PLUMBING SPECIFICATIONS

THIS SHEET SPECIFICATION SHALL GOVERN IN LIEU OF SEPARATE BOUND SPECIFICATIONS. UPON ISSUANCE SHOULD CONFLICTS ARISE BETWEEN THE SHEET AND THE BOUND SPECIFICATION THEN THE MORE STRINGENT OF THE TWO SHALL PREVAIL.

1. BASIC REQUIREMENTS

   A. PLUMBING PLANS MAY INCLUDE SCOPE INFORMATION FOR OTHER TRADES. GENERAL CONTRACTOR TO FACILITATE COORDINATION OF PERTINENT INFO TO ALL REQUIRED CONTRACTORS. CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES PRIOR TO BID TO CONFIRM A COMPLETE SYSTEM IS INCLUDED.

   B. PLUMBING DESIGN SHALL CONFORM TO ADOPTED CODES AND ALL LOCAL AMENDMENTS. PROJECT SHALL BE COORDINATED WITH ALL BUILDING SERVICES AND SHALL INCLUDE ALL ITEMS NECESSARY FOR COMPLETE AND FULLY OPERATIONAL PLUMBING SYSTEMS. MAKE CONNECTIONS TO AND EXTEND SYSTEMS INSTALLED BY OTHERS AND/OR FURNISHED BY OTHERS. PROVIDE ACCESSORIES AND INCIDENTAL ITEMS AS REQUIRED FOR A COMPLETE AND FULLY OPERATIONAL SYSTEM WHETHER OR NOT SPECIFICALLY SPECIFIED AND/OR SHOWN ON THE PLANS.

   C. DO NOT SCALE FROM THESE DRAWINGS. REFER TO ARCHITECTURAL, STRUCTURAL OR CIVIL DRAWINGS BY OTHER DESIGN PROFESSIONALS FOR DIMENSIONS AND FOR ESTIMATING DISTANCES. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS RELATING TO THE JOB WHETHER OR NOT INDICATED ON THESE DRAWINGS.

   D. ANY SCALE, DIMENSION OR QUANTITIES SHOWN ON THE DRAWINGS ARE FOR ENGINEERING CALCULATION PURPOSES ONLY. DESIGN IS DIAGRAMMATIC IN NATURE AND IS PROVIDED TO CONVEY DESIGN INTENT ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE SITE CONDITIONS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ESTIMATING AND DETERMINING ALL DISTANCES AND QUANTITIES RELATED TO THE PROJECT. REFER TO ALL DRAWINGS BY OTHERS AND VERIFY EXISTING CONDITIONS ON SITE PRIOR TO BID FOR ALL ESTIMATING PURPOSES.

   E. COORDINATE WITH OTHER TRADES FOR A COORDINATED INSTALLATION WITHIN THE AVAILABLE SPACE. WHERE CROWDED CONDITIONS EXIST, PREPARE COORDINATION DRAWINGS SHOWING ALL TRADE CONFLICTS AND SUBMIT TO ARCHITECT/ENGINEER FOR APPROVAL AND DIRECTION PRIOR TO ROUGH-IN AND/OR INSTALLATION. RELOCATION OF WORK MADE PRIOR TO ROUGH-IN SHALL BE DONE AT NO ADDITIONAL COST. PROVIDE OFFSETS AT CHANGES OF DIRECTION AND TO AVOID OBSTRUCTIONS AT NO ADDITIONAL COST TO OWNER.

   F. ALL WORK SHALL BE PERFORMED BY PROPERLY LICENSED CONTRACTORS OR UNDER THEIR DIRECT SUPERVISION. ALL MATERIALS AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF THE APPLICABLE STANDARDS OF UL, ASTM, CISPI, ETC. AND SHALL BEAR THE LABEL AS EVIDENCE THAT THE MATERIAL AND/OR EQUIPMENT MEETS THIS REQUIREMENT.

   G. CONFIRM ACTUAL VOLTAGES, PHASE AND CHARACTERISTICS OF EQUIPMENT, FIXTURES AND APPARATUS FURNISHED BY CONTRACTOR, OTHER TRADES, DIVISIONS AND/OR EXISTING. CONFIRM PRIOR TO ROUGH-IN. IF DISCREPANCIES ARE NOTED TO THE INSTRUCTIONS OF THESE PLANS AND SPECIFICATIONS, SUBMIT THE NOTED DISCREPANCIES TO THE ARCHITECT/ENGINEER FOR DIRECTION PRIOR TO PROCEEDING.

   H. INSTALL ALL EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS, RECOMMENDATIONS AND DETAILS UNLESS OTHERWISE NOTED IN THESE PLANS. IF DISCREPANCIES EXIST CONTACT THE ARCHITECT/ENGINEER PRIOR TO ORDERING EQUIPMENT AND ROUGH-IN.

   I. CONTRACTOR TO ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO PERFORM STARTUP SERVICES ON ALL EQUIPMENT AND PROVIDE ALL NECESSARY ADJUSTMENTS FOR PROPER OPERATION.

   J. SUBMIT MANUFACTURER'S LITERATURE (SHOP DRAWINGS) FOR MATERIALS AND EQUIPMENT. SUBMITTAL SHALL INCLUDE EQUIPMENT PERFORMANCE DATA AT ELEVATION AND/OR LOCAL CONDITIONS. EQUIPMENT CUTSHEETS OR CATALOG COPIES ARE NOT ACCEPTABLE. SUBMITTAL SHALL BEAR THE APPROVAL OF THE GENERAL CONTRACTOR FOR COMPLIANCE WITH COORDINATION AND THESE SPECIFICATIONS PRIOR TO SUBMITTAL TO ARCHITECT AND/OR THEIR AGENCIES. ANY SUBSTITUTED EQUIPMENT FROM SCHEDULED SHALL BE EQUAL TO THAT SCHEDULED IN CONTROLS, ACCESSORIES, AND PERFORMANCE REGARDLESS OF MANUFACTURER. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COSTS ASSOCIATED WITH THE SUBSTITUTED EQUIPMENT REALIZED BY OTHER CONTRACTORS OR THE DESIGN TEAM.

   K. AT TIME OF BID THE CONTRACTORS SHALL ENSURE THE SITE TO BUILDING UTILITY CONNECTIONS ARE INCLUDED. CONTRACTORS TO COORDINATE INVERT AND SIZING OF ALL PLUMBING LEAVING OR ENTERING THE BUILDING. CONTRACTORS SHALL CONTACT DESIGN TEAM DURING THE BID PROCESS IF THERE IS A DISCREPANCY BETWEEN THE CIVIL DOCUMENTS AND THE PLUMBING DOCUMENTS. COORDINATE WITH SITE CONTRACTOR TO BRING ALL UNDERGROUND PLUMBING TO A MINIMUM OF 5' OFF OF BUILDING FOUNDATION UNLESS NOTED OTHERWISE.

   L. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ALL NEW EQUIPMENT, FIXTURES AND DEVICES IN A LIKE NEW STATE AT TIME OF PROJECT CLOSEOUT. PROTECT EQUIPMENT, FIXTURES AND DEVICES AS REQUIRED AGAINST PHYSICAL DAMAGE, DEBRIS, RAIN, SNOW, WIND, DIRT, SUN FADING, RUST, CORROSION OR ANY OTHER DEGRADATION. CONTRACTOR TO REPAIR OR REPLACE ANY EQUIPMENT OR DEVICES AS REQUIRED.

2. BASIC MATERIALS

   A. PROVIDE PLUMBING SYSTEM CONTROLS, CONTROLLERS, CONTROL TRANSFORMER, DISCONNECTS, STARTERS, CONTROL WIRING, ASSOCIATED CONTROL POWER WIRING, AND ALL WORK NECESSARY FOR A COMPLETE AND OPERATIONAL PLUMBING SYSTEM. CONTRACTOR IS REQUIRED TO COORDINATE WITH OTHER TRADES OR RETAIN SUB-CONTRACTORS AS REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM PRIOR TO BID.

   B. PROVIDE SUPPLEMENTAL STEEL AND SUPPORTS AS REQUIRED FOR INSTALLATION OF PLUMBING MATERIALS, EQUIPMENT, AND APPARATUS.

   C. PROVIDE VIBRATION ISOLATION AND FLEXIBLE CONNECTIONS ON ALL EQUIPMENT WITH ROTATING OR OSCILLATING COMPONENTS AND PUMPS OVER 1 HORSEPOWER.

   D. ALL WORK IN FINISHED AREAS SHALL BE CONCEALED UNLESS SPECIFICALLY NOTED AS EXPOSED ON THE PLANS. PRIOR TO THE INSTALLATION OF ANY EXPOSED WORK THE CONTRACTOR SHALL VERIFY AND OBTAIN ARCHITECTURAL APPROVAL OF LOCATION, ELEVATION, EXTENT, MATERIAL, AND FINISH.

   E. UNLESS NOTED ELSEWHERE ON PLAN, PROVIDE ASSE 1003 PRESSURE REDUCING VALVE ASSEMBLY AT BUILDING WATER SERVICE ENTRY. OUTLET PRESSURE TO BE SET TO MAINTAIN A MAXIMUM STATIC PRESSURE OF 80 PSI AT ANY FIXTURE.

   F. PROVIDE DRAINAGE SYSTEM CLEANOUTS AS REQUIRED BY LOCAL CODES.

   G. PROVIDE QUARTER TURN BRANCH AND ZONE SHUT-OFF VALVES ON ALL WATER LINES EXTENDING FROM MAINS.

   H. THE CONTRACTOR SHALL LOCATE AND FURNISH FOR INSTALLATION BY OTHERS, ALL ACCESS PANELS AS REQUIRED FOR ACCESS TO VALVES, ACTUATORS, MOTORS, DEVICES, ETC AND THE PROPER SERVICING OF EQUIPMENT INSTALLED UNDER THIS CONTRACT. AT TIME OF BID THE CONTRACTOR AND GC SHALL COORDINATE TO ENSURE THAT ALL ACCESS PANELS (INCLUDING FIRE AND/OR SMOKE RATED MODELS) ARE INCLUDED.

   I. PROVIDE SEISMIC AND/OR WIND LOADING SECUREMENT DETAILS AS REQUIRED BY THE LOCAL JURISDICTION. THE CONTRACTOR SHALL COORDINATE WITH THE EQUIPMENT SUPPLIER(S) TO OBTAIN THE DRAWINGS AND INSTALL THE SYSTEM AS REQUIRED BY THE MANUFACTURER. CONTRACTOR TO SELECT ATTACHMENT AND MOUNTING SYSTEM(S) BASED ON ATTACHING TO THE DESIGNED SUBSTRATE AND STRUCTURE WITHOUT REQUIRING ADDITIONAL REINFORCEMENT BY OTHERS. IF ANY SUBSTRATE AND/OR STRUCTURE IS REQUIRED FOR PROPER REINFORCEMENT, CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR FOR ALL POTENTIAL REQUIREMENTS PRIOR TO BID.

   J. FIRE STOP ALL PIPING AND WIRING MATERIALS PASSING THROUGH RATED STRUCTURES OR ASSEMBLIES USING U.L. LISTED PRODUCTS FOR ALL APPLICABLE PENETRATIONS IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.

   K. FIELD LABEL ALL PLUMBING EQUIPMENT AND PIPING AS INDICATED ON THE PLANS PER PLUMBING AND LOCAL CODE REQUIREMENTS. INDICATE DIRECTION OF FLOW ON PIPING.

   L. TAG ALL ZONE VALVES WITH CONSECUTIVE NUMBERING ON PERMANENT HARD PLASTIC OR METAL TAB AND PROVIDE SCHEDULE LISTING ITEMS, AREA SERVED, SIZE AND VALVE TYPE. SUBMIT FINAL VALVE SCHEDULE FOR REVIEW.

   M. ALL PROVIDED MATERIALS LOCATED IN A RETURN AIR PLENUM SHALL HAVE A FLAME SPREAD OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS AS DETERMINED BY AN INDEPENDENT TESTING LAB. CONTRACTOR SHALL COORDINATE AT TIME OF BID WITH OTHER TRADES.

   N. DOMESTIC WATER CIRCULATION SYSTEMS WITH MANUAL FLOW CONTROL VALVES AND ALL RECIRCULATING PUMPS SHALL BE VERIFIED AND / OR BALANCED TO MEET DESIGN CRITERIA. BALANCING AND VERIFICATION SHALL BE BY AN INDEPENDENT THIRD PARTY CERTIFIED BALANCER. CONTRACTOR'S ARE RESPONSIBLE TO COORDINATE WITH THE BALANCING CONTRACTOR TO PROVIDE FLOW MONITORING STATIONS AND ACCESS PORTS AS REQUIRED FOR PROPER BALANCING AND SYSTEM VERIFICATION. BALANCING NOT REQUIRED IN RESIDENTIAL UNITS WITH INDIVIDUAL DEDICATED RECIRCULATION SYSTEMS.

3. DOMESTIC WATER FLOW CONTROL VALVES

   A. FURNISH AND INSTALL AN ASSE 1013, NSF 61, REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER WITH DISCHARGE FUNNEL FOR THE PRIMARY DOMESTIC WATER SERVICE IN ACCORDANCE WITH STATE, LOCAL, AND JURISDICTIONAL WATER DISTRICT REQUIREMENTS. CONTRACTOR TO COORDINATE WITH WATER DISTRICT FOR METER AND WATER ENTRY REQUIREMENTS. CONTRACTOR SHALL PROVIDE FLOOR SINK(S) SUTIABLE FOR DISCHARGE FUNNEL AND PIPING TO ACCEPT DEVICE FAILURE EMERGENCY FLOW RATE AS PROVIDED BY MANUFACTURER.

   B. UNLESS NOTED ELSEWHERE ON PLAN, CONTRACTOR TO PROVIDE AN ASSE 1003 NSF 61 PRESSURE REDUCING VALVE ON DOMESTIC WATER SERVICE ENTRY. CONTRACTOR TO ADJUST VALVE TO MAINTAIN A MAXIMUM OF 80 PSI AT ANY FIXTURE.

   C. FURNISH AND INSTALL AN ASSE 1013, NSF 61, REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER FOR ALL DOMESTIC WATER DIRECT CONNECTIONS TO MECHANICAL EQUIPMENT, POOL / SPA / FOUNTAINS, IRRIGATION, OR SIMILAR NON-POTABLE APPLICATIONS. PROVIDE DISCHARGE FUNNEL AND PIPING ROUTED TO APPROVED RECEPTOR WITH AIR GAP DISCHARGE.

4. PIPING

   A. PIPE MATERIALS SHALL BE PROVIDED PER THE SYSTEM TYPE. MAXIMUM OPERATING TEMPERATURE AND PRESSURE OF THE SYSTEM, AND SIZE UNLESS NOTED OTHERWISE. PIPE AND FITTINGS SHALL BE MANUFACTURED AS A SYSTEM AND BE THE PRODUCT OF ONE MANUFACTURER. ALL PIPE AND FITTINGS SHALL BE MANUFACTURED IN THE UNITED STATES. INSTALLATION SHALL COMPLY WITH THE LATEST INSTALLATION INSTRUCTIONS PUBLISHED BY MANUFACTURER AND SHALL CONFORM TO ALL APPLICABLE PLUMBING, BUILDING, AND FIRE CODE REQUIREMENTS. SYSTEMS SHALL BE HYDROSTATICALLY TESTED AFTER INSTALLATION. THE SYSTEM SHALL BE PROTECTED FROM CHEMICAL AGENTS, FIRE STOPPING MATERIALS, THREAD SEALANT, PLASTICIZED VINYL PRODUCTS, OR OTHER AGGRESSIVE CHEMICAL AGENTS NOT COMPATIBLE WITH PVC COMPOUNDS.

   B. PROVIDE EXPANSION LOOPS, SWING JOINTS, OR MECHANICAL EXPANSION COMPENSATING DEVICES AS REQUIRED TO ACCOUNT FOR THERMAL EXPANSION OF ALL PIPING SYSTEMS. EXPANSION SYSTEM SIZING SHALL BE IN ACCORDANCE WITH MATERIALS DATA SHEETS AND MANUFACTURER RECOMMENDATIONS.

   C. ANY PIPING SYSTEM LOCATED IN A RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NO MORE THAN 25 AND A SMOKE-DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E 84.

   D. FIRE STOP ALL PIPING MATERIALS PASSING THROUGH FIRE RATED STRUCTURES OR FIRE RATED ASSEMBLIES IN ACCORDANCE WITH THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION. USE CURRENTLY LISTED U.L. CLASSIFIED PRODUCTS, TESTED BY ASTM E814. USE FOR ALL APPLICABLE PIPE PENETRATIONS THROUGH FIRE RATED FLOORS, WALLS, OR FLOOR CEILING ASSEMBLIES IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.

   E. PRESSURE PIPING

      a. DOMESTIC WATER PIPING (WATER ENTRY, MECH ROOMS, MAINS, DISTRIBUTION) ABOVE/BELOW GRADE: ABOVE GRADE COPPER SHALL BE ASTM B 88, TYPE L COPPER WITH WROUGHT OR FORGED FITTINGS AND LEAD FREE SOLDERED OR MECHANICALLY PRESSED-CONNECTED JOINT PRO PRESS OR EQUAL. BELOW GRADE WATER PIPING SHALL BE TYPE K COPPER WITH SILVER SOLDERED JOINTS.

5. INSULATION

   A. PIPING INSULATION TO BE INSTALLED AS PER BELOW. WHEN CONFLICTING INSULATION REQUIREMENTS ARE LISTED, THE MORE STRINGENT SHALL BE USED.

   B. INSULATION SHALL BE INSTALLED PER IECC SECTION & TABLE C403 MINIMUM PIPE INSULATION THICKNESS AND TABLE C404 PIPING VOLUME AND MAXIMUM PIPING LENGTHS. HOT & RETURN WATER PIPING (105°-140°) 1-1/4" AND SMALLER SHALL HAVE 1" FIBER GLASS INSULATION WITH AN ALL-SERVICE JACKET, 1-1/2" AND LARGER SHALL HAVE 1-1/2" FIBER GLASS INSULATION WITH AN ALL-SERVICE JACKET (K-VALUE OF 0.21-0.28). 141°-200° 1 1/4" AND SMALLER SHALL HAVE 1 1/2" FIBER GLASS INSULATION WITH AN ALL-SERVICE JACKET, 1-1/2" AND LARGER SHALL HAVE 2" FIBER GLASS INSULATION WITH AN ALL-SERVICE JACKET (K-VALUES OF 0.25-0.29). EXCEPTION: PIPING SURROUNDED BY BUILDING INSULATION WITH A THERMAL RESISTANCE OF NOT LESS THAN R-3.

   C. IN COLD ENVIRONMENTS (99% WINTER DESIGN DB <34F):

      a. HORIZONTAL SANITARY AND STORM PIPING EXPOSED TO OUTDOOR TYPE AMBIENT CONDITIONS INCLUDING COVERED PARKING AND CRAWL SPACES SHALL BE HEAT-TRACED AND INSULATED WITH 1-INCH FIBERGLASS INSULATION.

      b. VERTICAL SANITARY AND STORM PIPING EXPOSED TO OUTDOOR TYPE AMBIENT CONDITIONS INCLUDING EXTERIOR WALLS, COVERED PARKING AND CRAWL SPACES SHALL BE INSULATED WITH 1-INCH FIBERGLASS INSULATION.

      c. DOMESTIC COLD & HOT WATER PIPING EXPOSED TO OUTDOOR TYPE AMBIENT CONDITIONS INCLUDING ATTICS, COVERED PARKING AND CRAWL SPACES SHALL BE HEAT-TRACED AND INSULATED WITH MINIMUM 2-INCH FIBERGLASS INSULATION.

      d. PROVIDE MINIMUM 1-INCH THICK INSULATION ON DOMESTIC WATER LINES IN AN EXTERIOR WALL, CEILING, OR FLOOR THAT IS ADJACENT TO AN UNCONDITIONED SPACE.

6. WATER SOURCE DOMESTIC WATER HEAT EXCHANGER

   A. HEAT EXCHANGER SKID

      a. MANUFACTURER SHALL FURNISH A HEAT EXCHANGER MODULE FOR CONNECTING THE AEGIS UNIT TO THE TANKS IN A PRIMARY / SECONDARY LOOP CONFIGURATION.

      b. THE HEAT EXCHANGER MODULE IS A PART OF THE OVERALL WATER HEATING PACKAGE AND SHALL BE MANUFACTURED BY THE PROVIDER OF THE HEAT PUMP SYSTEM COMPLETE ON A SKID AS A SINGLE COMPONENT.

      c. SKID SHALL BE DESIGNED FOR INDOOR MOUNTING.

      d. ALL COMPONENTS NECESSARY TO OPERATE THE HEAT PUMP IN CONJUNCTION WITH THE PRIMARY AND SECONDARY LOOP SHALL BE INCLUDED ON THE SKID.

      e. SINGLE POINT OF ELECTRICAL CONNECTION FOR A 120V 15A DEDICATED CIRCUIT SHALL BE PROVIDED ON THE HEAT EXCHANGER SKID. IN ADDITION, CONNECTIONS TO THE HEAT PUMP SHALL BE PROVIDED FOR A 0-10V MODULATION SIGNAL AND PUMP/VALVE ACTIVATION.

7. CIRCULATING PUMP

   A. FURNISH AND INSTALL A NSF RATED DOMESTIC WATER RETURN CIRCULATOR AS SCHEDULED ON THE PLANS. PROVIDE RETURN LINE AQUASTAT AND WIRE COMPLETE TO CYCLE CIRCULATOR TO PROVIDE 120 OR 140 DEGREES RETURN WATER TEMPERATURE (ADJUSTABLE).

CODE & DESIGN CRITERIA

JURSIDICTION	BOULDER, COLORADO
PROJECT ALTITUDE	5430 FT
CODES	TITLE 10, BOULDER REVISED CODE (2024 INTERNATIONAL PLUMBING CODE), 2024 CITY OF BOULDER ENERGY CONSERVATION CODE
UTILITY WATER PRESSURE	PSI STATIC AND/OR RESIDUAL
GAS METER OUTLET	N/A
PEAK RAINFALL RATE	N/A
S-O-I DISCHARGE	N/A
ELEVATOR PUMP REQUIRED	N/A
ELEVATOR PUMP DISCHARGE	N/A
CONDENSATE DISCHARGE	N/A
FULLY SPRINKLERED	YES
NUMBER OF FLOORS	5

PLUMBING SHEET LIST

NUMBER	TITLE
P001	PLUMBING SPECIFICATIONS
P002	PLUMBING LEGENDS
P003	PLUMBING SCHEDULES
P111	ENLARGED MECHANICAL ROOMPLAN - PLUMBING DEMO
P211	ENLARGED MECHANICAL ROOM PLAN - PLUMBING
P600	DOMESTIC WATER PIPING SCHEMATIC
P700	PLUMBING DETAILS

SHEET TOTAL: 7

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BUILDING AMERICA - WALNUT PLACE APTS

1940 WALNUT ST.
BOULDER, CO 80304

#	DESCRIPTION	DATE
	PERMIT	05.28.2026

Project Number 24007
Date 05.28.2026

A/E STAMP

05/28/2026

SHEET TITLE
PLUMBING SPECIFICATIONS

SHEET NUMBER
P001

PIPING SYSTEMS

—·—DCW—	DOMESTIC COLD WATER
——DCWR—	DOMESTIC COLD WATER RETURN
—·—XXX"—	DOMESTIC HOT WATER
- - - -XXX"R-	DOMESTIC HOT WATER RETURN
——CND——	CONDENSATE
——F——	FIRE SUPRESSION
——G——	NATURAL/PROPANE GAS
——GW——	GREASE WASTE
——IRR——	IRRIGATION
——SO——	SAND OIL
——SS——	SANITARY
——ST——	STORM
——STO——	STORM OVERFLOW
— —V— —	VENT

SHEET DESIGNATIONS

	ABOVE OR BELOW
	CLEARANCE
	CONTROL OR INTERLOCK
	DEMOLISH
	EXISTING
	FUTURE
	MATCHLINE
	NEW
	TEMPORARY
TAG-#	MEP EQUIPMENT/FIXTURE TAG
	NUMBER ON SHEET / SHEET NUMBER
#	EQUIPMENT COORDINATION TAG
#	KEY NOTE(S)
#	DETAIL NOTE(S)
	POINT OF CONNECTION (POC)
	POINT OF DISCONNECT (POD)

VALVES & FITTINGS

	3 WAY CONTROL VALVE
	3 WAY VALVE
	BALL VALVE
	BUTTERFLY VAVLE
	CALIBRATED BALANCE VALVE
	CHECK VALVE
	CONTROL VALVE
	DRAIN & FILL VALVE WITH CAP & 3/4" HOSE CONNECTION
XXX	FLEX CONNECTOR
	FLOW METER
	FLOW SWITCH
	GATE VALVE
	GLOBE VALVE
	PLUG VALVE/GAS COCK
	PRESSURE GAUGE & COCK
	PRESSURE REGULATING/REDUCING VALVE
	TEMPERATURE & PRESSURE TEST PORT
	TEMPERATURE & PRESSURE RELIEF VALVE
	TEST PORT
	THERMOMETER
	Y-STRAINER
	Y-STRAINER WITH VALVE, CAP & 3/4" HOSE CONNECTION
	CAP
	FLOW ARROW
	ELL/ELBOW DN
	ELL/ELBOW UP
	TEE DOWN
	TEE UP
	UNION

FIXTURES / DEVICES

	WALL CLEANOUT
	FLOOR CLEANOUT
PANEL	EQUIPMENT/CONTROL PANEL
VFD	VARIABLE FREQUENCY DRIVE
EPO	EMERGENCY POWER OFF (RE: ELEC)
S	SENSOR WITH ABBREVIATION

##	
AQ	AQUASTAT
P	PRESSURE
PD	PRESSURE DIFFERENTIAL
T	TEMPERATURE

ABBREVIATIONS

(D)	DEMOLISH
(E)	EXISTING
(F)	FUTURE
(N)	NEW
(_)WFU	(COLD OR HOT) WATER FIXTURE UNITS
AMP	AMPERE
AAV	AIR ADMITTANCE VALVE
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDELING UNIT
ALT	ALTITUDE
AVG	AVERAGE
BV	BALL VALVE
BTU	BRITISH THERMAL UNITS
CND	CONDENSATE
CFH	CUBIC FEET PER HOUR
CO2	CARBON DIOXIDE
CV	CHECK VALVE
DCW	DOMESTIC COLD WATER
DFU	DRAINAGE FIXTURE UNITS
DIA/Ø	DIAMETER
DN	DOWN
E.C.	ELECTRICAL CONTRACTOR
ECO	END OF LINE CLEANOUT
EOR	ENGINEER OF RECORD
EPO	EMERGENCY POWER OFF
EWT	ENTERING WATER TEMPERATURE
°/°F/F	FAHRENHEIT
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FLA	FULL LOAD AMPS
FPS	FEET PER SECOND
FTHD	FEET OF HEAD (WC)
FT / '	FOOT / FEET DIMENSIONAL
FU	FIXTURE UNIT(S)
GAL	GALLON(S)
GC	GENERAL CONTRACTOR
GCO	GRADE CLEANOUT
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GWI	GREASE INTERCEPTOR
HP	HORSEPOWER
HT	HEIGHT
HX	HEAT EXCHANGER
ID	INSIDE DIAMETER
IN / "	INCHES
LB(S)	POUND(S)
LF	LINEAR FEET
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSANDS OF (BTU)
M.C.	MECHANICAL CONTRACTOR
MCA	MINIMUM CURRENT AMPACITY
MFR	MANUFACTURER
MOCP	MAXIMUM OVERCURRENT PROTECTION
N/A	NOT APPLICABLE
NG/NAT	NATURAL GAS
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
№./#	NUMBER
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
OZ	OUNCES
PH/ϕ	PHASE
P.C.	PLUMBING CONTRACTOR
PROP	PROPANE GAS
PRV	PRESSURE REDUCING VALVE
PSIA	POUNDS PER SQUARE INCH ATMOSPHERIC
PSI(G)	POUNDS PER SQUARE INCH GAUGE
PSID	PRESSURE DIFFERENTIAL IN PSI
PV	PLUG VALVE
REFR	REFRIGERANT
RH	RADIANT HEATER
RPM	REVOLUTIONS PER MINUTE
RVM	RADON/VAPOR MITIGATION
SOI	SAND & OIL INTERCEPTOR
STD	STANDARD
SL	SEA LEVEL
TEMP	TEMPERATURE
T&P	TEMPERATURE & PRESSURE
TYP	TYPICAL
V	VOLT(S)
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
WC	WATER COLUMN
WCO	WALL CLEANOUT

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A/E STAMP

COLORADO LICENSED
JEFFREY L. GIVEN
32983
PROFESSIONAL ENGINEER
05/28/2026

SHEET TITLE
PLUMBING LEGENDS

SHEET NUMBER
P002

DOMESTIC WATER HEAT EXCHANGER SCHEDULE

REMARKS:
(1) PROVIDE AQUASTAT AS PER MANUFACTURER RECOMMENDATION.
(2) VERTICAL ASME TANK, 3" FIBERGLASS INSULATION, 20 GA ENAMELED METAL JACKET, 316L DOUBLE WALL STAINLESS STEEL BRAZED PLATE HEAT EXCHANGER.
(3) INTEGRAL DOMESTIC-SIDE CIRCULATOR PUMP FOR HEAT EXCHANGER CIRCULATION.
(4) SET WATER TANK TO MAINTAIN SET POINT OF 120F (ADJUSTABLE).

				CONNECTION SIZE (IN)			MECHANICAL HEAT EXCHANGER				ELECTRICAL					
PLAN MARK	MANUFACTURER	MODEL #	NOMINAL TANK VOLUME (GAL)	INLET	OUTLET	T&P	EWT	LWT	GPM	PSID	VOLTS	PHASE	WATTS	FLA	OPERATING WEIGHT (LBS)	REMARKS
DWHX-1	CEMLINE	V200CCH350-DW	200	2-1/2"	2-1/2"	3/4"	40	120	15		120	1			1480	1,2,3,4

GAS WATER HEATER SCHEDULE

REMARKS:
(1) PROVIDE MINIMUM 15YR WARRANTY WITH 8YRS NOT PRO RATED, NO ANODE RODS, & HARD WATER/SCALE OR RUST IN SYSTEM SHALL NOT VOID WARRANTY.
(2) 1ST YR SHALL COVER ANY FREIGHT, PARTS, DIAGNOSTICS, AND LABOR WITH ANY WATER HEATER ISSUES, PROVIDED BY MANUFACTURER.
(3) STARTUPS TO BE PERFORMED BY FACTORY AUTHORISED REPRESENATIVE.
(4) CA/FLUE DIAMETER AND DEVELOPED LENGTH SHALL BE PER MANUFACTUERS INSTALLATION INSTRUCTIONS. USE LONG RADIUS ELBOWS FOR BENDS.
(5) CA/FLUE MATERIAL PER MANUFACTURERS INSTALLATION INSTRUCTIONS. PVC NOT APPROVED FOR FLUE MATERIAL.
(5) PROVIDE CONDENSATE NEUTRALIZATION KIT.
(6) SET WATER HEATER TO MAINTAIN SET POINT OF 140F (ADJUSTABLE).
(7) PROVIDE 2 1/2" DRAIN PAN AND ROUTE 1 1/4" DRAIN LINE TO FLOOR DRAIN.
(8) PROVIDE WEEKLEY 2 HOUR SCHEDULED SHOCK CYCLE AS DICTATED BY MANUFACTURER TO ASSURE LEGONELLA CONTROL.

													ELECTRICAL DATA			
PLAN MARK	MANUFACTURER	MODEL #	NOMINAL TANK VOLUME (GAL)	THERMAL EFFICIENCY	ENERGY FACTOR	FUEL	MINIMUM GAS PRESSURE (WC)	MAXIMUM GAS PRESSURE (WC)	INPUT (MBH, SL)	RECOVERY (GPH, ALT)	TEMPERATURE RISE (°F)	CA & FLUE CONNECTION SIZE (IN)	VOLTS	PHASE	OPERATING WEIGHT (LBS)	REMARKS
GWH-1-1	A.O. SMITH	BTH-400	119	95%	-	NG	4.8	14	399	0	0	6/6	120	1	855	
GWH-1-2	A.O. SMITH	BTH-400	119	95%	-	NG	4.8	14	399	0	0	6/6	120	1	855	

PLUMBING ACCESSORIES SCHEDULE

REMARKS:
(1) VALVES SHALL BE PRESSURE INDEPENDENT AUTO FLOW LIMITING WITH SAME FLOW RATE ACROSS PSI RANGE, NON ADJUSTABLE, NSF RATED.
(2) REPLACEABLE FULL ACCEPTANCE BLADDER, NSF RATED, REPLACABLE PART.
(3) PROVIDE THERMOMETER ON OUTLET PIPE. THERMOWELL SHALL EXTEND PERBINDICULAR INTO MAIN WATER STREAM.
(4) VALVE SHALL HAVE PSID OVERLAP OF A MINIMUM 3PSI TO ALLOW BOTH VALVES TO OPERATE SIMOUTANIOUSLY AT THE LOW AND HI END OF THE VALVE.

						ELECTRICAL DATA				
PLAN MARK	DESCRIPTION	MANUFACTURER	MODEL #	CONNECTION SIZE (IN)	FLOW RATE (GPM)	VOLTS	PHASE	WATTS	OPERATING WEIGHT (LBS)	REMARKS
MMV-1	MASTER MIXING VALVE	LAWLER	805	2,2,2	1-50 GPM	0	0	0	20	

PLUMBING PUMP SCHEDULE

REMARKS:
(1) ECM OR VFD FLOW PUMP WITH INTEGRAL STAT SET POINT TO MAINTAIN 120F ADJ.
(2) ECM OR VFD FLOW PUMP WITH INTEGRAL STAT SET POINT TO MAINTAIN 140F ADJ.
(3) PROVIDE VIBERATION ISOLATION AT PUMP AND CONNECTION TO STRUCTURE.
(4) PROVIDE ALL VALVES REQUIRED PER LOCAL CODE ON DISCHARGE PIPE.
(5) COORDINATE EXACT LOCATION OF SUMP PIT IN SHAFT WITH OTHER TRADES.

						ELECTRICAL DATA					
PLAN MARK	MANUFACTURER	MODEL #	FLOW RATE (GPM)	DIFFERENTIAL PRESSURE (FTHD)	RPM	VOLTS	PHASE	HP	WATTS	OPERATING WEIGHT (LBS)	REMARKS
CP-1	BELL & GOSSETT	NBF-33	15	7	2950	120	1		125	12	

MINIMUM PIPE INSULATION TABLE

	INSULATION CONDUCTIVITY			NOMINAL PIPE OR TUBE SIZE				
FLUID TEMPERATURE RANGE	CONDUCTIVITY	MEAN TEMPERATURE	INSULATION MATERIAL	3/4" AND SMALLER	1" TO 1-1/4"	1-1/2" TO 3-1/2"	4" TO 6"	8" AND LARGER
141-200	0.25-0.29	125	FIBERGLASS	1-1/2"	1-1/2"	2"	2"	2"
			POLYETHYLENE					
105-140	0.21-0.28	100	FIBERGLASS	1"	1"	1-1/2"	1-1/2"	1-1/2"
			POLYETHYLENE					
40-60	0.21-0.27	75	FIBERGLASS	1/2"		1"	1"	1"
			POLYETHYLENE					
<40	0.20-0.26	50	FIBERGLASS	1/2"	1"	1"	1"	1-1/2"
			POLYETHYLENE					

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BUILDING AMERICA - WALNUT PLACE APTS

1940 WALNUT ST.
BOULDER, CO 80304

#	DESCRIPTION	DATE
	PERMIT	05.28.2026

Project Number 24007
Date 05.28.2026
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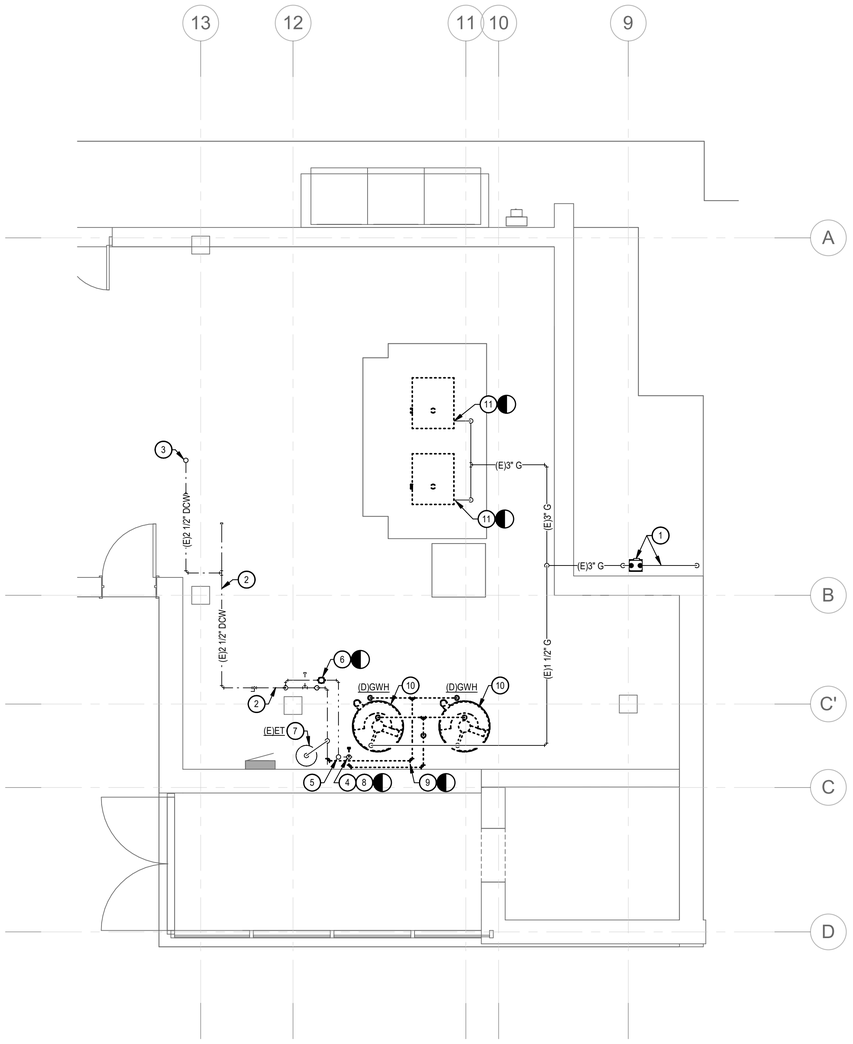
05/28/2026

SHEET TITLE
PLUMBING SCHEDULES

SHEET NUMBER
P003



NORTH

1 1ST FLOOR PLAN - PLUMBING DEMO

1/4" = 1'-0"

DRAWING NOTES:

1. PLUMBING PLANS ARE BASED ON BUILDING PLANS DATED 07/02/1970, BOILER REPLACEMENT PLANS (DATED 2004) AND LIMITED FIELD SURVEYS CONDUCTED ON 09/05/2024 & 07/10/2025. PC SHALL FIELD VERIFY & DOCUMENT ALL EXISTING CONDITIONS ON WHICH NEW WORK IS DEPENDENT INCLUDING PIPE SIZE, MATERIAL, LOCATION & ELEVATION/INVERT PRIOR TO STARTING WORK.
2. COORDINATE PIPE ROUTING WITH ALL TRADES FOR CONFLICTS PRIOR TO ROUGH-IN. COORDINATE NEW PIPE PENETRATIONS WITH ARCHITECT.
3. FOR REFERENCE, EXISTING NATURAL GAS PIPE SIZING SHOWN IS BASED ON 2021 IFGC TABLE 402.4(2), 6" W.C. REGULATOR OUTLET PRESSURE, 0.5" W.C. PRESSURE DROP, 30 TOTAL EQUIVALENT FEET OF GAS PIPING.

KEY NOTES:

1. (E)GAS METER, SERVICE REGULATOR, ETC. BY XCEL ENERGY SHALL REMAIN.
2. (E)DOMESTIC WATER PIPING SHALL REMAIN.
3. (E)2-1/2"DCW DN FROM CEILING ABOVE.
4. (E)2-1/2"DHW UP THRU CEILING ABOVE.
5. (E)1"DHWR DN FROM CEILING ABOVE.
6. REMOVE (E)DOMESTIC HOT WATER RECIRCULATION PUMP.
7. (E)DOMESTIC WATER EXPANSION TANK SHALL REMAIN.
8. REMOVE (E)DOMESTIC HOT WATER PIPING UPSTREAM OF SHUTOFF VALVE AT CEILING.
9. REMOVE DOMESTIC COLD WATER PIPING TO POINT SHOWN.
10. REMOVE (E)GAS FIRED WATER HEATERS FOR REPLACEMENT. REMOVE ASSOCIATED DOMESTIC WATER PIPING TO POINTS SHOWN. TEMP CAP (E)GAS PIPING, FLUES & COMBUSTION AIR IN PREPARATION FOR NEW WORK.
11. DISCONNECT (E)GAS PIPING FROM REMOVED HYDRONIC BOILERS. TEMP CAP IN PREPARATION FOR NEW WORK.

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COLORADO LICENSED
JEFF H. GIVEN
32961
PROFESSIONAL ENGINEER

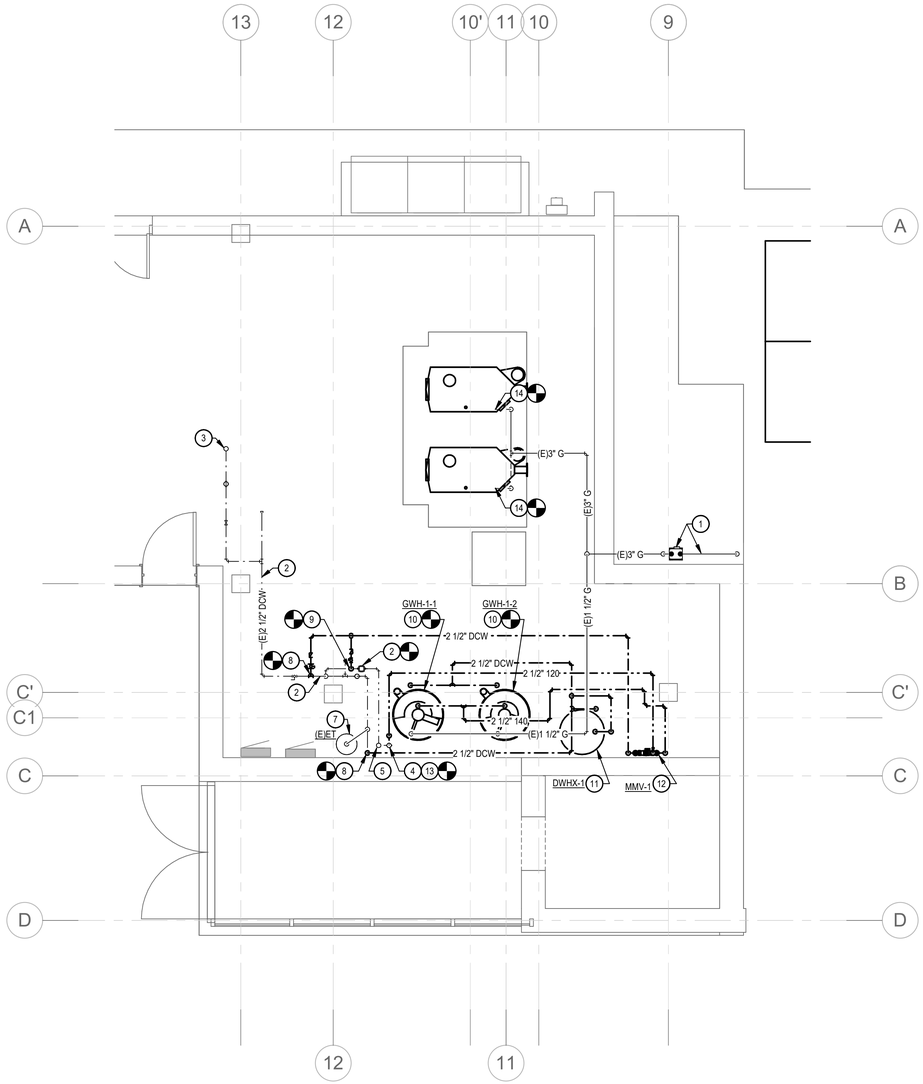
05/28/2026

SHEET TITLE

ENLARGED MECHANICAL ROOMPLAN - PLUMBING DEMO

SHEET NUMBER

P111



NORTH

1 1ST FLOOR PLAN - PLUMBING

1/4" = 1'-0"

DRAWING NOTES:

1. PLUMBING PLANS ARE BASED ON BUILDING PLANS DATED 07/02/1970, BOILER REPLACEMENT PLANS (DATED 2004) AND LIMITED FIELD SURVEYS CONDUCTED ON 09/05/2024 & 07/10/2025. PC SHALL FIELD VERIFY & DOCUMENT ALL EXISTING CONDITIONS ON WHICH NEW WORK IS DEPENDENT INCLUDING PIPE SIZE, MATERIAL, LOCATION & ELEVATION/INVERT PRIOR TO STARTING WORK.
2. COORDINATE PIPE ROUTING WITH ALL TRADES FOR CONFLICTS PRIOR TO ROUGH-IN. COORDINATE NEW PIPE PENETRATIONS WITH ARCHITECT.
3. FOR REFERENCE, EXISTING NATURAL GAS PIPE SIZING SHOWN IS BASED ON 2021 IFGC TABLE 402.4(2), 6" W.C. REGULATOR OUTLET PRESSURE, 0.5" W.C. PRESSURE DROP, 30 TOTAL EQUIVALENT FEET OF GAS PIPING.

KEY NOTES:

1. (E)GAS METER, SERVICE REGULATOR, ETC. BY XCEL ENERGY. EXISTING GAS LOAD = 4600.0 MBH/ 55535 CFH. NEW GAS LOAD = 4800.0 MBH/ 5776 CFH. TOTAL HAS LOAD INCREASE = 200.0 MBH/ 241 CFH.
2. INSTALL CP-1 ON DOMESTIC HOT WATER RECIRCULATION LINE AT POINT SHOWN.
3. (E)2-1/2"DCW DN FROM CEILING ABOVE.
4. (E)2-1/2"DHW UP THRU CEILING ABOVE.
5. (E)1"DHWR DN FROM CEILING ABOVE.
6. (E)DOMESTIC HOT WATER RECIRCULATION PUMP SHALL REMAIN.
7. (E)DOMESTIC WATER EXPANSION TANK SHALL REMAIN.
8. CONNECT 2-1/2"DCW TO (E)2-1/2"DCW AT POINT SHOWN.
9. CONNECT 1"DHWR TO (E)1"DHWR AT POINT SHOWN.
10. INSTALL GAS WATER HEATER AT LOCATION SHOWN. 1-1/2"DCW & 1-1/2"DHW TO WATER HEATER INLET/OUTLET LOCATIONS. CONNECT (E)1-1/4"G (400.0 MBH/ 481 CFH) TO WATER HEATER GAS SUPPLY CONNECTION WITH UNION & SHUTOFF VALVE. RECONNECT COMBUSTION AIR & FLUE PIPING AS NECESSARY. SEE MECHANICAL PLANS.
11. INSTALL DWHX-1 TANK HEAT EXCHANGER AT LOCATION SHOWN. CONNECT 2-1/2"DCW & 2-1/2"DHW TO DOMESTIC WATER INLET/OUTLET CONNECTIONS.
12. INSTALL MMV-1 MASTER MIXING VALVE AT LOCATION SHOWN. CONNECT 2-1/2"DCW & (2)2-1/2"DHW TO VALVE INLET/OUTLET CONNECTIONS.
13. CONNECT 2-1/2"DHW TO (E)2-1/2"DHW IMMEDIATELY UPSTREAM OF MAIN SHUTOFF VALVE AT CEILING LEVEL.
14. CONNECT (E)2-1/2"G (1000.0 MBH/ 1203 CFH) TO (N)BOILER CONNECTION W/UNION & GAS VALVE. SEE DIAGRAM.

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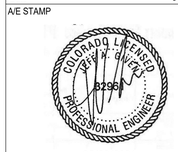


05/28/2026

SHEET TITLE

ENLARGED MECHANICAL ROOM PLAN - PLUMBING

SHEET NUMBER

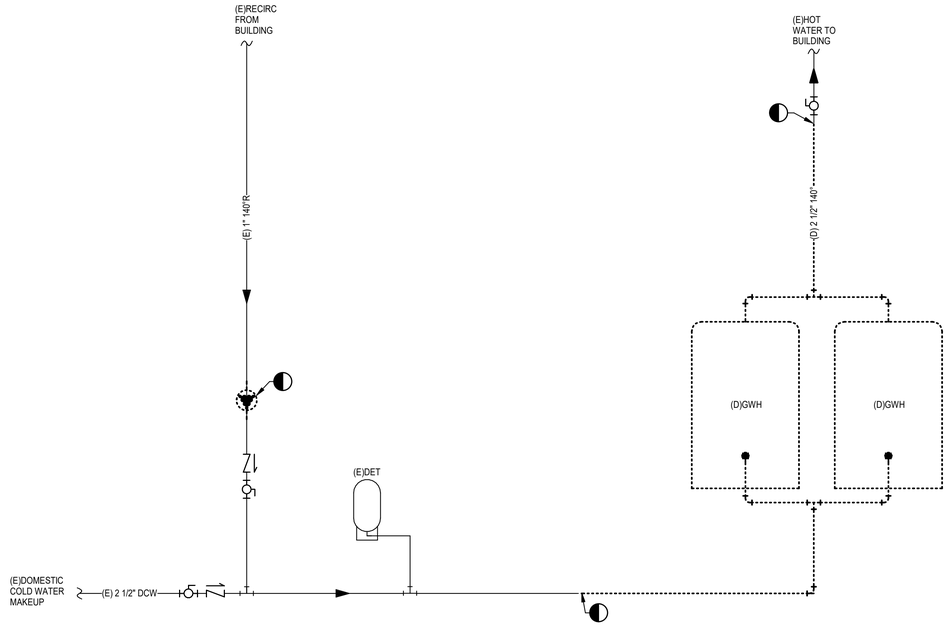
P211

GENERAL NOTES:

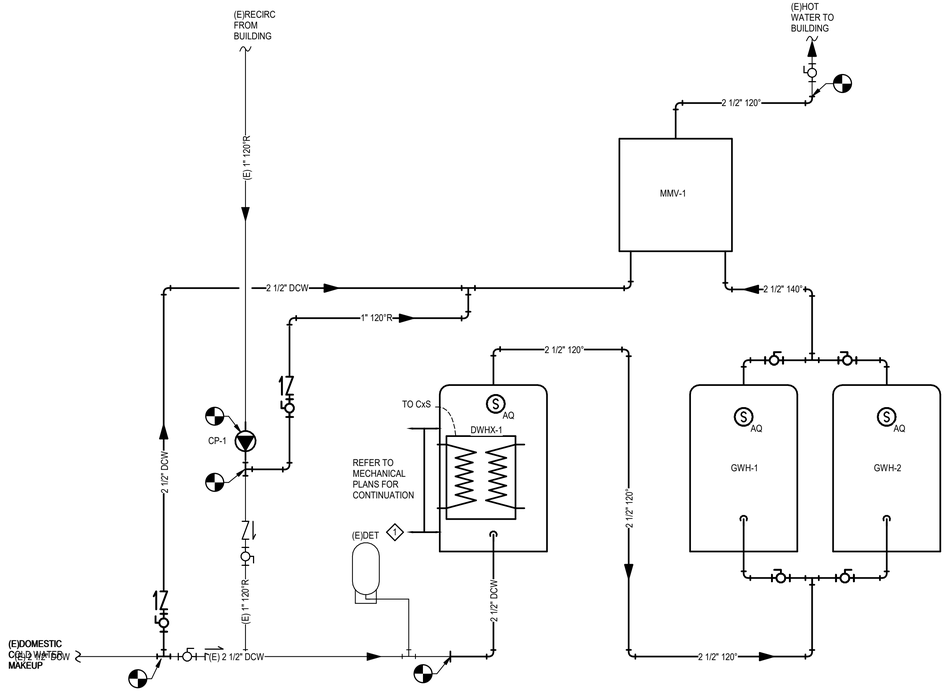
1. ALL PIPING SHALL BE COPPER OR STAINLESS STEEL IN MECHANICAL ROOM. TRANSISTION TO ALTERNATE MATERIALS SHALL OCCUR OUTSIDE MECHNICAL ROOM.
2. REFER TO FLOOR PLAN(S) FOR PIPE ROUTING IN ROOM AND ORENTATION OF EQUIPMENT.
3. MAINTAIN PIPE PENETRATION RATINGS THROUGH STRUCTURE.
4. PROPERLY SUPPORT PIPING THROUGHOUT ROOM PER MANUFACTURERS REQUIREMENTS, AND INDEPENDANTLY SUPPORT PIPE ACCESSORIES AND EQUIPMENT OVER 10LBS.
5. ALL EQUIPMENT AND ACCESSORIES SHALL HAVE UNIONS AND VALES LOCATED APPROPRIATELY TO ALLOW REMOVAL AND MAINTENANCE OF EQUPMENT AND ACCESSORIES.
6. REFER TO MECHANICAL PIPING SCEMATIC FOR ADDITIONAL SEQUENCE OF OPERATION AND CONTROLS FOR THE NEW EQUIPMENT.
7. TANK AQUASTATS SHALL BE CONNECTED BACK TO CxS CONTROLLER AND BUILDING BAS FOR SET POINTS. AQUASTATS SHALL BE IN LOWEST PORT OF TANK AVAILABLE.
8. PIPE AQUASTATS SHALL CONNECT BACK TO CxS CONTROLLER FOR REHEAT SEQUENCE.

DIAGRAM NOTES:

1. MECHANICAL CONTRACTOR TO PROVIDE AND INSTALL ALL FROM THIS POINT ON.



PIPING DIAGRAM DEMOLITION



PIPING DIAGRAM NEW

1 DOMESTIC WATER PIPING SCHEMATIC
N.T.S.

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COLORADO LICENSED JEFFREY K. GIVEN 32983 PROFESSIONAL ENGINEER
05/28/2026

SHEET TITLE
DOMESTIC WATER PIPING SCHEMATIC

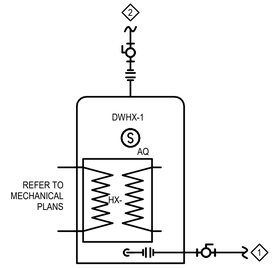
SHEET NUMBER
P600

GENERAL NOTES:

1. ALL PIPING SHALL BE COPPER OR STAINLESS STEEL IN MECHANICAL ROOM. TRANSISTION TO ALTERNATE MATERIALS SHALL OCCUR OUTSIDE MECHNICAL ROOM.
2. REFER TO FLOOR PIPING DIAGRAMS ANY CONTROL WIRING & REQUIREMENTS
3. REFER TO FLOOR PLANS FOR PIPE ROUTING IN ROOM AND ORENTATION OF EQUIPMENT.
4. BALL VALES AND UNIONS SHALL BE LOCATED TO ALLOW REMOVAL AND MAINTENANCE OF HEAT EXCHANGER TANK.
5. REFER TO MANUFACTURERS I/O MANUAL FOR INSTALLATION REQUIREMENTS.

DIAGRAM NOTES:

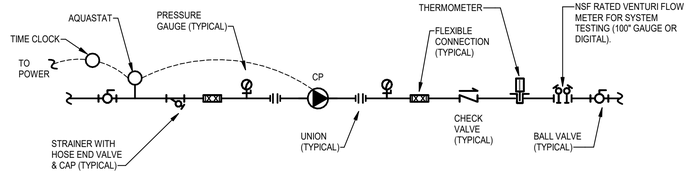
1. DOMESTIC HOT WATER RETURN FROM MIXING VALVE & COLD WATER MAKEUP.
2. HOT WATER TO MIXING VALVE AND/OR BUILDING.



3 DOMESTIC WATER HEAT EXCHANGER TANK DETAIL
N.T.S.

GENERAL NOTES:

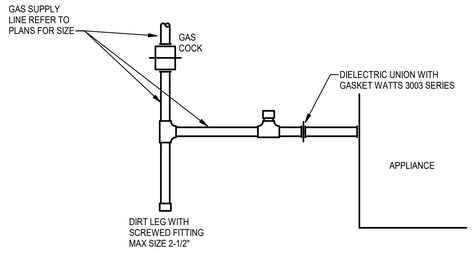
1. INDEPENDENTLY SUPPORT PUMP & PIPING. PROVIDE VIBERATION ISOLATION ON HANGERS.
2. THERMOMETERS & AQUASTATS STEMS SHALL BE IN THE WATER STREAM.



1 INLINE PUMP WITH AQUASTAT DETAIL
N.T.S.

GENERAL NOTES:

1. PC SHALL REFER TO MFG FOR REGULATOR VENT REQUIREMENTS; INCLUDING MATERIAL AND SIZE.
2. PC SHALL DISCHARGE VENT PER CODE AT ROOF OR EXTERIOR WALL OF BUILDING OR USE VENT LIMITERS IF ALLOWED PER JURISDICTION.
3. GAS COCK SHALL BE LOCATED WHERE ACCESSIBLE FROM STANDING ON THE FLOOR



2 TYPICAL GAS PIPE CONNECTION DETAIL
N.T.S.

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SHEET TITLE
PLUMBING DETAILS

SHEET NUMBER
P700