INVITATION TO BID

Normandy Elementary School
Boiler Replacement

For

CENTERVILLE CITY SCHOOLS
111 Virginia Ave.
Centerville, Ohio 45458

Sealed bids for furnishing all labor, materials, and equipment necessary to complete the boiler replacement for the above building as specified, will be received by the Director of Business Operations Director, Centerville City Schools Board of Education located at 111 Virginia Avenue, Centerville, Ohio 45458. On June 10, 2025 at 3:00 PM (local time), Bids will be opened and read aloud at that time.

The estimated base bid is: $419,000.00

A Pre-Bid conference will be held on June 2, 2025 at 10AM (local time) at 401 Normandy Ridge Rd, Dayton, OH 45459 Attendance will be a factor in determining bidder's qualifications.

Bids may be mailed or delivered in person to Mr. Chuck Cowgill, Director of Business Operations, at 111 Virginia Avenue, Centerville, Ohio 45458 on or before 3:00 PM, June 10, 2025. Bid envelope is to be marked Boiler Replacement for Normandy Elementary School bid. Bids received after 3:00 PM (local time) will be returned unopened.

Information outlined in this bid invitation can be found on the Centerville City Schools website's administration tab by selecting Business Operations. Or, you can address the site directly by going to https://www.centerville.k12.oh.us/departments/business-operations.

Qualified bidders may obtain one (1) electronic set of bidding documents and project plans by contacting David Zelinski, Nauman & Zelinski, LLC, 204 S. Ludlow Street, Suite 400,

Dayton, OH 45402 Phone: (937) 223-3821, or email @ dzelinski@nzengineering.com

A bid security in the form of a Bid Bond in accordance with Chapter 153.54 of the Ohio Revised Code in the amount of 100 percent of the total bid shall accompany each bid, or a certified check, cashier's check, or letter of credit pursuant to Chapter 1305 of the Ohio Revised Code in the amount of 10 percent of the total bid shall accompany each bid. The successful bidder will be required to furnish a satisfactory performance bond for one hundred (100%) of the contract price.

No bidder may withdraw his bid within 60 days after the actual date of the bid opening.

The Board of Education reserves the right to reject each and every bid, and wave informalities and errors in bidding to the extent permitted by law. This includes the right to extend the date and time for receipt of bids.

BOARD OF EDUCATION
CENTERVILLE CITY SCHOOLS

By: Chuck Cowgill
Director of Business Operations

NORMANDY ELEMENTARY SCHOOL
BOILER REPLACEMENT

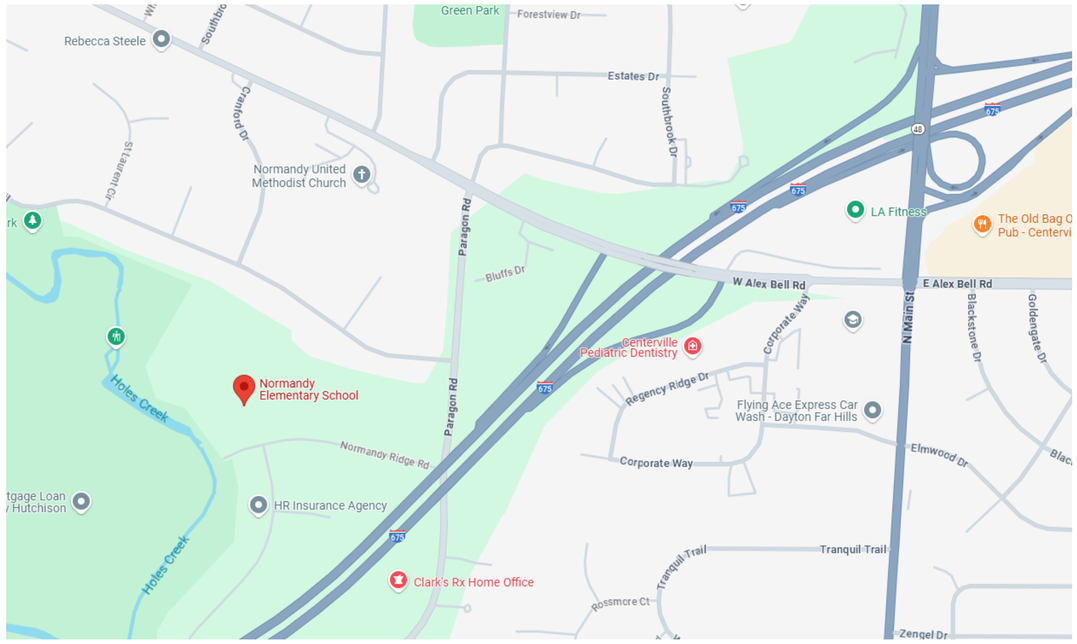
FOR

CENTERVILLE CITY SCHOOLS

111 VIRGINIA AVE. CENTERVILLE, OH 45458

PREPARED BY: NAUMAN & ZELINSKI LLC.
CONSULTING ENGINEERS

204. S LUDLOW ST.
DAYTON, OH 45402
(937)-223-3821



NORMANDY ELEMENTARY SCHOOL

401 NORMANDY RIDGE RD, DAYTON, OH 45459

HVAC INDEX OF DRAWINGS

SHEET	DRAWING TITLE
T0.1	TITLE SHEET
H0.1	LEGENDS AND SCHEDULES
H0.2	MATERIAL AND EQUIPMENT SCHEDULES & DIAGRAMS
H1.1	MECHANICAL ROOM WORK PLANS
H1.2	OVERALL PLAN
H3.1	DETAILS
H4.1	CONTROLS
E0.1	LEGENDS AND SCHEDULES
E1.1	DEMOLITION AND NEW WORK PLANS

NAUMAN & ZELINSKI LLC.
24656
204 S. Ludlow Street Dayton, Ohio 45402
Phone: (937) 223-3821

#	DATE	DESCRIPTION

REPLACE BOILERS
FOR
CENTERVILLE CITY SCHOOLS
Enter address here
TITLE SHEET

T0.1
SHEET NUMBER

GENERAL HVAC REMOVAL NOTES

A. GENERAL - THIS REMOVAL PLAN HAS BEEN MADE TO ASSIST THE CONTRACTOR IN DETERMINING GENERAL SCOPE OF REMOVALS. THESE DRAWINGS SHALL NEITHER BE CONSIDERED AS SHOWING ALL REMOVAL ITEMS NOR SHALL IT BE CONSIDERED A SUBSTITUTE FOR A THOROUGH SITE INVESTIGATION. NO ALLOWANCE SHALL BE MADE FOR LACK OF KNOWLEDGE CONCERNING EXISTING SITE CONDITIONS. ALL PIPE AND/OR DUCTWORK SHALL BE MADE CONTINUOUS TO ANY ACTIVE EQUIPMENT PAST THE ITEM(S) BEING REMOVED.

B. GENERAL REMOVALS - THE HVAC CONTRACTOR IS TO REMOVE ALL EXISTING, ACCESSIBLE UNUSED OR ABANDONED DEVICES, PIPING, WIRING, DUCTWORK AND SUPPORT HANGERS OR STRUCTURES TOTALLY BACK TO SOURCE. IN NO CASE SHALL ANY ABANDONED PIPING, WIRING, DUCTWORK, OR EQUIPMENT REMAIN WITHIN THE CONSTRUCTION AREA OR IN ADJACENT AREAS TO MECHANICAL ROOMS OR CLOSETS. ONLY ITEMS THAT ARE INACCESSIBLE SHALL BE ALLOWED TO BE ABANDONED IN PLACE WITH ALL ACCESSIBLE SERVICES APPROPRIATELY CAPPED.

C. SUPPORTS REMOVALS - ALL SUPPORTS SHALL BE REMOVED ENTIRELY FROM DEMOLISHED PIPING, DUCTWORK AND EQUIPMENT. REMAINING ACTIVE PIPING, DUCTWORK, ETC. SHALL BE RE-SUPPORTED AS REQUIRED WHERE EXISTING SUPPORTS ARE REMOVED, AS IN THE CASE OF DUCTWORK OR PIPING, WHICH IS BEING REMOVED OR WHERE EXISTING SUPPORTS/LOCATION CONFLICTS WITH NEW UTILITIES. NEW SUPPORTS SHALL UTILIZE APPROVED AND RECOGNIZED MATERIALS AND METHODS AND BE INSTALLED IN ACCORDANCE WITH THE DRAWINGS.

D. WALL REMOVALS - RECESSED DEVICES TO BE ABANDONED IN EXISTING WALLS WHICH ARE TO REMAIN IN FINISHED AREAS SHALL BE COVERED BY SUITABLE BLANK COVER PLATES AND PAINTED TO MATCH FINISH. WHERE REMOVALS ARE COMPLETELY REMOVED FROM FACE OF WALL, PATCH WALL CONSISTENT WITH ADJACENT FINISH. SURFACE MOUNTED REMOVED DEVICES SHALL HAVE SURFACE REPAIRED AND FINISHED TO MATCH ADJACENT EXISTING OR NEW ARCHITECTURAL FINISHES.

E. ROOF REMOVALS - DEVICES, SERVICES, SUPPORTS & EQUIPMENT REMOVED FROM ROOF SHALL BE REMOVED. THE HVAC CONTRACTOR SHALL ENGAGE A ROOFING CONTRACTOR TO PATCH THE ROOFING CONSISTENT WITH THE EXISTING ROOF WARRANTY.

F. ABANDONED SERVICES - ALL INACTIVE DUCT AND PIPE ABOVE CEILINGS SHALL BE REMOVED IN ENTIRETY AND CAPPED AT NEAREST ACTIVE MAINS.

G. EQUIPMENT REMOVAL/DISPOSAL COORDINATION - COORDINATE REMOVAL ITEMS CLOSELY WITH OWNER. ANY ITEMS REMOVED WITHIN THE CONSTRUCTION AREA SHALL BE TURNED OVER TO THE OWNER IN GOOD CONDITION WHEN INDICATED HEREIN OR WHEN SO REQUESTED BY THE OWNER. ALL OTHERS WILL BECOME THE PROPERTY OF THE CONTRACTOR AND WILL BE REQUIRED TO BE DISPOSED OF ACCORDINGLY. DISPOSALS REGUALTED BY EPA SHALL BE DONE IN STRICT ACCORDANCE WITH LATEST REQUIREMENTS AND DOCUMENTED.

H. PROTECTION - EXISTING MATERIALS AND FINISHES ARE TO BE PROTECTED AND RESTORED TO MATCH ADJACENT FINISHES. PROVIDE ADEQUATE PROTECTION TO ALL EXPOSED SURFACES AND EQUIPMENT WITHIN THE REMOVAL AREA.

I. ACTIVE EQUIPMENT & SERVICES - ANY EXISTING EQUIPMENT OR DEVICES TO REMAIN IN ADJACENT SPACES MADE INACTIVE BY REMOVAL OF DEVICES OR WIRING WITHIN THE CONSTRUCTION AREA SHALL BE RE-FED AS REQUIRED TO MAKE DEVICES OR EQUIPMENT OPERATIONAL.

J. DAMAGED SERVICES & INSULATION - EXISTING PIPING & DUCTWORK TO REMAIN WITH DAMAGED INSULATION ENCOUNTERED IN AREAS OF WORK SHALL HAVE DAMAGED INSULATION REMOVED AND REPLACED WITH NEW. INSULATION THICKNESS SHALL MATCH EXISTING CONDITION. WORK TO BE PERFORMED ON A TIME AND MATERIAL BASIS AS ENCOUNTERED. SERVICES DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR.

K. OPENINGS & PATCHING - WHERE DUCTWORK, PIPING, EQUIPMENT, OR AIR DEVICES ARE REMOVED THROUGH WALLS, FLOORS, CEILINGS AND ROOF, THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO PATCH AND FINISH CONSISTENT WITH THE EXISTING OR NEW ARCHITECTURAL FINISHES FOR THAT AREA. OPENINGS OR HOLES EXPOSED TO EXTERIOR CONDITIONS SHALL BE MADE WEATHER-TIGHT AND WATERPROOF AND CONSISTENT WITH ADJACENT WALL FINISHES. PATCHING AND SEALING TO BE CONSISTENT WITH FIRE AND SMOKE STOPPING AND RATING.

CMU WALLS - GROUT SMALL PENETRATIONS CLOSED. TOOTH IN WITH NEW BLOCKING FOR LARGE HOLES.
BRICK WALLS - TOOTH IN WITH NEW BRICK
GYPSUM BOARD WALLS - REPLACE WITH NEW GYPSUM BOARD
STRUCTURAL METAL ROOF/FLOOR DECKING - REPLACE WITH NEW DECKING, SAME AS EXISTING SIZE
CONCRETE FLOORS/WALLS - GROUT PENETRATIONS CLOSED
WOOD FLOORS/WALLS - PATCH CONSISTENT WITH WOOD TYPE

L. ASBESTOS REMOVALS - ANY MATERIAL SUSPECTED OF CONTAINING ASBESTOS ENCOUNTERED DURING THE COURSE OF CONSTRUCTION SHALL IMMEDIATELY BE REPORTED TO OWNER AND PROJECT MANAGER. ALL WORK IN THAT AREA SHALL CEASE UNTIL DEEMED SAFE.

M. CEILING REMOVALS - THE HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR THE TEMPORARY REMOVAL, STORAGE AND RE-INSTALLATION OF CEILING GRID AND TILES AS REQUIRED FOR WORK. CONTRACTOR IS RESPONSIBLE FOR REPLACEMENTS, IF DAMAGED.

GENERAL NOTES - HVAC

1. PROVIDE COMPLETE AND FUNCTIONAL HVAC SYSTEMS PER HVAC PLANS INCLUDING FURNISHING, INSTALLING, TESTING AND WARRANTY OF ALL WORK.
2. WORK SHALL BE IN ACCORDANCE WITH THE 2024 OHIO BUILDING AND MECHANICAL CODES INCLUDING REFERENCED CODES AND STANDARDS, ALL FEDERAL, STATE, AND LOCAL CODES AND ALL APPLICABLE LAWS, ORDINANCES AND REGULATIONS.
3. WORK SHALL BE PERFORMED USING BEST QUALITY INSTALLATION PRACTICE BY A QUALIFIED TRADE CONTRACTOR AND THEIR QUALIFIED SUBCONTRACTORS. ALL CONTRACTORS SHALL BE LICENSED AND BE BONDED FOR THE WORK.
4. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH OSHA AND OWNER SAFETY STANDARDS AND PRACTICES. ALL ON SITE PERSONNEL SHALL BE SAFETY TRAINED AND OWNER CERTIFIED.
5. OBTAIN REQUIRED PERMITS RELATED TO THE WORK AND PAY ALL PERMIT AND INSPECTION FEES.
6. THE AUTHORITY HAVING JURISDICTION SHALL INSPECT AND APPROVE ALL WORK. PROVIDE A FINAL CERTIFICATE OF APPROVAL FROM THE AUTHORITY HAVING JURISDICTION AND PRESENT TO THE OWNER BEFORE REQUESTING FINAL PAYMENT AND RELEASE OF RETAINAGE.
7. ALL EQUIPMENT AND MATERIAL REQUIRED FOR COMPLETE AND FUNCTIONAL HVAC SYSTEMS ARE INCLUDED IN THE CONTRACT.

GENERAL REQUIREMENTS - HVAC

1. PROTECT ALL FURNISHED MATERIAL AND EQUIPMENT FROM THEFT AND DETERIORATION OR CONTAMINATION DUE TO WEATHER OR CONSTRUCTION ACTIVITIES.
2. PROTECT OWNERS PROPERTY AND PROPERTY OF OTHER CONTRACTORS.
3. REMOVE ALL CONSTRUCTION DEBRIS FROM SITE. RECYCLE DEBRIS WHERE POSSIBLE. DISPOSE OF ALL HAZARDOUS MATERIAL IN ACCORDANCE WITH ENVIRONMENTAL LAWS.
4. PROVIDE ALL CUTTING AND PATCHING REQUIRED TO INSTALL MATERIAL AND EQUIPMENT.
5. EXISTING ROOF PATCHING SHALL BE SUBCONTRACTED TO A BONDED ROOFING CONTRACTOR FAMILIAR WITH THE ROOFING SYSTEM. MAINTAIN ANY REMAINING ROOF WARRANTY.
6. PROVIDE APPROPRIATE FIRESTOPPING SYSTEM FOR ANNULAR SPACE OPENINGS AROUND DUCT AND PIPE PENETRATIONS THROUGH FIRE RESISTANCE RATED CONSTRUCTION. ANNULAR SPACE OPENINGS AT DUCT OR PIPE PENETRATIONS IN NON RATED CONSTRUCTION TO BE CLOSED AIR AND WATER TIGHT.
7. MATERIALS AND EQUIPMENT SHALL BE ONE OF THE BRAND OR MANUFACTURERS LISTED OR AN APPROVED EQUAL.
8. ELECTRONIC SHOP DRAWINGS SHALL BE PROVIDED IN .PDF FORMAT FOR THE ENGINEER'S APPROVAL FOR ALL MATERIALS AND EQUIPMENT. SHOP DRAWINGS SHALL BE SPECIFICALLY EDITED TO ELIMINATE SUPERFLUOUS INFORMATION AND SHALL CLEARLY SHOW SPECIFICS FOR THE MATERIAL AND EQUIPMENT PROVIDED.
9. COORDINATE INSTALLATION OF ACTUAL EQUIPMENT AND SYSTEMS PROVIDED WITH OTHER TRADES AND NEW OR EXISTING CONDITIONS.
10. INSTALL ALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS. PROVIDE REQUIRED CLEARANCES TO MEET CODE REQUIREMENTS, MANUFACTURER'S RECOMMENDATIONS AND MAINTENANCE SERVICE.
11. ALL WORK AREAS SHALL BE CLEANED TO MATCH ORIGINAL CONDITION.
12. PROVIDE TESTING, ADJUSTING AND BALANCING (TAB) REPORTS FOR AIR AND WATER SYSTEMS. A CERTIFIED AABC OR NEBB FIRM SHALL PROVIDE THE BALANCE.
13. PROVIDE FINAL COORDINATION/INSTALLATION DRAWINGS TO THE OWNER IN BOUND PAPER AS WELL AS ELECTRONIC FORMAT FOR RECORD.
14. MAINTAIN RECORD DRAWINGS AND PROVIDE TO THE OWNER OR HIS AGENT.
15. PROVIDE TWO (2) BOUND, PAPER COPIES OF ALL OPERATING AND MAINTENANCE MANUALS. PROVIDE AN ELECTRONIC COPY OF THE OPERATING AND MAINTENANCE MANUAL.
16. PROVIDE WARRANTY FOR ALL WORKMANSHIP, EQUIPMENT AND MATERIAL. WARRANTY SHALL BE 1 YEAR FOR PART AND LABOR, PROVIDE EXTENDED WARRANTY PERIOD FOR PARTS AND/OR LABOR AS IDENTIFIED OR AS STANDARD FOR CERTAIN ITEMS OF EQUIPMENT.
17. PROVIDE TRAINING AND MAINTENANCE INSTRUCTION FOR SYSTEMS AND EQUIPMENT TO THE OWNER. TRAINING SHALL BE 16 HOURS OF TIME WITH MAXIMUM TRAINING PERIOD OF 4 HOURS.
18. ALL ROOFING WORK SHALL BE PROVIDED BY COTTERMAN ROOFING, CONTACT JOE BENDER 419-234-7238.

PIPING LEGEND

- HWS / HWS — HOT WATER SUPPLY
- HWR / HWR — HOT WATER RETURN
- INDICATES DIRECTION OF FLOW
- CD / CD — CONDENSATE DRAIN
- FLEXIBLE CONNECTION
- CAP
- CONNECTION, BOTTOM
- CONNECTION, TOP
- CONNECTION, SIDE
- ELBOW, 90°, LONG RADIUS
- ELBOW, 45°, LONG RADIUS
- ELBOW, TURNED UP
- ELBOW, TURNED DOWN
- REDUCER
- UNION, SCREWED
- PIPE HOSE THREAD CONNECTION
- (P) — PRESSURE GAUGE
- TEMPERATURE GAUGE
- MV — AIR VENT
  - MV = MANUAL
  - AV = AUTOMATIC

DUCTWORK LEGEND

- 20/12 / 20/12 — RECTANGULAR DUCT, FIRST FIGURE IS SIDE SHOWN
- 10"ø / 10"ø — ROUND DUCT, DIAMETER INDICATED
- INSULATED FLEXIBLE DUCT
- R — CHANGE OF ELEVATION, R = RISE, D = DROP
- ELBOW WITH TURNING VANES
- 20/12 — ROUND RUNOUT DUCT TAP TO RECTANGULAR DUCT WITH SPIN-IN FITTING, SEE DETAIL
- 10"ø — ROUND RUNOUT DUCT FITTING IN ROUND DUCT MAIN
- VOLUME DAMPER
- AUTOMATIC CONTROL DAMPER, REFER TO CONTROL DIAGRAMS FOR TYPE.
- SUPPLY DUCT SECTION - RISE, DROP
- RETURN DUCT SECTION - RISE, DROP
- (E) / 120 — EXISTING AIR DEVICE, REBALANCE TO AIR FLOW INDICATED
- (T) — ROOM TEMPERATURE SENSOR
- ROOM CO2 SENSOR, (MAY BE IN COMMON HOUSING W/ TEMP.)

TEMPERATURE CONTROLS LEGEND

ABBREVIATIONS

A.I. -	ANALOG INPUT
A.O. -	ANALOG OUTPUT
AFMS -	AIR FLOW MEASURING STATION
BAS -	BUILDING AUTOMATION SYSTEM
DDC -	DIRECT DIGITAL CONTROLS
D.I. -	DIGITAL INPUT
D.O. -	DIGITAL OUTPUT
ECM -	ELECTRICALLY COMMUTATE MOTOR
E.W.T. -	ENTERING WATER TEMPERATURE
L.W.T. -	LEAVING WATER TEMPERATURE
M.C. -	MASTER CONTROLLER
N.O. -	NORMALLY OPEN
N.C. -	NORMALLY CLOSED
SCR -	SILICON CONTROLLED RECTIFIER
VFD -	VARIABLE FREQUENCY DRIVE

SENSORS & TRANSMITTERS

- (T) TEMPERATURE SENSOR
- (H) HUMIDITY SENSOR
- (TH) COMBINATION TEMPERATURE & HUMIDITY SENSOR
- (TC) COMBINATION TEMPERATURE & CARBON DIOXIDE SENSOR
- (P) PRESSURE SENSOR
- (N) NITROGEN DIOXIDE (NO_2) SENSOR
- (CX) CARBON DIOXIDE (CO_2) SENSOR
- (C) CARBON MONOXIDE (CO) SENSOR
- (CN) COMBINATION CARBON MONOXIDE & NITROGEN DIOXIDE SENSOR
- (DP) DIFFERENTIAL PRESSURE SENSOR
- (E) ENTHALPY SENSOR
- (T) PIPE WELL TYPE TEMPERATURE SENSOR
- (FS) PIPE WELL TYPE FLOW METER
- THERMOSTAT - LINE OR LOW VOLTAGE
- [H] HUMIDISTAT
- [R] RELAY

VALVES

- MOTORIZED TWO-WAY CONTROL VALVE
- MOTORIZED THREE-WAY CONTROL VALVE

DAMPERS

- [M] MOTORIZED CONTROL DAMPER

OVER-RIDE TIMERS

- [V] OVERRIDE TIMER - LINE VOLTAGE
- OVERRIDE PUSH BUTTON - DIGITAL SIGNAL

GAUGES

- (PDX) PRESSURE DIAL GAUGE - REFER TO SPECIFICATION FOR RANGES
  - AIRFLOW UNITS: IN. W.C.
  - WATER UNITS: PSI

SAFETY DEVICES

- WIRED DIRECTLY TO EQUIPMENT STARTER W/ MANUAL RESET
- [SD] DUCTWORK SMOKE DETECTOR - RELAY & LOW VOLTAGE WIRING TO FAN CONTROLLER BY T.C.
- [P] HIGH STATIC SAFETY SWITCH
- [FS] FLOW SWITCH
- [FZ] FREEZE STAT

GENERAL LEGEND

EC	ELECTRICAL CONTRACTOR.
FC	FIRE PROTECTION CONTRACTOR.
GC	GENERAL CONTRACTOR.
HC	HVAC CONTRACTOR.
PC	PLUMBING CONTRACTOR.
TC	TEMPERATURE CONTROLS CONTRACTOR.
NIC	NOT IN CONTRACT.
AFF	ABOVE FINISHED FLOOR - TO BOTTOM OF ITEM UNLESS INDICATED OTHERWISE IN DRAWING.
(E)	EXISTING.
ES	EQUIPMENT SUPPLIER.
EM	EMERGENCY.
MH	MOUNTING HEIGHT.
S	SURFACE MOUNTED.
WP	WEATHER PROOF.
3	NOTE SYMBOL - APPLIES ONLY TO SHEET ON WHICH IS SHOWN.
2	DETAIL NOTE SYMBOL - APPLIES ONLY TO DETAIL ON WHICH IS SHOWN.
H-1	EQUIPMENT REFERENCE SYMBOL. ELECTRICAL CONNECTION REQUIRED.
H-1	EQUIPMENT REFERENCE SYMBOL. NO ELECTRICAL CONNECTION REQUIRED.
123	ROOM NUMBER.
B / H2	DETAIL SYMBOL, DETAIL "B" SHOWN ON SHEET H2.
A / H1	SECTION SYMBOL, SECTION "A" DESIGNATION, SHOWN ON SHEET H1.
A / H1	EXTERIOR ELEVATION SYMBOL, ELEVATION "A" DESIGNATION, SHOWN ON SHEET H1
	CONNECTION, NEW TO EXISTING.
FD1	UP TO SYMBOL, UP TO "FD1", SHOWN ON FLOOR ABOVE.
	1 HOUR FIRE PROTECTION, SEE SPECIFICATION FOR PENETRATION DETAILS
	2 HOUR FIRE PROTECTION, SEE SPECIFICATION FOR PENETRATION DETAILS
	3 HOUR FIRE PROTECTION, SEE SPECIFICATION FOR PENETRATION DETAILS
	ITEM TO BE REMOVED.
	EXISTING TO REMAIN.
	NEW ITEM.

VALVE LEGEND

- SHUT-OFF VALVE, SEE SCHEDULE FOR TYPE
- CHECK VALVE
- BALANCING VALVE
- GATE VALVE
- PRESSURE REDUCING VALVE
- TWO-WAY CONTROL VALVE
- THREE-WAY CONTROL VALVE
- STRAINER, Y-TYPE
- PRESSURE RELIEF VALVE

NAUMAN & ZELINSKI LLC.
204 S. Ludlow Street Dayton, Ohio 45402
Phone: (937) 223-3821

12 JUNE 2025
24056

#	DATE	DESCRIPTION

REPLACE BOILERS
FOR
CENTERVILLE CITY SCHOOLS
Enter address here
LEGENDS AND SCHEDULES

H0.1
SHEET NUMBER

DUCTWORK SYSTEMS SCHEDULE

DUCTWORK SYSTEMS	LOCATION	MATERIAL	SMACNA CLASS. SP. CONSTR.	SMACNA CLASS. SEAL CLASS	NOTES
COMBUSTION AIR	ALL	G1	-2"	A	
EXHAUST FLUE	ALL	D1	+4"	A	

DUCTWORK MATERIALS SCHEDULE

TYPE	MATERIAL	DESCRIPTION
D1	DOUBLE WALL FLUE	REFER TO SPECIFICATION 23 5100 FOR INFORMATION.
G1	GALVANIZED STEEL	24 GA. MIN., HOT DIPPED, GALVANIZED BOTH SIDES, G90 PER ASTM A653.

DUCTWORK INSULATION SCHEDULE

SYSTEM	INSULATION THICKNESS	TYPE	LOCATION	NOTES
COMBUSTION AIR	1"	1	INTERIOR	

TYPE	BASIS OF DESIGN	APPROVED EQUALS	DESCRIPTION
1	OWENS-CORNING SOFTR TYPE 75	KNAUF JM CERTAIN TEED	MATERIAL FIBERGLASS DUCT WRAP ON DUCT K = 0.30 @ 75 DEG. F. DENSITY - 0.75 PCF JACKET - FOIL REINFORCED JOINTS - OVERLAPPING STAPLE ALL JOINTS AT 6" CENTERS. FASTENERS - MECHANICAL ON 24" & WIDER DUCT. ADHESIVE - NONE TAPE - 3" WIDE

NOTES:

PIPING SYSTEMS - HVAC

PIPING SYSTEM	TYPE
HOT WATER - 0.50" TO 2"	C1
HOT WATER - 2.5" & ABOVE	S1
COLD WATER MAKE-UP	C1
CONDENSATE DRAINAGE	P1

TYPE	DESCRIPTION	TYPE	DESCRIPTION
S1	WELDED BLACK STEEL SCHEDULE 40, ASTM A53 TYPE E 150 LB. C.I. FITTINGS	C1	PRESS-FIT COPPER TYPE "L" HARD COPPER ASTM B88 WROUGHT COPPER ASTM B75 C12200 FITTINGS 250 DEG. F. EPDM SEALS
		P1	PVC SCHEDULE 40 PVC ASTM D2665 DWV FITTINGS, ASTM D3311 GLUED JOINTS

PIPE INSULATION SCHEDULE

SYSTEM & SIZE	INSULATION THICKNESS	TYPE	LOCATION
HOT WATER ≤ 1.25"	1.5"	F1	INTERIOR
HOT WATER ≥ 1.5"	2"	F1	INTERIOR
DOMESTIC MAKE-UP WATER	0.5"	F1	INTERIOR

TYPE	BASIS OF DESIGN	APPROVED EQUALS	DESCRIPTION
F1	OWENS CORNING #SSL II WITH ASJ MAX JACKET	- KNAUF - JOHNS MANVILLE - MANSON -CERTAINTEED	PREFORMED, TUBULAR, INORGANIC GLASS FIBER WITH RESIN BONDING. K=0.24 @ 100 DEG. F, 3.5 - 5.5 PCF, WHITE FSRK JACKET. LONGITUDINAL LAP, SELF-SEALING ADHESIVE. ELBOWS, TEES, VALVES, CAPS, ETC., WHITE ONE PIECE, PREMOLDED 25/50 0.20" PVC FITTING COVERS WITH HIGH DENSITY FIBERGLASS INSULATION INSERTS SAME THICKNESS, K=0.26 EQUAL TO ZESTON OR PROTO.

VALVE SCHEDULE

PIPING SYSTEM	VALVE TYPE BUTTERFLY	BALL	CHECK	GATE	BALANCING	PLUG
HOT, CHILLED, CONDENSER - 0.5" TO 2"		B1	C1		E1	
HOT, CHILLED, CONDENSER - 2.5" & LARGER	A1		C2		E2	

TYPE	DESCRIPTION	TYPE	DESCRIPTION	TYPE	DESCRIPTION
A1	BUTTERFLY VALVE NIBCO LD-2000 175 W.W.P. DUCTILE OR CAST IRON TAPPED LUG BODY, ALUMINUM BRONZE DISC, EPDM SEAT, 416 S.S. STEM, 10-POSITION HANDLE.	C1	CHECK VALVE NIBCO T-413-Y 125 W.W.P. BRONZE BODY Y-PATTERN, THREADED ENDS, RENEWABLE BRONZE SWING DISC TFE SEAT RING	E1	BALANCING VALVE BELL & GOSSETT MODEL CB 125 W.W.P. BRONZE BODY BRASS BALL THREADED ENDS READOUT & DRAIN PORTS TFE SEATS CALIBRATED NAMEPLATE HANDLE WITH MEMORY STOP
B1	BALL VALVE NIBCO T-580-70/T-585-70 150 W.W.P. 2-PIECE FULL PORT BRONZE BODY THREADED/PRESS ENDS CHROME PLATED BRONZE BALL/BRONZE STEM TFE SEAT AND SEAL HANDLE.	C2	CHECK VALVE NIBCO F-918-B 125 W.W.P. CAST IRON BODY FLANGED ENDS BRONZE TRIM RENEWABLE BRONZE SWING DISC & SEAT RING	E2	BALANCING VALVE BELL & GOSSETT MODEL CB 125 W.W.P. BRONZE BODY BRASS BALL THREADED ENDS READOUT & DRAIN PORTS TFE SEATS CALIBRATED NAMEPLATE HANDLE WITH MEMORY STOP

BOILER SCHEDULE - HEATING HOT WATER

GENERAL NOTES
BASIS OF DESIGN: BRYAN BOILERS - FREE FLEX
EQUAL BY: RBI - TORUS
MANUAL NATURAL GAS.
NATURAL GAS DELIVERY PRESSURE - 4" W.C. - 14" W.C.
BOILER RELIEF PRESSURE: 50 PSIG

UNIT	LOCATION	TYPE	GROSS INPUT (MBH)	GROSS OUTPUT (MBH)	GPM	E.W.T.	L.W.T.	MIN. EFF. (%)	INTAKE SIZE	FLUE SIZE	MAX W.P.D. (FT. HEAD)	ELECTRICAL MOTOR H.P.	ELECTRICAL VOLT/PHASE	ELECTRICAL AMPS	MANUFACTURER	MODEL NO.	NOTES
B-25-1	MECH. ROOM	WATER TUBE BOILER	2500	2375	119	120	160	95	10" DIA.	10" DIA.	5	1.5	208 / 1	8.3	BRYAN	FF-2500	2
B-25-2	MECH. ROOM	WATER TUBE BOILER	2500	2375	119	120	160	95	10" DIA.	10" DIA.	5	1.5	208 / 1	8.3	BRYAN	FF-2500R	1, 2

NOTES:
1. REVERSE CONSTRUCTION.
2. EXTERIOR ACCESS DOOR TO MECHANICAL ROOM IS 79" TALL. IF THE BOILER PROVIDED EXCEEDS THIS HEIGHT, THE BOILER SHALL SHIP FROM THE MANUFACTURER KNOCKED DOWN TO BE ASSEMBLED ONSITE. REASSEMBLY SHALL CONFORM TO MANUFACTURERS REQUIREMENTS TO MAINTAIN PRODUCT WARRANTIES.

HYDRONIC PUMPS SCHEDULE 2123

BASIS OF DESIGN - BELL & GOSSETT
EQUAL BY: ARMSTRONG, PATTERSON, GRUNDFOS

NOTES:
1. REFER TO PUMP MOUNTING DETAIL - DETAIL 2 -, SHEET H3.1.

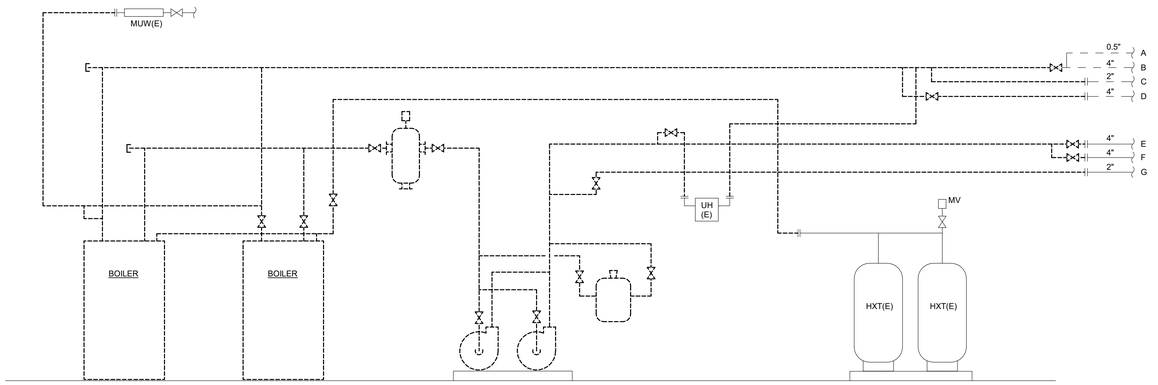
TAG	SERVICE	DESCRIPTION	MODEL NUMBER & SIZE	CAPACITY GPM	CAPACITY FT HD	MOTOR HP	MOTOR VOLT/PHASE	NOTES
P-25-1	B-25-1	BASE MOUNTED, END SUCTION	e-1510 2BD	120	65	5	208 V / 3 PH	1
P-25-2	BACKUP	BASE MOUNTED, END SUCTION	e-1510 2BD	120	65	5	208 V / 3 PH	1
P-25-3	B-25-2	BASE MOUNTED, END SUCTION	e-1510 2BD	120	65	5	208 V / 3 PH	1

VARIABLE FREQUENCY DRIVES

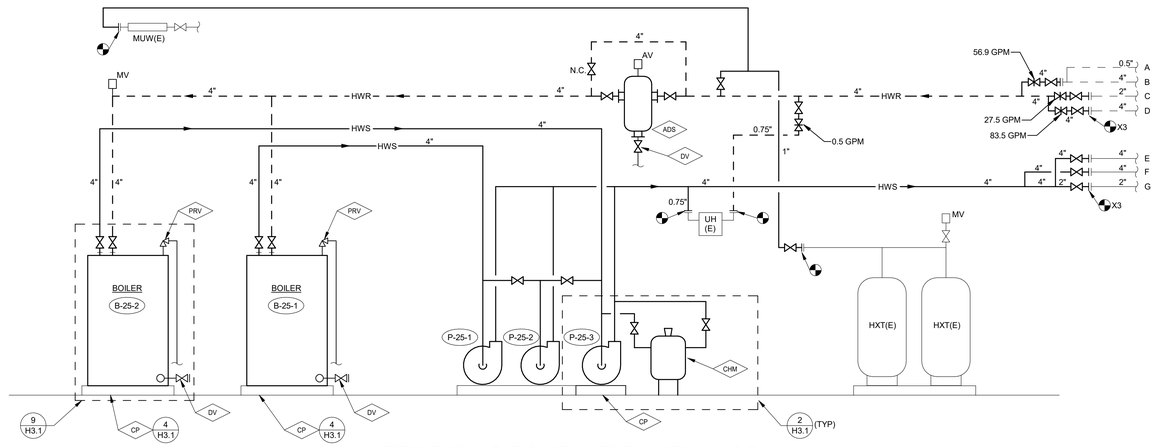
GENERAL NOTES
ALL VFD'S SHALL BE FROM SAME MANUFACTURER
ALL VFD'S SHALL HAVE A BACNET COMMUNICATION CARD
VFD'S FULL LOAD AMPS SHALL BE EQUAL TO OR GREATER THAN THE SUM OF THE INDIVIDUAL MOTOR FULL LOAD AMPS

TAG	SERVICE	H.P.	ENCLOSURE	NOTES
VFD-25-1	P-25-1	5	NEMA 1	1, 2
VFD-25-2	P-25-2	5	NEMA 1	1, 2
VFD-25-3	P-25-3	5	NEMA 1	1, 2

NOTES:
1. FURNISH WITH INTEGRAL DISCONNECT SWITCH.
2. VFD FURNISHED BY THE H.C., INSTALLED BY THE E.C.



HOT WATER PIPING SCHEMATIC - DEMOLITION
N.T.S



HOT WATER PIPING SCHEMATIC - NEW WORK
N.T.S

EQUIPMENT NOTES

ADS AIR-DIRT SEPARATOR
BELL & GOSSETT # CRSN-4F OR EQUAL.
CONNECTION SIZE: 4"
MAX. FLOW RATE: 245
WEIGHT: 147 LBS

CHM CHEMICAL SHOT FEEDER
5 GALLON
REFER TO SPECIFICATION

CP CONCRETE EQUIPMENT PAD
4"
REFER TO DETAIL

DV DRAIN VALVE
3/4" DRAIN VALVE W / THREADED HOSE CONNECTION.

PRV PRESSURE RELIEF VALVE
50 PSIG
REFER TO SPECIFICATION FOR ADDITIONAL INFORMATION.

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NZ JOB NUMBER 24056

#	DATE	DESCRIPTION

REPLACE BOILERS
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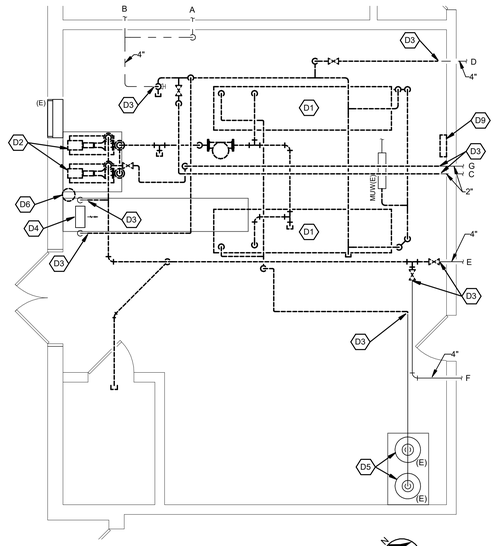
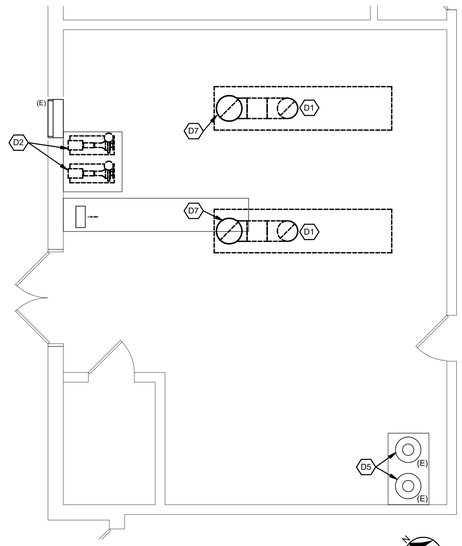
CENTERVILLE CITY SCHOOLS
Enter address here
MATERIAL AND EQUIPMENT SCHEDULES & DIAGRAMS

H0.2
SHEET NUMBER



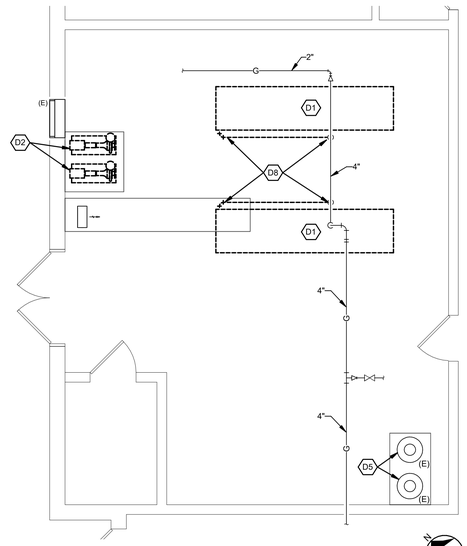
DEMOLITION PLAN - PIPING

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



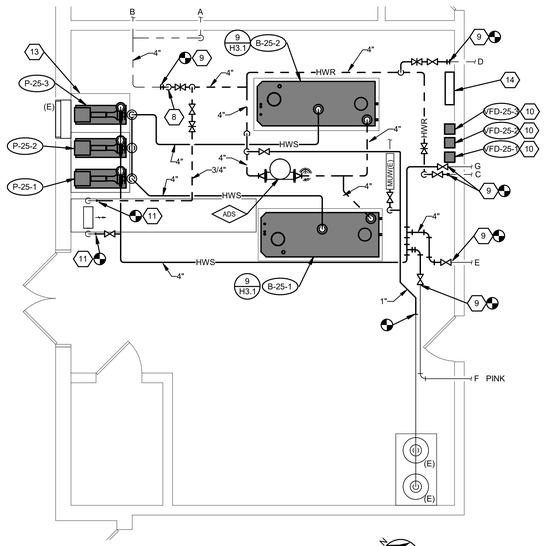
DEMOLITION PLAN - DUCTWORK

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



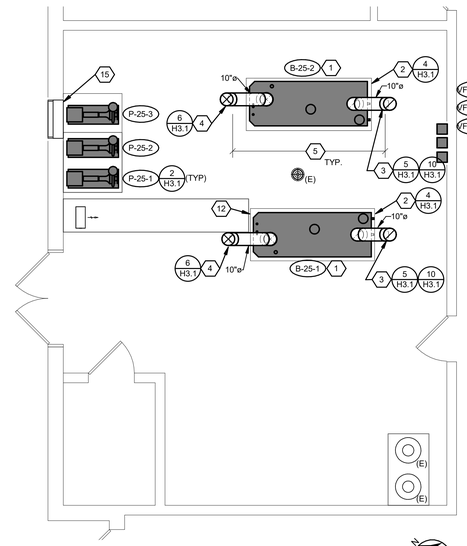
DEMOLITION PLAN - NATURAL GAS

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



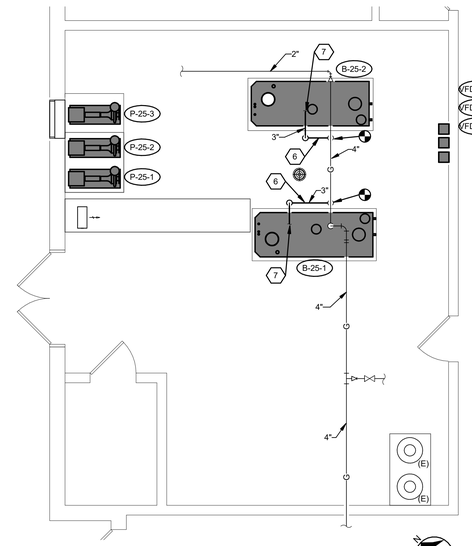
NEW WORK PLAN - PIPING

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



NEW WORK PLAN - DUCTWORK

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



NEW WORK PLAN - NATURAL GAS

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

DEMOLITION NOTES

D1. REMOVE BOILER.

D2. REMOVE PUMP.

D3. REMOVE PIPE TO LOCATION INDICATED. REFER TO NEW WORK PLAN.

D4. UNIT HEATER TO REMAIN.

D5. HOT WATER EXPANSION TANKS TO REMAIN.

D6. REMOVE CHEMICAL SHOT FEEDER.

D7. REMOVE EXISTING BOILER FLUE. EXISTING ROOF PENETRATION AND ROOF CURB TO BE REUSED. REFER TO NEW WORK PLAN.

D8. DISCONNECT NATURAL GAS FROM BOILER AND REMOVE BACK TO VALVE ON VERTICAL RISER. REFER TO NEW WORK PLAN.

D9. REMOVE EXISTING BOILER CONTROL PANEL.

CONSTRUCTION NOTES

1. NEW BOILER.
2. NEW 4" CONCRETE PAD.
3. BOILER FLUE. PROVIDE NEW ROOF PENETRATION. REFER TO DETAILS FOR SUPPLEMENTAL FRAMING AND ROOF PENETRATION.
4. COMBUSTION AIR INTAKE. REUSE EXISTING ROOF PENETRATION.
5. MAINTAIN 10 FT. MINIMUM DISTANCE FROM INTAKE AND FLUE. TYPICAL.
6. PROVIDE NATURAL GAS REGULATOR. SIZE PER BOILER GAS INPUT REQUIREMENTS.
7. CONNECT TO BOILER GAS TRAIN.
8. REMOVE AND REPLACE SHUT-OFF VALVE.
9. RECONNECT TO EXISTING BRANCH PIPE.
10. COORDINATE VFD INSTALLATION LOCATION ON WALL WITH EXISTING SYSTEMS.
11. FIELD VERIFY PIPE SIZE AND MATCH EXISTING HEATER INLET/OUTLET PIPE SIZE.
12. COORDINATE LOCATION OF CONCRETE EQUIPMENT PAD. DO NOT POUR ON TOP OF EXISTING TRENCH.
13. PROVIDE EXTENSION TO EXISTING CONCRETE PAD TO HOUSE NEW PUMPS.
14. NEW HEATING HOT WATER SYSTEM CONTROL PANEL. COORDINATE FINAL LOCATION ON WALL WITH NEW VFD'S AND EXISTING PIPING.
15. PROVIDE INSULATED BLANK OFF PANEL ON LOUVER. FIELD VERIFY SIZE PRIOR TO ORDERING.

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REPLACE BOILERS
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CENTERVILLE CITY SCHOOLS
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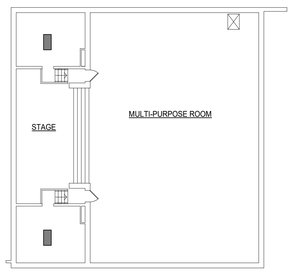
MECHANICAL ROOM WORK PLANS

H1.1
SHEET NUMBER

OVERALL PLAN
SCALE: 1/16" = 1'-0"



MEZZANINE PLAN
SCALE: 1/16" = 1'-0"

GENERAL BALANCING NOTES

1. THE BALANCING CONTRACTOR SHALL BALANCE ALL INDICATED ON THIS PLAN TO THE FLOW RATES SPECIFIED. PRIOR TO BALANCING TO NEW SET POINT, RECORD EXISTING BALANCING VALVE SET POINT AND INCLUDE THIS INFORMATION IN THE FINAL BALANCING REPORT.
2. ALL WORK IN THE SCHOOL BUILDING, OUTSIDE OF THE MECHANICAL ROOM, SHALL BE COMPLETED AFTER SCHOOL HOURS.

CONSTRUCTION NOTES

1. NEW DIFFERENTIAL PRESSURE SENSOR. INSTALL IN EXISTING PIPING.

0 8 16 32 48 64 80
SCALE: 1/16"=1'-0"

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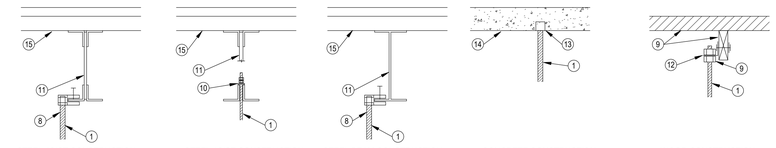
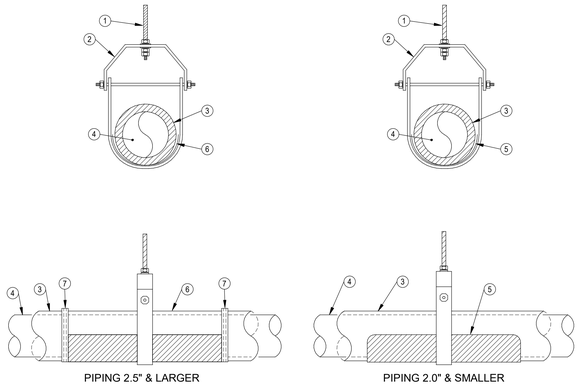
N.Z. JOB NUMBER 24056

#	DATE	DESCRIPTION

REPLACE BOILERS
FOR
CENTERVILLE CITY SCHOOLS
Enter address here
OVERALL PLAN

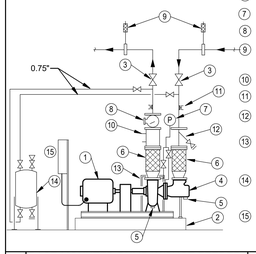
H1.2
SHEET NUMBER





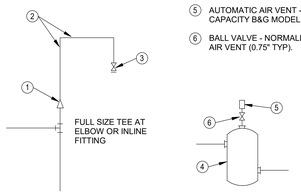
1. GALVANIZED THREADED ROD. ADJUST NUTS & RODS FOR PROPER ELEVATION.
2. STEEL CLEVIS PIPE HANGER. EQUAL TO ANVIL FIG. 260.
3. PIPE INSULATION.
4. PIPE.
5. 12" LONG, 18 GA. GALVANIZED INSULATION SHIELD. EQUAL TO ANVIL FIG. 168. CONTINUOUS INSULATION.
6. 18" LONG INSULATED PIPE SADDLES. BUCKAROOS TRU-BALANCE 3300E OR EQUAL. PROVIDE WITH 3.75 LB. DENSITY PHENOLIC FOAM INSULATION WITH VAPOR RETARDER JACKET & BOTTOM GALVANIZED METAL INSULATION SHIELD. SADDLES TO MEET 25/50 FLAME/SMOKE RATING.
7. PIPE INSULATION AND SADDLE INSULATION SHALL BE TIGHTLY ABUTTED TOGETHER. SEAL WITH 4" WIDE VAPOR RETARDER TAPE WITH FACTORY APPLIED JACKET WITH ACRYLIC ADHESIVE TO ASSURE VAPORTIGHT SEAL.
8. THREADED ROD BEAM CLAMP.
9. WOOD DECK & BEAM.
10. RETAINING NUTE & WASHERS.
11. STEEL JOIST OR BEAM.
12. 90 DEGREE SIDE BEAM BRACKET WITH THREADED ROD INTO WOOD.
13. CONCRETE EXPANSION ANCHOR OR CONCRETE INSERT IN NEW CONSTRUCTION.
14. CONCRETE SLAB OR PLANK.
15. METAL DECKING. DIRECT ATTACHMENT TO DECKING IS PROHIBITED. PROVIDE SUPPLEMENTAL STEEL ANGLES OR UNISTRUT WHERE REQUIRED FOR PROPER HANGER SPACING OR IN LIEU OF ATTACHMENTS SHOWN.

1 PIPE HANGERS N.T.S. — CLEVIS HANGER, INSULATED PIPE



1. BASE MOUNTED END SUCTION CENTRIFUGAL PUMP WITH INTEGRAL BASE.
2. CONCRETE EQUIPMENT PAD BY G.C. H.C. TO GROUT PUMP BASE.
3. SHUT-OFF VALVE.
4. SUCTION DIFFUSER W/INTEGRAL FINE MESH START-UP STRAINER AND ADJUSTABLE SUPPORT. REMOVE MESH STRAINER AFTER START-UP.
5. DRAIN PLUG.
6. FLEXIDUCER CONNECTOR.
7. PRESSURE GAUGE, PIPING AND VALVES.
8. CHECK VALVE.
9. COMBINATION SPRING ISOLATOR/PIPE HANGER.
10. BALANCING VALVE.
11. PRESSURE-TEMPERATURE TEST PLUG.
12. WYE STRAINER WITH 0.75" BALL BLOW-OFF VALVE AND CAPPED HOSE THREAD.
13. REMOVABLE RIGID INSULATION ENCLOSURE AROUND PUMP CASING - CHILLED SERVICES ONLY.
14. 5 GALLON CHEMICAL SHOT FEEDER WITH 12" HIGH STAND. PROVIDE ON ONE PUMP PER SYSTEM.
15. VFD. REFER TO PLAN FOR LOCATION.

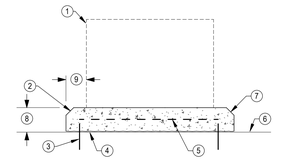
2 BASE MOUNTED PUMP W/SHOT FEEDER N.T.S.



1. REDUCER.
2. 0.75" x 6" LONG NIPPLES.
3. 0.75" BALL VALVE WITH HOSE THREAD CONNECTION. EXTEND TO ACCESSIBLE LOCATION.
4. AIR REMOVAL DEVICE IN PIPING SYSTEM OR PIPE MAIN HIGH POINT.
5. AUTOMATIC AIR VENT - FLOAT TYPE, HIGH CAPACITY B&G MODEL 107A OR EQUAL.
6. BALL VALVE - NORMALLY OPEN. SAME SIZE AS AIR VENT (0.75" TYP).

NOTE: PROVIDE MANUAL VENT WHERE SHOWN AND AT ALL HIGH POINTS OF SYSTEM SUPPLY & RETURN. PROVIDE AUTOMATIC VENTS AT AIR REMOVAL FITTINGS & WHERE SHOWN AT PIPE MAIN HIGH POINTS.

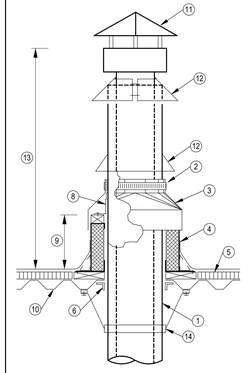
3 AIR VENTS N.T.S.



1. OUTLINE OF EQUIPMENT.
2. 4,000 PSI CONCRETE.
3. 1-#4 DOWEL, 6" LONG, EACH CORNER.
4. ROUGHEN SLAB & APPLY BONDING AGENT.
5. STEEL REINFORCING MESH.
6. FINISHED CONCRETE FLOOR.
7. 45 DEG. CHAMFER ALL AROUND.
8. 4" THICK CONCRETE SLAB.
9. MINIMUM 2" DISTANCE.

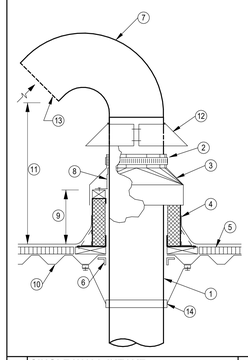
NOTE: OVERALL DIMENSION TO BE DETERMINED BY CONTRACTOR.

4 INTERIOR CONCRETE EQUIPMENT PAD N.T.S. — NEW BOILERS



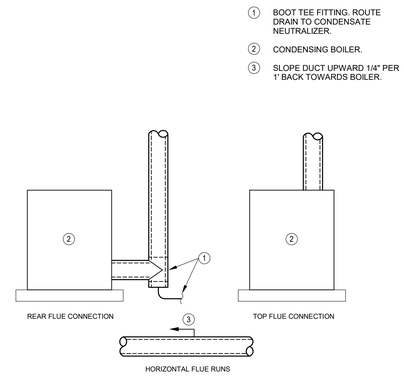
1. DOUBLE WALL VENT. REFER TO SPECIFICATION.
2. DRAW BAND. FILL VOID WITH CAULK.
3. COUNTERFLASHING.
4. NEW PREFABRICATED CURB.
5. INSULATION.
6. SUPPLEMENTAL STEEL FRAMING BY G.C.
7. LEAVE 1/4" SPACE AND FILL VOID WITH CAULK ALL AROUND.
8. SHEETMETAL SAFING ALL AROUND. TIGHT TO DUCT.
9. 12" MINIMUM.
10. ROOF DECK.
11. RAIN CAP.
12. STORM COLLAR.
13. MINIMUM 24" ABOVE ROOF.
14. STEEL SUPPORT RING. SECURE TO ROOF DECK WITH UNISTRUCT FRAMING.

5 DOUBLE WALL FLUE N.T.S.



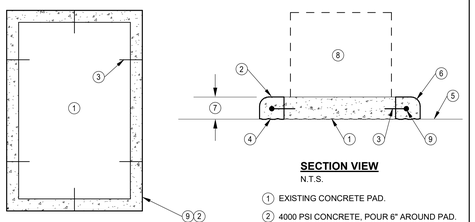
1. SINGLE WALL DUCT.
2. DRAW BAND. FILL VOID WITH CAULK.
3. COUNTERFLASHING.
4. NEW PREFABRICATED CURB.
5. INSULATION.
6. SUPPLEMENTAL STEEL FRAMING BY G.C.
7. GOOSENECK 45 DEG. DOWN.
8. SHEETMETAL SAFING ALL AROUND. TIGHT TO DUCT.
9. 12" MINIMUM.
10. ROOF DECK.
11. MIN. 36" ABOVE ROOF.
12. STORM COLLAR.
13. WIRE MESH BIRDSCREEN OVER INLET.
14. STEEL SUPPORT RING. SECURE TO ROOF DECK WITH UNISTRUCT FRAMING.

6 SINGLE WALL INTAKE N.T.S.



1. BOOT TEE FITTING. ROUTE DRAIN TO CONDENSATE NEUTRALIZER.
2. CONDENSING BOILER.
3. SLOPE DUCT UPWARD 1/4" PER 1' BACK TOWARDS BOILER.

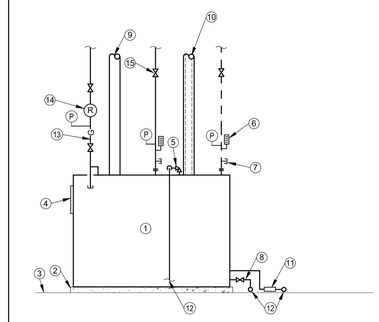
7 CONDENSING BOILER FLUES N.T.S.



NOTE: CONCRETE PADS TO BE PROVIDED BY H.C. OVERALL DIMENSION TO BE COORDINATED WITH ACTUAL EQUIPMENT USED & OTHER CONTRACTORS.

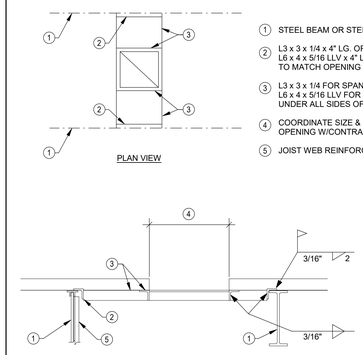
1. EXISTING CONCRETE PAD.
2. 4000 PSI CONCRETE, POUR 6" AROUND PAD.
3. 1-#4 DOWEL, 4" LONG @ 15" O.C., DOWEL 2" INTO EXISTING CONCRETE (TIE INTO CONTINUOUS DOWEL).
4. ROUGHEN SLAB & APPLY BONDING AGENT.
5. EXISTING CONC. FINISH FLOOR.
6. ROUNDED EDGES ALL AROUND.
7. 4" HIGH APPROX. TO MATCH.
8. EQUIPMENT.
9. 1-#4 DOWEL, RUN CONTINUOUS CENTERED IN NEW CONCRETE.

8 INTERIOR CONCRETE EQUIPMENT PAD EXTENSION N.T.S. — NEW PUMPS



1. HOT WATER BOILER.
2. 4" HIGH CONCRETE PAD.
3. FLOOR.
4. BOILER CONTROL PANEL.
5. SAFETY RELIEF VALVE PROVIDED WITH BOILER. SET AT 50 PSI.
6. THERMOMETER.
7. PRESSURE/TEMPERATURE TEST PLUG.
8. 1" DRAIN VALVE.
9. COMBUSTION AIR INTAKE DUCT.
10. DOUBLE WALL STAINLESS STEEL FLUE.
11. CONDENSATE DRAIN. CONDENSATE NEUTRALIZER PROVIDED BY BOILER MANUFACTURER.
12. EXTEND PIPE TO DRAIN.
13. GAS CONNECTION TO BOILER. PROVIDE DIRT LEG.
14. GAS REGULATOR.
15. SHUT-OFF VALVE.

9 CONDENSING HOT WATER BOILER N.T.S. — TOP CONNECTIONS



1. STEEL BEAM OR STEEL JOIST.
2. L3 x 3 x 1/4 x 4" LG. OR L6 x 4 x 5/16 LLV x 4" LG. TO MATCH OPENING FRAME.
3. L3 x 3 x 1/4 FOR SPANS UNDER 6'-6" L6 x 4 x 5/16 LLV FOR SPANS OVER 6'-6" UNDER ALL SIDES OF ROOF OPENING.
4. COORDINATE SIZE & LOCATION OF OPENING W/CONTRACTOR.
5. JOIST WEB REINFORCE ANGLE.

10 TYPICAL ROOF OPENING FRAMING N.T.S.

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NZ JOB NUMBER 24056

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REPLACE BOILERS FOR
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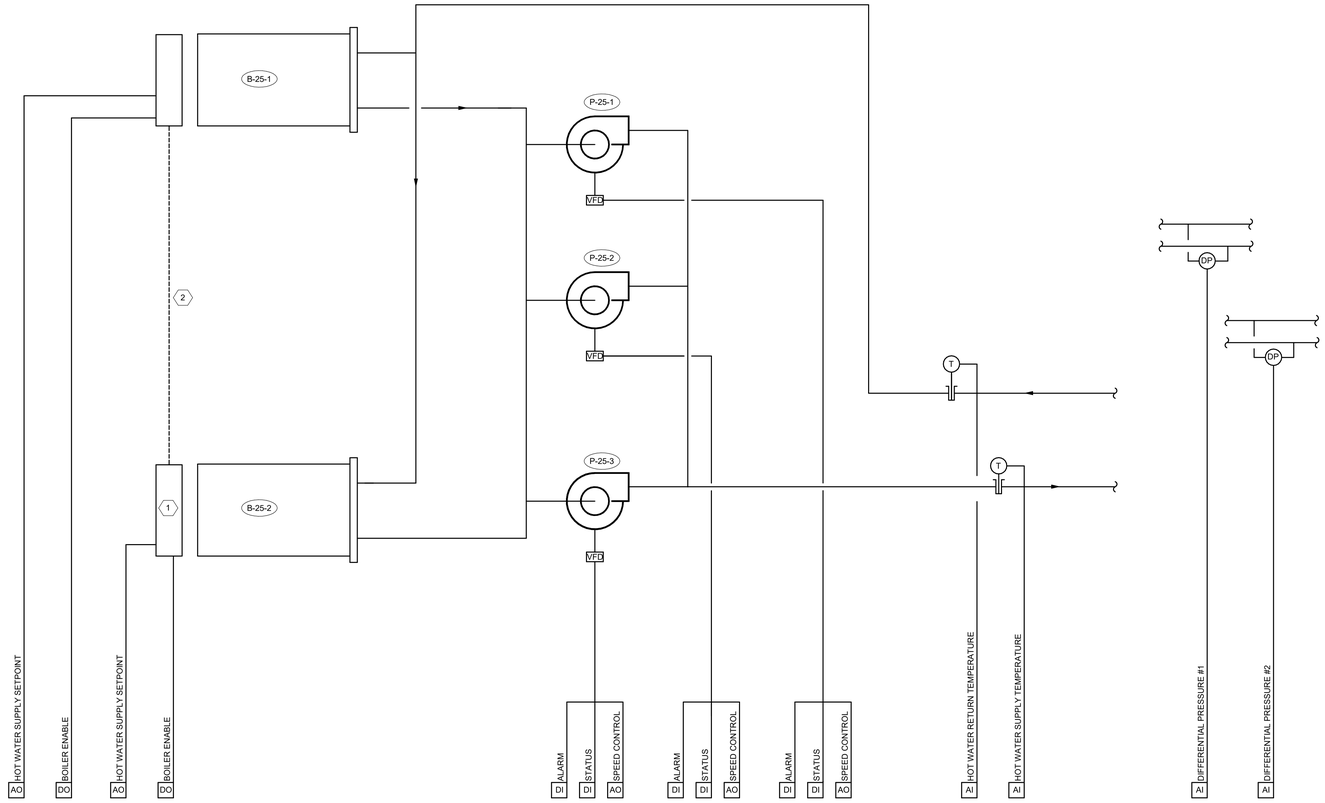
DETAILS

H3.1
SHEET NUMBER



1 **HEATING SYSTEM - BOILERS - PRIMARY/SECONDARY CONTROL DIAGRAM**
N.T.S.

SEQUENCE OF OPERATION

BOILERS & PRIMARY HOT WATER PUMPING

SYSTEM DESCRIPTION -
THE HEATING HOT WATER SYSTEM CONSISTS OF TWO BOILERS, EACH BOILER IS SIZED FOR APPROXIMATELY HALF OF THE BUILDING HEATING LOAD. THREE PRIMARY HOT WATER PUMPS WITH VFD'S WILL PROVIDE HEATING WATER TO BUILDING UNITS. ONE PUMP IS A BACKUP PUMP AND IS NORMALLY NOT IN OPERATION. THE PUMPS WILL OPERATE AT CONSTANT SPEED. VFD'S ARE PROVIDED TO BALANCE THE PUMPS AND FOR FUTURE PROVISIONS FOR A VARIABLE PRIMARY SYSTEM.

CONTROL SHALL BE THRU THE DDC SYSTEM AND THE INTEGRAL BOILER CONTROL SYSTEM S. THE BOILER SYSTEM CONTROLLER SHALL BE BACNET COMPATIBLE WITH ALL POINTS FULLY SHARED. THE DDC SYSTEM SHALL STAGE BOILERS AND PRIMARY PUMPS, THE INTEGRAL BOILER CONTROLS WILL MODULATE BOILER FIRING TO MAINTAIN A HOT WATER SUPPLY TEMP. BASED ON A RESET SCHEDULE.

ENABLE -
THE HEATING HOT WATER SYSTEM BOILERS AND PUMPS SHALL OPERATE ON AN ENABLED/DISABLE SEQUENCE. THE SYSTEM SHALL BE ENABLED FROM THE DDC SYSTEM AS FOLLOWS.

1. UPON A FALLING OUTDOOR AIR TEMPERATURE OF 50°F, THE BUILDING DDC SYSTEM WILL START THE LEAD PUMP AND ENABLE THE LEAD BOILER. THE BOILER'S INTEGRAL CONTROLS WILL MODULATE THE FIRING RATE TO MAINTAIN THE SUPPLY WATER TEMPERATURE WHICH WILL BE RESET BASED UPON THE SCHEDULE BELOW.
2. UPON THE OUTDOOR AIR TEMPERATURE FALLING BELOW 32°F, THE BUILDING DDC SYSTEM WILL START THE LAG PUMP AND ENABLE THE LAG BOILER. THE BOILER INTEGRAL CONTROLS WILL MODULATE BOTH BOILERS IN UNISON TO MAINTAIN THE HOT WATER SUPPLY TEMPERATURE.

ONCE A BOILER (LEAD OR LAG) IS ENABLED, THERE WILL BE A MINIMUM RUN TIME OF 2 HOURS, REGARDLESS OF OUTDOOR AIR TEMPERATURE. AFTER 2 HOURS, IF THE OUTDOOR AIR TEMPERATURE IS GREATER THAN 32°F, THE LAG BOILER AND LAG PUMP WILL SHUT DOWN. IF THE OUTDOOR AIR TEMPERATURE RISES ABOVE 50°F, THE LEAD PUMP AND LEAD BOILER WILL SHUTDOWN.

PROVIDE A PROGRAM TO SWITCH THE LEAD BOILER AND LEAD PUMP ON A MONTHLY BASIS.

WHEN COMMANDED TO BE ENABLED, SHOULD THE LEAD BOILER OR THE LEAD PUMP FAIL TO START, SEND AND ALARM TO THE DDC SYSTEM AND START THE LAG PUMP AND LAG BOILER.

HOT WATER SUPPLY TEMPERATURE RESET:

HOT WATER SUPPLY TEMPERATURE SET POINT RESET SCHEDULE - PROVIDE LINEAR RESET BASED ON THE FOLLOWING:
- 50 DEG F OUTDOOR AIR TEMP. HWST = 130 DEG F.
- 0 DEG F OUTDOOR AIR TEMP. HWST = 180 DEG F.

ALARMS & MONITORING POINTS VIA BACNET SHALL INCLUDE:
- PUMP COMMAND VS STATUS MISMATCH
- BOILER COMMAND VS. STATUS MISMATCH
- PRIMARY HOT WATER PUMPS NO FLOW ALARM
- LOW SUPPLY WATER TEMPERATURE ALARM
- LOW/HIGH SYSTEM DIFFERENTIAL PRESSURE ALARM

GENERAL CONTROL NOTES

1. THE NEW DDC CONTROLLER SHALL BE CONNECTED TO THE EXISTING BUILDING BACNET JACE PANEL. ALL NEW BOILER PLANT GRAPHICS SHALL BE PROVIDED, SHOWING CONTROL POINTS AND EQUIPMENT OPERATIONS.
2. CONTROLS CONTRACTOR SHALL BE A SUB-CONTRACTOR TO THE H.C. ALL CONTROLS WORK SHALL BE PERFORMED BY WAIBEL ENERGY SYSTEMS. ALL NEW CONTROLLERS SHALL BE DISTEC.
3. HEATING HOT WATER SYSTEM REQUIRES NEW SYSTEM CONTROL PANEL. PROVIDE ALL REQUIRED ROUTERS & COMMUNICATIONS DEVICES TO REESTABLISH CONNECTION TO EXISTING LON WORKS SYSTEM AND CONNECT TO FRONT END TRIDIUM.

(#) CONSTRUCTION NOTES

1. INTEGRAL BOILER CONTROL PANEL PROVIDED BY BOILER MANUFACTURER. PROVIDED WITH BACNET INTERFACE - EXTEND LAN FOR COMPLETE POINTS LIST.
2. INTERCONNECTING WIRING BETWEEN BOILERS BY T.C.

NAUMAN & ZELINSKI LLC.
204 S. Ludlow Street Dayton, Ohio 45402
Phone: (937) 223-3821

NZ JOB NUMBER 24056

#	DESCRIPTION	DATE

REPLACE BOILERS
FOR
CENTERVILLE CITY SCHOOLS
Enter address here
CONTROLS

H4.1
SHEET NUMBER

ELECTRICAL SPECIFICATIONS

X. LABEL ALL NORMAL POWER PANELBOARDS WITH PHENOLIC WHITE BACKGROUND AND BLACK LETTER PLATE WITH SOURCE OF FEEDER, SWITCH OR BREAKER NUMBER, VOLTAGE, PHASE, AND BRANCH. EMERGENCY POWERED ITEMS SHALL BE MARKED THE SAME WAY BUT SHALL BE WITH RED BACKGROUND AND WHITE LETTERS.

Y. LABEL ALL NORMAL POWER DISCONNECT SWITCHES WITH PHENOLIC WHITE BACKGROUND AND BLACK LETTER PLATE WITH PANEL, CIRCUIT NUMBER, VOLTAGE, PHASE, FED FROM AND DESCRIPTION OF LOAD FED. EMERGENCY POWERED ITEMS SHALL BE MARKED THE SAME WAY BUT SHALL BE WITH RED BACKGROUND AND WHITE LETTERS.

Z. ALL OPEN CABLING SHALL BE PLENUM RATED AND INSTALLED ON J-HOOK SYSTEM ABOVE ACCESSIBLE CEILINGS. COORDINATE LOCATIONS AND TYPE/SIZE WITH THE SYSTEMS VENDOR FOR OPTIMUM CABLE ROUTING.

AA. DISCONNECT SWITCHES SHALL BE HEAVY DUTY; FUSIBLE TYPE TO UTILIZE 'RK1' FUSES.

AB. EQUIPMENT, DUCTWORK AND PIPING SHALL NOT BE INSTALLED IN THE DEDICATED ELECTRICAL SPACE ABOVE OR IN THE WORKING SPACE REQUIRED AROUND ELECTRICAL SWITCHGEAR, MOTOR CONTROL CENTERS OR PANELBOARDS AS IDENTIFIED BY NEC 110.26 SPACES ABOUT ELECTRICAL EQUIPMENT – 600 VOLTS NOMINAL OR LESS. FOR EQUIPMENT RATED OVER 600 VOLTS NOMINAL – 110.32 WORK SPACE ABOUT EQUIPMENT – 110.33 ENTRANCE AND ACCESS TO WORK SPACE – 110.34 WORK SPACE AND GROUNDING. THE ELECTRICAL CONTRACTOR SHALL CAUTION OTHER TRADES TO COMPLY WITH THIS STIPULATION.

AC. EXISTING CONDUITS AND WIRING NOT TO BE REUSED, SHALL BE REMOVED BACK TO SOURCE. REMOVE ALL UNUSED ELECTRICAL WORK, EQUIPMENT, WIRING AND CONDUITS, ETC. IN AREA OF WORK. DO NOT ABANDON IN PLACE UNLESS INACCESSIBLE. DISPOSE OF ALL REMOVED ITEMS EXCEPT WHERE OWNER WISHES TO KEEP THE ITEM.

AD. PERFORM ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF ELECTRICAL SYSTEMS. PATCHING SHALL BE CONSISTENT WITH ADJACENT SURFACES.

AE. PROVIDE ONE YEAR COMPLETE WARRANTY (PARTS, MATERIALS, LABOR). START OF WARRANTY FROM DATE OF BENEFICIAL OCCUPANCY AGREED TO IN WRITING.

GENERAL NOTES - REMOVAL WORK

A. THIS REMOVAL PLAN HAS BEEN MADE TO ASSIST THE CONTRACTOR IN DETERMINING GENERAL SCOPE OF REMOVALS. THIS DRAWINGS SHALL NOT BE CONSIDERED AS SHOWING ALL REMOVAL ITEMS NOR SHALL IT BE CONSIDERED A SUBSTITUTE FOR SITE INVESTIGATIONS, AS NO ALLOWANCE WILL BE MADE FOR LACK OF KNOWLEDGE CONCERNING EXISTING SITE CONDITIONS. ALL CIRCUITING SHALL BE MADE CONTINUOUS TO ANY ACTIVE EQUIPMENT PAST THE ITEM BEING REMOVED.

B. THE ELECTRICAL CONTRACTOR IS TO REMOVE ALL EXISTING UNUSED DEVICES, FIXTURES AND ALL RELATED CONDUIT, BOXES AND WIRING AND ABANDONED CABLING TOTALLY BACK TO SOURCE PANELBOARD OR ELECTRIC CLOSET. IN NO CASE SHALL ANY ABANDONED CONDUIT, WIRING OR OPEN CABLING OR EQUIPMENT REMAIN WITHIN THIS AREA OR IN ADJACENT AREAS TO ELECTRICAL ROOM OR CLOSETS.

C. REMAINING ACTIVE CONDUITS, OPEN CABLES, ETC. SHALL BE RE-SUPPORTED AS REQUIRED WHERE EXISTING SUPPORTS ARE REMOVED, AS IN THE CASE OF CONDUIT OR CABLE SUPPORTED TO CEILING FRAMING, DUCTWORK, OR PIPING, WHICH IS BEING REMOVED OR WHERE EXISTING SUPPORTS/LOCATION CONFLICTS WITH NEW MECHANICAL UTILITIES, SUPPORTS SHALL UTILIZE APPROVED AND RECOGNIZED MATERIALS AND METHODS AND BE INSTALLED IN ACCORDANCE WITH N.E.C. EXISTING CABLES SHALL BE RE-SUPPORTED ON MAX. 5FT. CENTERS FROM STRUCTURE WITH J-HOOKS. RE-SUPPORT UTILITIES AS HIGH AS POSSIBLE.

D. RECESSED BOXES, OUTLETS, ETC., IN EXISTING WALLS OR CEILINGS WHICH ARE TO REMAIN IN FINISHED AREAS SHALL BE COVERED BY SUITABLE BLANK COVERPLATES. ALL UNUSED DEVICES, WIRING, ETC., WHICH ARE ABANDONED SHALL BE REMOVED.

E. WALLS OR SURFACES WHICH ARE LEFT WITH OPENINGS OR HOLES AFTER COMPLETION OF DEMOLITION WORK SHALL BE PATCHED BY THIS CONTRACTOR CONSISTENT WITH GENERAL CONTRACTOR'S ACTIVITIES.

F. ALL INACTIVE CONDUITS RUN ABOVE CEILINGS SHALL BE REMOVED IN ENTIRETY BACK TO SOURCE OR TERMINATION IN ELECTRICAL ROOM OR SOURCE PANELBOARD. NO UNUSED CONDUIT ASSOCIATED WITH THIS AREA SHALL REMAIN UNLESS NOTED.

G. ALL INACTIVE CONDUITS RUN BELOW FLOOR SLAB SHALL BE REMOVED AT STRUCTURE BELOW AND HAVE ALL ABANDONED WIRING REMOVED (AND BE CUT OFF AT SLAB AND GROUTED CLOSED) IF NOT RETAINED FOR REUSE) UNDER THIS CONTRACT.

H. ALL ABANDONED EQUIPMENT, DEVICES, CONTROLS, AND ASSOCIATED WIRING AND CONDUITS ABOVE CEILING WHICH ARE NO LONGER BEING USED SHALL BE REMOVED IN ENTIRETY. IN ADDITION ANY WALL MOUNTED DEVICES NOT SHOWN DUE TO NOT BEING ACCESSIBLE DURING DESIGN WHICH ARE ON WALLS BEING REMOVED OR IN AREAS BEING COMPLETELY RENOVATED SHALL BE REMOVED.

I. ANY ITEMS REMOVED WITHIN THIS AREA SHALL BE TURNED OVER TO THE OWNER IN GOOD CONDITION WHEN INDICATED HEREIN OR WHEN SO REQUESTED BY THE OWNER.

J. WHERE REMOVALS ARE IN AREAS (ABOVE CEILINGS, ETC.) BEYOND THE AREA OF GENERAL DEMOLITION, MATERIALS AND FINISHES ARE TO BE PROTECTED AND RESTORED TO MATCH ADJACENT FINISHES.

K. ANY EXISTING DEVICES IN ADJACENT SPACES MADE INACTIVE BY REMOVALS OF DEVICES OR CIRCUITRY SHALL BE RE-FED AS REQUIRED TO MAKE DEVICES OPERATIONAL.

L. DISPOSAL OF LAMPS AND BALLASTS - THIS CONTRACTOR SHALL REMOVE ALL LAMPS AND BALLASTS FROM REMOVED FIXTURES AND DISPOSE OF LAMPS AND BALLASTS VIA APPROVED DISPOSAL FACILITY.

M. ELECTRICAL CONTRACTOR TO REMOVE ALL VOICE AND DATA STATION CABLES AND ABANDONED VOICE AND DATA CABLING BACK TO SOURCE DATA RACK OR TELEPHONE BACKBOARD LOCATION. E.C. TO TRACE OUT AND REMOVE ALL REMAINING ABANDONED CABLING AND REMOVE ANY CABLING NOT BEING RETAINED FOR REUSE AS COORDINATED WITH OWNER.

N. COORDINATE WITH OWNER ANY SPECIAL REQUIREMENTS PRIOR TO COMMENCING REMOVAL OF VOICE AND DATA CABLING AND SPECIFIC DIRECTIONS FOR DISCONNECTION OF CABLES AT SOURCE PATCH PANEL OR PUNCHDOWN BLOCK.

ELECTRICAL SPECIFICATIONS

A. ALL ELECTRICAL WIRING, EQUIPMENT AND INSTALLATION SHALL CONFORM TO THE 2024 OHIO BUILDING CODE, 2023 NATIONAL ELECTRIC CODE AND LOCAL CODES, LATEST ADOPTED EDITIONS.

B. ALL ELECTRICAL EQUIPMENT SHALL BE U.L. APPROVED AND COMMERCIAL GRADE. PANELBOARDS, CIRCUIT BREAKERS AND DISCONNECTS BY SQUARE D, SIEMENS, CUTLER-HAMMER OR G.E

C. SUBMIT ELECTRONIC SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO ORDERING FOR THE FOLLOWING EQUIPMENT: LIGHT FIXTURES, PANELBOARD(S), CIRCUIT BREAKER(S) AND WIRING DEVICES.

D. ALL POWER AND SYSTEMS WIRING SHALL BE INSTALLED IN CONDUIT RACEWAYS UNLESS OTHERWISE SPECIFICALLY NOTED.

E. DRAWINGS ARE SCHEMATIC IN NATURE TO REPRESENT REQUIRED EQUIPMENT/DEVICES AND ASSOCIATED POWER/CIRCUITRY. DRAWINGS SHALL NOT BE SCALED FOR DEVICE LOCATIONS. THE E.C. SHALL COORDINATE THE FINAL LOCATIONS OF ALL FLUSH MOUNTED DEVICES (INCLUDING FIRE ALARM AND TECHNOLOGY ROUGH-IN BOXES) WITH CASEWORK, FIXED FURNITURE, ETC. TO AVOID CONFLICTS AND VIEWING OBSTRUCTIONS. RECEPTACLES ASSOCIATED WITH/ADJACENT TO TECHNOLOGY OUTLET BOXES SHALL BE LOCATED AT THE SAME MOUNTING HEIGHT AND WITHIN 6" HORIZONTALLY UNLESS SPECIFICALLY NOTED OTHERWISE.

F. THE ENGINEER SHALL RESERVE THE RIGHT TO MAKE MINOR ADJUSTMENT IN LOCATIONS OF SYSTEM RUNS AND COMPONENTS WHERE THEY CONSIDER SUCH ADJUSTMENTS DESIRABLE IN THE INTEREST OF CONCEALING WORK OR PRESENTING A BETTER APPEARANCE WHERE EXPOSED, ANY SUCH CHANGES SHALL BE ANTICIPATED AND REQUESTED SUFFICIENTLY IN ADVANCE SO AS TO NOT CAUSE EXTRA WORK, OR UNDULY DELAY THE WORK. COORDINATE WORK IN ADVANCE WITH ALL OTHER TRADES AND REPORT IMMEDIATELY ANY DIFFICULTIES WHICH CAN BE ANTICIPATED. WHERE ANY SYSTEM RUNS AND COMPONENTS ARE SO PLACED AS TO CAUSE OR CONTRIBUTE TO A CONFLICT, IT SHALL BE READJUSTED AT THE EXPENSE OF THE CONTRACTOR CAUSING SUCH CONFLICT. THE ENGINEER'S DECISION SHALL BE FINAL IN REGARD TO ARRANGEMENT OF EQUIPMENT, CONDUIT(S), DEVICES, WIREWAYS ETC., WHERE CONFLICT ARISES.

G. ALL WIRING SHALL UTILIZE MIN. #12 AWG SIZE COPPER THHN/THWN STRANDED CONDUCTORS WITH INSULATION SUITABLE FOR THE APPLICATION. CONDUCTORS FOR ELECTRIC RADIANT HEATERS SHALL BE LISTED FOR THE APPLICATION.

H. PROVIDE A SEPARATE NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT AND SEPARATE GREEN COLORED INSULATED COPPER GROUNDING CONDUCTOR FOR EACH BRANCH CIRCUIT CONDUIT. NEUTRAL WIRES FOR 120 VOLT CIRCUITS SHALL BE WHITE AND FOR 277 VOLT CIRCUITS SHALL BE GRAY COLOR.

I. ALL CONDUCTORS SHALL BE INSTALLED IN MIN. 0.75" SIZE CONDUIT OR MC CABLING AS ALLOWED BELOW. EMT SHALL BE UTILIZED FOR INTERIOR FEEDERS AND BRANCH CIRCUITRY. MC CABLE SHALL ONLY BE ALLOWED FOR 20 AMP CIRCUITS, FINAL CONNECTION TO INDOOR LIGHT FIXTURES, AND DROPS TO RECEPTACLES IN WALLS. MC CABLING IS NOT PERMITTED TO BE USED FOR EXPOSED CONDUIT LOCATIONS. ALL HOME RUN BRANCH CIRCUITS SHALL BE IN EMT CONDUIT. THE HOME RUN CONDUIT SHALL ORIGINATE AT THE PANEL BOARD AND SHALL TERMINATE AT THE LAST CONNECTED DEVICE ON THE CIRCUIT OR IN THE CENTER OF THE ROOM/AREA THAT THE CIRCUIT SERVES. LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL BE USED FOR ALL OTHER FINAL CONNECTIONS TO MOVEABLE/VIBRATING EQUIPMENT. ALL EXTERIOR CONDUIT SHALL BE RIGID METAL CONDUIT.

J. EMT CONDUIT FITTINGS SHALL BE ALL STEEL COMPRESSION OR SETSCREW TYPE.

K. ALL CONDUITS INSTALLED ON EXTERIOR OF BUILDING SHALL BE RIGID GALVANIZED TYPE WITH THREADED STEEL FITTINGS. UTILIZE COMPATIBLE NEMA 3R TYPE BOXES FOR ALL EXTERIOR FIXTURE AND OUTLET BOXES.

L. BRANCH CIRCUITS WHERE FISHED IN EXISTING INACCESSIBLE WALLS ONLY MAY UTILIZE MC CABLE OR 0.5" SIZE FLEXIBLE METALLIC CONDUIT TO INDIVIDUAL DEVICES WHEN PROPERLY SUPPORTED.

M. ALL EMPTY CONDUITS INSTALLED FOR ANY LOW VOLTAGE CABLING USES INCLUDING VOICE/DATA, SECURITY, AV, MONITORING OR ANY OTHER LOW VOLTAGE SYSTEM SHALL HAVE NYLON BUSHINGS INSTALLED ON ALL CONDUIT OPEN ENDS.

N. ALL EMPTY CONDUITS SHALL HAVE A NYLON PULLSTRING INSTALLED PER SPECIFICATIONS.

O. ALL CONDUIT, FITTINGS, BENDS, ETC. SHALL BE PROPERLY SUPPORTED PER NEC AND NEATLY INSTALLED.

P. PROVIDE TYPED PANEL DIRECTORIES INDICATING TYPE OF LOAD AND ROOM DESCRIPTION WITH ROOM NUMBER AND TYPE. UPDATE ALL EXISTING PANEL DIRECTORIES WITH NEW TYPED DIRECTORY CARDS WITH ALL CIRCUIT REVISIONS NOTED.

Q. ALL SPARE BREAKERS IN PANELBOARDS SHALL BE TURNED 'OFF'.

R. THE TOTAL LOAD (AMPERES) OF ANY BRANCH CIRCUIT SHALL NOT EXCEED 80% OF THE RATED AMPACITY OF THE CIRCUIT BREAKER FOR THAT CIRCUIT.

S. THE ELECTRICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS TO AVOID INTERFERENCE WITH THE BUILDING COMPONENTS, EXISTING UTILITIES, EQUIPMENT, ETC.

T. THE E.C. SHALL PROVIDE FIRESTOPPING FOR ALL PENETRATIONS THRU RATED WALLS. ALL FIRESTOPPING ASSEMBLIES SHALL BE LISTED AND APPROVED FOR THE ASSEMBLY AND PENETRATION UTILIZED.

U. IDENTIFY ALL BRANCH CIRCUITS AT ALL JUNCTION BOXES BY NEATLY PRINTING PANEL AND CIRCUIT NUMBERS ON BOX COVERS WITH INDELIBLE MARKER.

V. NEATLY LABEL BRANCH CIRCUIT NUMBERS ON EACH EXPOSED CONDUIT LEAVING PANELBOARDS WITH INDELIBLE MARKERS.

W. NEATLY LABEL PANEL AND BRANCH CIRCUIT NUMBERS ON EACH ACCESSIBLE OR EXPOSED CONDUIT ENTERING OR LEAVING ALL PULLBOXES AND JUNCTION BOXES WITH INDELIBLE MARKERS.

ELECTRICAL LEGEND

- ELECTRICAL CONNECTION REQUIRED.
- EXIT LIGHTING FIXTURE. ARROWS AS INDICATED.
- H1 B1 a b — LIGHTING FIXTURE. CAPITAL LETTER DENOTES FIXTURES TYPE. LOWER CASE LETTER DENOTES SWITCHING ARRANGEMENT.
- H1 B1 — LIGHTING FIXTURE ON NIGHT LIGHT OR EMERGENCY CIRCUIT.
- A-1&2 — EACH ARROWHEAD REPRESENTS ONE COMPLETE CIRCUIT; CAPITAL LETTER DENOTES PANEL; NUMBER DENOTES CIRCUIT.
- WIRE & CONDUIT IN WALL OR ABOVE CEILING
- WIRE & CONDUIT UNDERGROUND
- J — JUNCTION BOX.
- DASHED SYMBOL INDICATES THAT PARTICULAR OUTLET OR DEVICE TO BE REMOVED AND CIRCUITRY MADE CONTINUOUS WHERE REQUIRED.
- E — EXISTING OUTLET OR DEVICE TO REMAIN, MAINTAIN EXISTING CIRCUITRY.
- 20A-125V DUPLEX RECEPTACLE, NEMA 5-20R (18" M.H.).
- SPECIAL PURPOSE RECEPTACLE. REFER TO NOTE ON PLAN
- GF — 20A-125V DUPLEX RECEPTACLE, NEMA 5-20R, WITH GROUND FAULT CIRCUIT INTERRUPTER (18" M.H.).
- WP/GF — 20A-125V WEATHERPROOF DUPLEX RECEPTACLE, NEMA 5-20R, WITH GROUND FAULT CIRCUIT INTERRUPTER (18" M.H.), WITH HUBBELL #WP26M CAST ALUMINUM "WHILE-IN-USE" COVER.
- SINGLE POLE WALL SWITCH (46" M.H.)
- 3 — THREE-WAY WALL SWITCH (46" M.H.).
- OS — LIGHTING OCCUPANCY SENSOR WALL SWITCH (46" M.H.)
- D — LIGHTING 0-10V LED DIMMER SWITCH WITH PRESET SLIDE CONTROL AND POWER ON-OFF 'DECORATOR' STYLE SWITCH (46" M.H.) UNLESS OTHERWISE INDICATED.
- DISCONNECT SWITCH
- MOTOR STARTER OR VFD.
- COMBINATION MOTOR STARTER OR VFD AND DISCONNECT SWITCH.
- ELECTRIC MOTOR.
- CIRCUIT BREAKER PANEL, FLUSH MOUNTED.
- CIRCUIT BREAKER PANEL, SURFACE MOUNTED.
- POWER PANEL OR SWITCHBOARD, SURFACE MOUNTED.
- F — FIRE ALARM SENDING STATION (46" M.H.).
- S — CEILING MOUNTED SMOKE DETECTOR.
- H — CEILING MOUNTED HEAT DETECTOR.

GENERAL LEGEND

EC	ELECTRICAL CONTRACTOR.
FC	FIRE PROTECTION CONTRACTOR.
GC	GENERAL CONTRACTOR.
HC	HVAC CONTRACTOR.
PC	PLUMBING CONTRACTOR.
TC	TEMPERATURE CONTROLS CONTRACTOR.
NIC	NOT IN CONTRACT.
AFF	ABOVE FINISHED FLOOR - TO BOTTOM OF ITEM UNLESS INDICATED OTHERWISE IN DRAWING.
(E)	EXISTING.
ES	EQUIPMENT SUPPLIER.
EM	EMERGENCY.
MH	MOUNTING HEIGHT.
S	SURFACE MOUNTED.
WP	WEATHER PROOF.
3	NOTE SYMBOL - APPLIES ONLY TO SHEET ON WHICH IS SHOWN.
2	DETAIL NOTE SYMBOL - APPLIES ONLY TO DETAIL ON WHICH IS SHOWN.
H-1	EQUIPMENT REFERENCE SYMBOL. ELECTRICAL CONNECTION REQUIRED.
123	ROOM NUMBER.
	ITEM TO BE REMOVED.
	EXISTING TO REMAIN.
	NEW ITEM.

GENERAL NOTES

A. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2024 OHIO BUILDING CODE, INCLUDING REFERENCED CODES AND STANDARDS, ALL LOCAL AND STATE CODES AND MEET APPROVAL OF AUTHORITIES HAVING JURISDICTION.

B. BIDDERS SHALL INSPECT PROJECT SITE EXISTING CONDITIONS DURING BIDDING.

C. INCLUDE PAYMENT OF ALL PERMIT AND INSPECTION FEES AND OBTAIN AN ELECTRICAL PERMIT AND SECURE INSPECTION AND APPROVAL OF THE CODE OFFICIAL.

D. SUBMIT AN ELECTRONIC COPY OF SUBMITTAL DATA AND DESCRIPTIVE LITERATURE IN .PDF FORMAT FOR ALL FIXTURES AND EQUIPMENT.

E. WORKMANSHIP SHALL BE OF THE HIGHEST QUALITY AND REPRESENT THE BEST PRACTICES OF THE INDUSTRY.

F. COORDINATE INSTALLATION WITH OTHER TRADES; PROVIDE OFFSETS AS REQUIRED.

G. INSTALL ALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS.

H. COORDINATE EACH ROUGH-IN INSTALLATION REQUIREMENTS AND LOCATIONS WITH OTHER TRADES, ACTUAL EQUIPMENT OR CABINETRY PROVIDED AND FIELD CONDITIONS BEFORE PERFORMING WORK.

I. REFER TO ARCHITECTURAL DRAWING ELEVATIONS FOR MOUNTING LOCATION INFORMATION, ARRANGEMENT AND HEIGHT FOR ALL DEVICES AT FURNISHINGS, CASEWORK, ETC.

J. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL LIGHTING FIXTURES. WHERE DISCREPANCIES MAY OCCUR BETWEEN THE ELECTRICAL PLANS AND THE ARCHITECTURAL CEILING PLANS ON QUANTITY OF FIXTURES, THE ELECTRICAL PLANS SHALL TAKE PRECEDENCE. COORDINATE FIXTURE LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS WITH PIPING AND DUCTWORK.

K. ALL EQUIPMENT AND MATERIAL REQUIRED FOR COMPLETE AND FUNCTIONAL ELECTRICAL SYSTEMS SHALL BE INCLUDED IN THE CONTRACT.

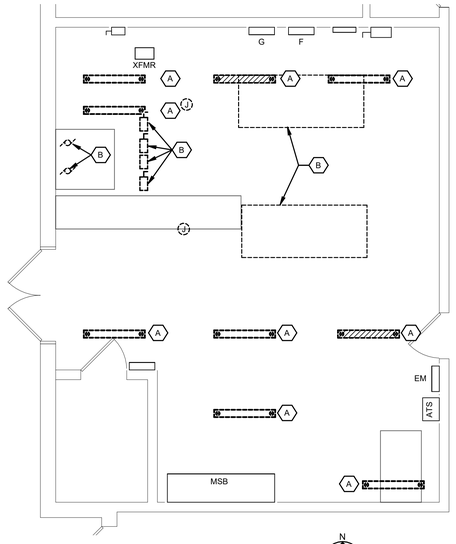
NAUMAN & ZELINSKI LLC.
204 S. Ludlow Street Dayton, Ohio 45402
Phone: (937) 223-3821

N.Z. JOB NUMBER 24058

#	DATE	DESCRIPTION

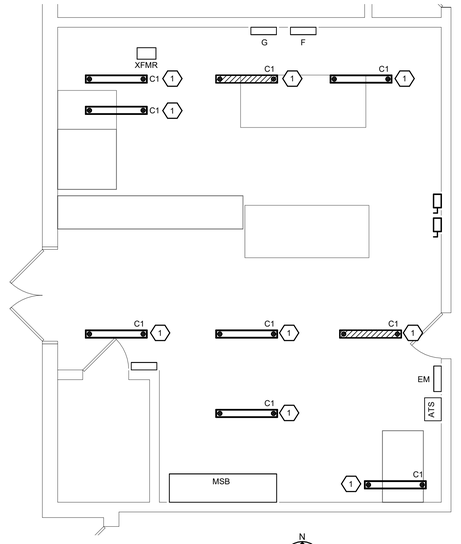
REPLACE BOILERS
FOR
CENTERVILLE CITY SCHOOLS
401 Normandy Ridge Rd, Dayton, OH 45459
LEGENDS AND SCHEDULES

E0.1
SHEET NUMBER



NEW WORK DEMOLITION PLAN

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



NEW WORK LIGHTING PLAN

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

CONSTRUCTION NOTES

A. REMOVE FIXTURE FROM STRUCTURE. DISCONNECT FIXTURE FROM SWITCH LEG OUTLET BOX SERVING FIXTURE.

B. REMOVE CONNECTION AND CONDUIT FROM EXISTING EQUIPMENT BACK TO PANEL.

CONSTRUCTION NOTES

1. MOUNT FIXTURE FROM STRUCTURE WITH CHAIN CLOSE TO STRUCTURE. CONNECT NEW FIXTURE TO EXISTING SWITCH LEG OUTLET BOX SERVING FIXTURE REMOVED IN THE SAME LOCATION.
2. PROVIDE NEW 208V-3PH CONNECTION TO NEW HOT WATER PUMP UTILIZE EXISTING BREAKER MADE SPARE BY DEMOLITION AS SHOWN ON PLAN. VFD FURNISHED BY H.C. INSTALLED BY E.C.
3. PROVIDE NEW 208V 3PH CONNECTION TO NEW BACKUP HOT WATER PUMP. PROVIDE NEW 20A-3PH BREAKER IN EXISTING SPACE PROVISION.
4. PROVIDE NEW 208V-3PH 30A FUSED DISCONNECT WITH 15A FUSES FOR CONNECTION TO NEW BOILER. UTILIZE EXISTING 20A-3P BREAKER MADE SPARE IN EXISTING PANEL AS SHOWN ON PLAN.

LIGHTING FIXTURE SCHEDULE

FIXTURE SYMBOL	LUMINAIRE TYPE: LED	LOW VOLTAGE	WATTS/ FIXTURE	LUMENS/ COLOR TEMP	FIXTURE VOLTAGE	MANUFACTURER & CATALOG NO.	OTHER ACCEPTABLE MANUFACTURES	DIFFUSING MEDIA	TRIM COLOR: WHITE	BLACK	ALUMINUM	BRONZE	STANDARD	SEE NOTES	MOUNTED (S - SURFACE, R - RECESSED, SM - STEM MTD., WM - WALL MTD., C - CHAIN MTD., UC - UNDER CAB., CS - CLG. SURF.)	SIZE: WIDTH	LENGTH	DEPTH	DIAMETER	SEE NOTES
C1	•		30	3500 LUMENS / 4000K	120	LITHONIA# CLX - L48 - 3500LM - SEF - FDL - MV - GZ10 - 40K - 80CRI WITH HC36 HANGERS	APPROVED EQUAL	FLAT DIFFUSE LENS	•						C	3.5	48	3.25		

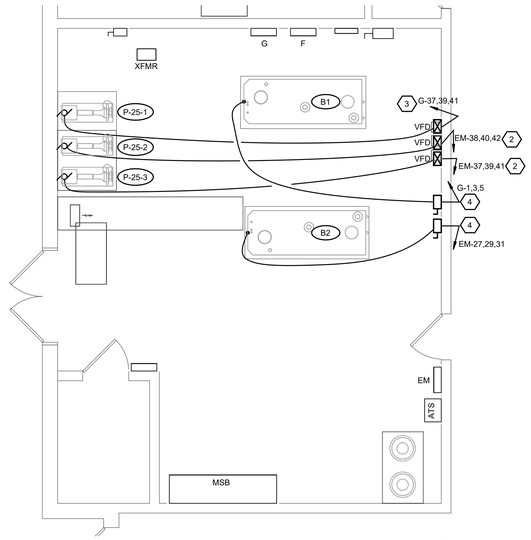
MOTORS, STARTERS, DISCONNECTS & CONTROLS

MOTOR: MOTOR NUMBER	CIRCUIT NUMBER	NAMEPLATE	CHARACTERISTICS: HP (KVA OR FLA)	120V-1PH	208V-3PH	208V-1PH	480V-1PH	480V-3PH	LOCATION	STARTERS: TYPE: NEMA SIZE	MANUAL	MAGNETIC	BUILT-IN MOTOR O/L	VFD	ECM*	NEAR MOTOR	LOCATION: MOTOR CONT. CNTR	EQUIP. CONT. PANEL	ROOM NUMBER	SEE NOTE	FURNISHED BY	DISCONNECT MEANS: TYPE: DISC. SWITCH	MANUAL STARTER	RECEPTACLE	BREAKER	FUSIBLE	NEAR MOTOR	LOCATION: MOTOR CONT. PANEL	EQUIP. CONT. PANEL	PANELBOARD	SEE NOTE	FURNISHED BY	CONTROL: INTERLOCK W/ DAMPER BY E.C.	MANUAL AT STARTER	INTEGRAL W/ EQUIP.	BY H.C.	SEE NOTE	FEEDER: NO. OF CONDUCTORS	WIRE SIZE	GRD. SIZE	CONDUIT SIZE	SEE NOTE
B1		BOILER 1	9.5 A		•																EC	•									EC				•		2	12	12	.5	
B2		BOILER 2	9.5 A		•																EC	•									EC				•		2	12	12	.5	
P-25-1		HOT WATER PUMP 1	5 HP		•									•						1	HC									ES				•		3	10	10	.75	
P-25-2		HOT WATER PUMP 2	5 HP		•									•						1	HC									ES				•		3	10	10	.75	
P-25-3		HOT WATER PUMP 3	5 HP		•									•						1	HC									ES				•		3	10	10	.75	

* REFER TO ECM CONTROL DIAGRAM(S) ON HVAC DRAWINGS. WHEN NOTED, FOR INTERLOCK WIRING AND AUX POWER REQUIREMENTS.

NOTES:

1. VFD FURNISHED BY H.C. AND INSTALLED BY E.C.
2.
3.
4.
5.



NEW WORK POWER AND SYSTEMS PLAN

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

Branch Panel: EM **Construction:** Exisitng **System:** Emergency Power

LOCATION: **MOUNTING:** Surface **A.I.C RATING** 10000
SUPPLY FROM: **ENCLOSURE:** Type 1 **MAINS TYPE:** M.L.O
VOLTAGE: 120/208 Wye-3-4 **MCB RATING:** NA **MAINS RATING:** 225 A

CKT	Description	Trip	Poles	Note	A	B	C	Note	Poles	Trip	Description	CKT
1	EX. Gym Ltgs	20 A	2		0 VA 0 VA				1	20 A	EX. Sew Pump	2
3	--	--	--			0 VA 0 VA			1	20 A	EX. Sew Pump	4
5	EX. Corr Ltgs	20 A	1				0 VA 0 VA		1	20 A	EX. Chiller...	6
7	EX. Corr Ltgs	20 A	1		0 VA 0 VA				1	20 A	EX. Corr Ltgs	8
9	EX. Exit Ltgs	20 A	1			0 VA 0 VA			1	20 A	EX. Corr Ltgs	10
11	Spare	20 A	1				0 VA 0 VA		1	20 A	EX. Corr Ltgs	12
13	EX. Fire Pnl	20 A	1		0 VA 0 VA				1	20 A	EX. Ltgs	14
15	EX. Chair Lift	20 A	1			0 VA 0 VA			1	20 A	EX. Telephone	16
17	EX. Battery	20 A	1				0 VA 0 VA		1	20 A	EX. Lead - LAG	18
19	Spare	20 A	1		0 VA 0 VA				1	20 A	Spare	20
21	Spare	20 A	1			0 VA 0 VA			1	20 A	Spare	22
23	Spare	20 A	1				0 VA 0 VA		1	20 A	Spare	24
25	Spare	20 A	1		0 VA 0 VA				2	20 A	Spare	26
27	Boiler #2	20 A	3	2		333 VA 0 VA			--	--	--	28
29	--	--	--				333 VA 0 VA		2	20 A	EX. Outside...	30
31	--	--	--		333 VA 0 VA				--	--	--	32
33	EX. Chair Lift	20 A	2			0 VA 0 VA			2	20 A	EX. Spare	34
35	--	--	--				0 VA 0 VA		--	--	--	36
37	HW Pump #3	20 A	3	1	1900 VA 1900 VA			1	3	20 A	HW Pump #2	38
39	--	--	--			1900 VA 1900 VA			--	--	--	40
41	--	--	--				1900 VA 1900 VA		--	--	--	42
		Total Load:			4133 VA	4133 VA	4133 VA					

NOTES:
1. UTILIZE EXISTING BREAKER AND CIRCUITRY FOR CONNECTION TO NEW EQUIPMENT.
2. UTILIZE EXISTING 20A 3P BREAKER MADE SPARE FOR CONNECTION TO NEW BOILER.

Load Classification	Connected Load	Demand Factor	Estimated...	Panel Totals	
Motor	11400 VA	112.50%	12825 VA		
Other	0 VA	0.00%	0 VA	**Total Conn. Load:**	12400 VA
Power	1000 VA	100.00%	1000 VA	**Total Est. Demand:**	13825 VA
				Total Conn. Current:	34 A
				Total Est. Demand Current:	38 A

Branch Panel: G **Construction:** Exisitng **System:** Normal Power

LOCATION: **MOUNTING:** Surface **A.I.C RATING** 10000
SUPPLY FROM: **ENCLOSURE:** Type 1 **MAINS TYPE:** M.L.O
VOLTAGE: 120/208 Wye-3-4 **MCB RATING:** NA **MAINS RATING:** 225 A

CKT	Description	Trip	Poles	Note	A	B	C	Note	Poles	Trip	Description	CKT
1	Boiler #1	20 A	3	2	333 VA 0 VA				3	20 A	Spare	2
3	--	--	--			333 VA 0 VA			--	--	--	4
5	--	--	--				333 VA 0 VA		--	--	--	6
7	EX. Load	20 A	2		0 VA 0 VA				2	20 A	Spare	8
9	--	--	--			0 VA 0 VA			--	--	--	10
11	Spare	20 A	2				0 VA 0 VA		2	20 A	Spare	12
13	--	--	--		0 VA 0 VA				--	--	--	14
15	Spare	20 A	1			0 VA 0 VA			1	20 A	EX. Vent	16
17	Spare	20 A	1				0 VA 0 VA		1	20 A	EX. Vent	18
19	Spare	20 A	1		0 VA 0 VA				1	20 A	EX. Vent	20
21	Spare	20 A	1			0 VA 0 VA			1	20 A	EX. Vent	22
23	Spare	20 A	1				0 VA 0 VA		1	20 A	Spare	24
25	Spare	20 A	1		0 VA 0 VA				1	20 A	Spare	26
27	Spare	20 A	1			0 VA 0 VA			1	20 A	Spare	28
29	Spare	20 A	1				0 VA 0 VA		2	20 A	Spare	30
31	Space	--	1		-- 0 VA				--	--	--	32
33	Space	--	1			-- --			1	--	Space	34
35	Space	--	1				-- --		1	--	Space	36
37	HW PUMP #1	20 A	3		1900 VA --				1	--	Space	38
39	--	--	--			1900 VA --			1	--	Space	40
41	--	--	--				1900 VA --		1	--	Space	42
		Total Load:			2233 VA	2233 VA	2233 VA					

NOTES:
1. PROVIDE NEW 40A-3P BREAKER IN EXISTING SPACE FOR NEW HW PUMP.
2. UTILIZE EXISTING 20A 3P BREAKER MADE SPARE FOR CONNECTION TO NEW BOILER.

Load Classification	Connected Load	Demand Factor	Estimated...	Panel Totals	
Motor	5700 VA	125.00%	7125 VA		
Other	0 VA	0.00%	0 VA	**Total Conn. Load:**	6700 VA
Power	1000 VA	100.00%	1000 VA	**Total Est. Demand:**	8125 VA
				Total Conn. Current:	19 A
				Total Est. Demand Current:	23 A

0 2 4 8 12 16 20

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

NAUMAN & ZELINSKI LLC.
204 S. Ludlow Street Dayton, Ohio 45402
Phone: (937) 223-3821

AZ JOB NUMBER 24056

#	DATE	DESCRIPTION

REPLACE BOILERS
FOR
CENTERVILLE CITY SCHOOLS
401 Normandy Ridge Rd. Dayton, OH 45459
DEMOLITION AND NEW WORK PLANS

E1.1
SHEET NUMBER