

HOUSING AUTHORITY OF THE CITY OF PUEBLO
201 S. Victoria Avenue
Pueblo, CO 81003

ADDENDUM 1
July 9, 2026

QUOTE NUMBER: I.F.B. 26-585-2025
PROJECT: Minnequa Apartments Boiler Replacement (AMP 200)
LOCATION: 1400 E. Orman Ave., Pueblo, CO

THIS ADDENDUM CONTAINS 2 PAGE(S) 3 ATTACHMENT(S) 0 DRAWING(S)

This Addendum is issued by the Owner for all known bidders. Bidders shall attach this Addendum to the Scope of Work and acknowledge receipt in their Bid Form. All information and instructions given herein shall become a part of the Contract documents.

SPECIFICATIONS ITEMS

ITEM NO. 1

DISTRIBUTION LIST

Add the following:

Distribution List (Attachment No. 1)

ITEM NO. 2

SECTION 01506
TEMP. FACILITIES

Change the following:

2. Temporary Toilet
 - a. Contractor **may** use the existing facilities.

DRAWING ITEMS

ITEM NO. 3

SHEETS M001 – E600

Add the following:

Attachment No. 2-Plant Engineering Consultants Addendum

ITEM NO. 4

SHEETS M001 – E600

Replace the following:

Replace all Sheets listed in Mechanical Sheet Index with Attachment No. 3.

CLARIFICATION ITEMS

ITEM NO. 5

Will the retainage be changed to 5% as that is the maximum allowed per Colorado law? In Colorado, the maximum construction retainage amount is capped at **5%** for both public works and most private commercial projects over \$150,000. RFP states "Retainage of ten (10%) percent of the amount of progress payments shall be withheld until completion and acceptance of all work under the Contract.

Per Item 27 Payments of HUD-5370: Retain ten (10) percent of the amount of progress.

ITEM NO. 6

If the boilers have a long lead time will the contract be extended?

Contract time will not start until the Notice to Proceed is issued. The Notice to Proceed will **not** be issued until the materials (Boilers) for the project are delivered.

ITEM NO. 7

Who has controls for this?

Localized controls by Mechanical Contractor for Tekmar-style pump sequencer.

ITEM NO. 8

Do you prefer going from steel to copper, or keeping it all copper?

Piping may be either copper or Steel (Schedule 40) including ProPress® for hydronic systems and natural gas.

ITEM NO. 9

Are press fittings allowed on water and gas lines?

Yes, see answer to Question above.

ITEM NO. 10

Flue Material to be Propylene or AL29-4C.

HOUSING AUTHORITY OF THE CITY OF PUEBLO

Addendum No. 1
Attachment No.1

PROJECT NUMBER: R.F.Q. 26-585-2025

PROJECT DESCRIPTION: Minnequa Apts. Boiler Replacement (AMP 200)

INFORMATION: WALK THRU DATE: 6/23/2026 @ 10:00 a.m. PLACE: 1400 E. Orman Ave., Pueblo, CO
BID DUE DATE: 7/16/2022 @ 11:00 a.m. PLACE: CMF, 201 S. Victoria Ave., 2nd Flr., Pueblo, CO

DISTRIBUTION LIST - SPECIFICATIONS AND PLANS

PHONE	CONTRACTOR / VENDOR / ADDRESS	Email Address	DATE	BY	NOTES
719-583-2331	AAA Plumbing - 2520 Santa Fe Dr., Pueblo, CO	Email: info@aaaplumbingcolorado@yahoo.com	6/15/26		Emailed spec
719-320-3333	Advanced Air - Pueblo CO - Austin Smart	airtechhvac719@gmail.com	6/15/26		Emailed spec
719-251-7602	All Around Plumbing	Email: propipeadam@yahoo.com	6/15/26		Emailed spec
719-994-0483	Affordable Service Plumbing -	Email: jeromy.martinez44@gmail.com	6/15/26		Emailed spec
719-225-8316	Best Heating & Cooling, 2821 Lancaster Dr. Pueblo CO	Email: info@mybestheating.com	6/15/26		Emailed spec
719-437-7986	Big Cat Plumbing	Email: spencer@bigcatplumbing.com	6/15/26		Emailed spec
719-696-9375	Clarks Mechanical - 2203 Santa Fe Dr. Pueblo CO	EM: sales@clarksmechanical.com	6/15/26		Emailed spec
719-564-2101	Flow Right Plumbing - 2406 W. 11th St., Pueblo, CO	Email: mikem@flowrightphi.com Email: sharvey@flowrightphi.com Email: ahamler@flowrightphi.com	6/15/26		Emailed spec
719-546-1730	Industrial Plumbing & Heating - 3102 S. Prairie Ave.	Email: service@industrialph.com	6/15/26		Emailed spec
719-242-1270	Integrity Plumbing & Heating	Email: josh@integrityplumbing.us	6/15/26		Emailed spec
719-564-1688	Jess' Plumbing & Heating, Inc.	Email: jesslbaca@jessplumbing.com	6/15/26		Emailed spec

PHONE	CONTRACTOR / VENDOR / ADDRESS	Email Address	DATE	BY	NOTES
719-459-6633 719-364-6839 Nick Cell	Mike's Plumbing & Heating LLC	Email: neverhart@mikeph.biz Email: mikeb@mikeph.biz	6/15/26		Emailed spec
719-212-2614	One Hour Heating & Air Conditions - Pueblo CO	Email: gina.velasquez@onehourair.com Email: bob.vigil@onehourheatandair.com	6/15/26		Emailed spec
719-635-3563	Olson Plumbing & Heating	Email: service@olsonph.com Email: dougmandarich@olsonph.com	6/15/26		Emailed spec
719-496-4939	Patterson Plumbing & Heating - 1010 Aspen Pl., Pueblo, CO	Email: service@pattersonplumbing.com	6/15/26		Emailed spec
719-544-6670	R Buck Heating & Air Conditioning, Inc. - 1721 N. Erie Ave. Pueblo CO 81001	Email: randy@callbuck.com	6/15/26		Emailed spec
719-470-1786 719-306-5279 eric Cell	Rocky Mechanical - 115 S. Grand Ave., Pueblo CO 81003	Email: eric@rockymechanical.com Email: kd@rockymechanical.com Email: hunter@rockymechanical.com	6/15/26		Emailed spec
719-546-0442	Royal Electric - 820 W. 2nd Street, Pueblo CO 81003	Email: via website email address	6/15/26		Emailed spec
719-542-4416	R&R Heating & Air Conditioning, Inc. - 314 Lamkin St.	Email: jodee@randrheatingandairco.com	6/15/26		Emailed spec
719-252-1632	SJM Services Inc.	Email: randy.levene@sjmservices1.com			
719-561-0024	Spectrum Plumbing & Heating	Email: clinedeeanna@yahoo.com	6/15/26		Emailed spec
719-547-1885	Total Service Heating & Air - 681 S. Tejon, Pueblo West, CO	Email: totalservicehvac@aol.com Email: eric.volz@totalservicehvac.com 93Downey@gmail.com	6/15/26		Emailed spec
719-390-6165	Valley Electric	Email: daveiten@gmail.com			
719-547-0218	Vision Mechanical - 35 N. Laser Dr. Pueblo West CO	Email: reception@visionmech.net	6/15/26		Emailed spec
719-543-0055	Wright - Jones Plumbing - 618 S. Union Ave., Pueblo, CO	Email: tina@wrightjones.com	6/15/26		Emailed spec

ADDENDUM

PROJECT: Minnequa Apartments

ADDENDUM NO:

01

DATE OF ISSUANCE:

07/9/2026

**OWNER: Pueblo Housing Authority
IFB: 26-585-2025**

PLANT PROJECT NO:

25087

TO CONTRACTOR:

To all bidders.

ENGINEER:

Plant Engineering Consultants
320 W. Fillmore, Suite 100
Colorado Springs, Co 80907

Please revise or add the following additional information to the Contract Documents as described herein. Since this information is being issued prior to the bid closing date, this work shall not require a change in the Contract Price or the Performance Period.

Description: Revised the following Sheets to reflect Request For Information (RFIs) during the pre-bid meeting and email(s) afterwards.

MD11

1. Clarified Keyed Note #3 regarding Combustion Air Openings.

M111

1. Separated Combustion Air (CA) Ducts from Boiler Flues (on separate sheets).
2. Added General Note #3 regarding Existing CA openings.
3. Clarified Keyed Note #2 regarding Boiler CA and Flues.
4. Added Metal Post to protect CA ducting from Door Swing.
5. Added Pump Sequencer to Plans and corresponding Keyed Note #9.

M610

1. Added Detail #1 -- Partial Flue Detail.
2. Added Detail #2 -- CA Elevation Detail.
3. On Pump Schedule, added Note #3 regarding Pump Sequencer.
4. On Boiler Schedule, Added OA Sensor on northside of building for boiler reset water temperature.

E121

1. Added Pump Sequencer and associated Circuit (Ckt).
2. Clarified Ckt. on Convenience Outlet.

E600

1. Revised Load Justification Summary (Slightly Reduced).
2. Revised (E) Panelboard "M" to include Convenience Outlet (ckt #10 and Pump Sequencer (ckt #24).

CC:

SUBMITTED BY: David Easter

07/7/2026

Date

7/7/2026 2:46:48 PM David Easter
G:\projects\2025\25087 minnequa boiler\4 minnequa boiler\4.3 addendum\4.3.2 mechanical\25087_m001.dwg

2021 INTERNATIONAL ENERGY CONSERVATION CODE COMPLIANCE

C403.4.2.2	AUTOMATIC SETBACK AND SHUTDOWN CAPABILITIES. AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR AT LEAST 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE: A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS, A MANUALLY OPERATED TIMER CAPABLE OF BEING ADJUSTED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS, OR AN OCCUPANCY SENSOR.
C403.3.2	HVAC EQUIPMENT PERFORMANCE REQUIREMENTS. EQUIPMENT SHALL MEET THE MINIMUM EFFICIENCY REQUIREMENTS OF TABLES C403.3.2(1) THROUGH C403.3.2(16), WHEN TESTED AND RATED IN ACCORDANCE WITH THE APPLICABLE TEST PROCEDURE. PLATE-TYPE LIQUID-TO-LIQUID HEAT EXCHANGERS SHALL MEET THE MINIMUM REQUIREMENTS OF AHRI 400. THE EFFICIENCY SHALL BE VERIFIED THROUGH CERTIFICATION UNDER AN APPROVED CERTIFICATION PROGRAM OR, IF NO CERTIFICATION PROGRAM EXISTS, THE EQUIPMENT EFFICIENCY RATINGS SHALL BE SUPPORTED BY DATA FURNISHED BY THE MANUFACTURER, WHERE MULTIPLE RATING CONDITIONS OR PERFORMANCE REQUIREMENTS ARE PROVIDED, THE EQUIPMENT SHALL SATISFY ALL STATED REQUIREMENTS. WHERE COMPONENTS, SUCH AS INDOOR OR OUTDOOR COILS, FROM DIFFERENT MANUFACTURERS ARE USED, CALCULATIONS AND SUPPORTING DATA SHALL BE FURNISHED BY THE DESIGNER THAT DEMONSTRATES THAT THE COMBINED EFFICIENCY OF THE SPECIFIED COMPONENTS MEETS THE REQUIREMENTS HEREIN.
C403.4.2.1	THERMOSTATIC SETBACK CAPABILITIES. THERMOSTATIC SETBACK CONTROLS SHALL HAVE THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).
C403.12.1	DUCT AND PLENUM INSULATION AND SEALING. SUPPLY AND RETURN AIR DUCTS AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACES AND WHERE LOCATED OUTSIDE THE BUILDING WITH A MINIMUM OF R-8 IN CLIMATE ZONES 0 THROUGH 4 AND A MINIMUM OF R-12 FOR CLIMATE ZONES 5 THROUGH 8. WHERE LOCATED WITHIN A BUILDING ENVELOPE ASSEMBLY, THE DUCT OR PLENUM SHALL BE SEPARATED FROM THE BUILDING EXTERIOR OR UNCONDITIONED OR EXEMPT SPACES BY A MINIMUM OF R-8 INSULATION IN CLIMATE ZONES 0 THROUGH 4 AND A MINIMUM OF R-12 INSULATION IN CLIMATE ZONES 5 THROUGH 8.
C408.2	MECHANICAL SYSTEMS AND SERVICE WATER-HEATING SYSTEM COMMISSIONING AND COMPLETION REQUIREMENTS. PRIOR TO THE FINAL MECHANICAL AND PLUMBING INSPECTIONS, THE REGISTERED DESIGN PROFESSIONAL OR APPROVED AGENCY SHALL PROVIDE EVIDENCE OF MECHANICAL SYSTEMS COMMISSIONING AND COMPLETION IN ACCORDANCE WITH THE PROVISIONS OF THIS SECTION. CONSTRUCTION DOCUMENT NOTES SHALL CLEARLY INDICATE PROVISIONS FOR COMMISSIONING AND COMPLETION REQUIREMENTS IN ACCORDANCE WITH THIS SECTION AND ARE PERMITTED TO REFER TO SPECIFICATIONS FOR FURTHER REQUIREMENTS. COPIES OF ALL DOCUMENTATION SHALL BE GIVEN TO THE OWNER OR OWNER'S AUTHORIZED AGENT AND MADE AVAILABLE TO THE CODE OFFICIAL UPON REQUEST IN ACCORDANCE WITH SECTIONS C408.2.4 AND C408.2.5.
C408.2.2.1	AIR SYSTEM BALANCING. EACH SUPPLY AIR OUTLET AND ZONE TERMINAL DEVICE SHALL BE EQUIPPED WITH MEANS FOR AIR BALANCING IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 6 OF THE INTERNATIONAL MECHANICAL CODE. DISCHARGE DAMPERS ARE PROHIBITED ON CONSTANT VOLUME FANS AND VARIABLE VOLUME FANS WITH MOTORS 10 HP AND LARGER. AIR SYSTEMS SHALL BE BALANCED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES THEN, FOR FANS WITH SYSTEM POWER OF GREATER THAN 1HP, FAN SPEED SHALL BE ADJUSTED TO MEET DESIGN FLOW CONDITIONS.
C408.1.1	MANUALS. AN OPERATING AND MAINTENANCE INFORMATION MANUAL SHALL BE PROVIDED TO THE OWNER AND INCLUDE ALL OF THE FOLLOWING: 1. CONSTRUCTION DRAWINGS, SHOWING LOCATION OF EQUIPMENT. 2. SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. 3. NAME AND ADDRESS OF NOT LESS THAN ONE SERVICE AGENCY FOR INSTALLED EQUIPMENT. 4. A NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING RECOMMENDED SETPOINTS. 5. MANUFACTURER'S OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, EXCEPT EQUIPMENT NOT FURNISHED AS PART OF THE PROJECT. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED. 6. HVAC CONTROLS SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS, DESIRED OR FIELD-DETERMINED SETPOINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR, FOR DIGITAL CONTROL SYSTEMS, IN SYSTEM PROGRAMING INSTRUCTIONS. 7. PER C408.2.5, A FINAL COMMISSIONING REPORT SHALL BE PROVIDED TO THE OWNER THAT DESCRIBE THE ACTIVITIES AND MEASUREMENTS PER THE SYSTEM ADJUSTING AND BALANCING (PER SECTION 408.2.2), THE REPORT SHALL INCLUDE: A. RESULTS OF FUNCTIONAL PERFORMANCE TESTS WHICH INCLUDE AIR SYSTEM AND HYDRONIC SYSTEM BALANCING. B. DISPOSITION OF DEFICIENCIES FOUND DURING TESTING, INCLUDING DETAILS OF CORRECTIVE MEASURES USED OR PROPOSED. C. FUNCTIONAL PERFORMANCE TEST PROCEDURES USED DURING THE COMMISSIONING PROCESS INCLUDING MEASURABLE CRITERIA FOR TEST ACCEPTANCE, PROVIDED HEREIN FOR REPEATABILITY.

ABBREVIATIONS

AAV/AV	AIR VENT
AC	AIR COMPRESSOR/ AIR CONDITIONER
ACU	AIR CONDENSING UNIT
AD	AIR DRIER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFS	AIRFLOW STATION
AHU	AIR HANDLING UNIT
AP	AIR PURIFIER
AT	AIR TANK
BCU	BATTERY COOLING UNIT
BFP	BACK FLOW PREVENTER
BOD	BOTTOM OF DUCT
CA	COMPRESSED AIR
CHWP	CHILLED WATER PUMP
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CIRC	CIRCULATION
CRAC	COMPUTER ROOM AIR CONDITIONER
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
D	DRAIN
DCW	DOMESTIC COLD WATER
DD	DUAL DUCT TERMINAL BOX
DDC	DIRECT DIGITAL CONTROLLER
DHW	DOMESTIC HOT WATER
DTW	DOMESTIC TEMPERED WATER
(E), EX	EXISTING
EA	EXHAUST AIR
EDH	ELECTRIC DUCT HEATER
EF/EX	EXHAUST FAN
EHC	ELECTRICAL HEATING CABINET
FB	FILTER BOX
FC	FAN COIL
G	NATURAL GAS
HWC	DOMESTIC HOT WATER RECIRCULATION
HWP	HOT WATER PUMP
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
MAU	MAKEUP AIR UNIT
MM	MINIMATE A/C UNIT
MR	MECHANICAL ROOM
MVD	MANUAL VOLUME DAMPER
MZU	MULTI ZONE UNIT
NA	NOT AVAILABLE
OA	OUTSIDE AIR
P	PUMP
PENT	PENTHOUSE
PWU	PACKAGED WALL UNIT
RA	RETURN AIR
RD	REFRIGERANT DISCHARGE
RF	RETURN FAN
RP	RADIANT PANEL
RR	REST ROOM
RS	REFRIGERANT SUCTION
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
TA	TRANSFER AIR
TF	TRANSFER FAN
TOD	TOP OF DUCT
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
VAV	VARIABLE AIR VOLUME

HVAC PIPING LEGEND

SYMBOL	ABBR.	DESCRIPTION
	HWS	HOT WATER SUPPLY
	HWR	HOT WATER RETURN
	CHWS	CHILLED WATER SUPPLY
	CHWR	CHILLED WATER RETURN
	C	CONDENSER WATER SUPPLY
	CR	CONDENSER WATER RETURN
	D	CONDENSATE OR EQUIPMENT DRAIN
	RD	REFRIGERANT DISCHARGE
	RS	REFRIGERANT SUCTION
		REFRIGERANT LINE SET (SUCTION AND DISCHARGE)
	G	NATURAL GAS
	CA	COMPRESSED AIR
	HPS	HIGH PRESSURE STEAM
	HPC	HIGH PRESSURE CONDENSATE
	MPS	MEDIUM PRESSURE STEAM
	MPC	MEDIUM PRESSURE CONDENSATE
	LPS	LOW PRESSURE STEAM
	LPC	LOW PRESSURE CONDENSATE
		EXISTING PIPING
		HATCH DENOTES TO BE REMOVED
		ELBOW DOWN
		ELBOW UP
		TEE DOWN
		TEE UP
		STRAINER WITH BLOWOFF VALVE
		REDUCER
		BALL VALVE
		BUTTERFLY VALVE
		DIAPHRAGM VALVE
		GATE VALVE
		GLOBE VALVE
		ANGLE VALVE
		PLUG VALVE
		CHECK VALVE
	CBV	CALIBRATED BALANCING VALVE
		SOLENOID ACTUATOR
		MOTOR ACTUATOR
		PNEUMATIC ACTUATOR
	PRV	PRESSURE REGULATING VALVE
	PSV	PRESSURE RELIEF VALVE

HVAC LEGEND

SYMBOL	DESCRIPTION
	SUPPLY DIFFUSER - FOUR WAY THROW, UNLESS NOTED OTHERWISE (UNO), OR SUPPLY (POSITIVE PRESSURE) AIR DUCT
	SUPPLY DIFFUSER WITH ROUND CONNECTION FOUR WAY THROW, UNLESS NOTED OTHERWISE (UNO)
	RETURN GRILLE OR RETURN (NEGATIVE PRESSURE) AIR DUCT
	RETURN GRILLE WITH ROUND CONNECTION
	EXHAUST GRILLE
	DUCT SIZE, FIRST FIGURE IS FOR SIDE SHOWN.
	TRANSITION, RECTANGULAR
	TRANSITION, SQUARE-TO-ROUND
	ELBOW WITH TURNING VANES
	BRANCH, NO SPLITTER
	ROUND SPIN-IN WITH MANUAL VOLUME DAMPER (MVD)
	PARALLEL BLADE DAMPER
	OPPOSED BLADE DAMPER
	MOTORIZED DAMPER
	FIRE DAMPER, FD= FIRE, SD=SMOKE, FSD= FIRE/SMOKE
	SMOKE DETECTOR
	FIRE (HEAT) DETECTOR
	FLEX DUCT TO DIFFUSER
	PRESSURE SENSOR
	HUMIDISTAT
	THERMOSTAT WITH EQUIPMENT CONTROLLED TAG
	WIRED THERMOSTAT TO EQUIPMENT
	WIRELESS THERMOSTAT TO EQUIPMENT
	CABINET EXHAUST FAN
	ROOF MOUNTED EXHAUST FAN
	AIR FLOW DIRECTION
	CONNECT NEW TO EXISTING
	SUPPLY AIR DEVICE CALLOUT TOP LINE DENOTES CFM BOTTOM LINE DENOTES NECK SIZE - (SEE SCHEDULE)
	SUPPLY AIR DEVICE CALLOUT WITH QUANTITY TOP LINE DENOTES CFM BOTTOM LINE DENOTES NECK SIZE - (SEE SCHEDULE)
	RETURN AIR GRILLE CALLOUT (SEE SCHEDULE)
	EQUIPMENT TAG (SEE SCHEDULE)
	EXISTING
	NEW
	RELOCATED
	SUPPLY AIR
	RETURN AIR
	OUTSIDE AIR
	EXHAUST AIR
	TRANSFER AIR

MECHANICAL GENERAL NOTES (2021)

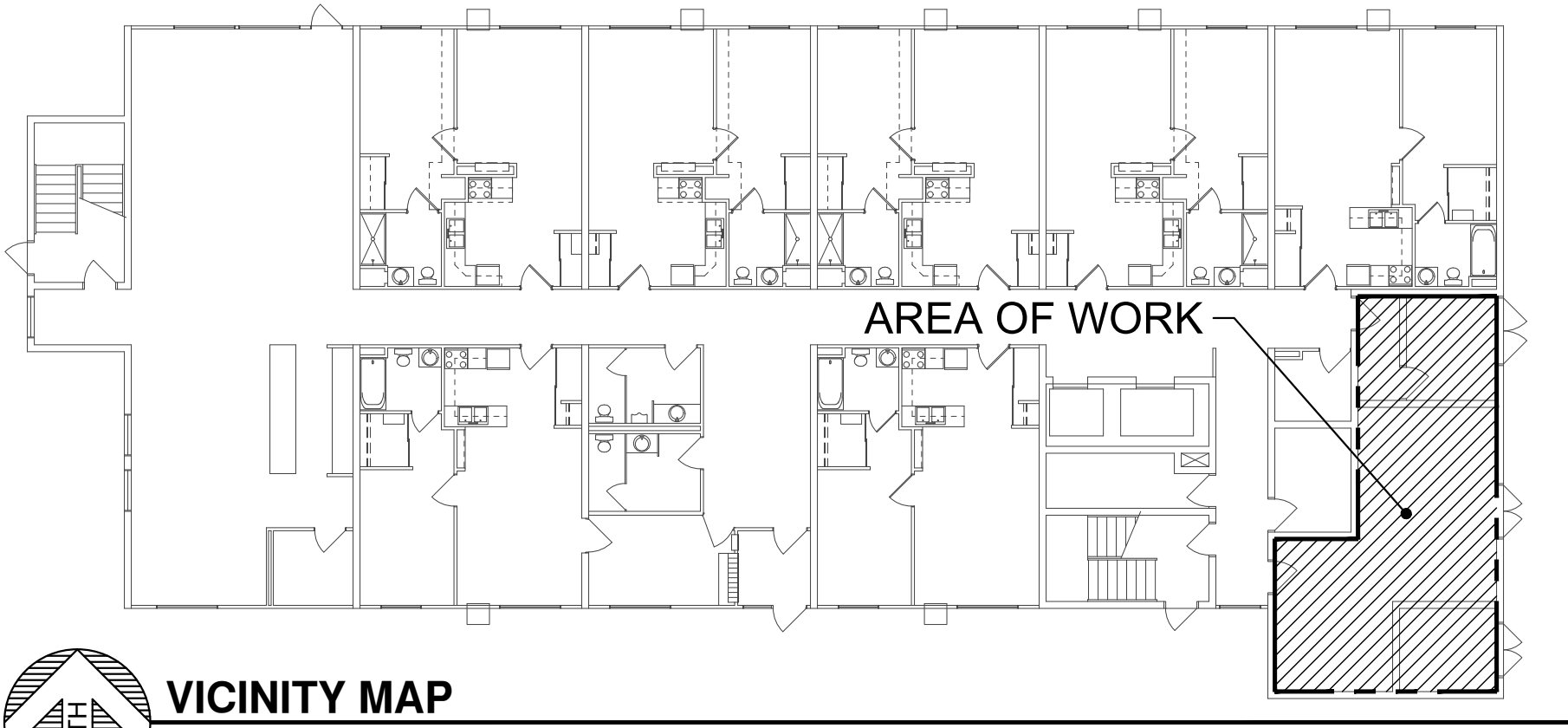
- A. NOT ALL EXISTING DUCTWORK, PIPING, AND ACCESSORIES ARE NECESSARILY SHOWN ON THIS DRAWING, BUT WHAT IS DEMAED NECESSARY TO SHOW INTENT OF WORK INVOLVED IMMEDIATELY AND REFER TO ALL PLANS, SECTIONS, DETAILS, SCHEDULES, AND SPECIFICATIONS FOR COMPLETE SYSTEM REQUIREMENTS.
- B. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO ORDERING, FABRICATION OF MATERIAL, OR PERFORMING ANY NEW WORK. DEVIATIONS FROM CONDITIONS SHOWN IN THESE PLANS SHALL BE REPORTED TO THE PROJECT MANAGER IMMEDIATELY. ALL WORK SHALL BE PERFORMED IN THIS AREA UNTIL A RESOLUTION HAS BEEN ESTABLISHED. SITE CONDITIONS DIFFERING FROM THOSE SHOWN ON THESE PLANS WILL NOT BE GENERALLY CONSIDERED A BASIS FOR CONTRACT MODIFICATION AS THE CONTRACTOR SHALL TAKE INTO ACCOUNT WORST CASE SITE CONDITIONS WHEREVER POSSIBLE.
- C. COORDINATE ALL PENETRATIONS OF FLOOR, ROOF, WALLS, ETC. WITH GENERAL CONTRACTOR. ALL PENETRATIONS THROUGH FIRE/SMOKE RATED CONSTRUCTION SHALL BE SEALED WITH A FIRE RATED CAULK EQUAL TO OR EXCEEDING THE CONSTRUCTION FIRE RATING.
- D. ALL NEW MATERIALS IN THE RETURN AIR PLENUM SHALL HAVE A MAXIMUM FLAME SPREAD RATING OF 25 AND A MAXIMUM SMOKE DEVELOPED RATING OF 50 IN ACCORDANCE WITH SECTION 602.2.1 OF THE 2021 INTERNATIONAL MECHANICAL CODE.
- E. FLEXIBLE AIR DUCTS SHALL CONFORM TO UL181 IN ACCORDANCE WITH SECTION 603.6 OF THE 2021 INTERNATIONAL MECHANICAL CODE. LENGTH OF FLEX DUCT SHALL NOT EXCEED 5 FT.
- F. ALL MECHANICAL EQUIPMENT SHALL BE LABELED AS TO THE AREA(S) SERVED IN ACCORDANCE WITH SECTION 304.12 OF THE 2021 INTERNATIONAL MECHANICAL CODE.
- G. PROVIDE ACCESS DOORS OR OTHER MEANS OF APPROVED ACCESS TO ALL FIRE AND FIRE/SMOKE DAMPERS. ACCESS DOORS SHALL BE LABELED ON THE ACCESS DOOR AND ON THE CEILING BELOW.
- H. PROVIDE AND INSTALL A BALANCING DAMPER AT EACH BRANCH TAKEOFF FOR THE SUPPLY AND EXHAUST AIR SYSTEMS. PROVIDE AND INSTALL A BALANCING DAMPER AT EACH BRANCH TAKEOFF FOR THE RETURN AIR SYSTEM WHERE INDICATED. BALANCING DAMPERS LOCATED ABOVE GYPSUM BOARD OR OTHER INACCESSIBLE CEILINGS SHALL BE INSTALLED WITH A CONCEALED DAMPER REGULATOR AND COVER PLATE, PAINTED TO MATCH CEILING COLOR.
- I. MOUNT SPACE TEMPERATURE SENSORS, THERMOSTATS, AND REMOTE CONTROL DEVICES WITH CENTERLINE AT 48" ABOVE FINISH FLOOR (AFF) UNLESS OTHERWISE INDICATED.
- J. PROVIDE BALANCE REPORT TO INSPECTOR AT TIME OF HEATING FINAL IN ACCORDANCE WITH 2021 INTERNATIONAL ENERGY CONSERVATION CODE. SUBMIT TO ARCHITECT FOR FINAL APPROVAL.
- K. DUCTWORK SHALL BE SEALED IN ACCORDANCE WITH THE SPECIFICATIONS AND THE 2021 EDITION OF THE INTERNATIONAL MECHANICAL CODE, SECTION 603.9.
- L. DUCT SIZES SHOWN REPRESENT CLEAR INSIDE DIMENSIONS.
- M. ALL RECTANGULAR DUCT ELBOWS OR CHANGES IN DIRECTION OF 45 DEGREES OR GREATER, OTHER THAN BRANCH CONNECTIONS, SHALL INCLUDE DOUBLE THICKNESS AIRFOIL SHAPED TURNING VANES.
- N. UNLESS NOTED OTHERWISE, GRILLE/REGISTER/DIFFUSER (GRD) NECK SIZE SHOWN ON DRAWINGS INDICATES SIZE OF DUCT TO GRILLE/REGISTER/DIFFUSER.
- O. COORDINATE FINAL LOCATION OF DUCTWORK, PIPING, DIFFUSERS, ETC. WITH ALL OTHER TRADES BEFORE FABRICATION OR INSTALLATION.
- P. CONTRACTOR SHALL PROVIDE ALL REQUIRED OFFSETS, TRANSITIONS, AND FITTINGS FOR DUCTWORK AND PIPING FOR COMPLETE SYSTEM.
- Q. UNLESS NOTED OTHERWISE, PROVIDE BELL MOUTH SPIN-IN FITTING WITH A 2" STAND-OFF BRACKET AND LOCKING QUADRANT VOLUME DAMPER FOR ALL DIFFUSER CONNECTIONS.
- R. COORDINATE LOCATION OF ALL WALL/CEILING MOUNTED DIFFUSERS AND GRILLES WITH ALL TRADES AND GENERAL CONTRACTOR.
- S. PROVIDE AND INSTALL 1/4" BIRD-SCREEN ON OPENINGS FREELY COMMUNICATING WITH THE OUTDOORS, EXCEPT GREASE HOOD EXHAUST FAN APPLICATIONS.
- T. FOR AIR HANDLING EQUIPMENT WITH A CAPACITY OF 2,000 CFM OR GREATER, A SMOKE DETECTOR SHALL BE INSTALLED IN THE RETURN AIR STREAM.
- U. PROVIDE 120V MAINTENANCE RECEPTACLE WITHIN 25'-0" OF ROOF TOP EQUIPMENT.
- V. BUILDING EXHAUST AND VENTS SHALL BE INSTALLED A MINIMUM OF 10'-0" FROM VENTILATION INTAKES.
- W. IN THE APPLICATION OF EXTERIOR DUCTWORK THAT CALLS FOR INSULATION AND ALUMINUM CLADDING, CONTRACTOR SHALL NOT USE ALUMAGUARD FLEXIBLE WEATHER PROOFING JACKET (AS AN EXAMPLE) TYPE CLADDING. THIS IS A FLEXIBLE STICKER TYPE APPLICATION THAT IS NOT RATED FOR RAIL. CONTRACTOR IS REQUIRED TO INSTALL METAL SHEETS OF ALUMINUM CLADDING, SIMILAR TO ITW ALUMINUM ROLL JACKETING.
- X. AN APPROVED SEISMIC SEPARATION ASSEMBLIES SHALL BE INSTALLED WHERE HYDRONIC HVAC, PLUMBING, IRRIGATION, OR FIRE PROTECTION SPRINKLER PIPING, REGARDLESS OF SIZE, PENETRATES OR CROSSES BUILDING SEISMIC SEPARATION (EXPANSION) JOINTS AT GROUND LEVEL AND ABOVE. SEISMIC SEPARATION ASSEMBLIES SHALL CONSIST OF FLEXIBLE FITTINGS OR FLEXIBLE PIPING SO AS TO ALLOW MOVEMENT SUFFICIENT TO ACCOMMODATE CLOSING OF THE SEPARATION, OPENING OF THE SEPARATION TO TWICE ITS NORMAL SIZE, AND MOVEMENT RELATIVE TO THE SEPARATION IN ANY DIRECTION IN AN AMOUNT EQUAL TO THE SEPARATION DISTANCE. A SEISMIC SEPARATION SHALL BE SELECTED BY A CONTRACTOR ACCORDING TO THE LATEST EDITIONS OF IBC, IPC, IMC, IFI, NFPA-13, AND RULES, CODES, ORDERS, REGULATIONS, ORDINANCES, AND LAWS IMPOSED BY JURISDICTIONAL AUTHORITIES.

CODE REFERENCE

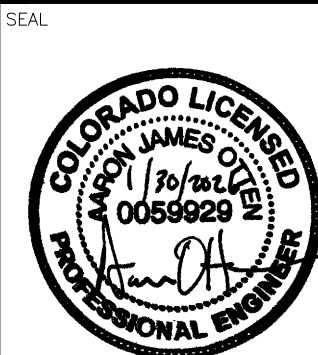
ELEVATION	JURISDICTION
4,800 FT	PUEBLO, COLORADO
YEAR	ADOPTED CODE
2021	INTERNATIONAL BUILDING CODE
2021	INTERNATIONAL FIRE CODE
2021	INTERNATIONAL MECHANICAL CODE
2021	INTERNATIONAL PLUMBING CODE
2021	INTERNATIONAL FUEL GAS CODE
2021	INTERNATIONAL ENERGY CONSERVATION CODE
2023	NATIONAL ELECTRICAL CODE

MECHANICAL SHEET INDEX

SHEET	TITLE
M001	MECHANICAL NOTES AND LEGEND
M002	MECHANICAL SPECIFICATIONS
MD111	MECHANICAL FIRST FLOOR HVAC & HYDRONIC DEMOLITION PLAN
M111	MECHANICAL FIRST FLOOR HVAC & HYDRONIC PLAN
M500	MECHANICAL DETAILS
M610	MECHANICAL SCHEDULES



VICINITY MAP
SCALE: 1/16" = 1'-0"



REVISIONS	DATE	COMMENT
1	12/12/2025	75% ISSUANCE
2	01/30/2026	100% CD ISSUANCE
3	07/09/2026	ADDENDUM #1

MECHANICAL NOTES AND LEGEND

© COPYRIGHT 2025 ALL DRAWN & WRITTEN INFORMATION APPEARING HEREIN SHALL NOT BE DUPLICATED, DISCLOSED OR OTHERWISE USED WITHOUT WRITTEN CONSENT OF PLANT ENGINEERING CONSULTANTS.

PROJECT	25087
DATE	07/09/2026
DRAWN	DES
CHECKED	DEE

SHEET

7/7/2026 2:46:49 PM David Estelle
C:\projects\2025\25087\minnequa boiler v4 drawings\4.3 submittal\4.3.2 mechanical\25087_m002.dwg

DIVISION 23 - MECHANICAL	
SECTION 23 01 00 - BASIC HVAC REQUIREMENTS	
1.01 GENERAL	A. ALL PROVISIONS OF THE CONTRACT DOCUMENTS APPLY TO THE WORK OF THIS DIVISION. B. ALL DIVISION 23 SECTIONS ARE SUBJECT TO THE PROVISIONS OF THIS SECTION.
1.02 SUMMARY OF WORK	A. WORK INCLUDED: PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTAL ITEMS NECESSARY FOR COMPLETELY FINISHED AND OPERATIONAL MECHANICAL SYSTEMS. EXAMINE DOCUMENTS OF OTHER TRADES FOR ANY ADDITIONAL WORK WHICH MAY BE REQUIRED OF THE MECHANICAL CONTRACTOR.
1.03 DEFINITIONS	A. EXPOSED: EXPOSED IN MECHANICAL ROOMS OR ROOMS WITH FINISHED WALLS OR CEILINGS. DOES NOT INCLUDE EXTERIOR. B. CONCEALED: LOCATED IN PIPE CHASES, FURRED SPACES, ATTICS, CRAWL SPACES, ABOVE SUSPENDED CEILINGS, OR ALL OTHER LOCATIONS NOT EXPOSED TO VIEW. C. PROVIDE: FURNISHED AND INSTALL. D. EXTERIOR: LOCATED OUTSIDE OF BUILDING ENVELOPE.
1.04 DIVISION OF RESPONSIBILITY	SPECIFICATION FORMATTING WHICH INDICATES A DIVISION IN THE MECHANICAL WORK IS FOR CONVENIENCE ONLY. IT IS NOT INTENDED TO DELINEATE LINES OF RESPONSIBILITY BETWEEN SUBCONTRACTORS AND/OR SUPPLIERS. SUCH DELINEATION RESTS ENTIRELY WITH THE CONTRACTOR.
1.05 PLANS AND SPECIFICATIONS	PLANS ARE DIAGRAMMATIC. THEY INDICATE GENERAL INTENT, DESIGN AND ARRANGEMENT OF SYSTEMS. PROVIDE ALL MINOR INCIDENTALS SUCH AS OFFSETS, FITTINGS, ETC., AS MAY BE REQUIRED EVEN THOUGH NOT SHOWN. PROVIDE ISOLATION VALVES AND UNIONS AS CALLED FOR IN THESE SPECIFICATIONS WHETHER OR NOT SHOWN ON DRAWINGS. DO NOT SCALE THE PLANS; TAKE DIMENSIONS FROM ACTUAL FIELD CONDITIONS.
1.06 CODES AND REGULATIONS	A. CONFORM TO CODES AND REGULATIONS APPLICABLE AT THE PROJECT SITE. B. CALL FOR INSPECTIONS FROM LOCAL AUTHORITIES AS REQUIRED IF DISCREPANCIES OCCUR BETWEEN CONTRACT DOCUMENTS AND LOCAL REGULATIONS. THE MORE STRINGENT REQUIREMENT APPLIES.
1.07 FEES AND PERMITS	A. OBTAIN REQUIRED PERMITS. B. PAY PERMIT FEES, CONSTRUCTION FEES, TAP FEES, INSPECTION FEES. C. DEVELOPMENT FEES ARE PAID BY OWNER.
1.08 COORDINATION	A. COORDINATE WITH OTHER TRADES TO ASSURE ORDERLY PROGRESS OF THE WORK AND TO ASSURE PROPER FIT IN CONFINED SPACES. B. REPORT TO THE ARCHITECT ANY CONSTRUCTION DEFECTS WHICH AFFECT THE MECHANICAL WORK; PROCEED WITH MECHANICAL WORK ONLY AFTER DEFECTS HAVE BEEN CORRECTED.
1.09 QUALITY ASSURANCE	A. PERFORM WORK IN ACCORDANCE WITH GOOD TRADE PRACTICE AND IN A NEAT MANNER. COMPLY WITH ARCHITECT'S DIRECTION CONCERNING FINISHED APPEARANCE. B. ADHERE TO MANUFACTURER'S RECOMMENDATIONS.
1.10 PROTECTION	A. OF PEOPLE: ARRANGE BARRIERS, SIGNS, ETC. AS REQUIRED TO MINIMIZE THE HAZARD TO PEOPLE. COMPLY WITH APPLICABLE SAFETY AND HEALTH REGULATIONS. B. OF WORK: TAKE ALL MEASURES NECESSARY TO PROTECT THE WORK BOTH BEFORE AND AFTER INSTALLATION, TO ASSURE THAT IT WILL BE IN CLEAN, UNDAMAGED, UNBLEMISHED CONDITION WHEN TURNED OVER TO THE OWNER. REPAIR/REPLACE WORK DAMAGED DURING CONSTRUCTION. C. OF EXISTING MECHANICAL: PROVIDE TEMPORARY FILTERS AT ALL EXISTING RETURN AIR DEVICES AND OPENINGS DURING CONSTRUCTION.
1.11 SUBMITTALS	A. SUBMIT PRODUCT DATA FOR THE FOLLOWING ITEMS: 1. GRILLES, REGISTERS, DIFFUSERS, SPIN-IN, FLEX, DUCT INSULATION, THERMOSTAT, HVAC EQUIPMENT AND OTHER MECHANICAL ITEMS. 2. ALL PLUMBING FIXTURES, ACCESSORIES AND PIPE INSULATION. B. SUBMIT PDF THROUGH GENERAL CONTRACTOR TO ENGINEER.
1.12 RECORD DOCUMENTS	A. MAINTAIN AT JOB SITE: CONTRACT DOCUMENTS, REVIEWED SUBMITTALS, FIELD TEST RECORDS. B. AS-BUILT DRAWINGS: NEATLY REVISE THE DESIGN DRAWINGS TO REFLECT THE AS-BUILT CONDITION. DIMENSIONALLY LOCATE SITE UTILITIES AND UNDER SLAB WORK. DELIVER AS-BUILT DRAWINGS TO ENGINEER AT PROJECT COMPLETION.
1.13 OPERATING & MAINTENANCE MANUAL	A. FORMAT: PDF B. CONTENTS: EACH SECTION SET OFF BY INDEX TABS. INCLUDE: 1. TABLE OF CONTENTS. 2. EXECUTED WARRANTIES. 3. NAME, ADDRESS AND TELEPHONE NUMBER OF INSTALLING CONTRACTORS AND SUBCONTRACTORS, ALONG WITH BRIEF DESCRIPTION OF THEIR PROJECT RESPONSIBILITY. 4. NAME, ADDRESS AND TELEPHONE NUMBER OF MATERIAL AND EQUIPMENT SUPPLIERS, ALONG WITH LISTING OF ITEMS SUPPLIED. 5. EQUIPMENT TABS. MINIMUM ONE TAB FOR EACH APPLICABLE DIVISION 23 SECTION, ARRANGED IN THE SAME ORDER AS THE SPECIFICATIONS. INCLUDE FOR ALL EQUIPMENT SUPPLIED: A. REVIEWED SUBMITTALS. B. INSTALLATION INSTRUCTIONS. C. OPERATING INSTRUCTIONS. D. MAINTENANCE INSTRUCTIONS. E. PARTS LISTS. F. TEST AND BALANCE REPORT. G. CERTIFICATES OF INSPECTION AT PROJECT COMPLETION SUBMIT ONE COPY OF MANUAL TO ENGINEER FOR REVIEW. MAKE ANY CORRECTIONS REQUIRED. TRANSMIT THREE CORRECTED COPIES TO GENERAL CONTRACTOR FOR DELIVERY TO OWNER.
1.14 WARRANTIES	A. PROVIDE ONE (1) YEAR WARRANTY ADDRESSED TO OWNER COVERING ALL DIVISION 23 WORK. PROVIDE ADDITIONAL FOUR (4) YEAR WARRANTY COVERING ALL REFRIGERANT COMPRESSORS. B. INCLUDE EXECUTED WARRANTIES IN OPERATING & MAINTENANCE MANUALS. C. DURING WARRANTY PERIOD, PROVIDE LABOR AND MATERIALS, INCLUDING SHIPPING, TO REPAIR OR REPLACE DEFECTS IN DIVISION 23 WORK. PAY FOR DAMAGE TO OTHER WORK RESULTING FROM DEFECTS IN DIVISION 23 WORK.
1.15 DEMONSTRATIONS	A. CONDUCT DEMONSTRATIONS WHEN SYSTEMS ARE COMPLETE AND OPERATIONAL AND READY TO BE TURNED OVER TO THE OWNER, AND AFTER THE OPERATING AND MAINTENANCE MANUAL IS COMPLETE. B. INSTRUCT THE OWNER'S REPRESENTATIVE ONCE ON THE PROPER OPERATION AND MAINTENANCE OF THE MECHANICAL SYSTEMS. PAY PARTICULAR ATTENTION TO NORMAL AND EMERGENCY START-UP AND SHUT-DOWN PROCEDURES, SEASONAL CHANGE OVER, SAFETY DEVICES, AND TEMPERATURE CONTROL SYSTEMS.

SECTION 23 05 00 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 WORK INCLUDED

THIS SECTION DESCRIBES MATERIALS AND METHODS COMMON TO THE WORK IN GENERAL FOR DIVISION 23.

PART 2 - PRODUCTS

2.01 MOTORS, STARTERS, MISC. ELECTRICAL

MOTORS: MINIMUM HORSEPOWER AS INDICATED HEREIN OR ON DRAWINGS. CONSTRUCTED FOR OPERATION AT SITE ALTITUDE, RUST PROOF/LEAK PROOF BEARING RINGS, BUILT TO NEMA STANDARDS, FACTORY BALANCED, OPEN DRIP PROOF, THERMAL OVERLOAD PROTECTED, 1.15 SERVICE FACTOR AT ALTITUDE. POWER FACTOR CORRECTED IN ACCORDANCE WITH APPLICABLE ENERGY CODE, SUITABLE FOR OPERATION ON VOLTAGE INDICATED.

SECTION 23 05 00 - BASIC MATERIALS AND METHODS (cont'd)

B. STARTERS: STARTERS OR SMALL MOTORS WITHOUT STARTERS SHALL HAVE THERMAL OVERLOAD PROTECTION IN EACH PHASE. ALL MAGNETIC STARTERS SHALL BE FURNISHED WITH TRANSFORMERS THAT PROVIDE 120V CONTROL VOLTAGE UNLESS ESTABLISHED BY OTHER MEANS. STARTERS SHALL INCLUDE TWO SETS OF AUXILIARY CONTACTS.

2.02 PIPE SCHEDULE

A. GENERAL: ALL EXTERIOR EXPOSED GAS PIPING SHALL BE PAINTED.
B. WATER: COPPER TUBING PER ASTM B88, TYPE L, HARD DRAWN ABOVEGROUND AND ASTM B42, TYPE K UNDERGROUND. GRADE 95TA SOLDER JOINTS ABOVEGROUND AND AWS AS 8 SILVER BRASS UNDERGROUND. CROSS-LINKED POLYETHYLENE PIPE (PEX) ASTM F876 OR F877.
C. HYDRONIC: 2" AND SMALLER COPPER TUBING SAME AS FOR WATER OR STEEL PIPE ASTM A53 SCH. 40 WITH ASME B16.3 MALLEABLE IRON OR ASTM A234 FORGED STEEL THREADED FITTINGS. PROVIDE DIELECTRIC UNIONS FOR DISSIMILAR METALS.
D. NATURAL GAS: STEEL PIPE, ASTM A53 SCH. 40 WITH ASME B16.3 MALLEABLE IRON OR ASTM A234 FORGED STEEL THREADED OR WELDED JOINTS.
E. REFRIGERANT: COPPER ACR TUBING ASTM B280, NITROGENIZED, TYPE L, HARD DRAWN.

2.03 PIPE HANGERS AND SUPPORTS

A. INSERTS: STEEL CASE AND EXPANDER PLUG FOR THREADED CONNECTION WITH LATERAL ADJUSTMENT, TOP SLOT FOR REINFORCING RODS AND LUGS FOR ATTACHING TO FORMS. SIZE TO MATCH HANGER ROD.
B. EXPANSION ANCHORS: LEAD SHIELD OR SLIDING EXPANSION TYPE WITH MACHINE BOLT. SIZE TO MATCH HANGER ROD.
C. BEAM CLAMPS: STEEL, WITH CLAMPING BOLT AND JAMB NUT, CONFIGURED TO ATTACH SECURELY TO BEAM.
D. CLIP ANGLES: SHORT SECTION OF STEEL ANGLE WITH SUITABLE FASTENERS.
E. HANGER RODS: STEEL ALL-THREAD.
F. HANGERS:
1. INDIVIDUAL HANGERS: ADJUSTABLE WROUGHT STEEL RING FOR PIPING THROUGH 1-1/2" ADJUSTABLE WROUGHT STEEL CLEVIS FOR PIPING 2" AND LARGER. CHAIN OR PERFORATED STRAP HANGERS NOT PERMITTED.
2. TRAPEZE: INVERTED STEEL CHANNELS WITH WELDED PIPE SPACERS. PIPING MAY REST DIRECTLY ON TRAPEZE. SIZE HANGER RODS ONE SIZE LARGER THAN REQUIRED FOR LARGEST PIPE ON TRAPEZE. UNIFORMLY SPACE HANGER RODS MAXIMUM 3' ON CENTER. LOCATE PIPING ON TRAPEZE TO ALLOW FOR INSULATION AND THERMAL EXPANSION. SEE SECTION 23 07 00 - INSULATION.
G. WALL STANDS: CAST IRON HOOK FOR PIPING THROUGH 3". WELDED STEEL WALL BRACKET WITH WROUGHT STEEL CLAMP FOR COLD PIPING 4" TO 6". SIZE IN ACCORDANCE WITH CODE AND TO ALLOW FOR INSULATION. SEE SECTION 23 07 00 - INSULATION.
H. RISER CLAMPS: STEEL, BOLT-TOGETHER, WITH SUPPORTING TABS. SIZE FOR UNINSULATED PIPE.
I. FLOOR STANDS:
1. BASE: CONCRETE PIER OR STEEL SUPPORT.
2. STAND: CAST IRON ADJUSTABLE SADDLE WITH PIPE NIPPLE RISER, LOCKNUT AND FLOOR FLANGE FOR PIPING THROUGH 5". ADJUSTABLE STEEL STAND AND CAST IRON ROLLER FOR PIPING 6" AND LARGER. SIZE IN ACCORDANCE WITH CODE AND TO ALLOW FOR INSULATION. SEE SECTION 23 07 00 - INSULATION.
J. MATERIALS: METALLIC PIPE HANGERS SHALL BE OF SAME MATERIAL AS BASE METAL OF PIPE OR INSTALL WEAR PADS FOR DISSIMILAR MATERIALS.

2.04 SLEEVES, SAFING, AND ESCUTCHEONS

A. SLEEVES:
1. ROUND: STEEL PIPE SIZED LARGE ENOUGH TO ALLOW FOR UNINTERRUPTED INSULATION AND FOR MOVEMENT.
2. RECTANGULAR: GALVANIZED STEEL, REINFORCED TO PREVENT DEFORMATION.
B. SAFING:
1. WATERPROOF: ELASTIC MASTIC, SILICONE, ETC.
2. FIREPROOF: PLASTER, GROUT, OTHER MATERIAL AS APPROVED BY LOCAL AUTHORITIES.
C. ESCUTCHEONS:
1. PIPING: ADJUSTABLE CHROME-PLATED, SOLID OR SPLIT, FLAT OR DISHED TO SUIT THE APPLICATION.
2. DUCTWORK: FABRICATED SHEET METAL.

2.05 VALVES

A. ACCEPTABLE MANUFACTURERS: CRANE, HAMMOND, JENKINS, KENNEDY, NIBCO, POWELL, STOCKHAM, GRINNELL.
B. GENERAL: ALL VALVES OF THE SAME TYPE SHALL BE OF ONE MANUFACTURER. USE VALVES LISTED WITH THE MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY.
C. ISOLATION VALVES:
1. 2" AND SMALLER: BALL VALVE; BRASS OR STAINLESS STEEL BODY, SWING-AWAY DESIGN, FULL PORT, STAINLESS STEEL STEM AND BALL, TEFLON SEAT, LEVER OPERATOR, SCREWED OR SOLDERED ENDS, 150# WSP, 400# WOG.
2. 2-1/2" AND LARGER: BUTTERFLY VALVE; 200 PSI, DUCTILE IRON BODY WITH 2" EXTENSION TO ACCOMMODATE INSULATION, LUG ONLY BODY STYLE, STAINLESS STEEL STEM, LEVER-LOCK OPERATOR, EPDM SEALS.
D. CHECK VALVES:
1. SWING CHECK 4" AND SMALLER: BRONZE, SCREWED BONNET, HORIZONTAL SWING DISC, RENEWABLE DISC AND SEAT, SOLDER OR SCREWED ENDS, 150# WSP, 300# WOG.
E. BALANCING VALVES:
1. 2" AND SMALLER: PLUG COCKS OR ECCENTRIC VALVES OR BALL VALVES.
2. ALL SIZES: WITH ADJUSTABLE MEMORY STOP.
F. DRAIN VALVES:
1. BRONZE, COMPRESSION STOP WITH NIPPLE AND CAP OR HOSE THREAD OUTLET, 125# WSP.
G. GAS PLUG VALVES:
1. UNDER 2-1/2": CAST IRON BODY, 150 #, BUILT IN STOP.
2. 2-1/2" AND LARGER: MSS SP-78, 150 #, CWP, CAST IRON BODY AND PLUG, PRESSURE LUBRICATED, TEFLON OR BUNA N PACKING.

2.06 UNIONS

A. FERROUS PIPING
1. 2" AND SMALLER: 150# MALLEABLE IRON GROUND JOINT, THREADED ENDS.
2. 2-1/2" AND LARGER: GRADE 1 150# FORGED STEEL SLIP ON OR WELD-NECK FLANGES IN ACCORDANCE WITH ASTM 181, REGULAR SQUARE-HEAD MACHINE BOLTS WITH HEAVY HEXAGONAL NUTS IN ACCORDANCE WITH ASTM A307 GRADE B, 1/16" THICK PRE-FORMED SYNTHETIC GASKETS.
B. COPPER PIPING
1. 2" AND SMALLER: WROUGHT COPPER IN ACCORDANCE WITH ANSI B16.22.
2. 2-1/2" AND LARGER: 150# BRONZE FLANGES, 1/16" THICK PRE-FORMED SYNTHETIC GASKETS.
C. DIELECTRIC UNIONS:
1. UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER.

2.07 PIPING SPECIALTIES

A. PRESSURE AND TEMPERATURE RELIEF VALVES
1. ACCEPTABLE MANUFACTURERS: WATTS, CRANE, CASH/ACME.
2. DESCRIPTION: ASME STAMPED, SUITABLY SIZED AND RATED TO PROTECT THE INTENDED SYSTEM AND EQUIPMENT.
B. THERMOMETERS
1. ACCEPTABLE MANUFACTURERS: SIKA, MOELLER, WEKSLER, WIKI.
2. DESCRIPTION: METAL CASE WITH COLORED-ALCOHOL FILLED GLASS OR PLASTIC READING TUBE WITH SUITABLE 9" SCALE, ADJUSTABLE MULTI-ANGLE HOUSING, BRASS SEPARABLE SOCKET.
C. EXPANSION TANK
1. ACCEPTABLE MANUFACTURERS: AMTROL, ITT BELL & GOSSETT, TACO.
2. DESCRIPTION: ASME STAMPED, WELDED STEEL WITH FLEXIBLE EPDM DIAPHRAGM OR BLADDER SEALED INTO TANK.
D. AIR SEPARATORS
1. ACCEPTABLE MANUFACTURERS: ARMSTRONG, ITT BELL & GOSSETT, TACO.
2. IN-LINE AIR SEPARATORS: CAST IRON OR STEEL, ASME STAMPED, 125 PSI OPERATING PRESSURE.
E. AIR VENTS
1. ACCEPTABLE MANUFACTURERS: ARMSTRONG, ITT BELL & GOSSETT, TACO.
2. MANUAL TYPE: VERTICAL PIPE TO FORM AIR CHAMBER WITH BRASS NEEDLE VALVE AT TOP OF CHAMBER.
3. FLOAT TYPE: BRASS OR SEMI-STEEL BODY, WITH FLOAT VALVE AND SEAT; SUITABLE FOR OPERATING TEMPERATURE AND PRESSURE, WITH ISOLATING VALVE.
4. WASHER TYPE: BRASS WITH HYGROSCOPIC FIBER DISCS, VENT PORTS, ADJUSTABLE CAP FOR MANUAL SHUT-OFF AND INTEGRAL SPRING LOADED BALL CHECK VALVE.

PART 3 - EXECUTION

3.01 MOTORS, STARTERS, AND MISC. ELECTRICAL PROVIDE MOTORS OF MINIMUM HORSEPOWER INDICATED, COMPLETE WITH STARTERS, AND ACCESSORIES AS REQUIRED.

SECTION 23 05 00 - BASIC MATERIALS AND METHODS (cont'd)

3.02 PIPE HANGERS, SUPPORTS

A. GENERAL: ADEQUATELY SUPPORT PIPING FROM BUILDING STRUCTURE. TO MAINTAIN REQUIRED GRADES, TO PREVENT SAGGING, SUPPORT PIPING INDEPENDENTLY OF EQUIPMENT SO ITS WEIGHT WILL NOT BE SUPPORTED BY THE EQUIPMENT. PROVIDE SWAY BRACING WHERE NECESSARY. ISOLATE HANGERS AND SUPPORTS COMING IN CONTACT WITH BARE COPPER PIPE; USE DIELECTRIC HANGER CONNECTORS OR WRAP WITH NON-CONDUCTIVE TAPE.
B. HANGER SPACING:
1. SPACING SHALL BE IN ACCORDANCE WITH IMC TABLE 305.4
2. TO PROVIDE 1/2" MINIMUM CLEARANCE BETWEEN INSULATION AND ADJACENT WORK.
3. SUPPORT HORIZONTAL CAST IRON PIPING NEAR EACH JOINT, MAXIMUM 5' ON CENTER.
4. SUPPORT VERTICAL CAST IRON PIPING AT EACH FLOOR INDEPENDENTLY OF CONNECTING HORIZONTAL PIPING WHERE PRACTICAL.
C. INSERTS: USE FOR CAST-IN-PLACE CONCRETE. SET IN PLACE PRIOR TO CONCRETE POUR. ATTACH INSERT TO RE-BAR IF INSERT WILL CARRY PIPING 4" AND OVER WHERE CONCRETE WILL REMAIN EXPOSED, FINISH INSERTS FLUSH WITH EXPOSED SURFACE.
D. EXPANSION ANCHORS: USE FOR PRECAST AND EXISTING CONCRETE. DRILL APPROPRIATE SIZE HOLE AND SECURELY SET ANCHOR. DO NOT CUT STRESSED CONCRETE REINFORCING. WHERE ARCHITECT ALLOWS, MAY DRILL THROUGH CONCRETE SLAB FROM BELOW AND PROVIDE HANGER ROD WITH RECESSED SQUARE STEEL PLATE AND NUT ABOVE SLAB.
E. BEAM CLAMPS: USE FOR STEEL BEAMS AND JOISTS, CLAMPED IN PLACE.
F. CLIP ANGLES: USE FOR STEEL BEAMS, WELDED IN PLACE. USE FOR WOOD BEAMS AND JOISTS, THROUGH-BOLTED IN PLACE WITH BACKER PLATE AND LOCK NUT.
G. HANGER RODS: SUSPENDED FROM INSERTS AND ANCHORS WITH JAMB NUT. SUSPENDED FROM CLAMPS AND ANGLES WITH TOP AND BOTTOM LOCK NUTS.
H. INSERTS: SUSPEND HANGER RODS WITH TOP AND BOTTOM LOCK NUTS. ALLOW FOR AT LEAST 1-1/2" VERTICAL ADJUSTMENT.
I. WALL SUPPORTS: SECURELY ATTACH TO WALL USING INSERTS, EXPANSION ANCHORS, BOLTS, ETC. AS SUITS THE APPLICATION AND TO ASSURE A PERMANENT FASTENING.
J. RISER CLAMPS: LOCATE AT EACH FLOOR FOR RISERS WHICH EXTEND THROUGH MORE THAN ONE FLOOR AND FOR PIPING WHICH IS NOT ADEQUATELY SUPPORTED FROM BELOW.
K. WALL STANDS: USE FOR HORIZONTAL PIPING SUPPORTED FROM THE FLOOR. PROVIDE GENERAL CONTRACTOR WITH ANCHOR BOLTS AND SETTING TEMPLATES FOR CONCRETE PIERS.

3.03 SLEEVES, SAFING, AND ESCUTCHEONS

A. MAKE PENETRATIONS THROUGH BUILDING ELEMENTS AS FOLLOWS:
1. NEW CONCRETE: USE INDIVIDUAL SLEEVES CAST IN PLACE. ONLY ONE PIPE OR DUCT TO A SLEEVE. MULTIPLE PIPES/DUCTS IN A STAND. DO NOT ALLOWED. EXTENDED FLOOR SLEEVES 2" ABOVE FINISHED FLOOR, NOTCHED AS REQUIRED FOR RISER CLAMPS. CUT WALL SLEEVES FLUSH WITH WALL.
2. PRE-CAST AND EXISTING CONCRETE, SLEEVES NOT REQUIRED. SAW CUT OR CORE DRILL CONCRETE AS IN ACCORDANCE WITH CUTTING AND PATCHING HEREIN.
3. NEW MASONRY: SAME AS NEW CONCRETE.
4. EXISTING MASONRY: SAME AS EXISTING CONCRETE.
5. FRAME: SAME AS EXISTING CONCRETE.
B. PROVIDE SAFING IN ANULAR SPACE BETWEEN PIPE/DUCT/INSULATION AND SLEEVE/OPENING AS FOLLOWS:
1. FOR UN-RATED CONCRETE FLOORS AND FOUNDATION WALLS USE WATERPROOF TYPE.
2. FOR FIRE-RATED CONSTRUCTION USE FIREPROOF TYPE FOR FULL THICKNESS OF THE CONSTRUCTION.
C. PROVIDE ESCUTCHEONS FOR PIPES AND DUCTS PASSING THROUGH WALLS, FLOORS AND CEILINGS IN FINISHED AREAS. PROVIDE TO COMPLETELY CONCEAL THE PENETRATION, TO BUTT TIGHTLY AGAINST THE WALL/FLOOR/CEILING AND THE PIPE/DUCT, AND TO YIELD A NEATLY FINISHED APPEARANCE. INSTALL PLATED ESCUTCHEONS AFTER WALL/FLOOR/CEILING HAS BEEN PAINTED.

3.04 VALVES

A. ORIENTATION: INSTALL WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED. INSTALL SWING CHECKS HORIZONTALLY OR IN UPFLOW VERTICAL PIPING, NOT DOWNFLOW VERTICAL.
B. SHUT-OFF AND ISOLATION: PROVIDE WHERE SHOWN, AT INLET AND OUTLET TO EACH PIECE OF EQUIPMENT, TO ISOLATE MAJOR HORIZONTAL BRANCHES, AT BASE OF VERTICAL RISERS, MAY OMIT WHERE BALANCING VALVE CAN BE USED FOR SHUT-OFF.
C. BALANCING: PROVIDE BALANCING VALVES WHERE SHOWN.
D. DRAINS: PROVIDE WHERE SHOWN, AT MAIN SHUT-OFF VALVES, AT LOW POINTS OF PIPING AND EQUIPMENT, TO ASSURE COMPLETE SYSTEM DRAIN-DOWN. LOCATE AT ACCESSIBLE POINTS WITHIN THE PIPING SYSTEM. USE DRAIN VALVES.

3.05 UNIONS

A. PROVIDE WHERE SHOWN, AT ALL EQUIPMENT AND CONTROL VALVE CONNECTIONS, FOR CONNECTION TO OTHER ITEMS REQUIRING REMOVAL FOR SERVICE/REPLACEMENT.
B. PROVIDE DIELECTRIC TYPE AT JUNCTIONS OF DISSIMILAR METALS.

3.06 PIPING SPECIALTIES

A. PRESSURE AND TEMPERATURE RELIEF VALVES: PROVIDE WHERE SHOWN AND TO ADEQUATELY PROTECT FIRED AND UNFIRED PRESSURE VESSELS AND PIPING SYSTEMS DESIGNED FOR OPERATION AT REDUCED PRESSURE. PIPE DISCHARGE TO A SAFE LOCATION. DO NOT PROVIDE ISOLATION VALVE BETWEEN RELIEF VALVE AND SYSTEM BEING PROTECTED.
B. THERMOMETERS: PROVIDE WHERE SHOWN, AT INLET AND OUTLET TO ALL FIRED PRESSURE VESSELS EXCEPT RESIDENTIAL-SIZED DOMESTIC WATER HEATERS, AT OUTLET FROM DOMESTIC WATER STORAGE TANKS AND STORAGE WATER HEATERS, AT PRIMARY AND SECONDARY INLET AND OUTLET TO CONVERTERS AND HEAT EXCHANGERS, DOWNSTREAM OF MAJOR MIXING VALVES. OMIT ON STEAM AND CONDENSATE SYSTEMS.

3.07 PIPE INSTALLATION

A. LOCATION: ROUTE PIPING GENERALLY AS INDICATED, PARALLEL WITH BUILDING ELEMENTS, IN AN ORDERLY MANNER. LOCATE CONCEALED UNLESS INDICATED OTHERWISE. ARRANGE TO CONSERVE HEADROOM AND TO CLEAR DOORS, WINDOWS AND OTHER OPENINGS.
B. INSTALLATION: INSTALL WITHOUT SPRING OR FORCING UNLESS COLD-SPRINGING IS INDICATED. MAKE CHANGES IN DIRECTION WITH FITTINGS. PROVIDE NECESSARY OFFSETS TO ACCOMMODATE OTHER WORK AND AS REQUIRED FOR EQUIPMENT FIT-UP. REAM AND CLEAN PRIOR TO JOINING. CAP OPEN ENDS TO PREVENT ENTRANCE OF FOREIGN MATERIAL.
C. GRADES: SLOPE ALL PIPING TO ALLOW FOR DRAINAGE. MINIMUM 1" IN 40' OR AS PRESCRIBED BY CODE OR SPECIFIED IN OTHER DIVISION 23 SECTIONS.
D. DRAINS: PROVIDE AT LOW POINTS IN WATER PIPING.
E. CLEARANCES: ALLOW FOR APPLICATION OF INSULATION AND FOR ACCESS TO VALVES, VENTS, DRAINS AND UNIONS. ALLOW FOR MINIMUM 1/2" CLEARANCE BETWEEN PIPES AFTER INSTALLATION.
F. BUILDING SETTLEMENT: PROVIDE SWING JOINTS AS NECESSARY TO PERMIT FREE BUILDING MOVEMENT WITHOUT CAUSING UNDUE PIPE STRESS OR DAMAGE TO BUILDING. PAY PARTICULAR ATTENTION TO PIPING CROSSING BUILDING EXPANSION JOINTS AND TO PIPING PENETRATING FLOORS, FOUNDATIONS, AND ROOF.
G. CONNECTIONS:
1. COPPER: SWEAT OR BRAZED AS IN ACCORDANCE WITH APPLICABLE DIVISION 23 SECTIONS.

3.08 PIPE TESTING

A. NEW PIPING: TEST ALL PIPING INSTALLED UNDER DIVISION 23. CONDUCT TESTS PRIOR TO CONCEALMENT OR INSULATING. NOTIFY ARCHITECT PRIOR TO CONDUCTING TESTS, TO ALLOW HIM TO OBSERVE TEST. PROVIDE ALL INSTRUMENTS AND EQUIPMENT REQUIRED TO CONDUCT TESTS. SEE APPROPRIATE DIVISION 23 SECTIONS FOR TESTING SPECIFICS AND PRESSURES.
B. EXISTING PIPING: ISOLATE FROM TEST PRESSURES USING ISOLATING VALVES, BLIND FLANGES, ETC. REPAIR ANY EXISTING PIPING DAMAGED DURING TESTING.
C. FIXTURES, EQUIPMENT: ISOLATE FROM TEST PRESSURES IF SUCH PRESSURE MAY DAMAGE THE FIXTURES/EQUIPMENT. USE ISOLATION VALVES, CAPS OR PLUGS.
D. DURATION: HOLD HYDROSTATIC TESTS FOR 15 MINUTES MINIMUM WITHOUT PRESSURE LOSS. HOLD AIR TESTS FOR 15 MINUTES MINIMUM WITHOUT SIGNIFICANT PRESSURE LOSS. AIR TEST MAY BE SUBSTITUTED FOR HYDROSTATIC TEST IF APPROVED BY ARCHITECT.
E. RE-TESTING: CORRECT ANY WORK FAILING THE INITIAL TEST. RE-TEST IN ACCORDANCE WITH INITIAL TEST PROCEDURES.
F. FIELD RECORDS: MAINTAIN FOR ALL TESTS. SUBMIT TO ARCHITECT IN TRIPLICATE.

SECTION 23 05 00 - BASIC MATERIALS AND METHODS (cont'd)

3.09 PIPE FLUSHING

FLUSH OR ROD OUT PIPING PRIOR TO MAKING FINAL CONNECTIONS, TO ASSURE REMOVAL OF FOREIGN MATERIAL. PROVIDE TEMPORARY CONNECTIONS, VALVES, ETC. AS MAY BE REQUIRED FOR THIS PURPOSE.
3.10 FLASHING AND COUNTERFLASHING
ROOF PENETRATIONS: FLASH AND COUNTERFLASH ROOF PENETRATION IN ACCORDANCE WITH ROOFING MANUFACTURER'S RECOMMENDATIONS.
3.11 CUTTING AND PATCHING
E. GENERAL: PERFORM AS REQUIRED FOR DIVISION 23 WORK. KEEP TO A MINIMUM THROUGH PROPER SCHEDULING. WHERE UNAVOIDABLE, PERFORM IN ACCORDANCE WITH APPLICABLE DIVISIONS. SEE DIVISION 1.
F. CUTTING: OBTAIN ARCHITECT'S APPROVAL PRIOR TO CUTTING OR DRILLING TO STRUCTURAL ELEMENTS. USE SAW OR ROTARY DRILL. DO NOT USE PNEUMATIC HAMMER.
G. PATCHING: SEAL OPENINGS, REPAIR, REFINISH, RESTORE DAMAGED ELEMENTS TO ORIGINAL CONDITIONS. COMPLY WITH PROVISIONS OF APPLICABLE DIVISIONS.

3.12 ACCESS PANELS

FURNISH IN ACCORDANCE WITH DIVISION 8 AND WITH FIRE RATING COMPATIBLE WITH CEILING OR PARTITION RATING. FURNISH WHERE INDICATED AND AT LOCATIONS WHERE REQUIRED FOR ACCESS TO CONCEALED VALVES, DAMPERS, CLEANOUTS, CONTROL DEVICES, EQUIPMENT, OTHER ITEMS REQUIRING SERVICE/MAINTENANCE. DELIVER TO GENERAL CONTRACTOR FOR INSTALLATION UNDER OTHER DIVISIONS. PROVIDE INSTRUCTIONS FOR LOCATION.

3.13 ITEMS FURNISHED BY OTHERS

INSTALL IN ACCORDANCE WITH MANUFACTURERS' DIRECTIONS AND AS REQUIRED BY APPLICABLE DIVISION 23 SECTIONS.

END OF SECTION 23 05 00

SECTION 23 07 00 - INSULATION

PART 1 - GENERAL

1.01 WORK INCLUDED

PROVIDE INSULATION AS SHOWN AND SPECIFIED HEREIN.

1.02 QUALITY ASSURANCE

A. FIRE HAZARD CLASSIFICATION: TESTED AS A COMPOSITE IN ACCORDANCE WITH ASTM E84 OR NFPA 255 OR UL723 AND SO LABELED. MAXIMUM FLAME SPREAD = 25, MAXIMUM SMOKE DEVELOPED = 50.
B. ENERGY CONSERVATION: COMPLY WITH INTERNATIONAL ENERGY CONSERVATION CODE, PER THE YEAR THAT APPLIES.
C. PROHIBITED MATERIALS: PRODUCTS OR MATERIALS CONTAINING ASBESTOS ARE EXPRESSLY PROHIBITED.

PART 2 - PRODUCTS

2.01 PIPE INSULATION - MATERIALS

A. ACCEPTABLE MANUFACTURERS: MANVILLE, CINTERT, OWENS-CORNING, AND ARMSTRONG.
B. FIBERGLASS: ASTM C547 TYPE I. MAXIMUM KIRCH = 0.27 AT MEAN TEMPERATURE OF 75 DEGREES F. ALL SERVICE JACKET WITH SELF-SEALING LAPS. PRE-MOLDED FITTING AND VALVE COVERS WITH FIBERGLASS INSERTS.
C. WRAP (SUPPLY IN PLENUM): MINERAL-FIBER BLANKET IN ACCORDANCE WITH ASTM C553, TYPE I, 2" THICK, MIN. R-6. 0.75 LB/FT3 DENSITY WITH K=0.29. FSK FACING.
D. LINER (UNCONDITIONED SPACES): RETURN DUCT ONLY. MINERAL-FIBER DUCT LINER IN ACCORDANCE WITH ASTM C1071, TYPE II, MIN. R-6. 1.5" THICK, 1.5 LB/FT3 DENSITY WITH COATING ON AIR-SIDE SURFACE RATED TO 6,000 FPM.
E. LINER (PLENUM NON-CONTROL): SAME AS ABOVE.
F. EXTERIOR: MINERAL-FIBER BOARD IN ACCORDANCE WITH ASTM C612, TYPE IA, 2" THICK, MIN. R-12 FOR CLIMATE ZONE 5-8. 6 LB/FT3 DENSITY WITH K=0.22. ASJ FACING.
G. EXTERIOR (ALTERNATE): MINERAL-FIBER DUCT LINER IN ACCORDANCE WITH ASTM C1071, TYPE II, MIN. R-12 FOR CLIMATE ZONE 5-8. 2" THICK, K=0.13, 1.5 LB/FT3 DENSITY WITH COATING ON AIR-SIDE SURFACE RATED TO 6,000 FPM.
H. EXPOSED IN CONDITIONED SPACE: R-6 FIBERGLASS LINER PER LETTER D ABOVE.

PART 3 - EXECUTION

3.01 GENERAL

A. APPLY INSULATION AFTER SYSTEMS HAVE BEEN TESTED.
B. COMPLY WITH MANUFACTURER RECOMMENDATIONS REGARDING AMBIENT AND SYSTEM TEMPERATURES AND APPLICATION METHODS.
C. APPLY INSULATION TO CLEAN, DRY SURFACES.
D. APPLY INSULATION WITH SECTIONS OR EDGES FIRMLY BUTTED TOGETHER.
E. RUN INSULATION CONTINUOUS THROUGH SLEEVES AND OPENINGS IN WALLS AND FLOORS.
F. MAINTAIN INTEGRITY OF VAPOR BARRIER ON COLD SYSTEMS. AVOID THE USE OF STAPLES ON VAPOR BARRIER. SEAL ALL VAPOR BARRIER PENETRATIONS.
G. REPAIR INSULATION DAMAGED DUE TO STRAIN OR POOR WORKMANSHIP.
H. LEAVE SURFACE CLEAN AND READY FOR PAINTING.
I. INSULATION WHICH HAS BEEN APPLIED IN AN UNSIGHTLY MANNER WILL BE ORDERED REPLACED.

3.02 PIPE INSULATION - INSTALLATION

A. GENERAL
1. INSULATE PIPE, FITTINGS AND VALVES.
2. DO NOT INSULATE UNIONS, FLANGES, STRAINERS, FLEXIBLE CONNECTIONS, EXPANSION JOINTS. TERMINATE INSULATION NEATLY WITH INSULATION AND FINISHING CEMENT TROWELED ON A BEVEL.
3. INSULATE THROUGH HANGERS AND SUPPORTS. USE HEAVY DENSITY INSERT AND SHEET METAL SHIELD.
4. FOR COLD PIPING, SEAL FITTING/VALVE COVERS AT EACH END AND THROAT.
B. USE
1. INDOORS, ABOVE GROUND: FIBERGLASS WITH LONGITUDINAL SEAMS LOCATED AWAY FROM NORMAL LINES OF SIGHT.
2. OUTDOORS, ABOVE GROUND: FIBERGLASS WITH METAL JACKET SECURED WITH DRAW BANDS 12" ON CENTER AND SEALED WEATHER TIGHT. FOR HORIZONTAL PIPING LOCATE LONGITUDINAL SEAM AND DRAWBAND CLAMP ON UNDERSIDE OF PIPE. FOR GIRTH JOINTS IN VERTICAL PIPING, WRAP UPPER JACKET SECTION AROUND THE LOWER SECTION.
3. INDOORS, BURIED:
a. 2" AND SMALLER: FLEXIBLE CLOSE CELL ELASTOMERIC WITH ALL JOINTS SEALED WATERTIGHT WITH CONTACT ADHESIVE. MITER INSULATION AT FITTINGS.
b. 2-1/2" AND LARGER: MINERAL FIBER INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDE MINERAL FIBER CUSHIONS AT ALL ELBOWS AND TEES TO ALLOW TAKE-UP SPACE FOR THERMAL EXPANSION. INSTALL RISERS AND WALL PENETRATIONS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. OUTDOORS, BURIED: MINERAL POWDER SAME AS FOR INDOORS BURIED.
C. THICKNESS: INSULATE PIPING SYSTEMS IN ACCORDANCE WITH INTERNATIONAL ENERGY CONSERVATION CODE (PER YEAR THAT APPLIES) TABLE C403.13.3(1) UNLESS NOTED OTHERWISE.
3.03 DUCT INSULATION - INSTALLATION
A. LINER: INTERNALLY INSULATE ALL RETURN DUCTWORK WITH DUCT LINER UNLESS INDICATED OTHERWISE. APPLY LINER WITH COATED SURFACE FACING THE AIR STREAM. APPLY LINER WITH 100% ADHESIVE COVERAGE. BUTTER ALL RAW EDGES WITH ADHESIVE. ADHERE TO MANUFACTURER'S RECOMMENDATIONS REGARDING MECHANICAL FASTENERS AND NOSINGS.
B. WRAP: 1-1/2" THICK. ADHERE TO DUCT EXTERIOR PER MANUFACTURER'S RECOMMENDATIONS. SEAL ALL JOINTS AND PUNCTURES TO MAINTAIN INTEGRITY OF VAPOR BARRIER ON COLD AIR DUCTS. APPLY TO ALL SUPPLY AIR AND OUTSIDE AIR DUCT WORK. AT CONTRACTOR'S OPTION, ALL DUCTS MAY BE LINED IN LIEU OF DUCT WRAP.
C. EXPOSED RECTANGULAR DUCT: ALL EXPOSED DUCT WITHIN BUILDING SHALL BE INTERNALLY LINED UNLESS NOTED OTHERWISE.
D. EXPOSED SPIRAL DUCT: SHALL BE UNINSULATED UNLESS OTHERWISE NOTED.

END OF SECTION 23 07 00

SECTION 23 33 00 - AIR DISTRIBUTION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. FURNISH AND INSTALL DUCTWORK AND SHEET METAL ACCESSORIES AS SHOWN AND SPECIFIED HERE-IN.

1.02 QUALITY ASSURANCE

A. COMPLY WITH APPLICABLE NFPA AND SMACNA STANDARDS, ASHRAE HANDBOOK, UL 181, AND INTERNATIONAL MECHANICAL CODE (IMC).
B. ENERGY CONSERVATION: COMPLY WITH INTERNATIONAL ENERGY CONSERVATION CODE (IECC), PER THE YEAR THAT APPLIES.

1.03 SUBMITTALS

A. IN ADDITION TO ALL ITEMS SCHEDULED ON THE DRAWINGS, FURNISH SUBMITTALS ON ALL ITEMS SPECIFIED HERE-IN.

PART 2 - PRODUCTS

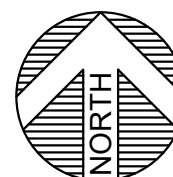
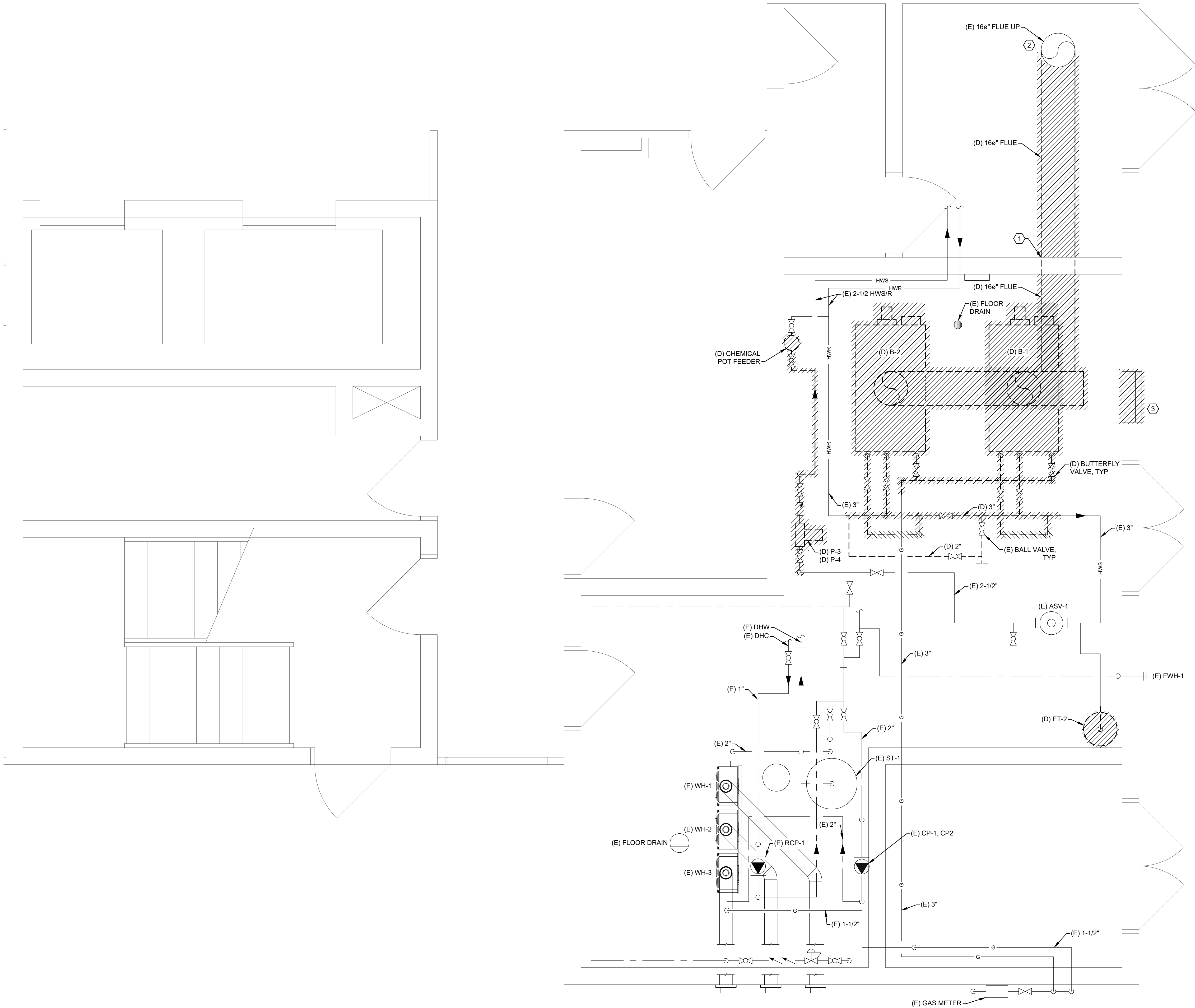
2.01 DUCTWORK MATERIALS

A. GALVANIZED STEEL
1. GAUGE: AS PRESCRIBED BY SMACNA.
2. FLAT SHEETS: ASTM A527.
3. ROUND:
a. FABRICATION FOR CONCEALED: PIPE LOCK LONGITUDINAL SEAMS WITH BEADED CRIMP TRANSVERSE JOINTS SECURED WITH SHEET METAL SCREWS.
b. FABRICATION FOR EXPOSED: SPIRAL PIPE WITH JOINTS SECURED WITH SHEET METAL SCREWS. USE DUCT SEALANT THAT IS NEATLY APPLIED AND MATCHES COLOR OF DUCT.
c. FITTINGS: ADJUSTABLE 4 - SEGMENT ELBOWS, MANUFACTURED CONICAL TEE FITTINGS AND TAPS (SADDLE TAPS NOT PERMITTED), MANUFACTURED REGISTER BOOTS AND STACK HEADS.
B. FLEX DUCT:
1. ACCEPTABLE MANUFACTURERS: FLEXMASTER, THERMAFLEX.
2. CLASSIFICATION: NFPA 90A - CLASS 1, UL 181 LABELED.
3. LOW PRESSURE: FLEXMASTER TYPE 5 - INSULATED WITH MIN R-8 INSULATION. FACTORY FABRICATED ASSEMBLY CONSISTING OF A ZINC-COATED SPRING STEEL HELIX, SEAMLESS INNER LINER WRAPPED WITH A NOMINAL 1" THICK ONE-POUND DENSITY FIBERGLASS INSULATION ALL ASSEMBLED IN A VAPOR BARRIER JACKET. RATED FOR PRESSURES TO +10" WG.
4. SPIN-INS: WITH BALANCING DAMPER AND 2" INSULATION STAND-OFF BRACKET.

2.02 DUCTWORK SPECIALTIES

A. TURNING VANES
B. BALANCING DAMPERS
1. CONSTRUCTION: RIGID BEARINGS AND LOCKING QUADRANTS. WHERE USED IN CONJUNCTION WITH DUCT-MOUNTED COILS, PROVIDE OPPOSED-BLADE TYPE WITH MAX 2" WIDE BLADES.
C. FIRE/SMOKE DAMPERS
1. CONSTRUCTION: CONSTRUCTION AND INSTALLATION SHALL CONFORM TO UL LISTINGS AND MANUFACTURER'S INSTRUCTIONS.
D. ACCESS DOORS
1. HINGED DOOR WITH HOUSING FRAME, SASH-TYPE CLOSURES, DOOR OF TWO GAUGES HEAVIER THAN DUCT, SPONGE RUBBER GASKETS CEMENTED IN PLACE.
E. FLEX CONNECTIONS EQUAL TO VENT/FABRICS VENTGLAS
F. TEST HOLE FOR LOW VELOCITY DUCTWORK: DRILLED HOLE WITH FRICTION-FIT PLASTIC CAP ON METAL DUCT.
H. WATER-BASED DUCT SEALANT TO COMPLY WITH UL 181A OR 181B.

7/7/2026 2:46:50 PM David Easter
p:\projects\2025\25087 minnequa boiler\4.3 auto\4.3.2 mechanical\25087_md11.dwg



MECHANICAL FIRST FLOOR HVAC,GAS & HYDRONIC DEMOLITION PLAN

SCALE: 1/2" = 1'-0"

MECHANICAL DEMOLITION GENERAL NOTES

- A. MECHANICAL EQUIPMENT SHOWN WITH HATCH IS TO BE REMOVED. ANY REMAINING PIPING SHOULD BE CAPPED AT SOURCE.
- B. VERIFY WITH THE OWNER IF ANY DEMOLISHED EQUIPMENT IS TO BE KEPT BY THE OWNER. THE OWNER MAINTAINS THE RIGHT TO RETAIN ANY MECHANICAL EQUIPMENT AND PIPING OR DUCTING REMOVED. THIS EQUIPMENT SHALL BE CAREFULLY REMOVED BY THE CONTRACTOR AND STORED ON THE PROPERTY AT A LOCATION DESIGNATED BY THE OWNER. ALL DEMOLISHED EQUIPMENT NOT KEPT BY THE OWNER SHALL BE LEGALLY DISPOSED OF OFF SITE BY THE CONTRACTOR.
- C. ANY FLOOR, WALL, OR CEILING OPENINGS MADE DUE TO DEMOLITION OF MECHANICAL EQUIPMENT SHALL BE PROPERLY PATCHED AND FINISHED TO MATCH THE ADJACENT SURFACE. BLANK COVERPLATES MAY BE USED IN CONCRETE WALLS.
- D. NOT ALL EXISTING DUCTWORK, PIPING, AND ACCESSORIES ARE NECESSARILY SHOWN ON THESE DRAWINGS, BUT WHAT IS DEEMED NECESSARY TO SHOW INTENT OF WORK INVOLVED IN THIS PROJECT. REFER TO ALL PLANS, SCHEDULES, AND SPECIFICATIONS FOR COMPLETE SYSTEM REQUIREMENTS.
- E. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO DEMO WORK. DEVIATIONS FROM CONDITIONS SHOWN IN THESE PLANS SHALL BE REPORTED TO THE PROJECT MANAGER IMMEDIATELY AND NO WORK SHALL BE PERFORMED IN THIS AREA UNTIL A RESOLUTION HAS BEEN ESTABLISHED. SITE CONDITIONS DIFFERING FROM THOSE SHOWN ON THESE PLANS WILL NOT BE GENERALLY CONSIDERED A BASIS FOR CONTRACT MODIFICATION AS THE CONTRACTOR SHALL TAKE INTO ACCOUNT WORST CASE SITE CONDITIONS WHEREVER POSSIBLE.
- F. DRAWINGS ARE BASED ON RECORD DRAWINGS AND LIMITED FIELD OBSERVATIONS. CONTRACTOR SHALL VERIFY EXISTING SYSTEMS BEFORE COMMENCING WITH WORK.
- G. UNLESS NOTED OTHERWISE, EXISTING MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT SHALL REMAIN AND BE PROTECTED DURING CONSTRUCTION.
- H. REMOVE ALL HANGERS, ALL-THREAD RODS, UNI-STRUT AND OTHER SUPPORTS ASSOCIATED WITH EQUIPMENT INDICATED FOR DEMOLITION.
- I. WIRING FOR CONTROL SYSTEM COMPONENTS SHALL NOT BE ABANDONED IN PLACE. FOR DEMOLISHED EQUIPMENT, REMOVE CONTROL WIRING BACK TO THE CONTROL PANEL AND TERMINATE PROPERLY SUCH THAT REMAINING CONTROL SYSTEM COMPONENTS CONTINUE TO OPERATE.
- J. PATCH, SEAL AND INSULATE DUCT MAINS TO MATCH EXISTING IN LOCATIONS WHERE RUNOUTS ARE REMOVED.

 **HATCH DENOTES DEMOLITION**

KEYED NOTES

- ① EXISTING EXPOSED FLUE TO BE DEMOED. CAP BOTH SIDES OF WALL PENETRATION WITH SHEET METAL AND SEAL EDGE WITH FIRE CAULKING.
- ② FLUE ROUTED UP THROUGH ROOF TO BE ABANDONED IN PLACE. DEMO EXPOSED DUCTWORK IN TRASH ROOM AND CAP AT CEILING. CAP OPENING ABOVE ROOF AND SEAL WATERTIGHT.
- ③ DEMO LOUVERS (HIGH AND LOW) BUT REUSE OPENINGS AND CAP. SEE NEW WORK FOR INFORMATION.



MINNEQUA PARK APARTMENTS
BOILER REPLACEMENT
1400 E. ORMAN AVE., PUEBLO, CO 81004

REVISIONS	MARK	DATE	COMMENT
	Δ	12/12/2025	75% ISSUANCE
	Δ	01/20/2026	100% CD ISSUANCE
	Δ	07/09/2026	ADDENDUM #1

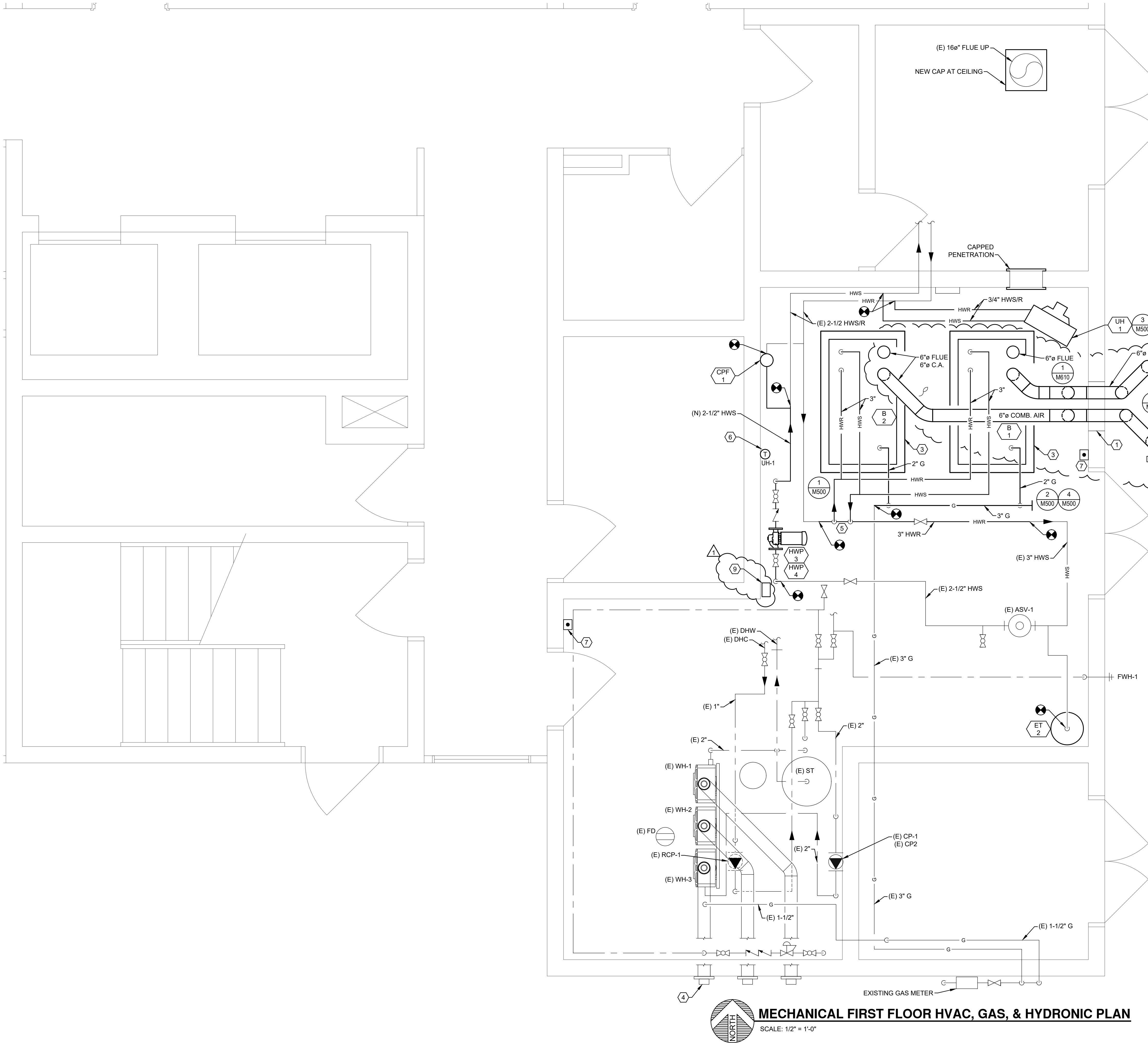
SHEET TITLE
MECHANICAL FIRST FLOOR HVAC,GAS & HYDRONIC DEMOLITION PLAN

© COPYRIGHT 2025. ALL DRAWN & WRITTEN INFORMATION APPEARING HEREIN SHALL NOT BE DUPLICATED, DISCLOSED OR OTHERWISE USED WITHOUT WRITTEN CONSENT OF PLANT ENGINEERING CONSULTANTS.

PROJECT	25087
DATE	07/09/2026
DRAWN	DES
CHECKED	DEE

SHEET
MD111

7/7/2026 2:46:51 PM David Easter
G:\projects\2025\25087 minnequa boiler\4 drawings\4.3 submittal\4.3.2 mechanical\25087_m11.dwg



GENERAL NOTES

- A. EXISTING BOILERS ARE RAYPACK MODEL H1-1125. EXISTING INPUT IS 1125 MBH AND A DERATED OUTPUT OF 742 MBH. NEW PROPOSED BOILERS HAVE A LOWER INPUT WITH A HIGHER OUTPUT, SO GAS LOAD WILL DECREASE.
- B. INSTALL NEW 6" COMBUSTION AIR (2 THUS) THROUGH THE EXISTING LOWER COMBUSTION AIR OPENING AND INSTALL NEW 6" FLUES (2 THUS) THROUGH HIGHER EXISTING COMBUSTION AIR OPENING. ROUTE NEW FLUE SHALL BE AL-29C.

KEYED NOTES

- 1. DEMO EXISTING BIRD SCREEN / LOUVER. THE CURRENT PENETRATION IS ASSUMED TO BE 16" WIDE BY 10" TALL. INSTALL NEW COMBUSTION AIR AND FLUE PIPING THROUGH OPENING. DEMO ADDITIONAL OPENING DIRECTLY BELOW THE EXISTING PENETRATION IF NECESSARY. REMAINING OPENING TO BE CAPPED WITH INSULATED METAL PANEL AND SEAL REMAINING GAPS. PRIME AND PAINT EXTERIOR TO MATCH ADJACENT SURFACES.
- 2. FOLLOW MANUFACTURERS INSTRUCTIONS FOR COMBUSTION AIR AND VENT TERMINATION REQUIREMENTS. SIZE COMBUSTION AIR COMMON DUCT ACCORDING TO MANUFACTURERS INSTRUCTIONS. RIELLO REQUIRES 12" MINIMUM SEPARATION DISTANCE FROM EACH CA INTAKE (CENTERLINE TO CENTERLINE).
- 3. INSTALL NEW 6" HOUSEKEEPING PAD.
- 4. EXISTING DOMESTIC WATER HEATERS ARE SEPARATED COMBUSTION. COMBUSTION AIR AND FLUE ARE DIRECT VENTED TO EXTERIOR OF BUILDING.
- 5. CLOSELY SPACES TEE.
- 6. ROUTE THERMOSTAT WIRING IN CONDUIT, COORDINATE WITH ELECTRICAL CONTRACTOR.
- 7. EMERGENCY POWER OFF FOR BOILERS. EACH EPO SHALL TURN OFF BOTH BOILERS. COORDINATE WITH ELECTRICAL PLANS FOR FINAL LOCATION AND ELECTRICAL CONTRACTOR FOR INSTALLATION.
- 8. INSTALL METAL POST TO PROTECT COMBUSTION AIR FROM DOOR SWING. COORDINATE WITH OWNER.
- 9. INSTALL PUMP SEQUENCER. SEE PUMP SCHEDULE FOR DETAILS.

PLANT
ENGINEERING CONSULTANTS
320 WEST FILLMORE STREET
COLORADO SPRINGS CO 80907
719.473.7077
www.planted.com

MINNEQUA PARK APARTMENTS
BOILER REPLACEMENT
1400 E. ORMAN AVE, PUEBLO, CO 81004

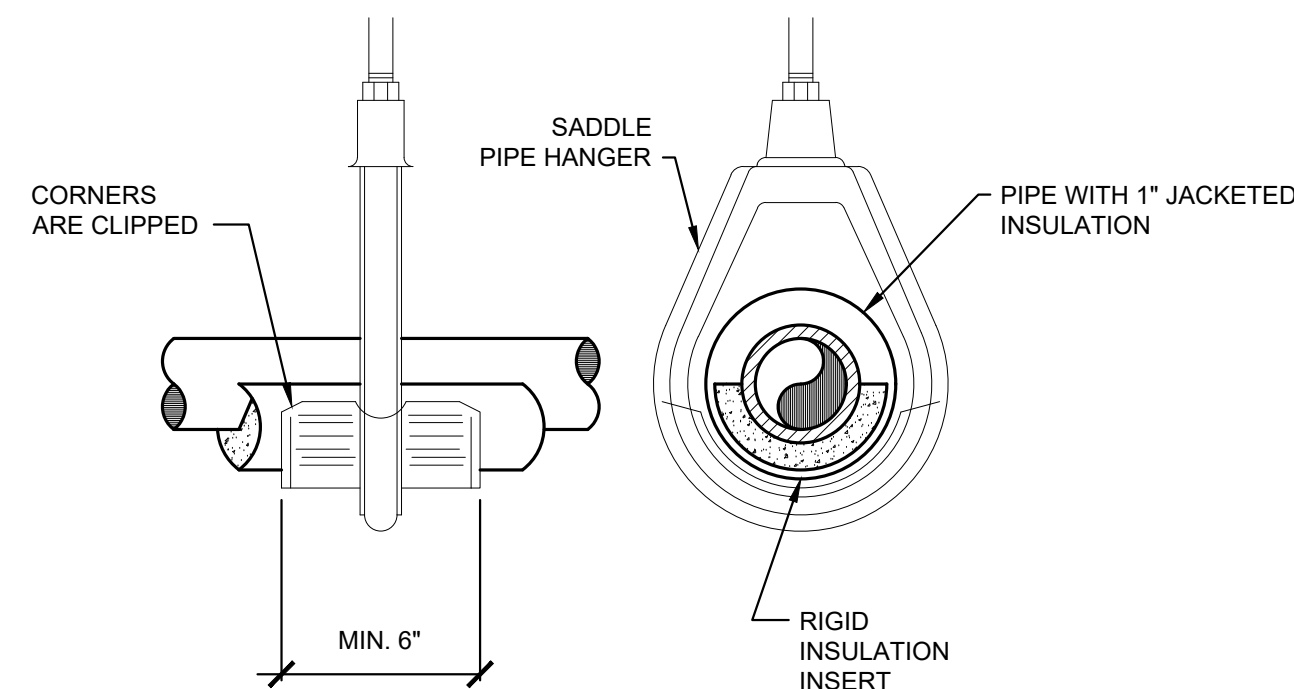
REVISIONS		SHEET TITLE	
MARK	DATE	COMMENT	
Δ	12/12/2025	75% ISSUANCE	
Δ	01/20/2026	100% CD ISSUANCE	
Δ	07/09/2026	ADDENDUM #1	

© COPYRIGHT 2025. ALL DRAWN & WRITTEN INFORMATION APPEARING HEREIN SHALL NOT BE DUPLICATED, DISCLOSED OR OTHERWISE USED WITHOUT WRITTEN CONSENT OF PLANT ENGINEERING CONSULTANTS.

PROJECT	25087
DATE	07/09/2026
DRAWN	DES
CHECKED	DEE

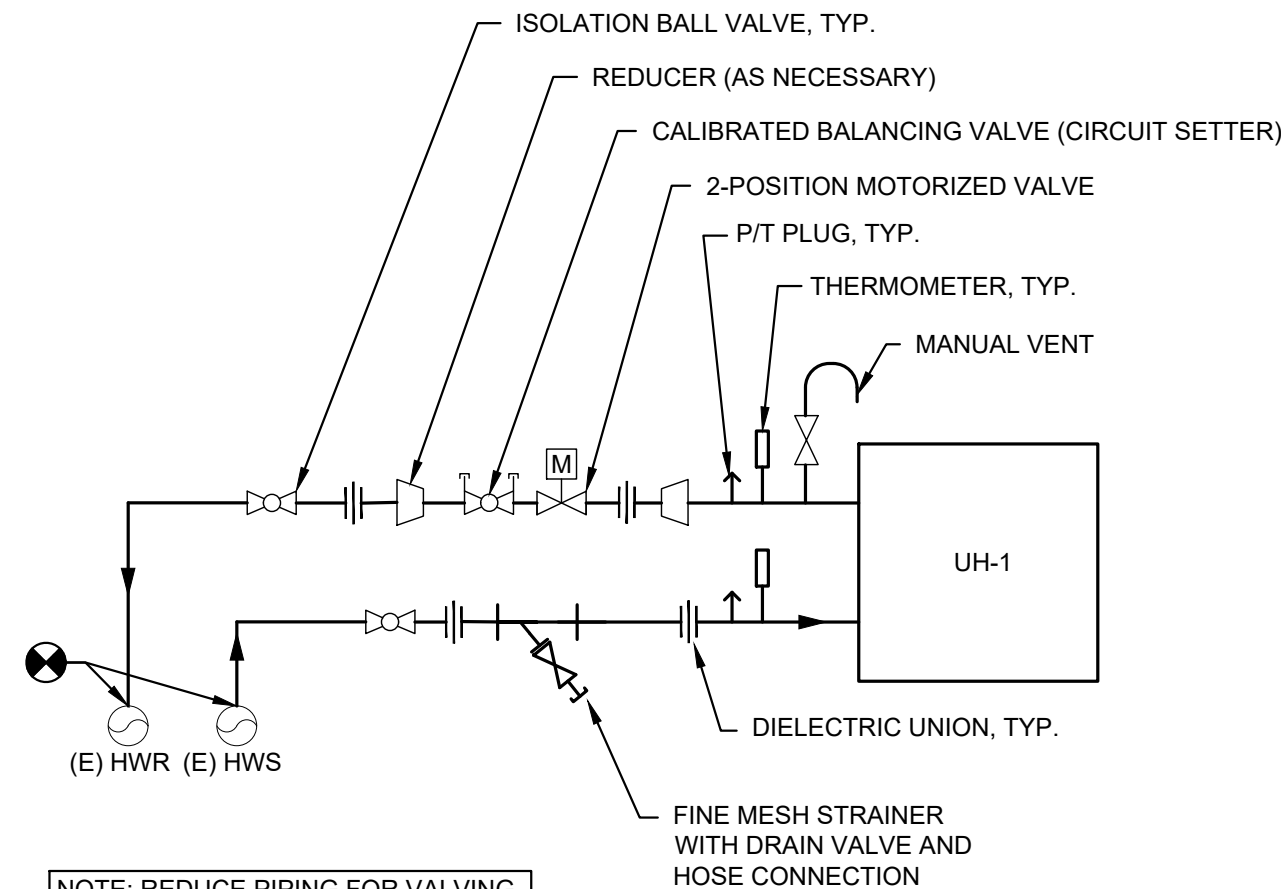
SHEET

M111



4 PIPE HANGER DETAIL

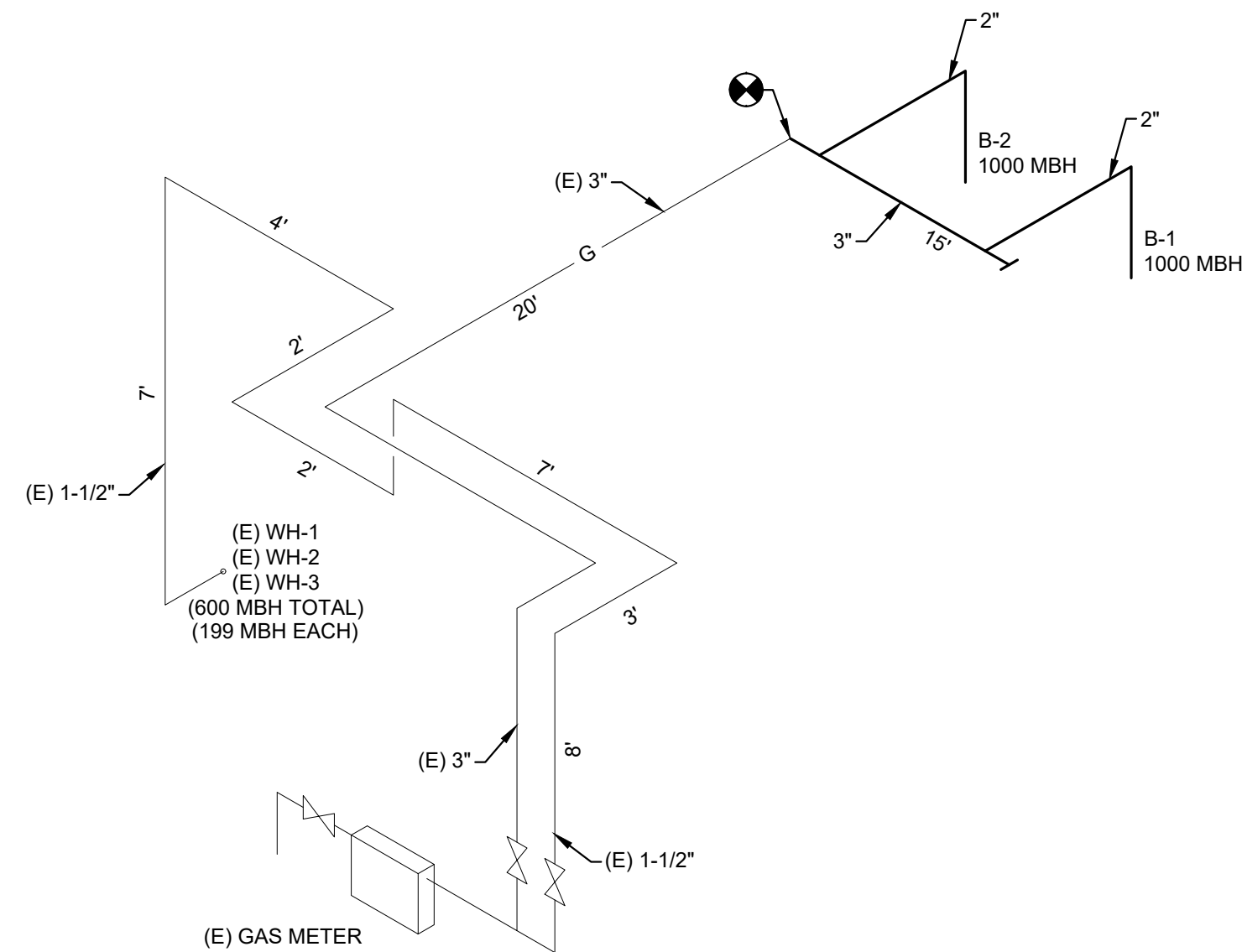
NOT TO SCALE



NOTE: REDUCE PIPING FOR VALVING WITHIN 5 FT OF UNIT HEATER (BOTH SUPPLY AND RETURN)

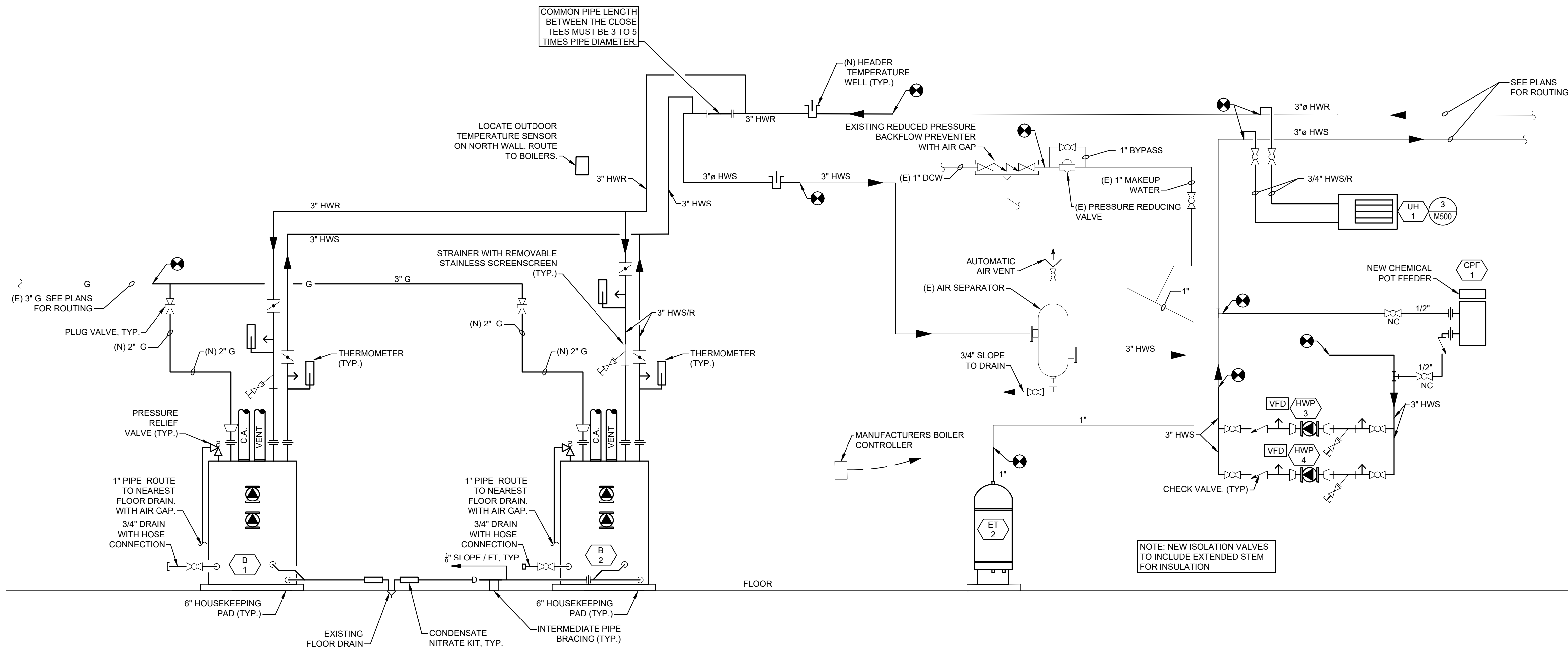
3 UNIT HEATER PIPING DIAGRAM

NOT TO SCALE



2 GAS PIPING ISOMETRIC

NOT TO SCALE



1 MECHANICAL ROOM PIPING

NOT TO SCALE

REVISIONS	MARK	DATE	COMMENT
1	A	12/12/2025	75% ISSUANCE
2	B	01/20/2026	100% CD ISSUANCE
3	C	07/09/2026	ADDENDUM #1

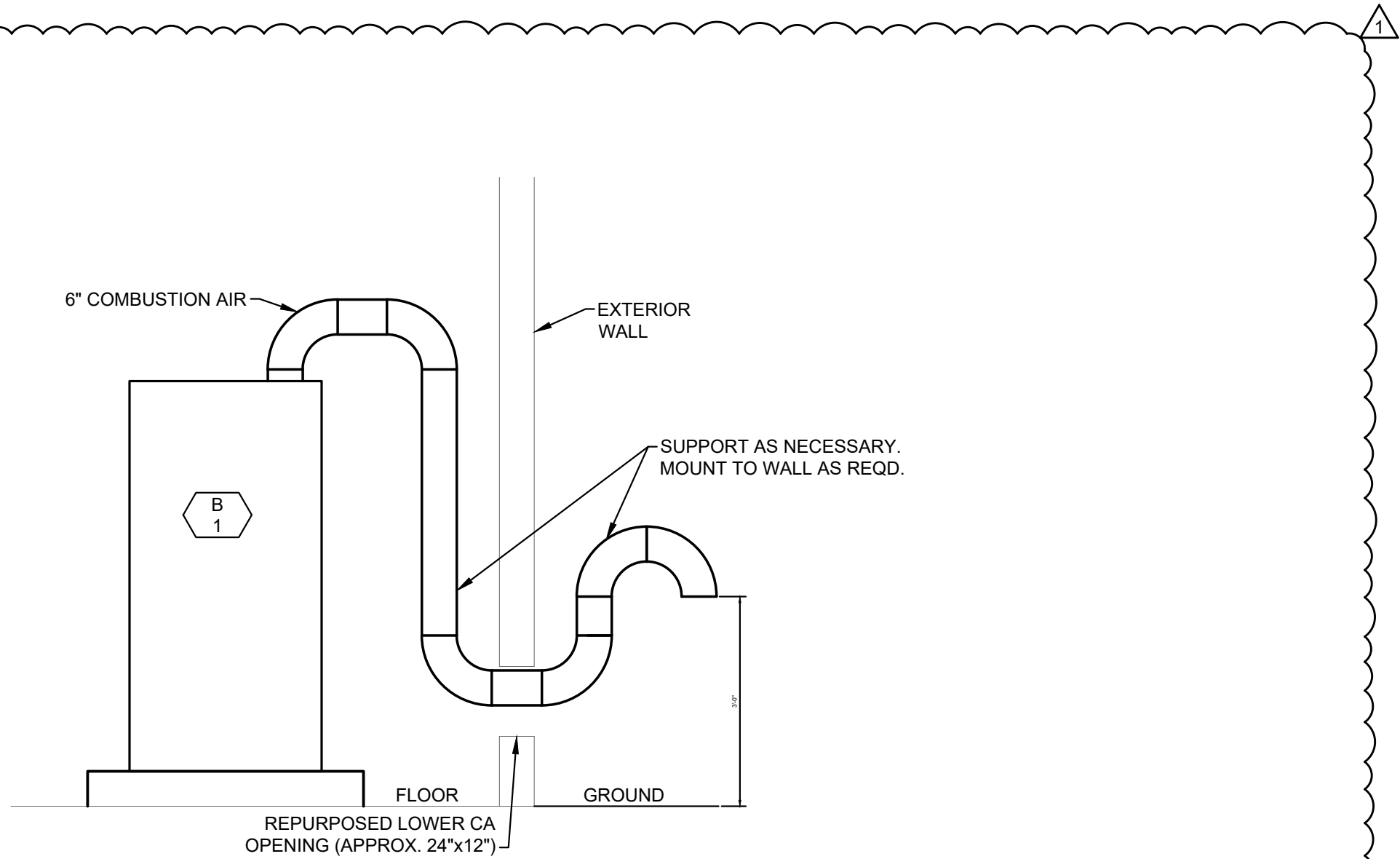
SHEET TITLE
MECHANICAL DETAILS

© COPYRIGHT 2025 ALL DRAWN & WRITTEN INFORMATION APPEARING HEREIN SHALL NOT BE DUPLICATED, DISCLOSED OR OTHERWISE USED WITHOUT WRITTEN CONSENT OF PLANT ENGINEERING CONSULTANTS.

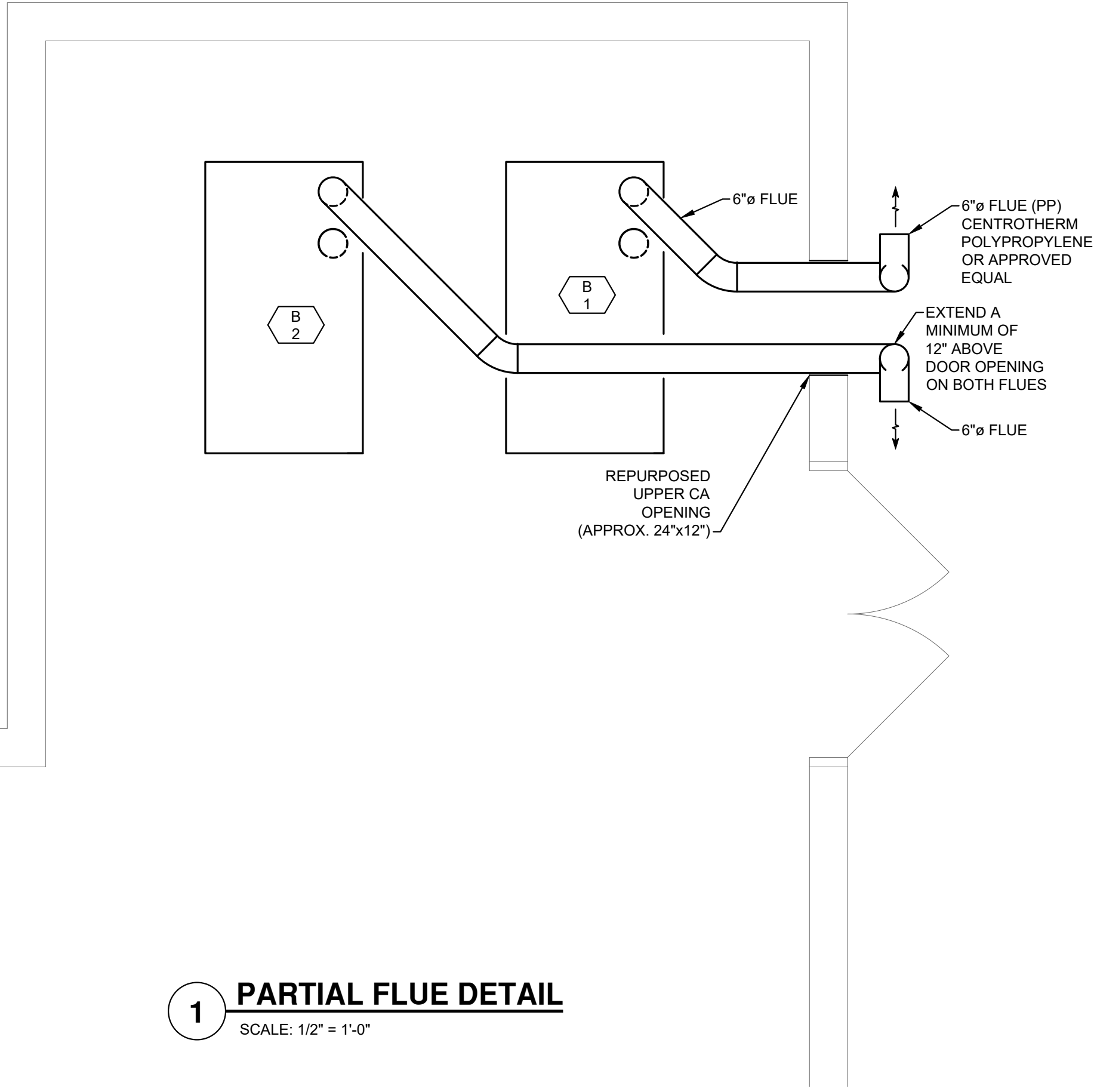
PROJECT	25087
DATE	07/09/2026
DRAWN	DES
CHECKED	DEE

SHEET

7/7/2026 2:46:54 PM David Easter
C:\projects\2025\25087 minnequa boiler\c drawings\4.3 submittal\4.3.2 mechanical\25087_m610.dwg



2 COMBUSTION AIR ELEVATION DETAIL
SCALE: N.T.S.



1 PARTIAL FLUE DETAIL
SCALE: 1/2" = 1'-0"

PUMP SCHEDULE

MARK	MAKE	MODEL	TYPE	SERVICE	FLOW (GPM)	HEAD (FT)	BHP (A) / HP	MOTOR RPM	VOLT / PHASE	CONNECTION SIZE (IN.)	TYPE	NOTES
HWP-3	B&G	e-90	2AB	HW SECONDARY	86	40	1.22 / 2	1,800	208 V / 3ø	2"	INLINE	(1)(2)(3)
HWP-4	B&G	e-90	2AB	HW SECONDARY	86	40	1.22 / 2	1,800	208 V / 3ø	2"	INLINE	(1)(2)(3)

NOTES:

- PROVIDE VFD. VFD SHALL BE BELL & GOSSETT TECHNOLOGIC INTELLIGENT PUMP CONTROLLER, STANDARD DRIVE, 208V/3-PHASE MAINS DRIVE, A2, IP20, OR EQUIVALENT.
- MECHANICAL CONTROLS CONTRACTOR SHALL PROVIDE AND INSTALL A BOILER EMERGENCY SHUT OFF SYSTEM WITH AN EMERGENCY POWER OFF (EPO) SWITCH LOCATED AS SHOWN
- ADD PUMP SEQUANCER TO ROTATE LEAD PUMP EVERY WEEK (ADJUSTABLE) BASED ON TEKMAR 132 OR APPROVED EQUAL. SIZE APPROXIMATELY (LxWxH) 8" x 3" x 7". COORDINATE WITH OWNER.

CHEMICAL POT FEEDER

TAG	MAKE	VOLUME (GALLONS)	DIMENSIONS	CONNECTION SIZE
CPF-1	GENERAL FILTRATION	2	20"H x 6.25"W	3/4"

NOTES:

- 12.75" BETWEEN CONNECTIONS

BOILER SCHEDULE

TYPE: HOT WATER CONDENSING FIRE-TUBE (NATURAL GAS)		
GENERAL:		
MARK	B-1	B-2
MAKE:	RIELLO ARRAY	RIELLO ARRAY
MODEL	AR - 1000	AR - 1000
INPUT (MBH) [MIN. - MAX.]	100 - 1,000	100 - 1,000
MODULES MBH/MODULE	2 AT 500 MBH EACH	2 AT 500 MBH EACH
PRIMARY PUMPS	2 PUMPS	2 PUMPS
EFFICIENCY RANGE	87% - 96%	87% - 96%
MAX. OUTPUT (MBH) AT SEA LEVEL	961	961
MAX. OUTPUT (MBH) AT SITE ELEVATION	765.6	765.6
FLOW:		
GPM (MAX POWER AT 20 DEG DELTA T)	80	80
MAX. OPERATING TEMPERATURE	194°F	194°F
MAX. HEAT EXCHANGER (HE) ALLOWABLE TEMP.	210°F	210°F
HEX SURFACE AREA(sq. ft)	86	86
HEX WATER VOLUME (GAL)	12	12
WATER CONN. SIZES (IN.):	3"	3"
EWT @ DESIGN (°F)	160°F	160°F
LWT @ DESIGN (°F)	180°F	180°F
TURN DOWN	10:1	10:1
PRESSURE RELIEF DRAIN CONNECTION	2-1/2"	2-1/2"
CONDENSATE CONNECTION SIZE	1"	1"
MAX. WORKING PRESSURE (PSIG):		
	80	80
NATURAL-GAS:		
GAS CONN (IN.)	1-1/2" NPT	1-1/2" NPT
COMBUSTION AIR (IN.)	6"	6"
FLUE VENT SIZE (IN.)	6"	6"
GAS PRESSURE (MIN-MAX)	4" - 20"	4" - 20"
STANDARD LISTINGS & APPROVAL	UL, CSD-1, ASME SECT. IV	UL, CSD-1, ASME SECT. IV
ELECTRICAL		
VOLTS / PHASE	120 V / 1ø	120 V / 1ø
FLA	15.5 FLA	15.5 FLA
NOTES:		
	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)

NOTES:

- PROVIDE POLYPROPYLENE (FLUE), COMBUSTION AIR INTAKE SHALL BE PVC OR APPROVED EQUAL.
- UNIT DIMENSIONS - 61" x 33" x 67" (LxWxH). NET WEIGHT (DRY) = 1,058 LBS.
- OPTIONS - FLOW SWITCH, MANUAL RESET HIGH LIMIT.
- ALTITUDE IS 4,800 FT ABOVE SEA LEVEL.
- PROVIDE WITH CONDENSATE NEUTRALIZER KIT. PROVIDE EXTRA REFILL FOR EACH KIT.
- PROVIDE WITH FACTORY CONTROL SYSTEM WITH MODBUS INTERFACE AND MODBUS TOUCHSCREEN DISPLAY.
- FULLY REDUNDANT HEAT EXCHANGERS, CONTINUOUS OPERATION IF ANY OTHER MODULE IS TURNED OFF OR REMOVED.
- SINGLE POINT CONNECTIONS, INDIVIDUAL PUMPS, GAS VALVES, ISOLATION VALVES FOR EACH HEAT EXCHANGER WITHIN BOILER.
- COUNTERFLOW 4-PASS HEAT EXCHANGER
- ADD OA SENSOR ON THE NORTH SIDE OF THE BUILDING TO RAMP HWS TEMPS FROM 120°F TO 180°F. COORDINATE LOCATION WITH OWNER.

EXPANSION TANK SCHEDULE

MARK	MANUFACTURER	MODEL	DIMENSIONS		VOLUME (GAL.)	WEIGHT (lbs)	NOTES
			INLET SIZE (in.)	HEIGHT (in.)			
ET-2	AMTROL	AX-60V	1/2"	45	33.6	104	(1)(2)(3)

NOTES:

- ASME RATED, VERTICAL TANK WITH FLOOR RING
- HEAVY DUTY BUTYL
- MAX. WORKING PRESSURE 150 PSIG, MAX OPERATING TEMP 240 °F.

UNIT HEATER (HYDRONIC)

MARK	MAKE	MODEL	AIRFLOW		TOTAL MBH	GPM	WPD (FT)	ROWS	FINS / FT	ELECTRICAL			NOTES
			CFM	AIR SP DROP						VOLT / PHASE	MCA/MOP	FLA	
UH-1	REZNOR	UWS 22/31	636	0.05	31.0	2.9	3.3	3	144	120/1	2.09/15	1.67	(1)(2)(3)(4)(5)(6)

NOTES:

- PROVIDE WITH 24V 2 POSITION VALVE. PROVIDE WITH SPRING RETURN TO FAIL OPEN.
- PROVIDE WITH THERMOSTAT. SET AT 55°F (ADJ.).
- DIMENSIONS 24"x16.5"x17" (LxWxH). 43 LBS
- BASED ON 20 DEGREE TEMP. DIFFERENCE (DELTA T).
- UNIT TO BE HUNG FROM CEILING. FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS.
- ON/OFF SWITCH PROVIDED BY MANUFACTURER INSTALLED IN A READILY ACESABLE LOCATION.

SEAL



REVISIONS		DATE	COMMENT
MARK	DATE	12/12/2025	75% ISSUANCE
Δ	01/30/2026	100% CD ISSUANCE	
Δ	07/09/2026	ADDENDUM #1	

SHEET TITLE

MECHANICAL SCHEDULES

© COPYRIGHT 2025. ALL DRAWN & WRITTEN INFORMATION APPEARING HEREIN SHALL NOT BE DUPLICATED, DISCLOSED OR OTHERWISE USED WITHOUT WRITTEN CONSENT OF PLANT ENGINEERING CONSULTANTS.

PROJECT	25087
DATE	07/09/2026
DRAWN	DES
CHECKED	DEE

SHEET

7/7/2026 2:46:56 PM David Easter
C:\projects\2025\25087 minnequa boiler.v drawing\4.3 electrical\25087_e001.dwg

ELECTRICAL SYMBOL LEGEND				NOTE: ALL SYMBOLS REPRESENTED BELOW BUT SHOWN ON PLANS IN A LIGHT LINE WEIGHT DENOTE EXISTING DEVICE	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
ANNOTATION			ELECTRICAL DISTRIBUTION EQUIPMENT	MECHANICAL EQUIPMENT & CONTROLS	
	POINT OF CONNECTION (POC)		EXISTING BRANCH CIRCUIT PANELBOARD		MOTOR
	EQUIPMENT TAG (SEE SCHEDULE)		NEW BRANCH CIRCUIT PANELBOARD		DISCONNECT SWITCH OR SAFETY SWITCH
	ELEVATION BUBBLE		MOTOR CONTROL CENTER		MOTOR STARTER
	DETAIL CALLOUT		MAIN DISTRIBUTION PANEL		WALL HEATER
	SECTION BUBBLE		TRANSFORMER		MOTOR AND DISCONNECT SWITCH
	COLUMN GRID BUBBLE		CONTACTOR		MOTOR, STARTER AND DISCONNECT SWITCH
CIRCUITING FOR POWER & LIGHTING			ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE) INCLUDING ELECTRIC VEHICLE CHARGING STATION, PLAN VIEW		SMOKE DAMPER OR COMBINATION FIRE / SMOKE DAMPER
					MOTOR SNAP SWITCH WITH THERMAL OVERLOAD
WIRING AND CONDUIT			POWER RECEPTACLES		
	CONCEALED BRANCH CIRCUIT WIRING. SHORT HATCHES DENOTE HOT OR SWITCH LEG CONDUCTORS. LONG HATCH INDICATES NEUTRAL CONDUCTOR. LONG HATCH WITH SINGLE BARB INDICATES EQUIPMENT GROUNDING CONDUCTOR. NO HATCHES INDICATES ONE HOT, ONE NEUTRAL AND ONE GROUNDING CONDUCTOR		FLUSH MOUNTED SIMPLEX RECEPTACLE		THERMAL OVERLOAD PILOT LIGHT SWITCH
	UNDERGROUND RACEWAY		FLUSH MOUNTED DUPLEX RECEPTACLE		HORSE POWER RATED MOTOR SNAP SWITCH WITHOUT THERMAL OVERLOAD PROTECTION.
	CONDUIT DOWN		FLUSH MOUNTED DOUBLE DUPLEX RECEPTACLE		MULTI-SIGNALING ACCESSORY FOR DUCT DETECTOR ALARM AND TROUBLE SIGNAL
	CONDUIT UP		FLUSH CEILING MOUNTED DUPLEX RECEPTACLE		PUSHBUTTON
	CONTINUATION		FLUSH FLOOR OR COUNTER MOUNTED DUPLEX RECEPTACLE		2-WAY START AND STOP PUSHBUTTON
	END CAP		FLUSH FLOOR OR COUNTER MOUNTED DOUBLE DUPLEX RECEPTACLE		"OPEN-CLOSE-STOP" PUSH-BUTTON, FURNISHED WITH POWER OPERATED DOOR, INSTALLED BY CONTRACTOR, +42" AFF.
	CONNECTION (DOT)		FLUSH MOUNTED IN CASEWORK		
	FLUSH MOUNTED JUNCTION BOX		CONNECTED TO DEDICATED CIRCUIT		
	FLUSH CEILING MOUNTED JUNCTION BOX		FLUSH MOUNTED, WEATHERPROOF, GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLE		
	FLUSH FLOOR OR COUNTER MOUNTED JUNCTION BOX		FLUSH DUPLEX RECEPTACLE HORIZONTALLY MOUNTED ABOVE COUNTER BACKSPASH		
	GROUND BAR, SUBSCRIPT "T" DENOTES TELECOMM GROUND BAR		FLUSH DUPLEX RECEPTACLE WITH USB PORTS, ONE USB TYPE A PORT AND ONE USB TYPE C PORT		
DIAGRAMS				DEMOLITION	
	FUSED SWITCH, AMPERE SWITCH (AS) AND AMPERE FUSE (AF) RATING AS INDICATED		FLUSH MOUNTED GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLE		CEILING MOUNTED LIGHTING FIXTURE. SUBSCRIPT "R" DENOTES FIXTURE SHALL BE RELOCATED, SEE LIGHTING PLAN
	CIRCUIT BREAKER, 3 POLE (U.N.O.), AMPERE FRAME (AF) AND AMPERE TRIP (AT) RATING AS INDICATED		FLUSH MOUNTED, BLANK FACE, GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE		WALL MOUNTED LIGHTING FIXTURE. SUBSCRIPT "R" DENOTES FIXTURE SHALL BE RELOCATED, SEE LIGHTING PLAN
	GROUNDING ELECTRODE		HALF-CONTROLLED DUPLEX RECEPTACLE		2'x4' TROFFER LIGHTING FIXTURE. SUBSCRIPT "R" DENOTES FIXTURE SHALL BE RELOCATED, SEE LIGHTING PLAN
	GROUNDING TO WATER ENTRANCE		FULLY-CONTROLLED DUPLEX RECEPTACLE		1'x4' SURFACE MOUNTED LIGHTING FIXTURE. SUBSCRIPT "R" DENOTES FIXTURE SHALL BE RELOCATED, SEE LIGHTING PLAN
	MEDIUM VOLTAGE DRAW-OUT CIRCUIT BREAKER		DOUBLE DUPLEX WITH (1) FULLY-CONTROLLED DUPLEX AND (1) UNCONTROLLED DUPLEX RECEPTACLES		2'x2' TROFFER LIGHTING FIXTURE. SUBSCRIPT "R" DENOTES FIXTURE SHALL BE RELOCATED, SEE LIGHTING PLAN
	LOW VOLTAGE DRAW-OUT CIRCUIT BREAKER		DOUBLE DUPLEX WITH (2) FULLY-CONTROLLED DUPLEX RECEPTACLES		TELEPHONE OUTLET. SUBSCRIPT "R" DENOTES OUTLET SHALL BE RELOCATED, SEE SIGNAL PLAN
	MEDIUM VOLTAGE SWITCH		DOUBLE DUPLEX WITH (1) FULLY-CONTROLLED GFCI DUPLEX AND (1) UNCONTROLLED GFCI DUPLEX RECEPTACLES		DATA OUTLET. SUBSCRIPT "R" DENOTES OUTLET SHALL BE RELOCATED, SEE SIGNAL PLAN
	LOW VOLTAGE SWITCH		FLUSH MOUNTED SWITCHED DUPLEX RECEPTACLE		VOICE / DATA OUTLET. SUBSCRIPT "R" DENOTES OUTLET SHALL BE RELOCATED, SEE SIGNAL PLAN
	MEDIUM VOLTAGE FUSE		FLUSH MOUNTED ISOLATED GROUND DUPLEX RECEPTACLE, ORANGE		RECEPTACLE FOR POWER. SUBSCRIPT "R" DENOTES RECEPTACLE SHALL BE RELOCATED, SEE POWER PLAN
	LOW VOLTAGE FUSE		FLUSH MOUNTED SPECIAL EQUIPMENT RECEPTACLE		WALL OR CEILING MOUNTED EXIT LIGHT. SUBSCRIPT "R" DENOTES LIGHT SHALL BE RELOCATED, SEE LIGHTING PLAN
	REACTOR		FLUSH CEILING MOUNTED SPECIAL EQUIPMENT RECEPTACLE		WALL SWITCH. SUBSCRIPT "R" DENOTES SWITCH SHALL BE RELOCATED SEE LIGHTING PLAN
	TRANSFORMER		FLUSH FLOOR OR COUNTER MOUNTED SPECIAL EQUIPMENT RECEPTACLE		JUNCTION BOX. SUBSCRIPT "R" DENOTES JUNCTION BOX SHALL BE RELOCATED, SEE PLANS
	CURRENT TRANSFORMER		208V RECEPTACLE		ELECTRICAL PANELBOARD. SUBSCRIPT "R" DENOTES PANEL SHALL BE RELOCATED SEE PLANS
	POTENTIAL TRANSFORMER		ELECTRICAL POWER POLE OR COMBINATION POWER/TELECOM POLE		MOTOR. SUBSCRIPT "R" DENOTES FIXTURE SHALL BE RELOCATED, SEE PLANS
	INVERTER/RECTIFIER				DISCONNECT OR SAFETY SWITCH. SUBSCRIPT "R" DENOTES FIXTURE SHALL BE RELOCATED, SEE PLANS
	BATTERY STRING				
	UPS STATIC SWITCH				
	AUTOMATIC TRANSFER SWITCH				
	AUTOMATIC TRANSFER SWITCH (DRAW OUT) WITH A BY-PASS ISOLATION SWITCH				
	LIGHTNING ARRESTOR				
	CAPACITOR				
	METER				
	DIGITAL POWER METER				
	SURGE PROTECTION DEVICE				
	GROUND FAULT PROTECTOR				
	ARC-ENERGY REDUCTION DEVICE				
	ELECTRIC VEHICLE SUPPLY EQUIPMENT				

PROJECT GENERAL NOTES

A. NOTICE TO CONTRACTOR: ALL COSTS AND FEES (REDESIGN COSTS) FOR MAKING MODIFICATIONS, E.G. ARCHITECTURAL, CIVIL, STRUCTURAL, ELECTRICAL, ETC., TO THE CONTRACT DOCUMENTS, AS WELL AS ALL COSTS PERTAINING TO CONSTRUCTION OF THE WORK, MADE NECESSARY BY SELECTION/PROVISION PRODUCTS OTHER THAN THE BASIS-OF-DESIGN PRODUCTS, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND NO INCREASE IN THE CONSTRUCTION CONTRACT AMOUNT WILL BE MADE ON ACCOUNT THEREOF. CONTRACTOR SHALL REIMBURSE OWNER FOR SAID REDESIGN COSTS VIA DEDUCTIVE CHANGE ORDER.

B. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL WORK WITH THE MECHANICAL, PLUMBING, STRUCTURAL, AND ARCHITECTURAL PLANS AND/OR CONTRACTORS PRIOR TO AND DURING CONSTRUCTION. COORDINATE WITH THE ARCHITECT, OWNER, AND GC ON ALL CONSTRUCTION PHASING REQUIREMENTS PRIOR TO STARTING DEMOLITION AND/OR NEW WORK.

C. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE EXACT LOCATION, POWER REQUIREMENTS, AND CONNECTION DETAILS OF ALL FURNITURE, EQUIPMENT, AND ASSOCIATED COMPONENTS WITH THE OWNER PRIOR TO ROUGH-IN.

D. ALL WORK SHALL COMPLY WITH THE ADOPTED VERSIONS OF THE NATIONAL ELECTRICAL CODE (NEC), NFPA-70, AND THE INTERNATIONAL CODES.

E. CONTRACTOR TO INFORM ARCHITECT AND ENGINEER IF THE EXISTING ELECTRICAL INSTALLATION, EQUIPMENT, AND/OR MATERIALS SHOWN TO BE RE-USED OR RE-PURPOSED DO NOT MEET THE REQUIREMENTS OF CURRENT ADOPTED CODES AND THE CONTRACT DOCUMENTS.

F. ALL NEW WORK SHALL BE CONCEALED AS MUCH AS POSSIBLE. ALL WIRING IN OPEN-TO-STRUCTURE AREAS SHALL BE ROUTED IN CONDUIT.

G. PROVIDE ACCURATE TYPEWRITTEN PANEL DIRECTORIES FOR ALL PANELS IN THE PROJECT.

H. PROTECTION OF CONDUIT PENETRATIONS:

- CONTRACTOR SHALL PROVIDE A UL LISTED, FIRE RATING ASSEMBLY FOR EACH PENETRATION OF A FIRE RATED WALL AND WHERE ANY OTHER FIRE RATED PENETRATIONS ARE CALLED FOR.
- BOTH THROUGH-FLOOR AND THROUGH-WALL PENETRATIONS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AND DETAILS WHICH HAVE BEEN TESTED AND CERTIFIED, AS WELL AS ANY LISTING INVOKED TO MAINTAIN THE WALL RATING.
- FIRESTOP PRODUCTS AND MATERIALS CANNOT BE MIXED AND/ OR COMBINED TOGETHER WITHOUT BEING TESTED AND CERTIFIED.
- SUBMIT FIRE-RESISTANCE-RATED ASSEMBLY OR FIRESTOP SYSTEM AS A DEFERRED SUBMITTAL TO THE AUTHORITY HAVING JURISDICTION (AHJ).
- COORDINATE WITH ARCHITECTURAL PLANS TO DETERMINE FIRE RATINGS OF WALLS, FLOORS, CEILINGS, ETC. IF NO ARCHITECTURAL PLANS, COORDINATE WITH EXISTING FIRE RATINGS FOR NEW PENETRATIONS THROUGH EXISTING WALLS, FLOORS, CEILINGS ETC. COORDINATE WITH FIELD MARKINGS AND/ OR EXISTING RECORD DRAWINGS.

GENERAL DEMOLITION NOTES

A. THE ELECTRICAL CONTRACTOR SHALL PERFORM A PRE-BID SITE WALK TO VERIFY EXISTING CONDITIONS.

B. NOT ALL EXISTING CONDITIONS ARE SHOWN FOR CLARITY. EQUIPMENT SHOWN HALFTONE AND/OR DESIGNATED WITH (E) IS EXISTING TO REMAIN. ELECTRICAL EQUIPMENT SHOWN BOLD IN DASHED LINE AND/OR DESIGNATED WITH (D) SHALL BE REMOVED. ELECTRICAL EQUIPMENT SHOWN IN BOLD IN DASHED LINE AND DESIGNATED WITH (R) INDICATES EQUIPMENT TO BE RELOCATED.

C. DEMOLITION PLANS ARE BASED ON CASUAL FIELD OBSERVATIONS AND PREVIOUS DESIGN AND RECORD DRAWINGS. VERIFY FIELD MEASUREMENTS AND CIRCUITING ARRANGEMENTS ARE AS SHOWN ON DRAWINGS. REPORT DISCREPANCIES TO OWNER BEFORE DISTURBING EXISTING INSTALLATION. BEGINNING OF DEMOLITION MEANS INSTALLER ACCEPTS EXISTING CONDITIONS.

D. THE ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING WHERE REQUIRED AND/OR WHERE DIRECTED.

E. FOR ALL BUILDING WALLS AND CHASES SCHEDULED FOR DEMOLITION, REMOVE ALL ASSOCIATED ELECTRICAL DEVICES AND WIRING.

F. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL DEMOLITION WORK WITH THE MECHANICAL, PLUMBING, STRUCTURAL, AND ARCHITECTURAL DEMOLITION PLANS AND/OR CONTRACTORS PRIOR TO AND DURING DEMOLITION.

G. REMOVE ALL ASSOCIATED ELECTRICAL SYSTEMS FOR EQUIPMENT NOTED TO BE REMOVED ON OTHER TRADES' DEMOLITION PLANS.

H. REMOVE ALL INDICATED EQUIPMENT AND ASSOCIATED CIRCUITS BACK TO SOURCE OR TO NEAREST DEVICE ON THE SAME CIRCUIT TO REMAIN. EXTEND CIRCUITING AS REQUIRED TO MAINTAIN CONTINUITY TO DOWNSTREAM DEVICES TO REMAIN. PROVIDE, RELOCATE, OR EXTEND CONDUCTORS AND RACEWAY AS NECESSARY TO MAINTAIN CONTINUITY FOR ALL ELECTRICAL SYSTEMS SERVING FACILITY AREAS OUTSIDE OF THE PROJECT AREA. DO NOT INTERRUPT OPERATIONS OUTSIDE OF THE PROJECT AREA.

I. VERIFY WITH THE OWNER IF ANY DEMOLISHED ELECTRICAL EQUIPMENT IS TO BE KEPT BY THE OWNER. THE OWNER MAINTAINS THE RIGHT TO RETAIN ANY ELECTRICAL EQUIPMENT AND CONDUCTORS REMOVED. THIS EQUIPMENT SHALL BE CAREFULLY REMOVED BY THE CONTRACTOR AND STORED ON THE PROPERTY AT A LOCATION DESIGNATED BY THE OWNER. ALL DEMOLISHED EQUIPMENT NOT KEPT BY THE OWNER SHALL BE LEGALLY DISPOSED OF OFF SITE BY THE CONTRACTOR.

J. ALL UNUSED RACEWAYS, JUNCTION BOXES, PULL BOXES, ETC. SHALL BE DEMOLISHED. IT IS PERMISSIBLE TO ABANDONED RACEWAYS, BOXES, ETC IN PLACE ONLY IF THEY ARE CONCEALED IN EXISTING INACCESSIBLE WALLS OR CEILINGS. REMOVE ANY EXISTING CONDUCTORS. CUT RACEWAYS TO BE CONCEALED WHERE THEY PASS THROUGH INACCESSIBLE LOCATIONS.

K. OPENINGS MADE IN BUILDING SURFACES (TRENCH OPENINGS, WALLS, CEILINGS, ETC) MADE DUE TO DEMOLITION OF ELECTRICAL EQUIPMENT SHALL BE PROPERLY PATCHED AND FINISHED TO MATCH THE ADJACENT SURFACE.

L. PROVIDE BLANK OFF PLATES FOR DEVICES REMOVED FROM WALLS WHICH ARE TO REMAIN.

M. PROVIDE APPROPRIATE PROTECTION FOR ALL EXISTING LIGHTING, POWER, LOW VOLTAGE, SECURITY, AND FIRE ALARM DEVICES TO REMAIN DURING DEMOLITION.

N. WHERE NOTED TO BE RELOCATED, OR REINSTALLED, CAREFULLY REMOVE AND RETAIN EXISTING ELECTRICAL EQUIPMENTS/DEVICES FOR REINSTALLATION.

ELECTRICAL ABBREVIATIONS

SYMBOL	DESCRIPTION
A, AMP	AMPERES
AC	ALTERNATING CURRENT
AFC	ABOVE FINISHED CEILING
AF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERES INTERRUPTING CAPACITY (SYMMETRICAL)
BOD	BASIS OF DESIGN
BOF	BOTTOM OF FIXTURE
BFC	BELOW FINISHED CEILING
BWE	BAKED WHITE ENAMEL
C	CONDUIT
CB, C/B	CIRCUIT BREAKER
CCT	CIRCUIT
CLG	CEILING MOUNTED
COFF, CM	COFFEE/ ESPRESSO MACHINE
(D), DEMO	DEMOLISH
D, DED	DEDICATED
DC	DIRECT CURRENT
(E), (EX), EX	EXISTING
EC	EMPTY CONDUIT
EGC	EQUIPMENT GROUNDING CONDUCTOR
EMT	ELECTRICAL METALLIC TUBING
EPO	EMERGENCY POWER OFF
EVCS	ELECTRIC VEHICLE CHARGING STATION
EVSE	ELECTRIC VEHICLE SUPPLY EQUIPMENT, CHARGING STATION
EXT.	EXTERIOR
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE METALLIC CONDUIT
FPN	FUSED PER NAMEPLATE
(F)	FUTURE
G, GND	GROUND
GB	GROUND BAR
GEC	GROUNDING ELECTRODE CONDUCTOR
GES	GROUNDING ELECTRODE SYSTEM
GFCI	GROUND FAULT CIRCUIT INTERRUPTER FOR PERSONNEL
GFP	GROUND FAULT PROTECTION OF EQUIPMENT
GFFPA	GROUND FAULT PROTECTION OF EQUIPMENT - ALARM ONLY
GRC	GALVANIZED RIGID CONDUIT
HACR	HEATING, AIR CONDITIONING, REFRIGERATION RATED DEVICE
HP	HORSEPOWER
HPS	HORSEPOWER RATED SWITCH
IMC	INTERMEDIATE METALLIC CONDUIT
INT.	INTERIOR
J-BOX	JUNCTION BOX
KAIC	KILOAMPERES INTERRUPTING CAPACITY (SYMMETRICAL)
KV	KILOVOLTS
KVA	KILOVOLT-AMPS
KVAR	KILOVOLT-AMPS REACTIVE
KW	KILOWATT
LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS AND GROUND FAULT ELECTRONIC TRIP UNIT
MA, mA	MILLIAMPER
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCS	MOLDED-CASE SWITCH
MGB	MAIN GROUND BAR
MLO	MAIN LUGS ONLY
MM	MILLIMETER
MTD	MOUNTED
MW	MICROWAVE
(N)	NEW
N	NEUTRAL CONDUCTOR (GROUNDED CIRCUIT CONDUCTOR)
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFE	OWNER FURNISHED EQUIPMENT
P	PHASE OR POLE
PNL	PANELBOARD
POS, P.O.S.	POINT OF SALE SYSTEM
PVC	POLYVINYL CHLORIDE CONDUIT (SCHEDULE 40)
(R)	RELOCATE / RELOCATED
REF	REFERENCE, REFER TO
SCA	SHORT CIRCUIT AVAILABLE
SCCR	SHORT CIRCUIT CURRENT RATING
SEC	SECTION
T, XFMR	TRANSFORMER
TGB	TELECOMMUNICATIONS GROUND BAR
TER	TELEPHONE TERMINAL BOARD
UC	UNDER COUNTER
UNO, U.N.O.	UNLESS NOTED OTHERWISE
V	VOLTAGE OR VOLTS
W	WATTS
WAP	WIRELESS ACCESS POINT
WCR	WITH-STAND CURRENT RATING
WP	WEATHERPROOF
WT	WIRING TROUGH

CODE REFERENCE

ELEVATION	JURISDICTION
4,800 FT	PUEBLO, COLORADO
YEAR	ADOPTED CODE
2021	INTERNATIONAL BUILDING CODE
2021	INTERNATIONAL FIRE CODE
2021	INTERNATIONAL MECHANICAL CODE
2021	INTERNATIONAL PLUMBING CODE
2021	INTERNATIONAL FUEL GAS CODE
2021	INTERNATIONAL ENERGY CONSERVATION CODE
2023	NATIONAL ELECTRICAL CODE

ELECTRICAL SHEET INDEX

SHEET	TITLE
E001	ELECTRICAL LEGEND
E002	ELECTRICAL NOTES AND SPECIFICATIONS
ED121	ELECTRICAL FIRST FLOOR POWER DEMOLITION PLAN
E121	ELECTRICAL FIRST FLOOR POWER PLAN
E600	ELECTRICAL ONE-LINE DIAGRAM
E003	ELECTRICAL NOTES AND SPECIFICATIONS

NOTES TO PLAN REVIEWER:

- A FINAL COMMISSIONING REPORT SHALL BE DELIVERED TO THE BUILDING OWNER PER SECTION C408.2.5 OF THE 2021 IECC. COMMISSIONING, REPORT PREPARATION, AND REVIEW OF THIS REPORT ARE NOT IN THE ENGINEER'S SCOPE OF WORK.
- ELECTRICAL DESIGN COMPLIES WITH THE MAXIMUM VOLTAGE DROP OF 5% (ACROSS THE COMBINATION OF CUSTOMER-OWNED SERVICE ENTRANCE CONDUCTORS, FEEDERS, AND BRANCH CIRCUITS) PER C405.10 FOR ALL NEW FEEDERS AND BRANCH CIRCUITS. REVIEW OF EXISTING-TO-REMAIN CONDITIONS FOR VOLTAGE DROP IS NOT IN THE ENGINEER'S SCOPE OF WORK.

MINNEQUA PARK APARTMENTS

BOILER REPLACEMENT

1400 E. ORMAN AVE, PUEBLO, CO 81004

REVISIONS

MARK	DATE	COMMENT
1	12/12/2025	75% ISSUANCE
2	01/20/2026	100% CD ISSUANCE
3	07/09/2026	ADDENDUM #1

SHEET TITLE

ELECTRICAL
LEGEND

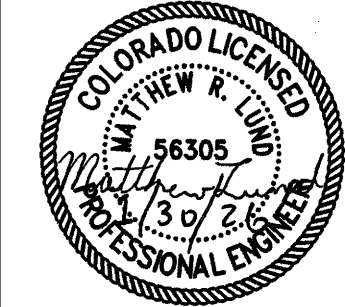
© COPYRIGHT 2025. ALL DRAWN & WRITTEN INFORMATION APPEARING HEREIN SHALL NOT BE DUPLICATED, DISCLOSED OR OTHERWISE USED WITHOUT WRITTEN CONSENT OF PLANT ENGINEERING CONSULTANTS.

PROJECT	25087
DATE	07/09/2026
DRAWN	JAG
CHECKED	MRL

SHEET

E001

REAL



PLANT
ENGINEERING CONSULTANTS
320 WEST FILLMORE STREET
COLORADO SPRINGS CO 80907
719.473.7077
www.plantecol.com

7/7/2026 2:46:57 PM David Estess
c:\projects\2025\25087 minnequa boiler.v4 drawings\4.3 submittal\4.3.4 electrical\25087_e002.dwg

DIVISION 26 - ELECTRICAL

SECTION 26 00 10 - BASIC ELECTRICAL REQUIREMENTS

- 1.01 GENERAL
- A. PROVISIONS OF THE GENERAL CONDITIONS AND DIVISION 1 - GENERAL REQUIREMENTS OF THE CONTRACT SHALL APPLY TO THE CONTRACT DOCUMENTS APPLY TO THE WORK OF DIVISION 26 ELECTRICAL.
- B. ALL DIVISION 26 SECTIONS ARE SUBJECT TO THE PROVISIONS OF THIS SECTION.
- C. ALL ELECTRICAL PRODUCTS AND THEIR INSTALLATION SHALL BE UL LISTED AND COMPLY WITH THE ADOPTED VERSION OF THE PERTINENT STATE AND LOCAL CODES AND ALL INSPECTION AUTHORITIES HAVING JURISDICTION.
- D. ALL ELECTRICAL PRODUCTS SHALL BE PROPERLY RATED FOR THE INSTALLED ALTITUDE, INCLUDING ANY REQUIRED DERATING.
- 1.02 SUMMARY OF WORK
- A. WORK INCLUDED: PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTAL ITEMS NECESSARY FOR COMPLETELY FINISHED AND OPERATIONAL ELECTRICAL SYSTEMS. EXAMINE DOCUMENTS OF OTHER TRADES FOR ANY ADDITIONAL WORK WHICH MAY BE REQUIRED OF THE ELECTRICAL CONTRACTOR.
- B. ONE PRIME ELECTRICAL SUBCONTRACTOR IS TO BE RESPONSIBLE FOR ALL THE WORK DONE UNDER DIVISION 26 OF THE CONTRACT DOCUMENTS, INCLUDING THE ELECTRICAL SUBCONTRACTOR'S FORCES AND LOWER TIER SUBCONTRACTORS, UNLESS AS AMENDED BY THE CONTRACT WITH THE PRIME CONTRACTOR AND/OR OWNER.
- 1.03 DEFINITIONS
- A. EXPOSED: EXPOSED IN EQUIPMENT ROOMS OR ROOMS WITH FINISHED WALLS OR CEILINGS. DOES NOT INCLUDE EXTERIOR.
- B. CONCEALED: LOCATED IN PIPE CHASES, FURRED SPACES, ATTICS, CRAWL SPACES, ABOVE SUSPENDED CEILINGS, OR ALL OTHER LOCATIONS NOT EXPOSED TO VIEW.
- C. PROVIDED: FURNISH AND INSTALL.
- D. EXTERIOR: LOCATED OUTSIDE OF BUILDING ENVELOPE.
- 1.04 DIVISION OF RESPONSIBILITY
- A. SPECIFICATION FORMATTING WHICH INDICATES A DIVISION IN THE ELECTRICAL WORK IS FOR CONVENIENCE ONLY. IT IS NOT INTENDED TO DELINEATE LINES OF RESPONSIBILITY BETWEEN SUBCONTRACTORS AND/OR SUPPLIERS. SUCH DELINEATION RESTS ENTIRELY WITH THE CONTRACTOR.
- 1.05 CONTRACT DOCUMENT DISCREPANCIES
- A. THE ELECTRICAL CONTRACTOR SHALL REVIEW ALL DRAWINGS OF ARCHITECTURAL, CIVIL, STRUCTURAL, ELECTRICAL AND MECHANICAL FOR ANY ITEMS TO BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S SCOPE OF WORK. ANY CONFLICTS, DUPLICATIONS OR OMISSIONS NOTED BETWEEN THE MECHANICAL DIVISION AND ANY OTHER DIVISION SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR CLARIFICATION PRIOR TO BID. CONFLICTS, DUPLICATIONS OR OMISSIONS NOTED AFTER THE AWARD OF THE CONTRACT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
- B. IN THE EVENT OF CONFLICTS OR DISCREPANCIES BETWEEN THE SPECIFICATIONS AND THE DRAWINGS, OR WITHIN EITHER DOCUMENT ITSELF, THE BID SHALL BE BASED ON THE BETTER QUALITY EQUIPMENT OR GREATER QUANTITY OF WORK.
- 1.06 PLANS AND SPECIFICATIONS
- A. DESIGN DRAWINGS ARE DIAGRAMMATIC TO SHOW GENERAL DESIGN AND ROUTING, EQUIPMENT CAPACITIES, ARRANGEMENTS, AND EXTENT OF SYSTEMS. THEY DO NOT SHOW EXACT SIZES, LOCATIONS, CLEARANCES AND DETAILS FOR USE WITH ALL MANUFACTURER'S EQUIPMENT. WHERE INDICATED, EQUIPMENT SIZES SHOWN ARE BASED ON ONE MANUFACTURER'S AVAILABLE INFORMATION.
- B. EXISTING UTILITIES: ARE INDICATED BASED ON RECORD DRAWINGS AND/OR CASUAL SITE OBSERVATION ON THE DRAWINGS. WORK ON UTILITIES ENCOUNTERED AND NOT INDICATED ON THE DRAWINGS WILL BE DIRECTED BY CHANGE ORDER AFTER BEING BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER. CLOSE OPENINGS AND REPAIR DAMAGE IN ACCEPTABLE MANNER TO UTILITIES ENCOUNTERED.
- C. SPECIFICATIONS GIVE EQUIPMENT QUALITY, ACCEPTABLE BRANDS, AND MANUFACTURING DETAILS. DRAWINGS PROVIDE CAPACITY, ARRANGEMENT, AND APPROXIMATE SIZE. EQUIPMENT MUST MEET ALL OF THESE REQUIREMENTS.
- 1.07 REGULATORY REQUIREMENTS
- A. CONFORM TO CODES AND REGULATIONS APPLICABLE AT THE PROJECT SITE. COMPLY WITH ALL REQUIREMENTS OF UTILITY COMPANIES.
- B. CALL FOR INSPECTIONS FROM LOCAL AUTHORITIES AS REQUIRED. IF DISCREPANCIES OCCUR BETWEEN CONTRACT DOCUMENTS AND LOCAL REGULATIONS, THE MORE STRINGENT REQUIREMENT APPLIES.
- C. PROCURE ALL PERMITS, LICENSES AND CERTIFICATES AND PAY ALL ASSOCIATED FEES REQUIRED TO PERFORM THE DIVISION 26 WORK.
- 1.08 COORDINATION
- A. INSTALLATION PROCEDURES: CONFER AND COOPERATE WITH OTHER TRADES AND COORDINATE THE WORK IN PROPER RELATION WITH THEIRS. COORDINATE CEILING CAVITY SPACE CAREFULLY WITH OTHER TRADES.
- B. UTILITY INTERRUPTIONS: COORDINATE ELECTRICAL UTILITY INTERRUPTIONS WITH THE OWNER AND THE UTILITY COMPANY. PLAN WORK SO THAT DURATION OF THE INTERRUPTION IS KEPT TO A MINIMUM.
- C. CONTRACTOR SHALL SUBMIT A METHOD OF PROCEDURE (MOP) TO THE OWNER FOR APPROVAL A MINIMUM OF TWO WEEKS PRIOR TO INTERRUPTION OF ELECTRICAL SERVICE.
- D. CHECK AND REVIEW THE MECHANICAL DRAWINGS AND SPECIFICATIONS TO ENSURE COORDINATION WITH DIVISIONS 21, 22, AND 23. PROVIDE A REQUEST FOR INFORMATION TO THE ARCHITECT/ENGINEER FOR ANY COORDINATION ITEMS NEEDING CLARIFICATION.
- E. REPORT TO THE ARCHITECT ANY CONSTRUCTION DEFECTS WHICH AFFECT THE ELECTRICAL WORK. PROCEED WITH ELECTRICAL WORK ONLY AFTER DEFECTS HAVE BEEN CORRECTED.
- 1.09 QUALITY ASSURANCE
- A. PERFORM WORK IN ACCORDANCE WITH GOOD TRADE PRACTICE AND IN A NEAT MANNER. COMPLY WITH ARCHITECT'S DIRECTION CONCERNING FINISHED APPEARANCE.
- B. ADHERE TO MANUFACTURER'S RECOMMENDATIONS.
- 1.10 SUBMITTALS
- A. SUBMIT PRODUCT DATA FOR APPROVAL ON DISTRIBUTION EQUIPMENT, MOTOR CONTROLLERS, AND WIRING DEVICES.
- B. SUBMIT SHOP DRAWINGS FOR ELECTRICAL DISTRIBUTION (INCLUDING CONDUIT ROUTING, PULL-BOX LOCATIONS, EQUIPMENT LAYOUTS, AND SECTIONS AT LOCATIONS OF SUBSTANTIAL COORDINATION WITH OTHER SYSTEMS).
- 1.11 RECORD DOCUMENTS
- A. MAINTAIN AT JOB SITE: CONTRACT DOCUMENTS, REVIEWED SUBMITTALS, FIELD TEST RECORDS.
- B. AS-BUILT DRAWINGS: NEATLY REVERSE THE DESIGN DRAWINGS TO REFLECT THE AS-BUILT CONDITION. DIMENSIONALLY LOCATE SITE UTILITIES AND UNDER SLAB WORK. DELIVER AS-BUILT DRAWINGS TO ENGINEER AT PROJECT COMPLETION.
- 1.12 OPERATING & MAINTENANCE MANUAL
- A. FORMAT: PDF.
- B. CONTENTS: EACH SECTION SET OFF BY PDF BOOKMARKS. INCLUDE:
1. TABLE OF CONTENTS.
 2. EXECUTED WARRANTIES.
 3. NAME, ADDRESS AND TELEPHONE NUMBER OF INSTALLING CONTRACTORS AND SUBCONTRACTORS, ALONG WITH BRIEF DESCRIPTION OF THEIR PROJECT RESPONSIBILITY.
 4. NAME, ADDRESS AND TELEPHONE NUMBER OF MATERIAL AND EQUIPMENT SUPPLIERS, ALONG WITH LISTING OF ITEMS SUPPLIED.
 5. EQUIPMENT PDF BOOKMARKS, MINIMUM ONE BOOKMARK FOR EACH APPLICABLE DIVISION 26 SECTION, ARRANGED IN THE SAME ORDER AS THE SPECIFICATIONS. INCLUDE FOR ALL EQUIPMENT SUPPLIED.
- C. REVIEWED SUBMITTALS.
- D. INSTALLATION INSTRUCTIONS.
- E. OPERATING INSTRUCTIONS.
- F. MAINTENANCE INSTRUCTIONS.
- G. PARTS LISTS.
- H. POWER SYSTEM STUDIES (COORDINATION, FAULT CURRENT, AND/OR ARC FLASH STUDIES).
- I. CERTIFICATES OF INSPECTION.
- J. AT PROJECT COMPLETION SUBMIT ONE COPY OF MANUAL TO ENGINEER FOR REVIEW. MAKE ANY CORRECTIONS REQUIRED. TRANSMIT THREE CORRECTED COPIES TO GENERAL CONTRACTOR FOR DELIVERY TO OWNER.

SECTION 26 00 10 - BASIC ELECTRICAL REQUIREMENTS (CONTINUED)

- 1.13 WARRANTIES
- A. PROVIDE A MINIMUM OF ONE (1) YEAR WARRANTY ADDRESSED TO OWNER COVERING ALL DIVISION 26 WORK. UNLESS NOTED OTHERWISE PROVIDE MANUFACTURER STANDARD WARRANTY COVERING ALL EQUIPMENT AND DEVICES.
- B. INCLUDE EXECUTED WARRANTIES IN OPERATING & MAINTENANCE MANUALS.
- C. DURING WARRANTY PERIOD, PROVIDE LABOR AND MATERIALS, INCLUDING SHIPPING, TO REPAIR OR REPLACE DEFECTS IN DIVISION 26 WORK. PAY FOR DAMAGE TO OTHER WORK RESULTING FROM DEFECTS IN DIVISION 26 WORK.
- D. WARRANTY SHALL BE FROM DATE OF SUBSTANTIAL COMPLETION.
- 1.14 DEMONSTRATIONS
- A. CONDUCT DEMONSTRATIONS WHEN SYSTEMS ARE COMPLETE, OPERATIONAL, COMMISSIONED AND READY TO BE TURNED OVER TO THE OWNER, AND AFTER THE OPERATING AND MAINTENANCE MANUAL IS COMPLETE.
- B. INSTRUCT THE OWNER'S REPRESENTATIVE ON THE PROPER OPERATION AND MAINTENANCE OF THE ELECTRICAL SYSTEMS.
- END OF SECTION 26 00 10
- SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL
- PART 1 GENERAL
- 1.01 COORDINATION
- A. COORDINATE ARRANGEMENT, MOUNTING, AND SUPPORT OF ELECTRICAL EQUIPMENT:
1. TO ALLOW MAXIMUM POSSIBLE HEADROOM UNLESS SPECIFIC MOUNTING HEIGHTS THAT REDUCE HEADROOM ARE INDICATED.
 2. TO PROVIDE FOR EASE OF DISCONNECTING THE EQUIPMENT WITH MINIMUM INTERFERENCE TO OTHER INSTALLATIONS.
 3. TO ALLOW RIGHT OF WAY FOR PIPING AND CONDUIT INSTALLED AT REQUIRED CLEARANCE.
 4. SO CONNECTING RACEWAYS, CABLES, WIREWAYS, CABLE TRAYS, AND BUSWAYS WILL BE CLEAR OF OBSTRUCTIONS AND CLEAR OF THE WORKING AND ACCESS SPACE OF OTHER EQUIPMENT.
- B. COORDINATE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND SET SLEEVES IN CAST-IN-PLACE CONCRETE, MASONRY WALLS, AND OTHER STRUCTURAL COMPONENTS AS THEY ARE CONSTRUCTED.
- C. COORDINATE LOCATION OF ACCESS PANELS AND DOORS FOR ELECTRICAL ITEMS THAT ARE BEHIND FINISHED SURFACES OR OTHERWISE CONCEALED.
- D. COORDINATE SLEEVE SELECTION AND APPLICATION WITH SELECTION AND APPLICATION OF FIRESTOPPING SPECIFIED IN DIVISION 07.
- E. COORDINATE INSTALLATION OF DRAIN PANS UNDER PIPING IN ROOMS OR AREAS WITH ELECTRICAL EQUIPMENT. DIVISION 26 TO COORDINATE WITH OTHER DIVISIONS TO PROTECT ELECTRICAL EQUIPMENT INSTALLATIONS.
- PART 2 PRODUCTS
- 2.01 SLEEVES FOR ELECTRICAL PENETRATIONS
- A. STEEL PIPE SLEEVES: ASTM A 53/A 53M, TYPE E, GRADE B, SCHEDULE 40, GALVANIZED STEEL, PLAIN ENDS.
- B. SLEEVES FOR RECTANGULAR OPENINGS: GALVANIZED SHEET STEEL.
1. MINIMUM METAL THICKNESS:
 - a. FOR SLEEVE CROSS-SECTION RECTANGLE PERIMETER LESS THAN 50 INCHES AND NO SIDE MORE THAN 16 INCHES, THICKNESS SHALL BE 0.052 INCH.
 - b. FOR SLEEVE CROSS-SECTION RECTANGLE PERIMETER EQUAL TO, OR MORE THAN, 50 INCHES AND 1 OR MORE SIDES EQUAL TO, OR MORE THAN, 16 INCHES, THICKNESS SHALL BE 0.136 INCH.
- 2.03 PAINTING
- A. IN FINISHED AREAS: UNLESS NOTED OTHERWISE, EXPOSED CONDUITS SHALL BE PAINTED TO MATCH SURROUNDING FINISHES, OR A FINISH AS SELECTED BY ARCHITECT/OWNER.
- B. DAMAGE AND TOUCHUP: REPAIR MARRED AND DAMAGED FACTORY-PAINTED FINISHES WITH MATERIALS AND PROCEDURES TO MATCH ORIGINAL FACTORY FINISH.
- PART 3 EXECUTION
- 3.01 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. COMPLY WITH NECA 1.
- B. MEASURE INDICATED MOUNTING HEIGHTS TO BOTTOM OF UNIT FOR SUSPENDED ITEMS AND TO CENTER OF UNIT FOR WALL-MOUNTED ITEMS.
- C. HEADROOM MAINTENANCE: IF MOUNTING HEIGHTS OR OTHER LOCATION CRITERIA ARE NOT INDICATED, ARRANGE AND INSTALL COMPONENTS AND EQUIPMENT TO PROVIDE MAXIMUM POSSIBLE HEADROOM CONSISTENT WITH THESE REQUIREMENTS.
- D. EQUIPMENT: INSTALL TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS OF BOTH ELECTRICAL EQUIPMENT AND OTHER NEARBY INSTALLATIONS. CONNECT IN SUCH A WAY AS TO FACILITATE FUTURE DISCONNECTING WITH MINIMUM INTERFERENCE WITH OTHER ITEMS IN THE VICINITY.
- E. RIGHT OF WAY: GIVE TO PIPING SYSTEMS INSTALLED AT A REQUIRED SLOPE. DOORS PROVIDING ACCESS/EGRESS FOR ELECTRICAL EQUIPMENT.
- F. ACCESS/EGRESS: INSTALLATIONS SHALL MEET THE REQUIREMENTS OF NFPA 70.
- G. ILLUMINATION SHALL BE PROVIDED FOR ELECTRICAL EQUIPMENT INSTALLATIONS MEETING THE REQUIREMENTS OF NFPA 70.
- 3.02 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS
- A. ELECTRICAL PENETRATIONS OCCUR WHEN RACEWAYS, CABLES, WIREWAYS, CABLE TRAYS, OR BUSWAYS PENETRATE CONCRETE SLABS, CONCRETE OR MASONRY WALLS, OR FIRE-RATED FLOOR AND WALL ASSEMBLIES.
- B. CONCRETE SLABS AND WALLS: INSTALL SLEEVES FOR PENETRATIONS UNLESS CORE-DRILLED HOLES OR FORMED OPENINGS ARE USED. INSTALL SLEEVES DURING ERECTION OF SLABS AND WALLS.
- C. USE PIPE SLEEVES UNLESS PENETRATION ARRANGEMENT REQUIRES RECTANGULAR SLEEVED OPENING.
- D. CUT SLEEVES TO LENGTH FOR MOUNTING FLUSH WITH BOTH SURFACES OF WALLS.
- E. EXTEND SLEEVES INSTALLED IN FLOORS 2 INCHES ABOVE FINISHED FLOOR LEVEL.
- F. SIZE PIPE SLEEVES TO PROVIDE 1/4-INCH ANNULAR CLEAR SPACE BETWEEN SLEEVE AND RACEWAY OR CABLE, UNLESS INDICATED OTHERWISE.
- G. SEAL SPACE OUTSIDE OF SLEEVES WITH GROUT FOR PENETRATIONS OF CONCRETE AND MASONRY.
1. PROMPTLY PACK GROUT SOLIDLY BETWEEN SLEEVE AND WALL SO NO VOIDS REMAIN. TOOL EXPOSED SURFACES SMOOTH; PROTECT GROUT WHILE CURING.
- H. INTERIOR PENETRATIONS OF NON-FIRE-RATED WALLS AND FLOORS: SEAL ANNULAR SPACE BETWEEN SLEEVE AND RACEWAY OR CABLE USING JOINT SEALANT APPROPRIATE FOR SIZE, DEPTH, AND LOCATION OF JOINT. COMPLY WITH REQUIREMENTS IN DIVISION 07 SECTION "JOINT SEALANTS."
- 3.03 FIRE-RATED PENETRATIONS AND FIRESTOPPING
- A. FIRE-RATED ASSEMBLIES: INSTALL SLEEVES FOR PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES UNLESS OPENINGS COMPATIBLE WITH FIRESTOP SYSTEM USED ARE FABRICATED DURING CONSTRUCTION OF FLOOR OR WALL.
- B. FIRE-RATED-ASSEMBLY PENETRATIONS: MAINTAIN INDICATED FIRE RATING OF WALLS, PARTITIONS, CEILINGS, AND FLOORS AT RACEWAY AND CABLE PENETRATIONS: INSTALL SLEEVES AND SEAL CABLES AND CABLE PENETRATION SLEEVES WITH FIRESTOP MATERIALS TO RESTORE ORIGINAL FIRE-RESISTANCE RATING OF ASSEMBLY.

SECTION 26 05 19 - LOW-VOLTAGE POWER CONDUCTORS AND CABLES

- PART 1 GENERAL
- 1.01 GENERAL
- A. CONFORM TO CONSTRUCTION AND APPLICATIONS REQUIREMENTS OF NFPA 70, NEMA WC 70, AND PRODUCT LISTING.
- PART 2 PRODUCTS
- 2.01 CONDUCTOR AND CABLE REQUIREMENTS AND APPLICATIONS
- A. ALL CONDUCTORS SHALL BE 600V, COPPER, SINGLE CONDUCTOR INSTALLED IN SUITABLE RACEWAY UNLESS NOTED OTHERWISE.
1. THHN/THWN IN DRY LOCATIONS, THWN-2 IN DAMP/WET LOCATIONS, THWN-2 OR XHHW-2 FOR UNDERGROUND LOCATIONS.
- B. CONDUCTORS SHALL BE SOLID IN SIZES UP TO #10 AND STRANDED FOR SIZES #8 AND LARGER.
- C. MINIMUM WIRE SIZE SHALL BE #12 AWG UNLESS NOTED OTHERWISE.
- D. ALUMINUM CONDUCTORS ARE NOT PERMITTED.
- E. VARIABLE FREQUENCY DRIVE (VFD) CABLES:
1. MULTI-CONDUCTOR, COPPER, SHIELDED TYPE TC-ER CABLE DESIGNED FOR USE WITH VFD'S, OVERSIZED CROSSLINKED POLYETHYLENE (XLPE) INSULATION, 90°C (WET OR DRY), SUNLIGHT- AND OIL-RESISTANT PVC OUTER JACKET
 2. DUAL SPIRALLY WRAPPED COPPER TAPE SHIELDS AND THREE (3) SYMMETRICALLY PLACED BARE COPPER GROUNDING CONDUCTORS WITH DIRECT CONTACT WITH SHIELD
 3. MANUFACTURERS: BELDEN, SOUTHWIRE COMPANY, OR GENERAL CABLE TECHNOLOGIES CORPORATION
- G. NON-METALLIC (SHEATHED CABLE (TYPES NM AND NMC) IS NOT PERMITTED.
- H. SERVICE-ENTRANCE CABLE (TYPE SE AND USE) IS NOT PERMITTED.
- 2.03 WIRING CONNECTORS
- A. WIRING CONNECTORS APPROPRIATE FOR THE APPLICATION, SUITABLE FOR USE WITH THE CONDUCTORS TO BE CONNECTED, AND UL LISTED.
1. COPPER CONDUCTORS SIZE 8 AWG AND SMALLER: TWIST-ON INSULATED SPRING CONNECTORS.
 2. COPPER TO DELIVERATORS SIZE 6 AWG AND LARGER: MECHANICAL CONNECTORS OR COMPRESSION CONNECTORS.
 3. CONNECTORS FOR ALUMINUM CONDUCTORS: COMPRESSION CONNECTORS.
- PART 3 EXECUTION
- 3.01 INSTALLATION
- A. WHERE 20A, 120VAC BRANCH CIRCUIT LENGTH IS IN EXCESS OF 75 LINEAR FEET, CONDUCTORS SHALL BE #10 AWG. WHERE 20A, 120VAC BRANCH CIRCUIT LENGTH IS IN EXCESS OF 150 LINEAR FEET, CONDUCTORS SHALL BE #8 AWG.
- B. ARRANGE CIRCUITING TO MINIMIZE SPLICES.
- C. MAINTAIN PHYSICAL SEPARATION BETWEEN VOLTAGES, SYSTEMS, AND EMERGENCY SYSTEMS IN ACCORDANCE WITH NFPA 70.
- D. UNLESS NOTED OTHERWISE, WHEN BRANCH CIRCUITS ARE INDICATED AS SEPARATE, COMBINING THEM TOGETHER IN A SINGLE RACEWAY IS PERMITTED UNDER THE FOLLOWING CONDITIONS:
1. PROVIDE NO MORE THAN SIX CURRENT-CARRYING CONDUCTORS IN A SINGLE RACEWAY. DEDICATED NEUTRAL CONDUCTORS ARE CONSIDERED CURRENT-CARRYING CONDUCTORS.
 2. INCREASE SIZE OF CONDUCTORS AS REQUIRED TO ACCOUNT FOR AMPACITY DERATING PER THE REQUIREMENTS OF NFPA 70, ARTICLE 310.
 3. SIZE RACEWAYS, BOXES, ETC. TO ACCOMMODATE CONDUCTORS PER NFPA 70.
- E. UNLESS NOTED OTHERWISE, OR FOR COORDINATING WITH SYSTEMS FURNITURE CONNECTIONS, THE USE OF A COMMON NEUTRAL IS NOT PERMITTED; PROVIDE DEDICATED NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT.
1. FOR SYSTEMS FURNITURE MULTI-WIRE CIRCUITS, PROVIDE LISTED HANDLE TIE TO SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS OF THE MULTIWIRE BRANCH CIRCUIT.
- F. USE SUITABLE WIRE PULLING LUBRICANT WHEN NECESSARY, EXCEPT WHEN LUBRICANT IS NOT RECOMMENDED BY THE MANUFACTURER.
- G. CONDUCTORS INSTALLED ON THE LOAD SIDE OF A VARIABLE FREQUENCY DRIVE (VFD) OR OTHER DEVICE UTILIZING PULSE-WIDTH MODULATION SHALL BE:
1. UNDER 20-FEET OF TOTAL CONDUCTOR LENGTH: XHHW-2 COPPER CONDUCTORS
 2. 20-FEET OR MORE OF TOTAL CONDUCTOR LENGTH: VFD CABLE
- END OF SECTION 26 05 19
- SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
- PART 1 GENERAL
- 1.01 GENERAL
- A. CONFORM TO APPLICATIONS REQUIREMENTS OF NFPA 70 AND PRODUCT LISTING.
- B. COORDINATE EXACT LOCATIONS OF GROUNDING AND BONDING CONNECTIONS WITH OTHER TRADES, INCLUDING, BUT NOT LIMITED TO UNDERGROUND METAL WATER SERVICE PIPING, STEEL REINFORCEMENT FOR CONCRETE ENCASED ELECTRODES, AND OTHER PIPING, DUCTWORK, OR OTHER SYSTEMS REQUIRED TO BE BONDED.
- C. EXISTING CONDITIONS: WHERE EXISTING GROUNDING AND BONDING SYSTEM COMPONENTS ARE INDICATED TO BE REUSED, THEY MAY BE REUSED ONLY WHERE THEY ARE FREE FROM CORROSION, WHERE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION, AND THE INTEGRITY, CONTINUITY, AND SYSTEM RESISTANCE ARE TESTED AND VERIFIED. EXISTING SYSTEM AND COMPONENTS SHALL MEET THE RESISTANCE REQUIREMENTS LISTED IN PART 3 OF THIS SECTION.
- PART 2 PRODUCTS
- 2.01 GENERAL PRODUCT REQUIREMENTS
- A. ALL CONDUCTORS SHALL BE INSULATED COPPER, EXCEPT USE BARE COPPER CONDUCTORS WHERE INSTALLED IN DIRECT CONTACT WITH EARTH OR WHERE ENCASED IN CONCRETE.
- B. PROVIDE A GREEN GROUNDING CONDUCTOR IN ALL RACEWAYS.
- PART 3 EXECUTION
- 3.01 BONDING
- A. THE FOLLOWING SHALL BE BONDED BACK TO THE GROUNDING ELECTRODE SYSTEM:
1. ALL METALLIC PARTS OF EQUIPMENT, RACEWAYS, BOXES, CABLE TRAYS, GUTTERS, ENCLOSURES, ARMOR/ SHEATHES, AND OTHER COMPONENTS REQUIRED TO BE ELECTRICALLY CONTINUOUS.
 2. EACH ABOVEGROUND PORTION OF THE GAS PIPING SYSTEM, AND/ OR ANY METAL PIPING SYSTEM DOWNSTREAM FROM EQUIPMENT SHUTOFF VALVE.
- B. BONDING CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH NFPA 70 REQUIREMENTS.
- END OF SECTION 26 05 26

SECTION 26 05 33 - CONDUIT FOR ELECTRICAL SYSTEMS

- PART 1 GENERAL
- 1.01 GENERAL
- A. CONFORM TO APPLICATIONS REQUIREMENTS OF NFPA 70 AND PRODUCT LISTING.
- B. COORDINATE SIZES OF RACEWAYS WITH THE ACTUAL CONDUCTORS TO BE INSTALLED, INCLUDING ADJUSTMENTS FOR CONDUCTOR SIZES INCREASED FOR VOLTAGE DROP.
- C. COORDINATE THE ARRANGEMENT OF CONDUITS WITH STRUCTURAL MEMBERS, DUCTWORK, PIPING, EQUIPMENT AND OTHER POTENTIAL CONFLICTS INSTALLED UNDER OTHER SECTIONS OR BY OTHERS.
- D. PENETRATIONS OF STRUCTURAL MEMBERS OR COMPONENTS SHALL BE COORDINATED WITH AND APPROVED BY THE STRUCTURAL ENGINEER.
- PART 2 PRODUCTS
- 2.01 GENERAL PRODUCT REQUIREMENTS
- A. PROVIDE ALL CONDUIT, BOXES, BODIES, FITTINGS, SUPPORTS, AND ACCESSORIES REQUIRED FOR A COMPLETE RACEWAY SYSTEM.
- B. BOXES: CODE-GAUGE, GALVANIZED STEEL BOXES, 4-INCH OR LARGER AS REQUIRED.
- C. SUPPORTS: CORROSION RESISTANT, STEEL COMPONENTS SUITABLE FOR INSTALLED ENVIRONMENT AND COMPATIBLE WITH THE SUPPORTED RACEWAY COMPONENT.
- D. RIGID METAL CONDUIT (RMC) GRC: HOT DIPPED GALVANIZED CONDUIT, THREADED TYPE CONNECTORS AND FITTINGS, COMPLYING WITH ANSI C80.1, UL 6 LISTED AND LABELED.
- E. ELECTRICAL METALLIC TUBING (EMT): COMPRESSION TYPE CONNECTORS AND FITTINGS, COMPLYING WITH ANSI C80.3, UL 797 LISTED AND LABELED.
- F. POLYVINYL CHLORIDE CONDUIT (PVC): SCH 40 UNLESS NOTED OTHERWISE, COMPLYING WITH NEMA TC 2 AND UL 651 LISTED AND LABELED.
- G. FLEXIBLE METAL CONDUIT (FMC): STANDARD WALL STEEL FLEXIBLE CONDUIT, UL 1 LISTED AND LABELED.
- H. LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC): PVC JACKETED STEEL FLEXIBLE CONDUIT, UL 360 LISTED AND LABELED. FITTINGS: COMPATIBLE WITH CONDUIT TYPE, COMPLYING WITH NEMA FB 1 AND UL 5148 LISTED AND LABELED.
- SECTION 26 05 33 - CONDUIT FOR ELECTRICAL SYSTEMS (CONTINUED)
- PART 3 EXECUTION
- 3.01 INSTALLATION
- A. MINIMUM CONDUIT SIZES, UNLESS NOTED OTHERWISE:
1. ABOVE GROUND: 3/4".
 2. BELOW GROUND OR ENCASED IN CONCRETE: 1".
- B. CONCEAL ALL CONDUITS UNLESS SPECIFICALLY INDICATED TO BE EXPOSED.
- C. SECURE AND SUPPORT CONDUITS IN ACCORDANCE WITH NFPA 70 USING FLEXIBLE SUPPORTS AND METHODS.
- D. PROVIDE INDEPENDENT SUPPORT FROM BUILDING STRUCTURE. CONDUITS SHALL NOT BE SUPPORTED FROM CEILING SUPPORT SYSTEMS, PIPING, DUCTWORK, OR OTHER SYSTEMS.
- E. PROVIDE PUL STRING IN ALL EMPTY CONDUITS, OR CONDUITS WHERE CONDUCTORS ARE TO BE INSTALLED BY OTHERS.
- F. INCLUDE PLASTER-RINGS FOR RECESSED BOXES. PROVIDE CAST METAL BOXES WITH NEOPRENE GASKETS IN WET AND OUTSIDE LOCATIONS.
- G. CONDUITS SHALL NOT PENETRATE OTHER SYSTEM, SUCH AS DUCTWORK, LOUVERS, PLENUM BOXES, ETC.
- H. PROVIDE ACOUSTICAL PUTTY PADS FOR ALL BOXES RECESSED IN ACOUSTICALLY RATED WALLS OR IN WALLS OF ACOUSTICALLY SENSITIVE SPACES. COORDINATE WITH ARCHITECTURAL DRAWINGS.
- I. PROVIDE FIRE-RATED BACKBOXES IN ALL FIRE-RATING ASSEMBLIES. COORDINATE WITH THE ARCHITECTURAL DRAWINGS.
- 3.02 APPLICATION
- A. INTERIOR, CONCEALED: EMT
- B. INTERIOR, EXPOSED AND SUBJECT TO DAMAGE: GRC
- END OF SECTION 26 05 33
- SECTION 26 05 48 - ELECTRICAL NOISE AND VIBRATION CONTROL
- PART 1 GENERAL
- 1.01 GENERAL
- A. VIBRATION CONTROL SHALL BE A DELEGATED DESIGN SUBMITTAL. CONTRACTOR SHALL ENGINEER AND SELECT NOISE AND VIBRATION CONTROL SYSTEMS TO MEET PROJECT REQUIREMENTS.
- PART 2 PRODUCTS
- 2.01 GENERAL PRODUCT REQUIREMENTS
- A. FOAM BACKER ROD: CLOSED-CELL POLYETHYLENE FOR USE AS BACKING FOR NON-HARDENING SEALANT.
- B. ACOUSTICAL SEALANT: PERMANENTLY NON-HARDENING TYPE.
- C. PACKING MATERIAL: MINERAL FIBER, NON-COMBUSTIBLE, RESISTANT TO WATER, MILDEW, AND VERMIN.
- D. PERMANENTLY FLEXIBLE FIRESTOP SYSTEMS MAY BE USED FOR PENETRATIONS OF FIRE-RATED NOISE CRITICAL WALLS AND SLABS.
- E. VIBRATION ISOLATION EQUIPMENT AND MATERIALS SHALL BE PROVIDED BY SINGLE MANUFACTURER OF THE FOLLOWING: MASON INDUSTRIES, INC.; VIBRATION MOUNTINGS AND CONTROLS; KINETICS NOISE CONTROL.
1. TYPE NIS: MASON INDUSTRIES TYPE RBA, OR EQUAL
 2. TYPE DDNM (DOUBLE DEFLECTION NEOPRENE MOUNT): MASON INDUSTRIES TYPE HD, OR EQUAL
 3. TYPE DDNH (DOUBLE DEFLECTION NEOPRENE HANGERS): MASON INDUSTRIES TYPE HD, OR EQUAL
 4. TYPE SPNM (SPRING AND NEOPRENE MOUNTS): MASON INDUSTRIES TYPE SLFSW, OR EQUAL
- PART 3 EXECUTION
- 3.01 INSTALLATION
- A. PROVIDE STEEL LOAD SPREADING PLATES BETWEEN THE SUPPORTED EQUIPMENT AND NEOPRENE PAD.
- B. WIRING CONNECTIONS TO VIBRATING EQUIPMENT, SUCH AS MOTORS, TRANSFORMERS, OR SIMILAR SHALL BE MADE WITH FLEXIBLE CONDUIT INSTALLED IN A SLACK U-SHAPE.
- C. PACK AND SEAL AIR-TIGHT WITH NON-HARDENING ACOUSTICAL SEALANT ALL PENETRATIONS OF PARTITIONS AND SLABS WITHIN SOUND-SENSITIVE ROOMS AND EQUIPMENT ROOMS (MECHANICAL, ELECTRICAL, ETC).
- END OF SECTION 26 05 48

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

- PART 1 GENERAL
- 1.01 GENERAL
- A. CONFORM TO APPLICATIONS REQUIREMENTS OF NFPA 70 AND PRODUCT LISTING.
- B. COORDINATE COLOR CODING, AND POWER SOURCE AND CIRCUIT NUMBER IDENTIFICATION WITH OWNER FOR FACILITIES WITH EXISTING IDENTIFICATION REQUIREMENTS, INCLUDING, BUT NOT LIMITED TO, LABELS, EQUIPMENT DESIGNATIONS, COLOR CODING, ETC.
- PART 2 PRODUCTS
- 2.01 GENERAL PRODUCT REQUIREMENTS
- A. EQUIPMENT IDENTIFICATION: 1/16" THICK PLASTIC NAMEPLATES INDICATING EQUIPMENT DESIGNATION, SYSTEM TYPE, RATING, VOLTAGE, PHASE, CONDUCTOR COLOR CODING, AND POWER SOURCE AND CIRCUIT NUMBER (INCLUDING SOURCE LOCATION WHERE REMOTELY LOCATED).
1. EQUIPMENT DESIGNATION: 1/2" TEXT HEIGHT
 2. SYSTEM TYPE: 1/2" TEXT HEIGHT
 3. OTHER INFORMATION: 1/4" TEXT HEIGHT.
- B. ARC FLASH WARNING LABELS: MINIMUM 3.5" X 5", INDICATING EQUIPMENT DESIGNATION, NOMINAL SYSTEM VOLTAGE, AVAILABLE SHORT-CIRCUIT FAULT CURRENT, MAXIMUM TIME TO CLEAR SHORT-CIRCUIT FAULTS OF UPSTREAM OVERCURRENT PROTECTIVE DEVICE(S), AND DATE LABEL IS APPLIED.
1. LEGEND: ORANGE HEADER THAT READS "WARNING", FOLLOWED BY "ARC FLASH AND SHOCK HAZARD. APPROPRIATE PPE REQUIRED. DO NOT OPERATE CONTROLS OR OPEN COVERS WITHOUT APPROPRIATE PERSONAL PROTECTION EQUIPMENT; FAILURE TO COMPLY MAY RESULT IN INJURY OR DEATH; REFER TO NFPA 70E FOR MINIMUM PPE REQUIREMENTS" OR "APPROVED EQUIPMENT."
- D. MARKERS FOR CONDUCTORS AND CABLES: WRAP-AROUND SELF-ADHESIVE VINYL SELF-LAMINATING PLASTIC SLEEVE, PLASTIC CLIP-ON, OR VINYL SPLIT SLEEVE TYPE MARKERS SUITABLE FOR THE CONDUCTOR OR CABLE TO BE IDENTIFIED.
- PART 3 EXECUTION
- 3.01 INSTALLATION
- A. INSTALL IDENTIFICATION PRODUCTS TO BE PLAINLY VISIBLE FOR EXAMINATION, ADJUSTMENT, SERVICING, AND MAINTENANCE.
- B. PROVIDE EQUIPMENT IDENTIFICATION AND ARC FLASH LABELS ON ALL ELECTRICAL EQUIPMENT. EQUIPMENT IDENTIFICATION SHALL INDICATE SYSTEM TYPE.
- C. COLOR:
1. NORMAL POWER SYSTEM: BLACK TEXT ON WHITE BACKGROUND
- END OF SECTION 26 05 53
- SECTION 26 27 26 - WIRING DEVICES
- PART 1 GENERAL
- 1.01 GENERAL
- A. CONFORM TO APPLICATIONS REQUIREMENTS OF NFPA 70 AND PRODUCT LISTING.
- PART 2 PRODUCTS
- 2.01 GENERAL PRODUCT REQUIREMENTS
- A. PROVIDE DEVICES FROM ONE OF THE FOLLOWING MANUFACTURERS: LEVITON, PASS & SEYMOUR/ LEGRAND, HUBBELL, LUTRON.
- B. PROVIDE SPECIFICATION GRADE DEVICES, 20A UNLESS NOTED OTHERWISE.
- C. STYLE: STANDARD STYLE WITH COMPATIBLE COVERPLATES.
- D. COLOR-MATCH EXISTING.
- PART 3 EXECUTION
- 3.01 INSTALLATION
- A. COVERPLATES: PROVIDE MATCHING THERMOPLASTIC COVERPLATES IN FINISHED AREAS AND GALVANIZED STEEL COVERPLATES IN UNFINISHED AREAS.
- B. PROVIDE HOT-STAMPED PANEL AND CIRCUIT ID ON RECEPTACLE COVERPLATES AND SWITCHES.
- C. PROVIDE HOT-STAMPED LABEL ON SWITCHES SERVING REMOTE DEVICES/EQUIPMENT INDICATING THE LOAD SERVED.
- D. FOR DEVICES SERVING SPECIFIC EQUIPMENT: COORDINATE CONNECTION TYPE, RATING, AND NUMBER OF POLES WITH EQUIPMENT SERVED.
- END OF SECTION 26 27 26
- SECTION 26 29 13 - MOTOR CONTROLLERS
- PART 1 GENERAL
- 1.01 GENERAL
- A. CONFORM TO APPLICATIONS REQUIREMENTS OF NFPA 70 AND PRODUCT LISTING.
- B. COORDINATE ELECTRICAL EQUIPMENT TERMINATIONS ARE SUITABLE FOR USE WITH THE CONDUCTORS TO BE INSTALLED.
- C. COORDINATE MOTOR CONTROLLERS ARE SUITABLE FOR USE WITH MOTORS AND EQUIPMENT SERVED.
- D. COORDINATE WITH MECHANICAL CONTRACTOR AND CONTROLS CONTRACTOR FOR MOTOR AND EQUIPMENT SEQUENCES OF OPERATIONS.
- PART 2 PRODUCTS
- 2.01 GENERAL PRODUCT REQUIREMENTS
- A. EQUIPMENT SHALL HAVE AVAILABLE INTERRUPTING CURRENT (AIC) RATING OR SHORT-CIRCUIT CURRENT RATING (SCCR) EXCEEDING AVAILABLE FAULT CURRENT AT THE INSTALLED LOCATION. IF THE AVAILABLE FAULT CURRENT IS NOT INCLUDED THE DRAWINGS OR POWER SYSTEM STUDY, THE AIC/ SCCR SHALL MATCH OR EXCEED THE SOURCE PANEL'S AIC RATING.
- B. FRACTIONAL HORSEPOWER MANUAL CONTROLLERS: MOTOR-RATED TOGGLE SWITCH WITH THERMAL OVERLOAD.
- C. COMBINATION MOTOR STARTER: HEAVY-DUTY DISCONNECT, FVNR ACROSS-THE-LINE START, CLASS 30 SOLID STATE OVERLOAD RELAY WITH ADJUSTABLE SETTINGS, NO & NC AUX CONTACTS, HOA SWITCH, INTEGRAL CONTROL TRANSFORMER AND RED RUN LIGHT.
1. EXTERNALLY OPERABLE HANDLE WITH MEANS FOR LOCKING IN THE OPEN POSITION.
- D. VARIABLE FREQUENCY DRIVES (VFD): PULSE-WIDTH-MODULATED INVERTER, OVERCURRENT, AND OVERLOAD PROTECTION. ARRANGED TO PROVIDE SELF-PROTECTION, PROTECTION, AND VARIABLE-SPEED CONTROL OF CONTROLLED MOTORS.
1. 6-PULSE
 2. OVERLOAD CAPABILITY: 1.1 TIMES BASE LOAD CURRENT FOR 60 SECONDS, MINIMUM OF 1.8 TIMES BASE LOAD CURRENT FOR 3 SECONDS.
 3. EXTERNALLY OPERABLE HANDLE WITH MEANS FOR LOCKING IN THE OPEN POSITION.
4. FACTORY-INSTALLED HARDWARE AND SOFTWARE SHALL INTERFACE WITH BUILDING AUTOMATION SYSTEM FOR HVAC TO MONITOR, CONTROL, DISPLAY, AND RECORD DATA FOR USE IN PROCESSING REPORTS. VFD SETTINGS SHALL BE RETAINED WITHIN VFD'S NONVOLATILE MEMORY
5. SPECIAL WARRANTY PERIOD: FIVE YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
6. ACCEPTABLE MANUFACTURERS:
- a. FOR VFD'S PROVIDED WITH EQUIPMENT: AS RECOMMENDED BY MOTOREQUIPMENT MANUFACTURER.
 - b. FOR VFD'S PROVIDED SEPARATELY FROM EQUIPMENT: ABB, DANFOSS, ROCKWELL AUTOMATION, SIEMENS, SCHNEIDER ELECTRIC, YASKAWA, MITSUBISHI ELECTRIC, OR TOSHIBA.
- PART 3 EXECUTION
- 3.01 INSTALLATION
- A. MAINTAIN ALL NFPA 70 ELECTRICAL CLEARANCES.
- B. PROVIDE NEMA RATED ENCLOSURE SUITABLE FOR THE LOCATION INSTALLED.
- C. SELECT AND SET OVERLOADS ON THE BASIS OF FULL-LOAD CURRENT RATING AS SHOWN ON MOTOR NAMEPLATE.
- D. ADJUST CRITICAL FREQUENCY REJECTION DEADBANDS TO AVOID CRITICAL RESONANCE FREQUENCIES COORDINATED WITH INSTALLED FIELD CONDITIONS.
- E. CIRCUIT CONDUCTORS INSTALLED ON LINE-SIDE OF A VFD SHALL HAVE A MINIMUM AMPACITY OF 125% OF THE VFD'S NAMEPLATE INPUT CURRENT RATING.
- F. FOR DISCONNECTS LOCATED ON LOAD SIDE OF VFD: PROVIDE AUXILIARY CONTACTS IN DISCONNECT WITH TWISTED PAIR CONNECTING VFD AND DISCONNECT TO NOTIFY VFD TO SHUT-DOWN WHEN THE DISCONNECT IS IN OPEN POSITION.
- END OF SECTION 26 29 13

PLANT
ENGINEERING CONSULTANTS

320 WEST FILLMORE STREET
COLORADO SPRINGS CO 80907
719.473.7077

SEAL

MINNEQUA PARK APARTMENTS
BOILER REPLACEMENT

1400 E. ORMAN AVE., PUEBLO, CO 81004

REVISIONS	MARK	DATE	COMMENT
	A	12/12/2025	15% ISSUANCE
	B	01/20/2026	100% CD ISSUANCE
	C	07/09/2026	ADDENDUM #1

ELECTRICAL
NOTES AND
SPECIFICATIONS

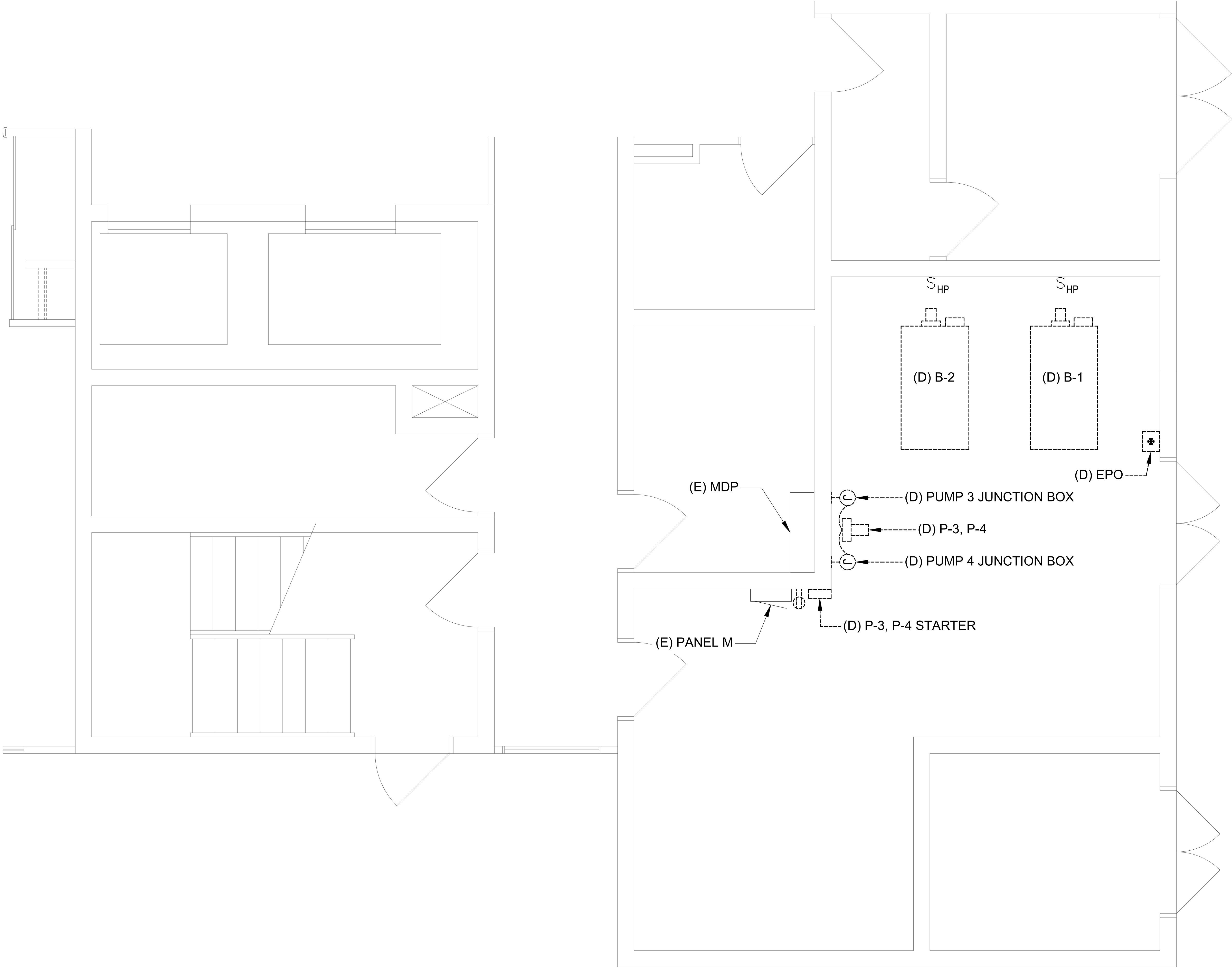
© COPYRIGHT 2025. ALL DRAWING & WRITTEN INFORMATION APPEARING HEREIN SHALL NOT BE DUPLICATED, DISCLOSED OR OTHERWISE USED WITHOUT WRITTEN CONSENT OF PLANT ENGINEERING CONSULTANTS.

PROJECT	25087
DATE	07/09/2026
DRAWN	JAG
CHECKED	MRL

SHEET

E002

7/7/2026 2:46:59 PM David Easter
C:\projects\2025\25087 minnequa boiler\4 minnequa boiler\4.3 subarea\4.3.4 electrical\25087_eet121.dwg

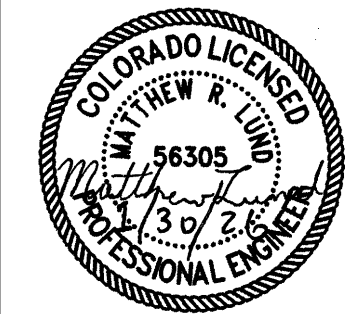


ELECTRICAL FIRST FLOOR POWER DEMOLITION PLAN

SCALE: 1/2" = 1'-0"

GENERAL NOTES

- REFER TO SHEET E001 FOR THE SYMBOLS LEGEND AND GENERAL DEMOLITION NOTES.
- NOT ALL EXISTING CONDITIONS ARE SHOWN FOR CLARITY. EXISTING CONDITIONS ARE BASED ON CASUAL FIELD OBSERVATIONS AND PREVIOUS DESIGN AND RECORD DRAWINGS.
- PROVIDE APPROPRIATE PROTECTION FOR ALL EXISTING-TO-REMAIN EQUIPMENT AND DEVICES.



MINNEQUA PARK APARTMENTS BOILER REPLACEMENT

1400 E. ORMAN AVE., PUEBLO, CO 81004

REVISIONS	MARK	DATE	COMMENT
	A	12/12/2025	75% ISSUANCE
	B	01/30/2026	100% CD ISSUANCE
	C	07/09/2026	ADDENDUM #1

SHEET TITLE
**ELECTRICAL
FIRST FLOOR
POWER
DEMOLITION
PLAN**

© COPYRIGHT 2025 ALL DRAWN & WRITTEN INFORMATION APPEARING HEREIN SHALL NOT BE DUPLICATED, DISCLOSED OR OTHERWISE USED WITHOUT WRITTEN CONSENT OF PLANT ENGINEERING CONSULTANTS.

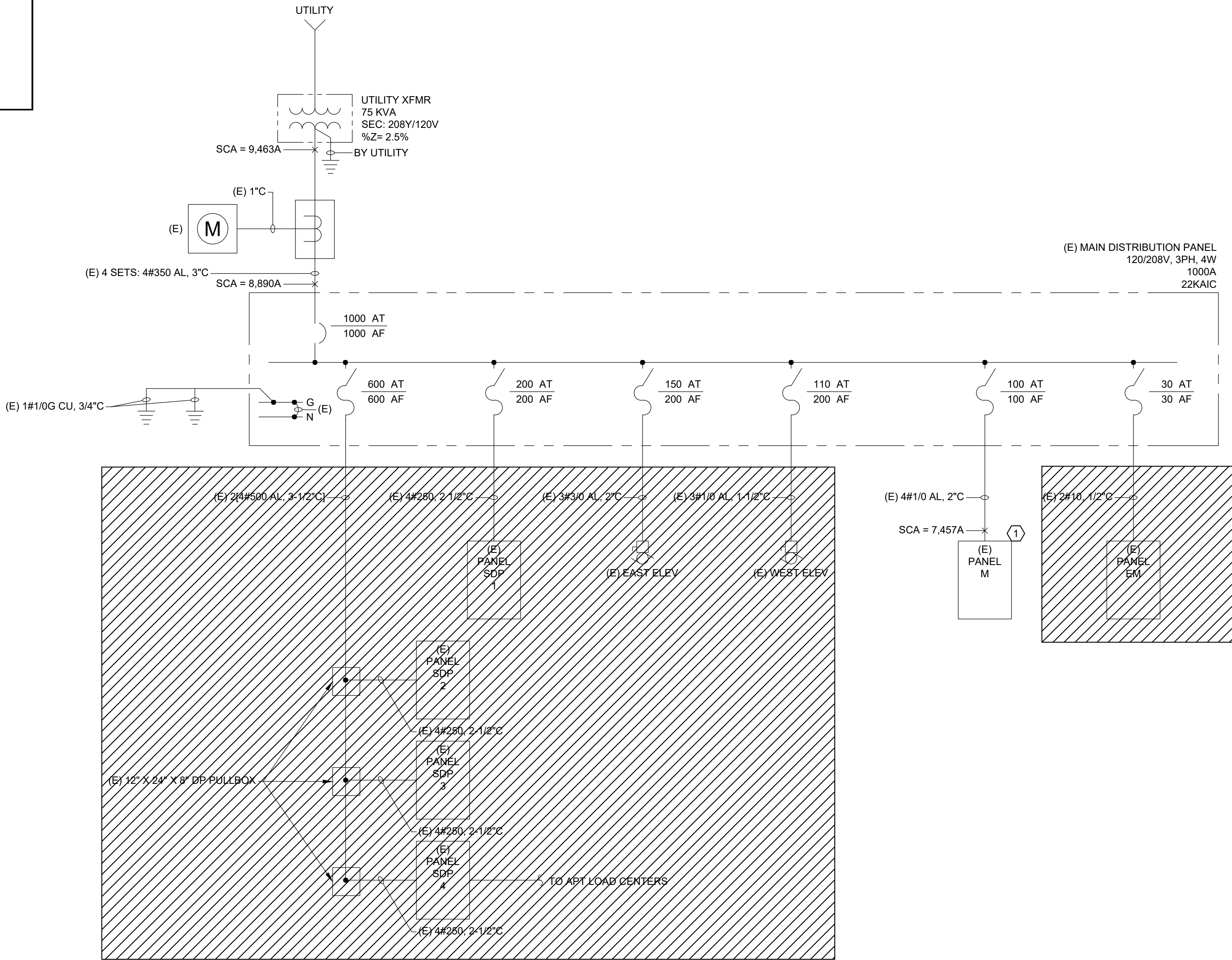
PROJECT	25087
DATE	07/09/2026
DRAWN	JAG
CHECKED	MRL

SHEET
ED121

EXISTING PANELBOARD M																		
PROJECT: MINNEQUA BOILER REPLACEMENT					120/	208 V, 3 PHASE, 4 WIRE					GENERAL NOTES: A. BOLD TEXT INDICATES NEW WORK B. C.							
PROJECT NO: 25087						100 A BUS												
BY: JON GOMEZ, PE						100 A MLO												
FILE NAME: Panel M.xlsx						10000 AIC RATING												
						SURFACE MOUNTING												
CCT	BRKR	DESCRIPTION			LTG	RCPT	MTR	OTHR	APPL	PH	APPL	OTHR	MTR	RCPT	LTG	DESCRIPTION	BRKR	CCT
1	30/	AC					1945			A			901			(N) HWP-3	15/	2
3							1945			B			901			(SEE NOTES 2&3)		4
5	3						1945			C			901			--	3	6
7	20/1	BOILER ROOM LIGHTS			180					A						BOILER ROOM LIGHTS	20/1	8
9	20/1	AIR HANDLER #1					1656			B				180		RECPT. (SEE NOTE #2)	20/1	10
11	15/	(N) HWP-4					0			A			232			PUMP #5	20/1	12
13		(SEE NOTES 1&3)					0			B			0			(N) BOILER #2 (SEE NOTES 2&3)	20/1	14
15	3						0			C			1860			(N) BOILER #1 (SEE NOTES 2&3)	20/1	16
17	20/1	BT4 METER						500		B	500					(N) BOILER CONTROLS (SEE NOTE 2)	20/1	18
19	15/1	(N) UNIT HEATER #1					200			A			840			PUMP #1 & PUMP #2	20/1	20
21		SPACE								B			1200			RUNAWAY WATER LEAKER	20/1	22
23		SPACE								C	720					PUMP SEQUENCER	20/1	24
25		SPACE								A						SPACE		26
27		SPACE								B						SPACE		28
29		SPACE								C						SPACE		30
LOAD SUMMARY																		
LOAD TYPE:		PH A	PH B	PH C	TOTALS				DMD FACT	DMD KVA								
LIGHTING		0.18	0.00	0.00	0.18	KVA	ALL		0.18	1.25	0.23							
RECEPTACLES		0.00	0.18	0.00	0.18	KVA	1ST 10KVA REMAINING		0.18 0.00	1.00 0.50	0.18 0.00							
MOTORS		3.89	7.56	3.07	14.52	KVA	LARGEST REMAINING		5.84 1.00	1.25 1.00	7.30 8.69							
OTHER		0.00	0.00	0.50	0.50	KVA	ALL		0.50	1.25	0.63							
APPLIANCE		0.00	0.00	1.22	1.22	KVA	ALL		1.22	1.00	1.22							
TOTALS		4.07	7.74	4.79	16.60	KVA					18.23							
MINIMUM PANELBOARD AMPACITY:											50.61							

25087 LOAD JUSTIFICATION SUMMARY

EXISTING MDP CAPACITY, AMPS	1000.00 AMPS
EXISTING MDP CAPACITY, KVA	360.00 KVA
EXISTING UTILITY XFMR CAPACITY, KVA	75.00 KVA
AT 125% OVERDRIVE	93.75 KVA
PEAK DEMAND OBTAINED FROM UTILITY (10/14/2025)	49.60 KW
EST. 0.9 POWER FACTOR	55.11 KVA
+ 25% PER NEC 220.87	68.89 KVA
REMOVED ELECTRICAL LOADS	
MECHANICAL EQUIPMENT LOADS	6.36 KVA
TOTAL REMOVED ELECTRICAL LOAD	6.36 KVA
CAPACITY AVAILABLE FOR ADDITIONAL LOAD	31.22 KVA
ADDED ELECTRICAL LOADS	
MECHANICAL LOADS	10.16 KVA
TOTAL PROPOSED/ADDED ELECTRICAL LOAD	10.16 KVA
CAPACITY AVAILABLE AFTER PROJECT, KVA	21.06 KVA
CAPACITY AVAILABLE AFTER PROJECT, AMPS	58.46 AMPS



ELECTRICAL ONE-LINE DIAGRAM

NOT TO SCALE

GENERAL SHEET NOTES

- A. REFER TO THE SYMBOLS LEGENDS AND GENERAL ELECTRICAL PROJECT NOTES ON SHEET E001.
- B. NOT ALL EXISTING CONDITIONS ARE SHOWN FOR CLARITY. EXISTING CONDITIONS ARE BASED ON CASUAL FIELD OBSERVATIONS AND PREVIOUS DESIGN AND RECORD DRAWINGS.
- C. HATCHING INDICATES DISTRIBUTION NOT AFFECTED BY PROJECT SCOPE.
- D. THE ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING WHERE REQUIRED AND/OR WHERE DIRECTED.
- E. ALL CONDUCTORS, BUSSING, AND TRANSFORMER WINDINGS SHALL BE COPPER UNLESS NOTED OR APPROVED OTHERWISE.
- F. NEW OVERCURRENT PROTECTION DEVICES INSTALLED IN EXISTING EQUIPMENT SHALL MATCH EXISTING EQUIPMENT MANUFACTURER AND SHALL BE CERTIFIED BY THE MANUFACTURER FOR USE IN THE EXISTING EQUIPMENT. NEW OVERCURRENT PROTECTION DEVICES SHALL MATCH OR EXCEED THE MINIMUM AIC RATING OF EXISTING EQUIPMENT.

KEYED NOTES

- ① SEE MECHANICAL EQUIPMENT SERVICE SCHEDULE ON SHEET E121 FOR BRANCH CIRCUIT CONDUCTOR AND CONDUIT SIZES.

MINNEQUA PARK APARTMENTS BOILER REPLACEMENT

1400 E. ORMAN AVE, PUEBLO, CO 81004

REVISIONS	MARK	DATE	COMMENT
1	Δ	12/12/2025	75% ISSUANCE
2	Δ	01/20/2026	100% CD ISSUANCE
3	Δ	07/09/2026	ADDENDUM #1

SHEET TITLE

ELECTRICAL ONE-LINE DIAGRAM

© COPYRIGHT 2025. ALL DRAWN & WRITTEN INFORMATION APPEARING HEREIN SHALL NOT BE DUPLICATED, DISCLOSED OR OTHERWISE USED WITHOUT WRITTEN CONSENT OF PLANT ENGINEERING CONSULTANTS.

PROJECT	25087
DATE	07/09/2026
DRAWN	JAG
CHECKED	MRL

SHEET

E600



PLANT
ENGINEERING CONSULTANTS
320 WEST FILLMORE STREET
COLORADO SPRINGS CO 80907
719.473.7077
www.planted.com