION FLOW MEASURING AND BALANCING DEVICE
	AUTOMATIC AIR VALVE
	MANUAL AIR VALVE

MECHANICAL SYMBOLS	
ABBREV.	DESCRIPTION
	RECTANGULAR TAKE-OFF (SINGLE LINE)
	RECTANGULAR TAKE-OFF (DOUBLE LINE)
	ROUND TAKE-OFF (SINGLE LINE)
	ROUND TAKE-OFF (DOUBLE LINE)
	SPIN-IN FITTING (WITH VOLUME DAMPER)
	ELBOW (WITH TURNING VANES)
	RADIUS RECTANGULAR ELBOW
	RADIUS ROUND ELBOW
	RECTANGULAR ELBOW UP
	ROUND ELBOW UP
	RECTANGULAR ELBOW DOWN
	ROUND ELBOW DOWN
	CONCENTRIC TRANSITION (DOUBLE LINE)
	CONCENTRIC TRANSITION (SINGLE LINE)
	ECCENTRIC TRANSITION (DOUBLE LINE)
	ECCENTRIC TRANSITION (SINGLE LINE)
	INCLINED RISE IN DIRECTION OF AIR FLOW (DOUBLE LINE)
	INCLINED RISE IN DIRECTION OF AIR FLOW (SINGLE LINE)
	INCLINED DROP IN DIRECTION OF AIR FLOW (DOUBLE LINE)
	INCLINED DROP IN DIRECTION OF AIR FLOW (SINGLE LINE)
	FLEXIBLE CONNECTION
	FLEXIBLE DUCT CONNECTION TO SUPPLY DIFFUSER
	SUPPLY DIFFUSER
	LINEAR SLOT DIFFUSER
	RETURN OR EXHAUST GRILLE
	TRANSFER GRILLE
	CROSS SECTION OF SUPPLY AIR DUCT
	CROSS SECTION OF EXHAUST OR RETURN AIR DUCT
	EXISTING FIRE DAMPER (HORIZONTAL)
	NEW FIRE DAMPER (HORIZONTAL)
	EXISTING FIRE DAMPER (VERTICAL)
	NEW FIRE DAMPER (VERTICAL)
	EXISTING SMOKE DAMPER
	NEW SMOKE DAMPER
	EXISTING COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
	NEW COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
	EXISTING COMBINATION FIRE/SMOKE DAMPER (HORIZONTAL)
	NEW COMBINATION FIRE/SMOKE DAMPER (HORIZONTAL)
	VOLUME DAMPER (MANUALLY ADJUSTABLE)
	MOTORIZED DAMPER
	SMOKE DETECTOR
	CO2 SENSOR
	THERMOSTAT OR TEMPERATURE SENSOR
	HUMIDISTAT OR HUMIDITY SENSOR
	RETURN OR EXHAUST / SUPPLY AIR FLOW

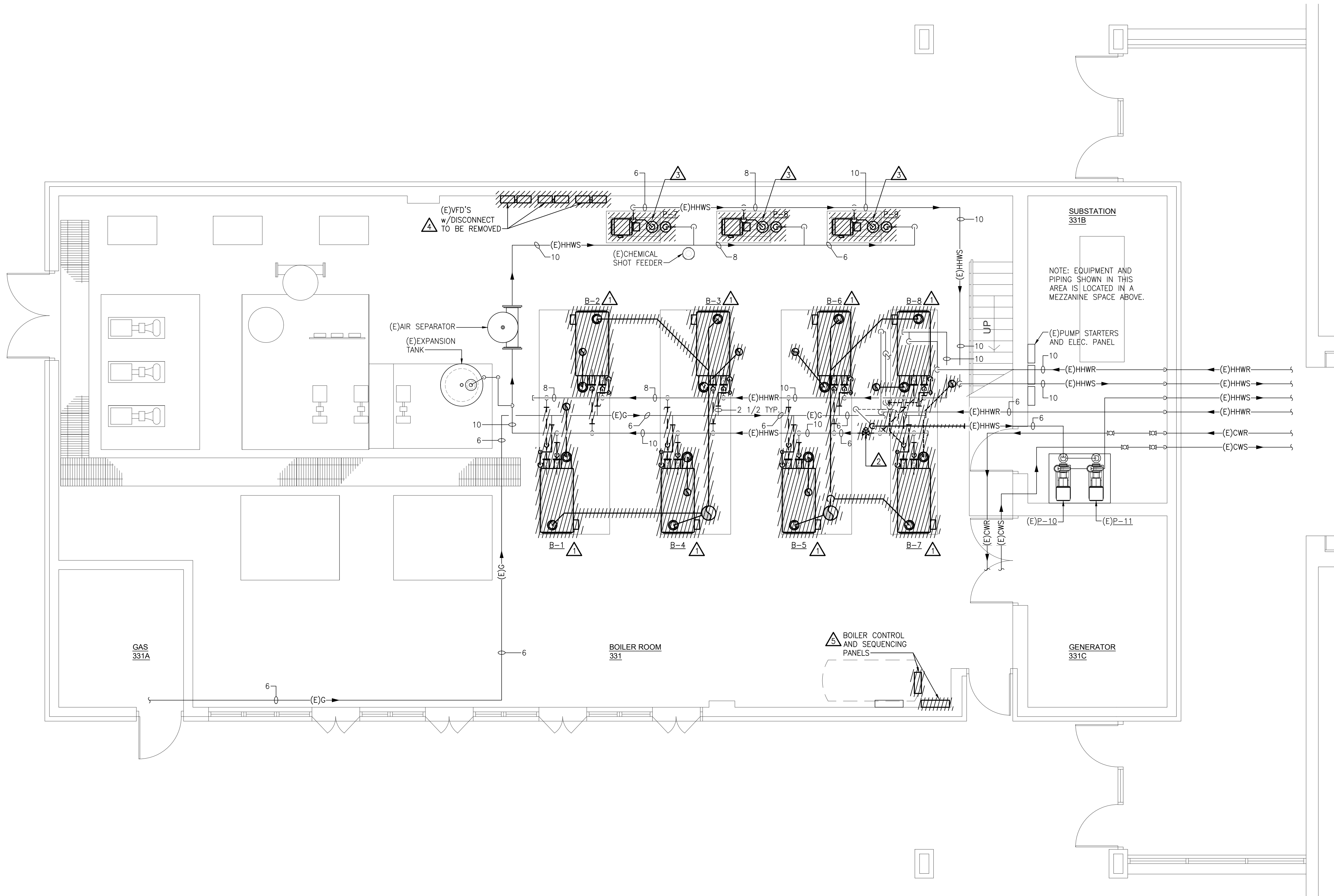
PIPING LEGEND	
ABBREV.	DESCRIPTION
—CA—	COMPRESSED AIR PIPING
—CD—	CONDENSATE DRAIN PIPING
—DT—	DRAIN TILE
—F—	FIRE PROTECTION PIPING
—FOR—	FUEL OIL RETURN PIPING
—FOS—	FUEL OIL SUPPLY PIPING
—G—	NATURAL GAS PIPING
—BCW—	BOOSTED—DOMESTIC COLD WATER PIPING
—BHW—	BOOSTED—DOMESTIC HOT WATER PIPING
—CW—	DOMESTIC COLD WATER PIPING
—NPCW—	NON POTABLE COLD WATER PIPING
—TW—	TEMPERED WATER PIPING
—HW—	DOMESTIC HOT WATER PIPING
—HW(XXX)—	DOMESTIC HOT WATER PIPING CIRCULATED AT XXX TEMPERATURE
—HWR—	DOMESTIC HOT WATER RETURN PIPING
—SAN—	SANITARY WASTE PIPING
—PSAN—	PUMPED SANITARY PIPING
—V—	VENT PIPING
—ST—	STORM SEWER PIPING
—PST—	PUMPED STORM PIPING
—RC—	RAIN CONDUCTOR PIPING
—ORC—	OVERFLOW RAIN CONDUCTOR PIPING
—CHWR—	CHILLED WATER RETURN PIPING
—CHWS—	CHILLED WATER SUPPLY PIPING
—CWR—	CONDENSER WATER RETURN PIPING
—CWS—	CONDENSER WATER SUPPLY PIPING
—HHWR—	HEATING HOT WATER RETURN PIPING
—HHWS—	HEATING HOT WATER SUPPLY PIPING
—HPLR—	HEAT PUMP LOOP RETURN PIPING
—HPLS—	HEAT PUMP LOOP SUPPLY PIPING
—RL—	REFRIGERANT LIQUID PIPING
—RS—	REFRIGERANT SUCTION PIPING
—HGB—	HOT GAS BY-PASS PIPING
—GXHR—	GEO HEAT EXCHANGE RETURN
—GXHS—	GEO HEAT EXCHANGE SUPPLY
—STM—	STEAM PIPING
—HPS—	HIGH PRESSURE STEAM PIPING
—LPS—	LOW PRESSURE STEAM PIPING
—CR—	STEAM CONDENSATE RETURN PIPING
—PCR—	PUMPED STEAM CONDENSATE RETURN PIPING
—LPC—	LOW PRESSURE CONDENSATE PIPING
—HPC—	HIGH PRESSURE CONDENSATE PIPING
—MA—	MEDICAL AIR PIPING
—N—	NITROGEN GAS PIPING
—O2—	OXYGEN GAS PIPING
—VAC—	VACUUM PIPING

APPLICABLE CODES AND REGULATIONS	
YEAR	CODE
2015	MICHIGAN BUILDING CODE
2015	MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS
2021	MICHIGAN MECHANICAL CODE
2015	MICHIGAN UNIFORM ENERGY CODE
2015	INTERNATIONAL FIRE CODE
2021	INTERNATIONAL FUEL GAS CODE
2012	NFPA 101 WITH BFS AMENDMENTS
2009	ICC/ANSI ACCESSIBLE AND USABLE BUILDING & FACILITIES
—	AMERICANS WITH DISABILITIES ACT ACCESSIBILITIES GUIDELINE (ADA—AG)

DRAWING INDEX	
SHT NO	DESCRIPTION
M0.0	MECHANICAL GENERAL INFORMATION
MD1.1	BOILER ROOM – MECHANICAL DEMOLITION PLAN
M1.1	BOILER ROOM – MECHANICAL PLAN
M5.0	MECHANICAL DETAILS & SCHEDULES
M8.0	MECHANICAL TEMPERATURE CONTROL DIAGRAMS

DRAWING NOTATION		
SYMBOL	DESCRIPTION	
	NEW WORK KEY NOTE NO. 1	
	DEMOLITION KEY NOTE NO. 1	
<u>EF-1</u>	EQUIPMENT TAG	
S-1 10x10 100-2	AIR TERMINAL TAG: IE: DIFFUSER TYPE = S-1 NECK SIZE = 10x10 CFM = 100 (TYPICAL FOR 2)	S = SUPPLY R = RETURN E = EXHAUST T = TRANSFER
	EXISTING DEVICES OR EQUIPMENT	
	NEW OR MODIFIED DEVICES OR EQUIPMENT	
	EXISTING SYSTEM COMPONENT TO BE REMOVED	
	POINT OF NEW CONNECTION	
		
		
		
S: SANITARY D: DOMESTIC WATER H: HVAC PIPING SP: STAIRWELL PRESSURIZATION V: VENT E: EXHAUST		

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Plotted by: vjgonzalez



 **BOILER ROOM - MECHANICAL DEMOLITION PLAN**
SCALE: 1/4" = 1'-0"

MECHANICAL DEMOLITION NOTES

- THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
- PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING SITE CONDITIONS, SYSTEMS, AND UTILITIES. NOTIFY ARCHITECT OF ANY INTERFERENCES OR DISCREPANCIES.
- VERIFY DEPTH, SIZE, LOCATIONS AND CONDITION OF EXISTING UTILITIES IN THE FIELD, INCLUDING POINTS OF CONNECTION PRIOR TO STARTING ANY WORK.
- ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.
- ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED. ALL WORK INDICATED ON PLANS HAS BEEN LOCATED PER EXISTING DRAWINGS AND/OR FIELD OBSERVATION AND REQUIRES FIELD VERIFICATION.
- ALL ITEMS INDICATED WITH CROSS-HATCHING SHALL BE REMOVED COMPLETE, WITH ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, INSULATION, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTS.
- ALL EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE, WHERE DUCT OR PIPE INSULATION HAS BEEN DAMAGED DURING DEMOLITION, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
- THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED. ALL ITEMS REMOVED SHALL BE LEGALLY DISPOSED OF. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING RELOCATED AND OWNER PROVIDED EQUIPMENT.

DEMOLITION KEYED NOTES

- COORDINATE WITH OWNER AND ALLOW OWNER TO SALVAGE BOILER COMPONENTS PRIOR TO DEMOLITION AND DISPOSAL OF BOILER. WHEN OWNER IS COMPLETED, REMOVE BOILER COMPLETE, INCLUDING OUTDOOR AIR INTAKE, BOILER FLUES, PIPING AT EACH BOILER AND OTHER MISC. COMPONENTS. PREPARE PIPING FOR NEW VALVE.
- CAREFULLY DISCONNECT AND REMOVE EXISTING PUMP, PIPING AND SPECIALTIES. SEPARATE PUMP FROM PIPING SPECIALTIES AND SALVAGE PUMP FOR OWNER. COORDINATE WITH OWNER AND DISPOSE OF ALL OTHER ITEMS WHICH ARE DEMOLISHED.
- CAREFULLY REMOVE AND SALVAGE VFDs AND DISCONNECTS AND RETURN TO OWNER.
- REMOVE ALL OBSOLETE BOILER CONTROLS, SEQUENCING PANEL, OTHER OBSOLETE CONTROL DEVICES, AND OBSOLETE CONDUIT AND BOXES. LOCKING ENCLOSURE CAN BE REUSED IF NEEDED. PRIOR TO DEMOLITION, VERIFY IF ANY CONTROL DEVICES OR TRANE CONTROLLERS ARE USED FOR THE WITH THE CHILLED WATER OR DOMESTIC WATER SYSTEMS WITHIN THE ROOM. INFORM OWNER AND DO NOT DEMO IF REQUIRED FOR OTHER SYSTEMS.



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PROJECT:

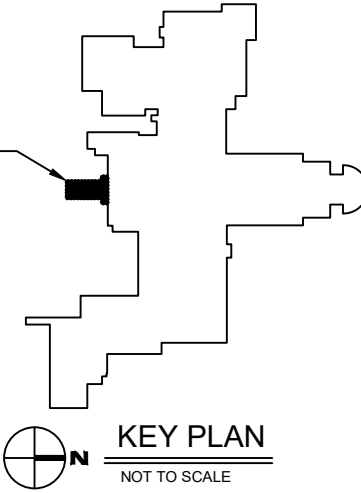
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BOILER REPLACEMENT

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ENLARGED
PLAN AREA
OF WORK



KEY PLAN
NOT TO SCALE

Seal:

ISSUED FOR:

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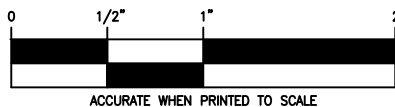
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ENGINEER:	NCS

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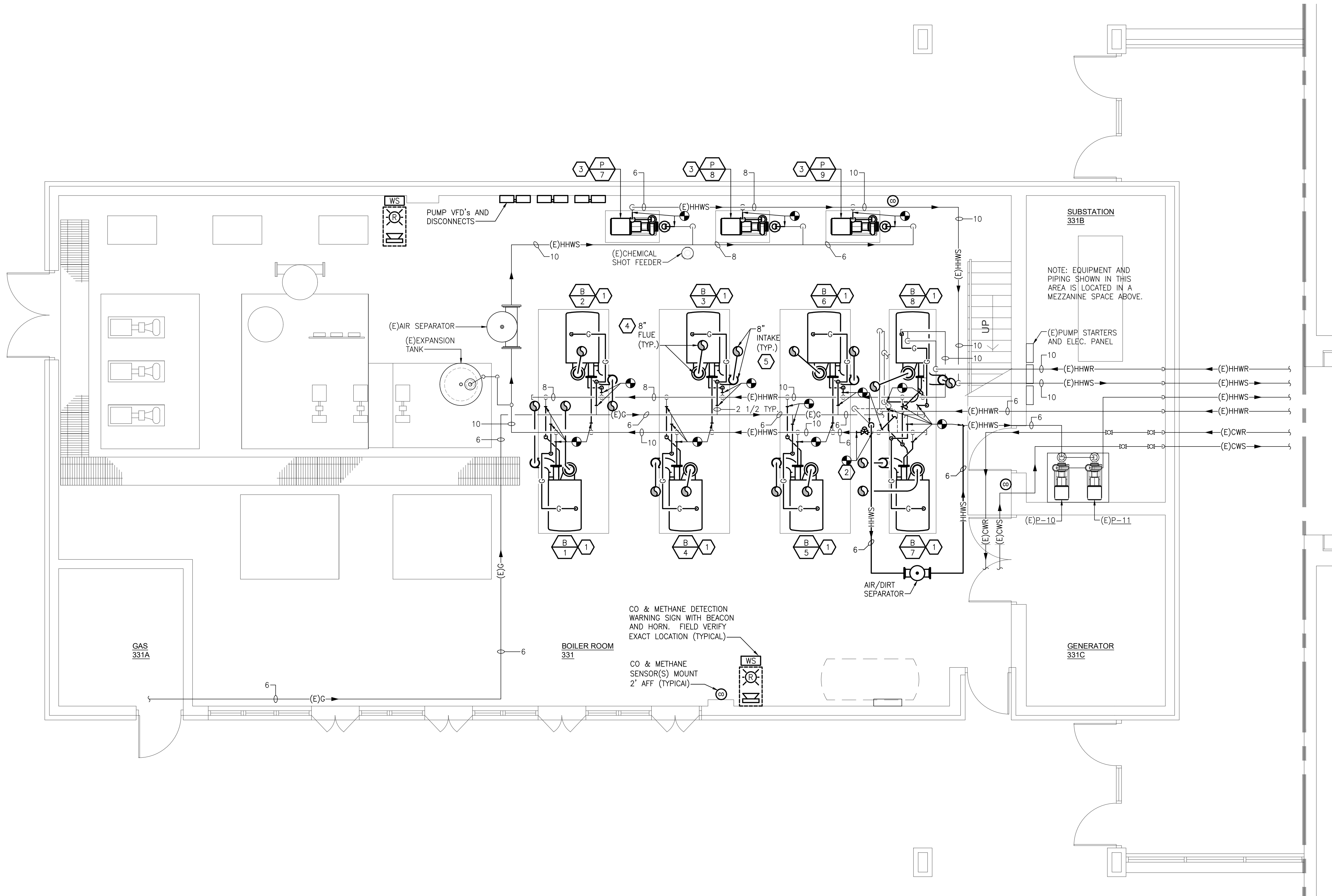
**BOILER ROOM -
MECHANICAL DEMOLITION
PLAN**

SHEET NUMBER:

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Plotted by: vgamand



BOILER ROOM - MECHANICAL PLAN
SCALE: 1/4" = 1'-0"

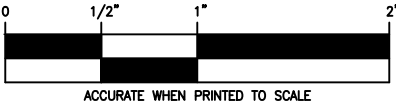
HVAC GENERAL NOTES

- THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. PROVIDE HVAC SYSTEMS COMPLETE PER SPECIFICATION, SMACNA STANDARDS, AND PER APPLICABLE CODES INCLUDING ALL NECESSARY OFFSETS, FITTINGS, SPECIAL RADIUS OR MITERED ELBOWS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR STRUCTURAL CONDITIONS OR OTHER CONDITIONS.
- CONTRACTOR SHALL COORDINATE THEIR WORK WITH THE WORK OF ALL OTHER TRADES. PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. VERIFY ALL CLEARANCES PRIOR TO THE FABRICATION OF ANY WORK.
- DUCTWORK/PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE AND SHALL NOT BE LOCATED OVER ELECTRICAL EQUIPMENT/PANELS. PROVIDE REQUIRED CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT. DUCTWORK/PIPING SHALL NOT INTERFERE WITH ELECTRICAL EQUIPMENT CLEARANCE.
- DUCTWORK/PIPING SHALL NOT BE INSTALLED IN A LOCATION THAT RESTRICTS THE ACCESS TO MECHANICAL DEVICES REQUIRING ACCESS.
- THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL, ETC. FOR THE PROPER INSTALLATION OF ALL MECHANICAL SYSTEMS.
- COORDINATE FLOOR, WALL, ROOF PENETRATIONS, LOUVER SIZES, PAD LOCATIONS ETC. WITH ARCHITECTURAL TRADES. SEAL ALL PIPING AND DUCT PENETRATIONS.
- FOR EQUIPMENT VALVING, COMPONENT, AND PIPING ARRANGEMENT, REFER TO PIPING DIAGRAMS AND DETAILS.
- PROVIDE CODE REQUIRED CLEARANCE/ACCESS DOORS FOR DAMPERS, VALVES, AND CLEANOUTS LOCATED IN WALLS OR ABOVE HARD CEILINGS. COORDINATE LOCATIONS WITH ARCHITECT. REFER TO ARCHITECTURAL PLANS FOR CEILING TYPES.
- CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. TRANSITIONS TO ALL EQUIPMENT SHALL BE VERIFIED AND PROVIDED FOR EQUIPMENT FURNISHED.
- ROOF MOUNTED EQUIPMENT REQUIRING SERVICE SHALL BE LOCATED A MINIMUM OF 10 FEET FROM ROOF EDGES. WHERE EQUIPMENT CAN'T BE LOCATED AWAY FROM ROOF EDGE AND GUARD RAILS ARE NOT PROVIDED, PROVIDE PERMANENT FALL ARREST ANCHORAGE CONNECTION DEVICE THAT COMPLIES WITH ANSI/ASSE Z 359.1.



KEYED NOTES

- BOILER ON EXISTING CONCRETE PAD. CONNECT TO HEADERS WITH NEW PIPING, VALVES AND SPECIALTIES AS INDICATED. REFER TO PIPING AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
- PROVIDE NEW MOTORIZED, 2-POSITION VALVE IN LOCATION OF EXISTING. FIELD VERIFY FLANGE TO FLANGE DIMENSIONS PRIOR TO ORDERING OR MODIFY PIPING AS REQUIRED FOR VALVE INSTALLATION.
- PUMP ON EXISTING CONCRETE PAD. CONNECT TO HEADERS WITH NEW PIPING, VALVES AND SPECIALTIES. REFER TO PIPING AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
- BOILER FLUE UP THROUGH ROOF. ROOF IS APPROXIMATELY 26 FEET ABOVE FINISH FLOOR. FIELD VERIFY EXACT ROUTING AND PROVIDE OFFSETS AS NECESSARY TO AVOID EXISTING STRUCTURE OR OTHER OBSTACLES. MINIMIZE ELBOWS, USE 45s IN LIEU OF 90s AS MUCH AS POSSIBLE AND PROVIDE AT LEAST 5 FEET BETWEEN ELBOWS. TERMINATE APPROXIMATELY 7' ABOVE ROOF PER MANUFACTURER INSTRUCTIONS. PROVIDE ROOF CURB, FLASHING, COUNTER FLASHING AND STORM COLOR AT ROOF PENETRATION. PROVIDE ANGLE IRON AS NECESSARY TO FRAME OPENING BELOW ROOF.
- BOILER COMBUSTION AIR INTAKE DUCT UP THROUGH ROOF. ROOF IS APPROXIMATELY 26 FEET ABOVE FINISH FLOOR. FIELD VERIFY EXACT ROUTING AND PROVIDE OFFSETS AS NECESSARY TO AVOID EXISTING STRUCTURE OR OTHER OBSTACLES. MINIMIZE ELBOWS, USE 45s IN LIEU OF 90s AS MUCH AS POSSIBLE AND PROVIDE AT LEAST 5 FEET BETWEEN ELBOWS. TERMINATE WITH GOOSENECK, APPROXIMATELY 3' ABOVE ROOF PER MANUFACTURER INSTRUCTIONS. PROVIDE ROOF CURB, FLASHING, COUNTER FLASHING AND STORM COLOR AT ROOF PENETRATION. PROVIDE ANGLE IRON AS NECESSARY TO FRAME OPENING BELOW ROOF.



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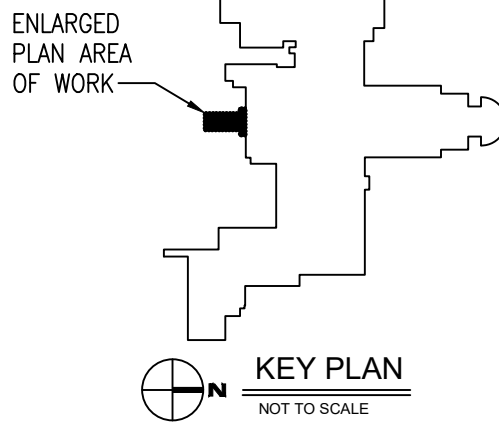
MIDLAND PUBLIC SCHOOLS

600 East Carpenter Street
Midland, MI 48640

PROJECT:

**MIDLAND PUBLIC SCHOOLS
DOW HIGH SCHOOL
BOILER REPLACEMENT**

600 East Carpenter Street
Midland, MI 48640



Seal:

ISSUED FOR:

BIDS/PERMITS 04/26/2024
ISSUED DATE

DESIGNER: VAG
ENGINEER: NCS

SHEET TITLE:

**BOILER ROOM -
MECHANICAL PLAN**

SHEET NUMBER:

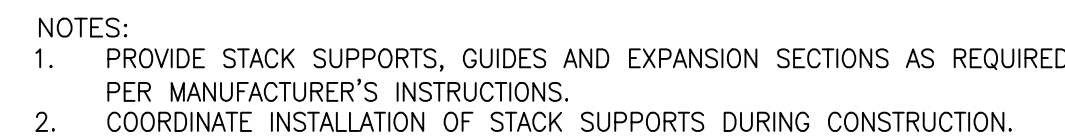
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PROJECT:
MIDLAND PUBLIC SCHOOLS
DOW HIGH SCHOOL
BOILER REPLACEMENT
600 East Carpenter Street
Midland, MI 48640

NOTES:

1. PERFORMANCE DATA IS BASED ON WATER, UNLESS OTHERWISE NOTED
2. PROVIDE CONDENSATE NEUTRALIZATION KIT.



NOTES:

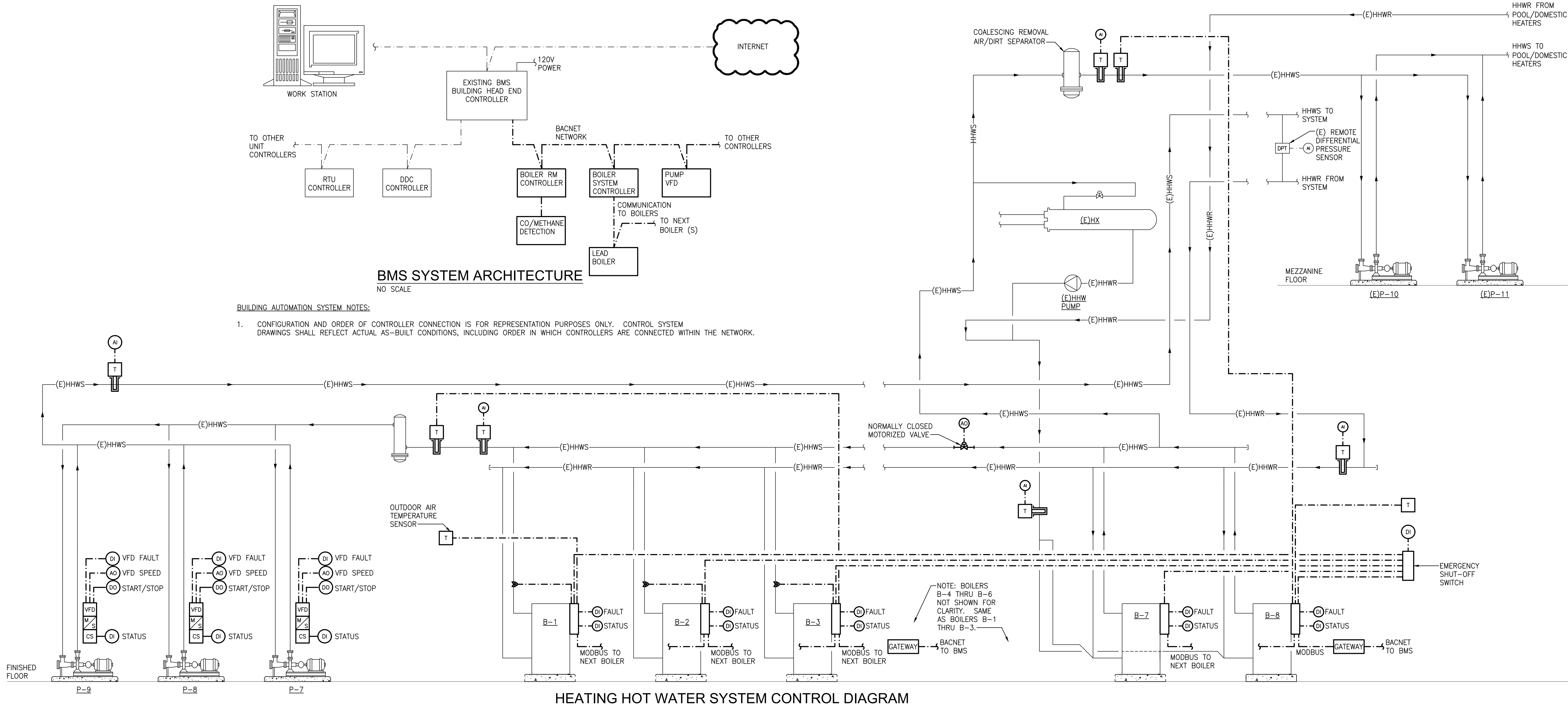
1. PERFORMANCE BASED ON WATER, UNLESS OTHERWISE INDICATED.

2. PUMPS SHALL BE NON-OVERLOADING



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BMS SYSTEM ARCHITECTURE
NO SCALE

- BUILDING AUTOMATION SYSTEM NOTES:**
1. CONFIGURATION AND ORDER OF CONTROLLER CONNECTION IS FOR REPRESENTATION PURPOSES ONLY. CONTROL SYSTEM DRAWINGS SHALL REFLECT ACTUAL AS-BUILT CONDITIONS, INCLUDING ORDER IN WHICH CONTROLLERS ARE CONNECTED WITHIN THE NETWORK.

HEATING HOT WATER SYSTEM CONTROL DIAGRAM
NO SCALE

HEATING HOT WATER SYSTEM SEQUENCE OF OPERATIONS:

NOTE: ALL SETPOINTS AND TIME INTERVALS SHALL BE ADJUSTABLE BY THE SYSTEM OPERATOR.

BOILERS B-1 THRU B-6 AND PUMPS P-7, P-8 AND P-9 (LOWER TEMPERATURE RESET SYSTEM)

1. WITH THE HYDRONIC HEATING PUMPS' HAND/AUTO/OFF SWITCH IN THE "AUTO" POSITION, THE DDC SYSTEM SHALL ENERGIZE THE LEAD PUMP. ONE OF THE PUMPS SHALL BE DESIGNATED "LEAD PUMP" AND SHALL OPERATE CONTINUOUSLY. THE OTHER PUMPS SHALL SERVE AS THE LAG PUMPS. WHEN THE LEAD PUMP IS OPERATING AT 80% (ADJ.) AND THE LOAD IS INCREASING, THE 1ST LAG PUMP SHALL BE STARTED AND BOTH PUMPS SHALL MODULATE IN UNISON TO MAINTAIN THE SYSTEM PRESSURE. IF BOTH PUMPS REACH 90% (ADJ.) AND THE LOAD IS INCREASING, THE 2ND LAG PUMP SHALL BE STARTED AND ALL PUMPS SHALL MODULATE IN UNISON TO MAINTAIN THE SYSTEM DIFFERENTIAL PRESSURE. AS THE LOAD DECREASES, THE LAG PUMPS SHALL BE STOPPED IN REVERSE OF THE STARTING PROCEDURE.
2. THE DDC SYSTEM SHALL ALTERNATE LEAD PUMP BASED ON RUN TIME HOURS OR AT THE BEGINNING OF EACH MONTH.
3. EACH PUMP WILL PROVE OPERATION TO THE DDC SYSTEM WITH ITS CURRENT SWITCH. IF A PUMP FAILS, AN ALARM WILL BE SENT TO THE DDC SYSTEM AND THE NEXT PUMP WILL BE ACTIVATED.
4. PUMP SPEED SHALL MODULATE TO MAINTAIN HEATING HOT WATER DIFFERENTIAL PRESSURE AT THE EXISTING DP TRANSMITTER.
5. WHEN ENABLED BY THE BMS, THE BOILER CONTROL PANEL (INTERNAL TO THE LEAD BOILER) SHALL CONTROL THE SEQUENCING AND FIRING OF THE BOILERS TO MAINTAIN THE SYSTEM SUPPLY WATER TEMPERATURE BASED ON AN INDOOR/OUTDOOR RESET SCHEDULE. IF A BOILER FAILS TO START, AN ALARM WILL BE GENERATED AND STANDBY BOILERS WILL BE ACTIVATED.
6. BOILER OPERATION: UPON A CALL TO START, THE BOILER'S ISOLATION VALVE SHALL BE OPENED BY THE BOILER INTERNAL CONTROLS. THE BOILER SHALL THEN START AND MODULATE IT'S FIRING RATE TO MAINTAIN THE BOILER LEAVING WATER TEMPERATURE SETPOINT.
8. WHEN THE EMERGENCY SHUT OFF SWITCH IS ACTIVATED, THE BOILERS SHALL IMMEDIATELY BE DE-ENERGIZED AND AN ALARM SHALL BE SENT TO THE BMS (THRU MONITORING OF THE EMERGENCY SHUT-OFF SWITCH).
9. THE BUILDING DDC SYSTEM SHALL MONITOR ALL TEMPERATURE POINTS INDICATED, BOILER STATUS, BOILER ALARM, PUMP STATUS, SPEED, COMMAND AND ALARM, AND OUTSIDE AIR TEMPERATURE.

BOILERS B-7 AND B-8 AND PUMPS P-10 AND P-11 (HIGH TEMPERATURE RESET SYSTEM)

1. WITH THE HYDRONIC HEATING PUMPS' HAND/AUTO/OFF SWITCH IN THE "AUTO" POSITION, THE DDC SYSTEM SHALL ENERGIZE THE LEAD PUMP. ONE OF THE PUMPS SHALL BE DESIGNATED "LEAD PUMP" AND SHALL OPERATE CONTINUOUSLY. THE OTHER PUMP SHALL SERVE AS THE STANDBY PUMP. THESE PUMPS PROVIDE HEATING HOT WATER TO THE POOL AND DOMESTIC HOT WATER HEATERS.
2. THE DDC SYSTEM SHALL ALTERNATE LEAD PUMP BASED ON RUN TIME HOURS OR AT THE BEGINNING OF EACH MONTH.
3. EACH PUMP WILL PROVE OPERATION TO THE DDC SYSTEM WITH ITS CURRENT SWITCH. IF THE LEAD PUMP FAILS, AN ALARM WILL BE SENT TO THE DDC SYSTEM AND THE STAND-BY PUMP WILL BE ACTIVATED.
5. WHEN ENABLED BY THE BMS, THE BOILER CONTROL PANEL (INTERNAL TO THE LEAD BOILER) SHALL CONTROL THE SEQUENCING AND FIRING OF THE BOILERS TO MAINTAIN THE SYSTEM SUPPLY WATER TEMPERATURE BASED ON AN INDOOR/OUTDOOR RESET SCHEDULE. IF A BOILER FAILS TO START, AN ALARM WILL BE GENERATED AND THE STANDBY BOILER WILL BE ACTIVATED.
8. WHEN THE EMERGENCY SHUT OFF SWITCH IS ACTIVATED, THE BOILERS SHALL IMMEDIATELY BE DE-ENERGIZED AND AN ALARM SHALL BE SENT TO THE BMS (THRU MONITORING OF THE EMERGENCY SHUT-OFF SWITCH).
9. THE BUILDING DDC SYSTEM SHALL MONITOR ALL TEMPERATURE POINTS INDICATED, BOILER STATUS, BOILER ALARM, PUMP STATUS, SPEED, COMMAND AND ALARM, AND OUTSIDE AIR TEMPERATURE.

SUPPLY HEADER NORMALLY CLOSED, 2-WAY, MOTORIZED VALVE.

1. THE VALVE SHALL BE NORMALLY CLOSED. THE VALVE IS MANUALLY CONTROLLED BY THE SYSTEM OPERATOR THRU THE DDC SYSTEMS. THE VALVE SHOULD BE OPENED BY THE OPERATOR WHEN ADDITIONAL CAPACITY IS NEEDED BY EITHER B-1 THRU B-6 OR B-7 THRU B-8.
2. UPON OPENING THE VALVE, THE DDC SYSTEM SHALL OVERRIDE THE HEATING HOT WATER SET POINT OF BOILERS B-1 THRU B-6 TO MATCH THE HEATING HOT WATER SETPOINT OF BOILERS B-7 AND B-8.
3. THE VALVE POSITION SHALL BE REPORTED AT THE BMS AND SHALL BE CONSIDERED "IN ALARM" WHEN IN THE OPEN POSITION.

CO MONITORING

1. THE CO DETECTION IN THE BOILER ROOM SHALL BE PROVIDED FOR LOCAL AUDIO AND VISUAL ALARMS. WHEN THE ALARMS ARE ACTIVE, IT SHALL BE REPORTED TO THE BMS.



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BOILER REPLACEMENT

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Seal:

ISSUED FOR:

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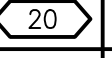

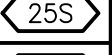
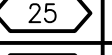
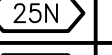
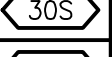
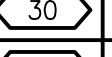

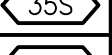
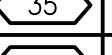
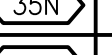
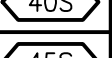
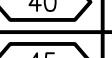

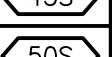
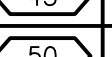
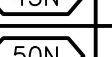
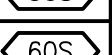
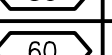
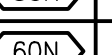
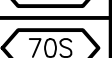
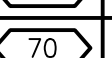

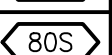
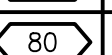

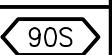
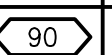

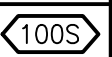
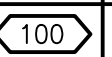


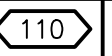

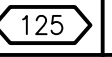

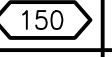

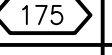
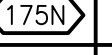
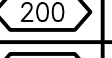
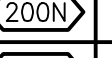
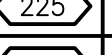
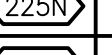
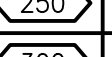
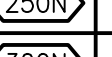
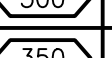
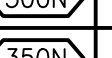


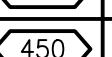





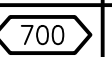

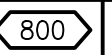

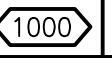

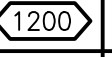

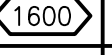
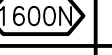
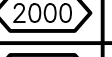
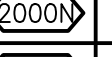


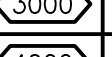
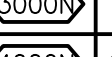
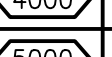
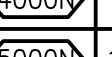
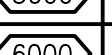
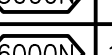
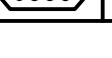
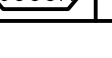


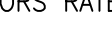

DESIGNER:	VAG
ENGINEER:	NCS






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











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TEMPERATURE CONTROL
DIAGRAMS

SHEET NUMBER:

























M8.0

COPPER FEEDER SCHEDULE									
FEEDER (AMPS)	COND. SIZE	2 WIRE WITH GROUND	FEEDER (AMPS)	COND. SIZE	3 WIRE WITH GROUND	FEEDER (AMPS)	COND. SIZE	4 WIRE WITH GROUND	
 15S	12	2#12, 1#12 GND IN 3/4°C	 15	12	3#12, 1#12 GND IN 3/4°C	 15N	12	4#12, 1#12 GND IN 3/4°C	
 20S	12	2#12, 1#12 GND IN 3/4°C	 20	12	3#12, 1#12 GND IN 3/4°C	 20N	12	4#12, 1#12 GND IN 3/4°C	
 25S	10	2#10, 1#10 GND IN 3/4°C	 25	10	3#10, 1#10 GND IN 3/4°C	 25N	10	4#10, 1#10 GND IN 3/4°C	
 30S	10	2#10, 1#10 GND IN 3/4°C	 30	10	3#10, 1#10 GND IN 3/4°C	 30N	10	4#10, 1#10 GND IN 3/4°C	
 35S	8	2#8, 1#10 GND IN 3/4°C	 35	8	3#8, 1#10 GND IN 3/4°C	 35N	8	4#8, 1#10 GND IN 3/4°C	
 40S	8	2#8, 1#10 GND IN 3/4°C	 40	8	3#8, 1#10 GND IN 3/4°C	 40N	8	4#8, 1#10 GND IN 3/4°C	
 45S	6	2#6, 1#10 GND IN 3/4°C	 45	6	3#6, 1#10 GND IN 3/4°C	 45N	6	4#6, 1#10 GND IN 1°C	
 50S	6	2#6, 1#10 GND IN 3/4°C	 50	6	3#6, 1#10 GND IN 3/4°C	 50N	6	4#6, 1#10 GND IN 1°C	
 60S	4	2#4, 1#10 GND IN 1°C	 60	4	3#4, 1#10 GND IN 1°C	 60N	4	4#4, 1#10 GND IN 1 1/4°C	
 70S	4	2#4, 1#8 GND IN 1°C	 70	4	3#4, 1#8 GND IN 1°C	 70N	4	4#4, 1#8 GND IN 1 1/4°C	
 80S	3	2#3, 1#8 GND IN 1°C	 80	3	3#3, 1#8 GND IN 1°C	 80N	3	4#3, 1#8 GND IN 1 1/4°C	
 90S	2	2#2, 1#8 GND IN 1°C	 90	2	3#2, 1#8 GND IN 1 1/4°C	 90N	2	4#2, 1#8 GND IN 1 1/2°C	
 100S	1	2#1, 1#8 GND IN 1 1/4°C	 100	1	3#1, 1#8 GND IN 1 1/4°C	 100N	1	4#1, 1#8 GND IN 1 1/2°C	
			 110	2	3#2, 1#6 IN 1 1/4°C	 110N	2	4#2, 1#6 GND IN 1 1/4°C	
			 125	1	3#1, 1#6 GND IN 1 1/4°C	 125N	1	4#1, 1#6 GND IN 1 1/2°C	
			 150	1/0	3#1/0, 1#6 GND IN 1 1/2°C	 150N	1/0	4#1/0, 1#6 GND IN 2°C	
			 175	2/0	3#2/0, 1#6 GND IN 1 1/2°C	 175N	2/0	4#2/0, 1#6 GND IN 2°C	
			 200	3/0	3#3/0, 1#6 GND IN 2°C	 200N	3/0	4#3/0, 1#6 GND IN 2°C	
			 225	4/0	3#4/0, 1#4 GND IN 2°C	 225N	4/0	4#4/0, 1#4 GND IN 2 1/2°C	
			 250	250	3–250 KCML, 1#4 GND IN 2°C	 250N	250	4–250 KCML, 1#4 GND IN 2 1/2°C	
			 300	350	3–350 KCML, 1#4 GND IN 2°C	 300N	350	4–350 KCML, 1#4 GND IN 3°C	
			 350	500	3–500 KCML, 1#3 GND IN 3°C	 350N	500	4–500 KCML, 1#3 GND IN 3 1/2°C	
			 400	600	3–600 KCML, 1#3 GND IN 3 1/2°C	 400N	600	4–600 KCML, 1#3 GND IN 4°C	
			 450	2–4/0	(2) 3#4/0, 1#2 GND IN 2°C	 450N	2–4/0	(2) 4#4/0, 1#2 GND IN 2 1/2°C	
			 500	2–250	(2) 3–250 KCML, 1#2 GND IN 2 1/2°C	 500N	2–250	(2) 4–250 KCML, 1#1 GND IN 3°C	
			 600	2–350	(2) 3–350 KCML, 1#1 GND IN 2 1/2°C	 600N	2–350	(2) 4–350 KCML, 1#1 GND IN 3°C	
			 700	2–500	(2) 3–500 KCML, 1#1/0 GND IN 3°C	 700N	2–500	(2) 4–500 KCML, 1#1/0 GND IN 3 1/2°C	
			 800	2–600	(2) 3–600 KCML, 1#1/0 GND IN 3 1/2°C	 800N	2–600	(2) 4–600 KCML, 1#1/0 GND IN 4°C	
			 1000	3–500	(3) 3–500 KCML, 1#2/0 GND IN 3°C	 1000N	3–500	(3) 4–500 KCML, 1#2/0 GND IN 3 1/2°C	
			 1200	3–600	(3) 3–600 KCML, 1#3/0 GND IN 4°C	 1200N	3–600	(3) 4–600 KCML, 1#3/0 GND IN 4°C	
			 1600	4–600	(4) 3–600 KCML, 1#4/0 GND IN 4°C	 1600N	4–600	(4) 4–600 KCML, 1#4/0 GND IN 4°C	
			 2000	5–600	(5) 3–600 KCML, 1–250 KCML GND IN 4°C	 2000N	5–600	(5) 4–600 KCML, 1–250 KCML GND IN 4°C	
			 2500	7–500	(7) 3–500 KCML, 1–350 KCML GND IN 3 1/2°C	 2500N	7–500	(7) 4–500 KCML, 1–350 KCML GND IN 3 1/2°C	
			 3000	8–500	(8) 3–500 KCML, 1–400 KCML GND IN 3 1/2°C	 3000N	8–500	(8) 4–500 KCML, 1–400 KCML GND IN 3 1/2°C	
			 4000	10–600	(10) 3–600 KCML, 1–500 KCML GND IN 4°C	 4000N	10–600	(10) 4–600 KCML, 1–500 KCML GND IN 4°C	
			 5000	12–600	(12) 3–600 KCML, 1–700 KCML GND IN 4°C	 5000N	12–600	(12) 4–600 KCML, 1–700 KCML GND IN 4°C	
			 6000	15–600	(15) 3–600 KCML, 1–500 KCML GND IN 4°C	 6000N	15–600	(15) 4–600 KCML, 1–800 KCML GND IN 4°C	
NOTES: 1. AMPACITIES FOR FEEDER SIZES ARE BASED ON N.E.C. CODE 110–14. (TERMINATION PROVISIONS FOR EQUIPMENT RATED 100A OR LESS ARE RATED FOR USE WITH CONDUCTORS RATED 60°C. TERMINATION PROVISIONS FOR EQUIPMENT RATED GREATER THAN 100A ARE RATED FOR USE WITH CONDUCTORS RATED 75°C.) 2. CONTRACTOR MAY OPTIONALLY USE 1/2" CONDUIT IN LIEU OF 3/4" CONDUIT FOR #10 AND #12 CONDUCTORS. 3. CONDUIT FILL IS BASED ON 40% FILL USING SINGLE CONDUCTOR BUILDING WIRE OF INSULATION TYPES THHN, THWN, THWN–2, XHH, XHHW, AND XHHW–2 IN RMC. FOR OTHER RACEWAY TYPES REFER TO APPROPRIATE N.E.C. APPENDIX C TABLES. 4. EQUIPMENT GROUND SIZING BASED ON N.E.C. TABLE 250.122.									























LIGHTING CONTROLS LEGEND	
SYMBOL	DESCRIPTION
	SINGLE POLE SWITCH
	THREE WAY SWITCH
	FOUR WAY SWITCH
	LIGHT CONTROL LOCATION
	GENERATOR TRANSFER DEVICE

TECHNOLOGY SYMBOL LIST	
SYMBOL	DESCRIPTION
	CAMERA
	CARD READER
	TECHNOLOGY OUTLET – 6" ABOVE COUNTER
	TECHNOLOGY OUTLET – FLOOR
	TECHNOLOGY OUTLET – WALL
	MAGNETIC DOOR HOLDER
	PUSH BUTTON
	SPEAKER
	WALL CLOCK – SINGLE FACE
	WALL CLOCK – DOUBLE FACE
	WALL CLOCK AND SPEAKER UNIT
	WIRELESS ACCESS POINT

- NOTES:
1. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR BOX AND CONDUIT FOR ALL DEVICES INDICATED.
2. LOW VOLTAGE CONTRACTOR SHALL PROVIDE EXACT SPECIFICATIONS AND LOCATIONS OF ALL DEVICES.

POWER SYMBOL LIST	
SYMBOL	DESCRIPTION
	CONDUIT DOWN
	CONDUIT UP
	DISCONNECT SWITCH – NON FUSED
	DISCONNECT SWITCH – FUSED
	DISCONNECT SWITCH – COMB. MOTOR STARTER
	ELECTRICAL PANEL
	GROUNDING ROD
	GROUND
	GROUNDING BAR
	JUNCTION BOX
	METER
	MOTOR – SINGLE PHASE
	MOTOR – THREE PHASE
	MOTOR RATED SWITCH
	POWER RECEPTACLE – SIMPLEX TYPE
	POWER RECEPTACLE – DUPLEX TYPE
	POWER RECEPTACLE – DUPLEX 6" ABOVE COUNTER
	POWER RECEPTACLE – USB/DUPLEX COMBO. DEVICE
	POWER RECEPTACLE – QUADRUPLIX TYPE
	POWER RECEPTACLE – RECESSED FLOOR TYPE
	POWER RECEPTACLE – POKE THRU TYPE
	POWER RECEPTACLE – SPECIALTY TYPE
	TIME CLOCK
	TRANSFORMER

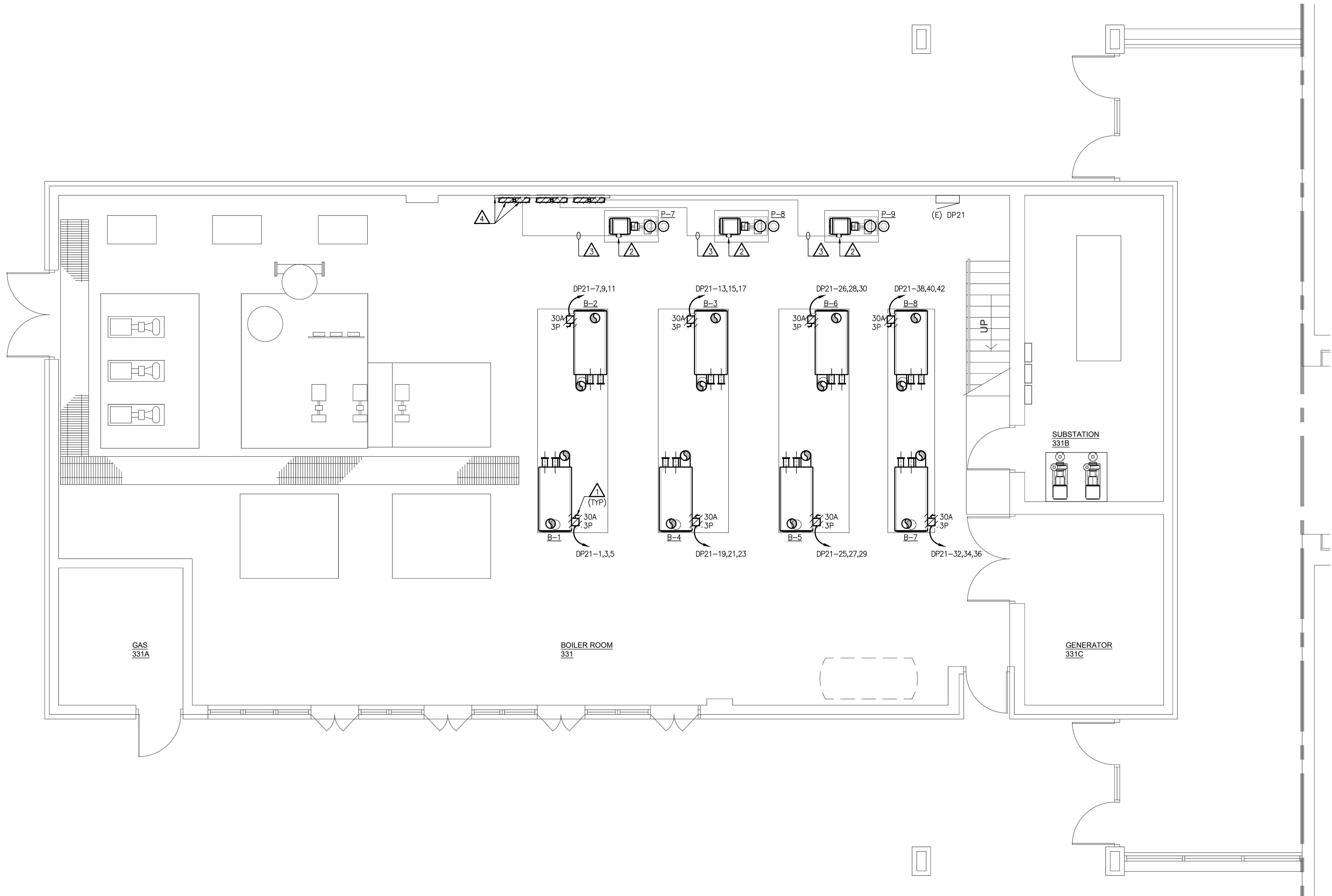
- NOTES:
1. ALL DEVICE RATINGS/SIZES SHALL BE COORDINATED WITH PLANS AND SCHEDULES.

FIRE ALARM SYMBOL LIST	
SYMBOL	DESCRIPTION
	AUDIBLE DEVICE/WALL MOUNTED
	VISUAL DEVICE/WALL MOUNTED
	COMBO AUDIBLE/VISUAL DEVICE/WALL MOUNTED
	AUDIBLE DEVICE/CEILING MOUNTED
	VISUAL DEVICE/CEILING MOUNTED
	COMBO AUDIBLE/VISUAL DEVICE/CEILING MOUNTED
	CO ALARM/SMOKE DETECTOR
	SMOKE DETECTOR
	CO ALARM
	DUCT MOUNTED SMOKE DETECTOR
	HEAT DETECTOR
	FIRE DEPARTMENT COMMUNICATION OUTLET
	EXISTING COMBINATION FIRE/SMOKE DAMPER (HORIZONTAL)
	NEW COMBINATION FIRE/SMOKE DAMPER (HORIZONTAL)
	EXISTING COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
	NEW COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
	MANUAL PULL STATION
	FLOW SWITCH
	TAMPER SWITCH
	FIRE ALARM ANNUNCIATOR PANEL
	FIRE ALARM CONTROL PANEL
	INPUT/OUTPUT CONTROL MODULE

- NOTES:
1. DRAWINGS INDICATE DESIGN INTENT ONLY, FINAL LOCATIONS AND DEVICE SPECIFICATIONS SHALL BE PROVIDED BY FIRE ALARM MANUFACTURER. REFER TO PROJECT SPECIFICATIONS FOR APPROVED MANUFACTURERS.
2. FIRE DETECTION AND SIGNALING DEVICES ARE SHOWN FOR COORDINATION PURPOSES. FINAL SYSTEM DESIGN TO BE PERFORMED BY CONTRACTOR AND SUPPLIER FOR OFFICIAL SUBMISSION. COORDINATE ALL DEVICE QUANTITIES AND LOCATIONS WITH SUPPLIER PRIOR TO INSTALLATION. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY PATHWAYS, POWER SUPPLIES AND DEVICES PER SUPPLIER CONTRACT DOCUMENTS.

ELECTRICAL ABBREVIATIONS	
ABBREV.	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
A	AMPERE
AF	AMPERE FUSE/AMPERE FRAME
AWG	AMERICAN WIRE GAUGE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AIC	AVAILABLE INTERRUPTING CURRENT (AMPS)
C	CONDUIT OR CEILING MOUNTED
CB	CIRCUIT BREAKER
CL	CONTROL LOAD
CU	COPPER
CT	CURRENT TRANSFORMER
DIA	DIAMETER
DISC	DISCONNECT
EMT	ELECTRICAL METALLIC TUBING
EWC	ELECTRIC WATER COOLER
EPO	EMERGENCY POWER OFF
(E)	EXISTING ELECTRICAL EQUIPMENT OR WORK
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
F	FUSE
G/GRD	GROUND
GFCI/GFI	

Drawing: S:\24_0339_01_dwg\hs boiler replacement\CAD\Elec\24_0339_01_ED1.dwg
Date: Apr 26, 2024, 4:47pm
Layout: ED1.1
Plotted by: vgonzalez



BOILER ROOM - ELECTRICAL DEMOLITION PLAN

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

ELECTRICAL DEMOLITION NOTES

- VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
- EXAMINE THE DRAWINGS OF OTHER TRADES, BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES.
- PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION OF DEVICES AND EQUIPMENT REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES.
- COORDINATE WITH NEW WORK PLANS, ONE LINE, AND RISER DIAGRAMS FOR EXTENT OF DEMOLITION WORK.
- COORDINATE ANY SHUTDOWN OF EXISTING SERVICES AND EQUIPMENT REMAINING IN USE WITH OWNERS' REPRESENTATIVE. WHERE EXISTING BUILDING SERVICE IS REQUIRED TO BE SHUT DOWN, INCLUDE ALL ASSOCIATED OVERTIME COST TO PERFORM THIS WORK DURING EVENING AND WEEKENDS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER.
- REMOVE ALL CONDUIT AND WIRE BACK TO NEAREST UPSTREAM DEVICE REMAINING IN SERVICE.
- WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM DEVICES TO REMAIN; EXTEND CONDUIT AND WIRE AS REQUIRED TO MAINTAIN ELECTRICAL SERVICE.
- PROVIDE BLANK COVER PLATES WHERE SWITCHES AND DEVICES ARE REMOVED AND WALL REMAINS INTACT. MARK ALL UNUSED CIRCUIT BREAKERS AS "SPARE".
- CONTRACTOR TO TAG ALL CIRCUITS AT BOTH ENDS AFFECTED BY THIS SCOPE OF WORK.
- CONTRACTOR SHALL PROVIDE UPDATED, TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS SCOPE OF WORK.
- CONTRACTOR SHALL VERIFY ALL UNDERGROUND AND IN-SLAB UTILITIES LOCATIONS PRIOR TO SAW CUTTING OR PENETRATING ANY FLOOR SLABS. CONTRACTOR SHALL REPAIR ALL UTILITIES DAMAGED BY SAW CUTTING.



DEMOLITION KEYED NOTES

- ELECTRICAL CONTRACTOR TO DISCONNECT AND REMOVE EXISTING DISCONNECT SWITCH ON BOILER AND RETURN FEEDERS, AS INDICATED, BACK TO SOURCE. CONDUIT TO REMAIN FOR NEW CIRCUITS. REFER TO NEW WORK PLANS.
- ELECTRICAL CONTRACTOR TO DISCONNECT INCOMING CONDUIT FROM PUMP JUNCTION BOX. MAINTAIN INCOMING EXISTING CIRCUITS, AS INDICATED FOR NEW PUMPS.
- EXISTING CONDUIT & FEEDERS FROM PUMP TO ASSOCIATED DISCONNECTS TO REMAIN FOR NEW PUMPS. REFER TO NEW WORK PLANS.
- EXISTING PUMP VFD'S, AND DISCONNECTS TO BE DISCONNECTED AND REMOVED. RETURN VFD'S AND DISCONNECTS TO OWNER. MAINTAIN EXISTING WIRE-WAY. EXISTING CIRCUITS TO REMAIN FOR NEW VFD'S AND DISCONNECTS BY MECHANICAL TRADES, INSTALLED BY ELECTRICAL CONTRACTOR. REFER TO NEW WORK PLANS.



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CLIENT:

MIDLAND PUBLIC SCHOOLS

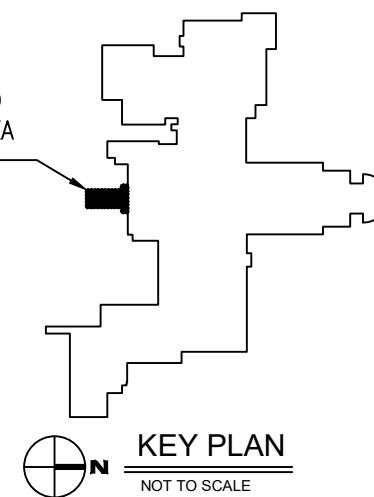
600 East Carpenter Street
Midland, MI 48640

PROJECT:

MIDLAND PUBLIC SCHOOLS DOW HIGH SCHOOL BOILER REPLACEMENT

600 East Carpenter Street
Midland, MI 48640

ENLARGED
PLAN AREA
OF WORK



Seal:

ISSUED FOR:

_____	_____
_____	_____
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BIDS/PERMITS	04/26/2024
ISSUED	DATE

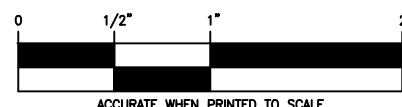
DESIGNER:	RWC
ENGINEER:	SET

SHEET TITLE:

BOILER ROOM - ELECTRICAL DEMOLITION PLAN

SHEET NUMBER:

ED1.1





E1.1



PROJECT:
MIDLAND PUBLIC SCHOOLS
DOW HIGH SCHOOL
BOILER REPLACEMENT
600 East Carpenter Street
Midland, MI 48640

DESIGNER: _____ RWC
ENGINEER: _____ SET

SHEET NUMBER:

E5.0



NOTES--

1. PROVIDE PUSHBUTTON AT EACH DOOR OUT OF BOILER ROOM.
2. PROVIDE ENGRAVED FACEPLATE WITH 'BOILER E--STOP' AT EACH PUSHBUTTON WITH PROTECTIVE COVER/RING.
3. EXTEND CIRCUIT TO ALL BOILERS IN ROOM.

SCALE: NOT TO SCALE

Panel Designation: (E) DP21 w/ NEW LOADS										Main: 400A MLO					P-P Voltage: 208				
Panel Location:										Bussing: 400A					P-N Voltage: 120				
Fed From: SUB STATION #2										Ground Bus: STANDARD					Phase: 3				
Feeder Size: EXISTING										Mouling: SURFACE					Wire: 4				
										Neutral: 100%					Min SC Interrupting Rating: 35KAIC				
Remarks	Light Load	Recept Load	Cont Load	nonC Load	OC Prot	CKT	Ø A	Ø B	Ø C	CKT	OC Prot	nonC Load	Cont Load	Recept Load	Light Load	Remarks			
NEW BOILER 1				1920	20	1	X			2		1800				EXISTING AIR COMP			
NEW BOILER 4				1920	20	3		X		4	15	1800							
NEW BOILER 5				1920	20	5			X	6		1800							
NEW BOILER 7				1920	20	7		X		8		3600				EXISTING PUMP 7			
NEW BOILER 2				1920	20	9			X	10	100	3600							
NEW BOILER 3				1920	20	11			X	12		3600							
NEW BOILER 6				1920	20	13		X		14		3600				EXISTING PUMP 8			
NEW BOILER 8				1920	20	15		X		16	100	3600							
SPACE				--	--	17			X	18		3600							
SPACE				--	--	19		X		20		3600				EXISTING PUMP 9			
SPACE				--	--	21			X	22	100	3600							
SPACE				--	--	23			X	24		3600							
SPACE				--	--	25		X		26	--					SPACE			
SPACE				--	--	27			X	28	--					SPACE			
SPACE				--	--	29			X	30	--					SPACE			
EXISTING				3600		31		X		32	--					SPACE			
				3600	100	33		X		34	--					SPACE			
				3600		35			X	36	--					SPACE			
EXISTING				3600		37		X		38	--					SPACE			
				3600	100	39			X	40	--					SPACE			
				3600		41				X	42	--				SPACE			

Load Description	Connected Load				
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NOTES:
1. LOADS SHOWN BOLD ARE NEW. PROVIDE NEW 20A-1P BREAKER COMPATIBLE WITH I-LINE TYPE HCN PANEL BOARD. TYPES BD, BG, BJ, AND BK.
2. PROVIDE BLANK INSERTS FOR SPACES, AS INDICATED.