

ZEHNDER'S SPLASH VILLAGE

FRANKENMUTH, MI

RENOVATIONS FOR

TSSF ARCHITECTS, INC.

ARCHITECTS INTERIORS PLANNERS

122 N. WASHINGTON AVENUE

SAGINAW, MICHIGAN

DRAWN BY STM
DATE 12/05/25
APPROVED GRS
SHEET NO.

M1.2

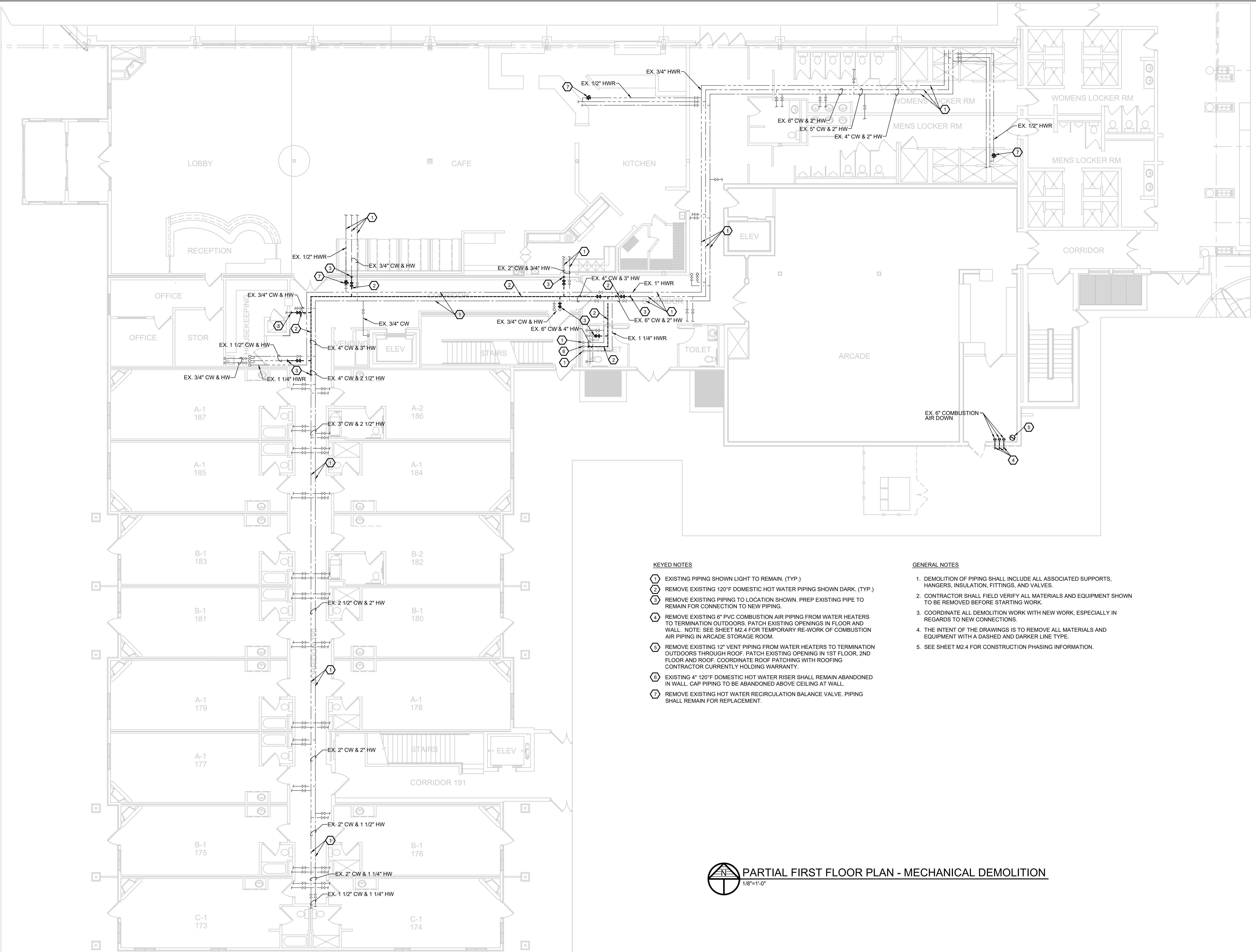
PROJECT NO.
2529

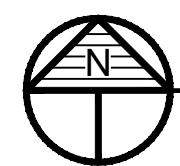
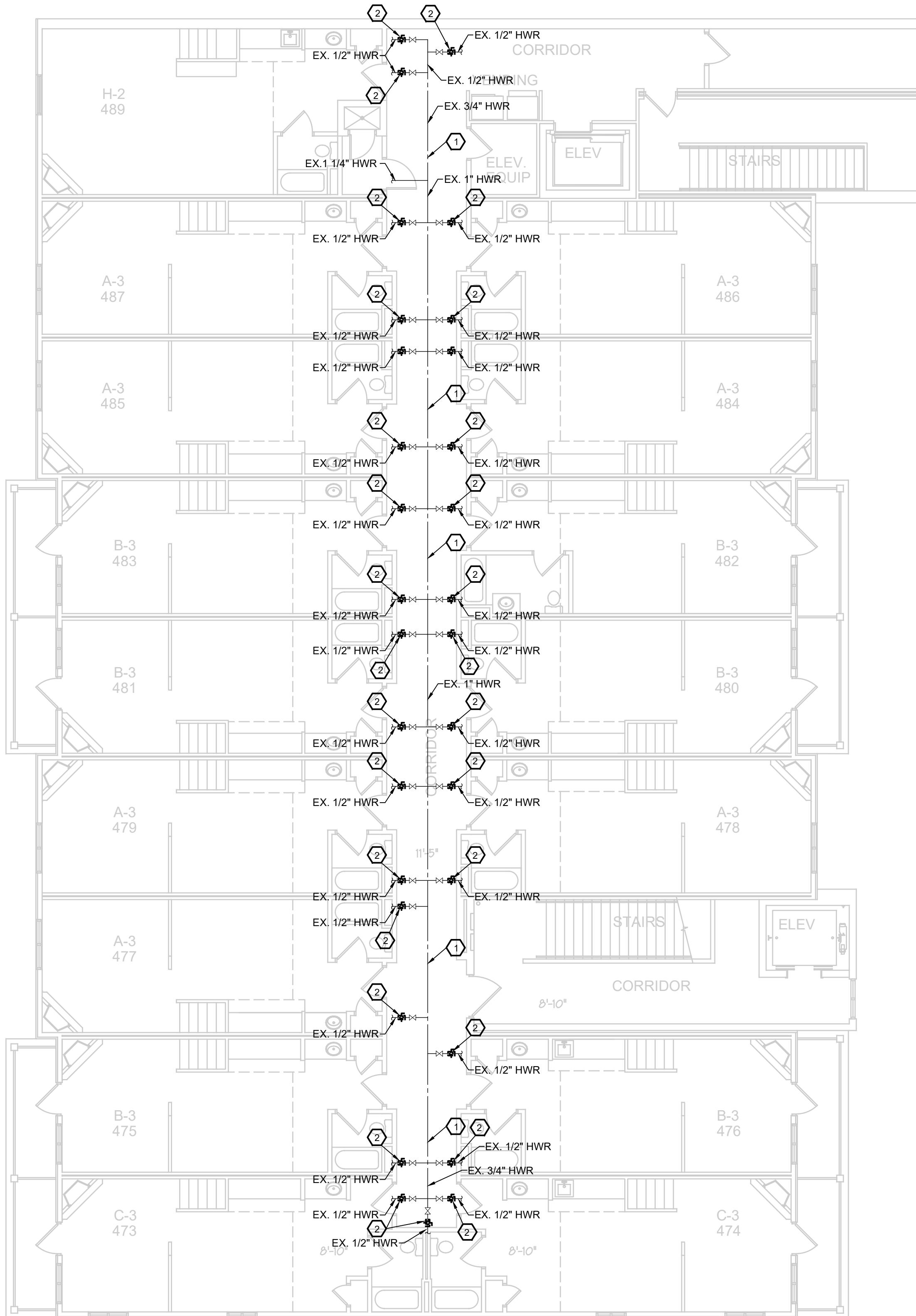
MACMILLAN ASSOCIATES CONSULTING ENGINEERS
714 EAST MICHAND STREET • BAY CITY, MICHIGAN 48706
(989) 654-4300 • www.macmillanassociates.com • SINCE 1963



PARTIAL FIRST FLOOR PLAN - MECHANICAL DEMOLITION

1/8"=1'-0"





PARTIAL FOURTH FLOOR PLAN - MECHANICAL DEMOLITION

1/8"=1'-0"

KEYED NOTES

① EXISTING 120°F DOMESTIC HOT WATER RETURN PIPING SHOWN LIGHT TO REMAIN. (TYP.)
 ② REMOVE EXISTING HOT WATER RECIRCULATION BALANCE VALVE. ONLY REMOVE ENOUGH PIPING AS NEEDED TO REPLACE EXISTING BALANCE VALVE WITH NEW. ALL OTHER HOT WATER RECIRCULATION PIPING IS INTENDED TO REMAIN.

GENERAL NOTES

- DEMOLITION OF PIPING SHALL INCLUDE ALL ASSOCIATED SUPPORTS, HANGERS, INSULATION, FITTINGS, AND VALVES.
- CONTRACTOR SHALL FIELD VERIFY ALL MATERIALS AND EQUIPMENT SHOWN TO BE REMOVED BEFORE STARTING WORK.
- COORDINATE ALL DEMOLITION WORK WITH NEW WORK, ESPECIALLY IN REGARDS TO NEW CONNECTIONS.
- THE INTENT OF THE DRAWINGS IS TO REMOVE ALL MATERIALS AND EQUIPMENT WITH A DASHED AND DARKER LINE TYPE.
- SEE SHEET M2.4 FOR CONSTRUCTION PHASING INFORMATION.

TSSF

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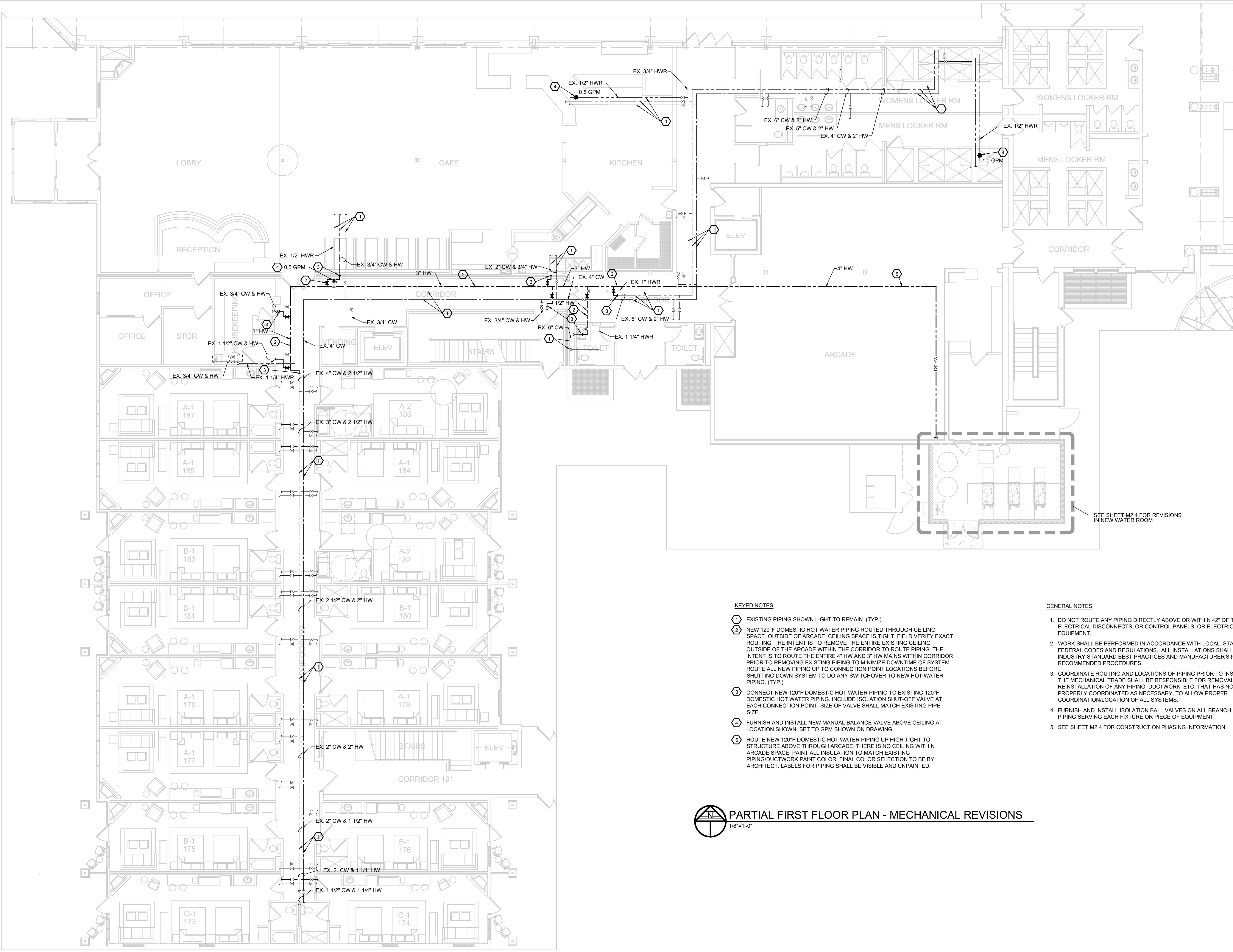
PLANNERS
 122 N. WASHINGTON AVENUE SAGINAW, MICHIGAN

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FRANKENMUTH, MI			
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**RENOVATIONS FOR
ZEHNDER'S SPLASH VILLAGE**
FRANKENMUTH, MI

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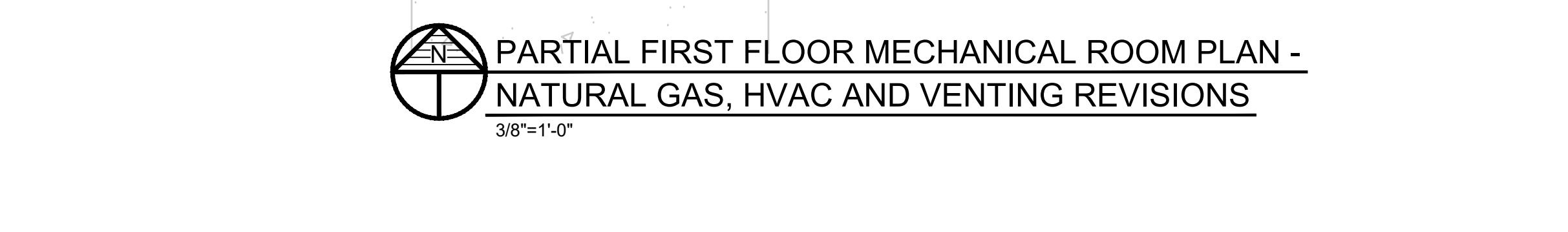
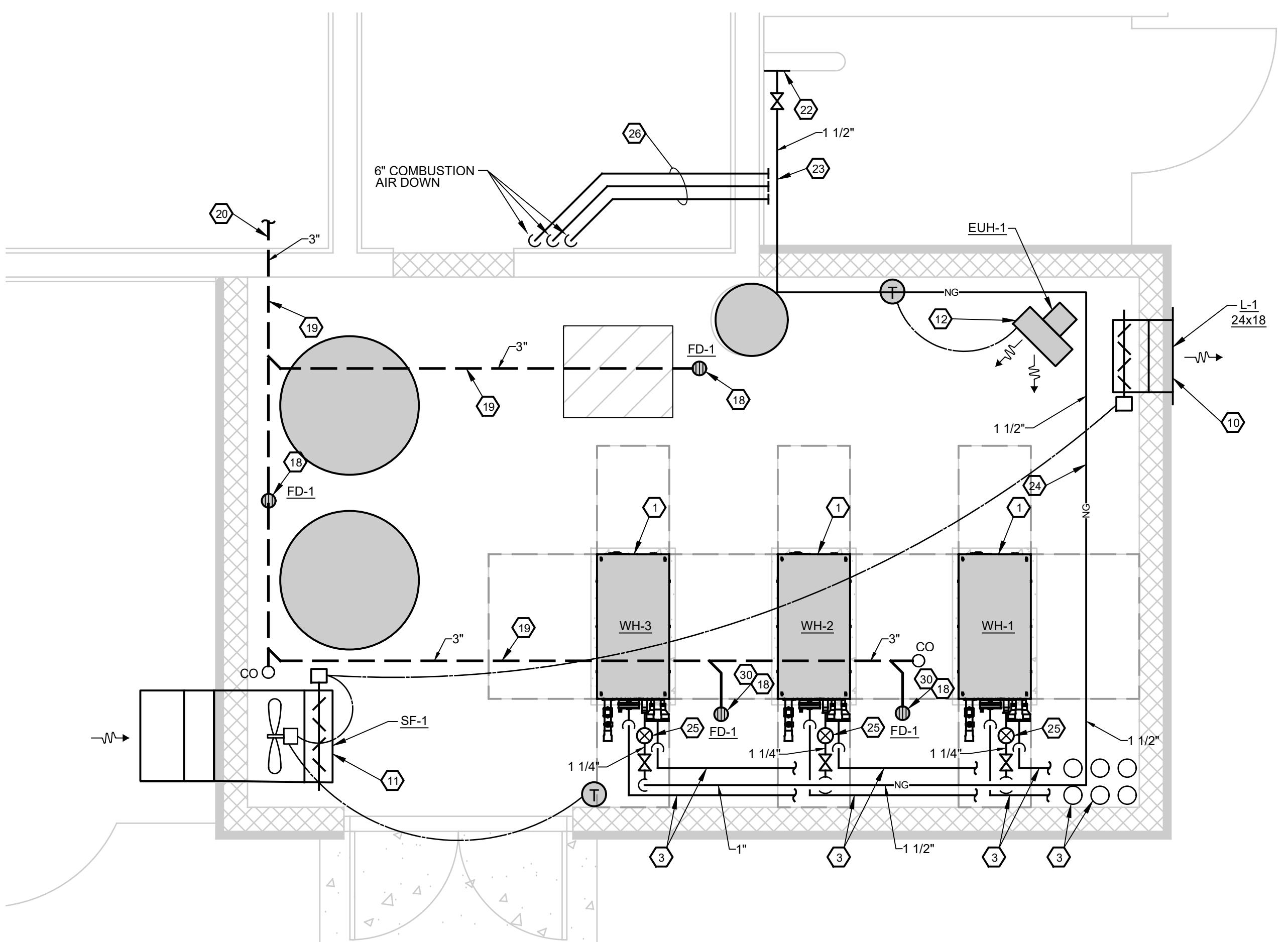
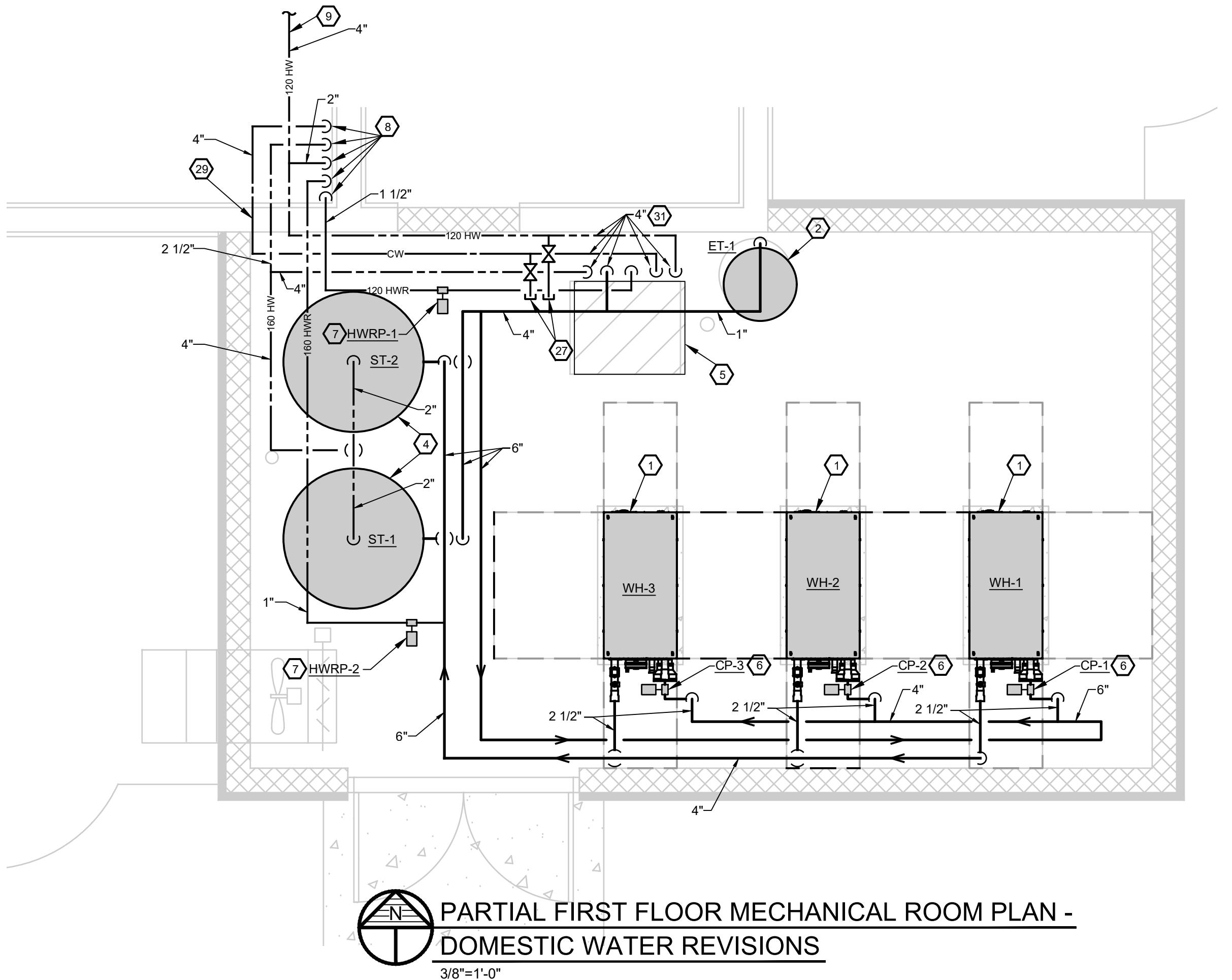
FRANKENMUTH, MI

RENOVATIONS FOR

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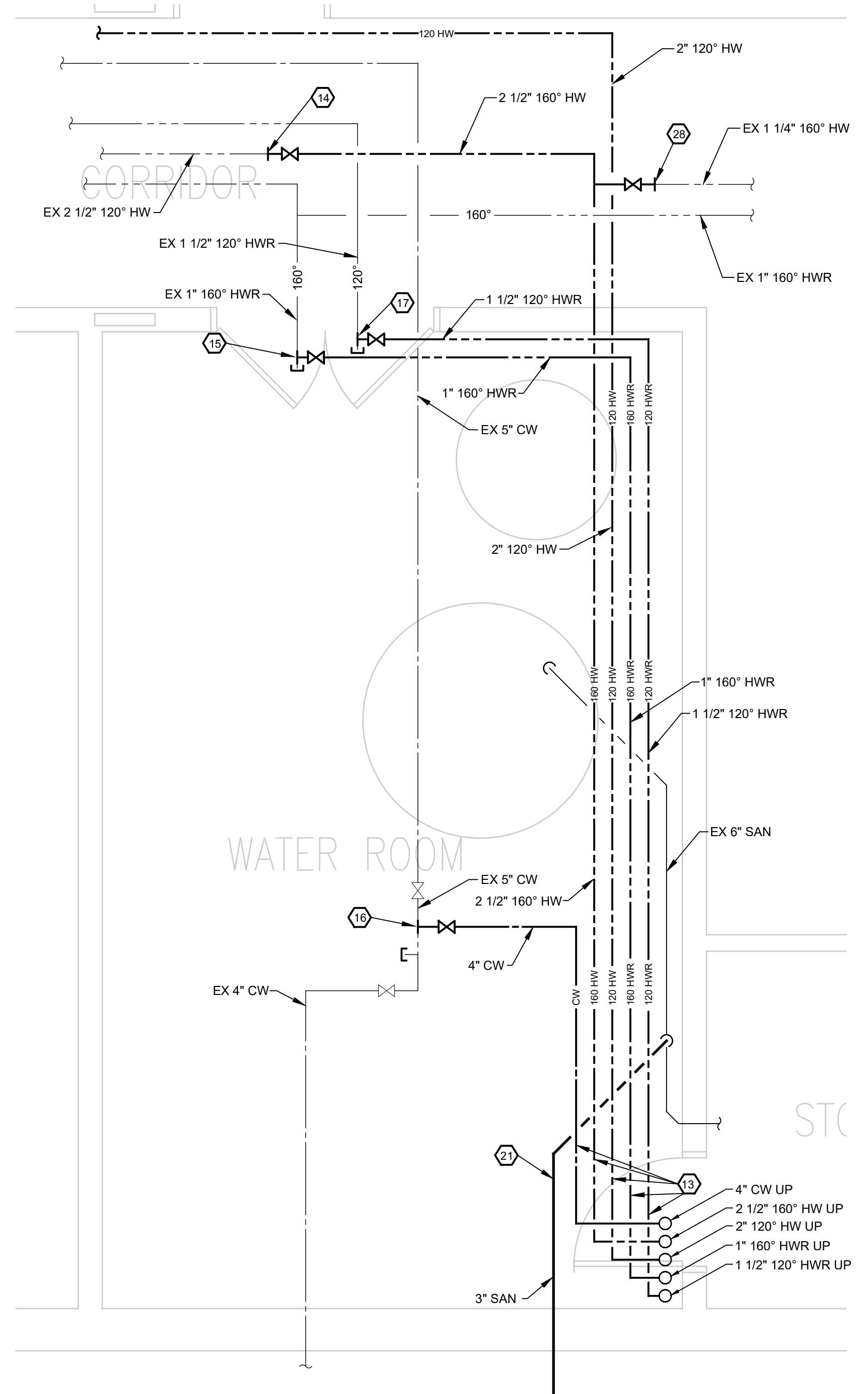
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KEYED NOTES

- ① FURNISH AND INSTALL NEW WATER HEATER ON NEW 4" REINFORCED CONCRETE HOUSEKEEPING PAD. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND PER ALL APPLICABLE CODES AND STANDARDS.
- ② FURNISH AND INSTALL NEW DOMESTIC WATER EXPANSION TANK ON NEW 4" REINFORCED CONCRETE HOUSEKEEPING PAD. SEE WATER HEATER DETAIL FOR PIPING INFORMATION.
- ③ NEW 6" DIA. CENTROTHERM POLYPROPYLENE VENT PIPING AND 6" PVC COMBUSTION AIR PIPING ROUTED HIGH IN SPACE. ROUTE UP THROUGH FLOOR INTO CHASE ON SECOND FLOOR. THE MECHANICAL TRADES SHALL FURNISH AND INSTALL ALL COMBUSTION AIR AND VENT PIPING AND SHALL BE RESPONSIBLE FOR VERIFICATION AND COORDINATION WITH THE WATER HEATER MANUFACTURER FOR ALL INSTALLATION INSTRUCTIONS AND REQUIREMENTS.
- ④ NEW DOMESTIC HOT WATER STORAGE TANK ON NEW 4" REINFORCED CONCRETE HOUSEKEEPING PAD. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND PER ALL APPLICABLE CODES AND STANDARDS.
- ⑤ INSTALL EXISTING RELOCATED ELECTRONIC TEMPERING STATION/MIXING VALVE ON NEW 4" THICK REINFORCED CONCRETE HOUSEKEEPING PAD. INTENT IS TO PROVIDE TEMPORARY BYPASS FOR ELECTRONIC TEMPERING STATION UNTIL ELECTRONIC TEMPERING STATION/MIXING VALVE CAN BE RELOCATED. ONCE THE NEW DOMESTIC WATER HEATER SYSTEM IS OPERATIONAL AND THE OLD SYSTEM IS DECOMMISSIONED, INSTALL RELOCATED ELECTRONIC TEMPERING STATION. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND PER ALL APPLICABLE CODES AND STANDARDS. DESIGN INTENT WHILE TEMPORARY BYPASS IS INSTALLED IS TO STORE AND DELIVER 120°F WATER TO THE ENTIRE BUILDING. ONCE THE RELOCATED ELECTRONIC TEMPERING STATION IS INSTALLED, STORE HOT WATER AT 160°F, DELIVER 160°F TO KITCHEN AND LAUNDRY AND DELIVER 120°F TO REMAINDER OF BUILDING.
- ⑥ FURNISH AND INSTALL NEW WATER HEATER CIRCULATION PUMP. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- ⑦ FURNISH AND INSTALL NEW HOT WATER RECIRCULATION PUMP. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- ⑧ ROUTE PIPING DOWN WALL IN ARCADE AND THROUGH EXISTING FLOOR INTO EXISTING WATER ROOM. SEE PARTIAL BASEMENT PLAN FOR CONTINUATION (THIS SHEET).
- ⑨ ROUTE NEW 120°F DOMESTIC HOT WATER PIPING HIGH IN ARCADE SPACE. SEE DRAWING M2.2 FOR CONTINUATION.
- ⑩ FURNISH AND INSTALL RELIEF LOUVER AND MOTORIZED DAMPER. DAMPER ACTUATOR SHALL BE 120V AND OPEN DAMPER WHEN SF-1 IS OPERATING. LOUVER SHALL BE INSTALLED AS HIGH AS POSSIBLE ON WALL. COORDINATE WITH STRUCTURAL.
- ⑪ FURNISH AND INSTALL NEW SUPPLY FAN. PROVIDE WITH MOTORIZED DAMPER AND 90° WEATHER HOOD ON INTAKE. DAMPER ACTUATOR SHALL BE 120V AND OPEN DAMPER WHEN SF-1 IS OPERATING. FAN SHALL BE INSTALLED AS HIGH AS POSSIBLE ON WALL. COORDINATE WITH STRUCTURAL.
- ⑫ FURNISH AND INSTALL NEW ELECTRIC UNIT HEATER WITH REMOTE 24V THERMOSTAT. MOUNT ON WALL USING FACTORY PROVIDED WALL MOUNT KIT. INSTALL PER MANUFACTURER'S REQUIREMENTS.
- ⑬ NEW PIPING ROUTED HIGH THROUGH EXISTING WATER ROOM SPACE.
- ⑭ CONNECT NEW 2 1/2" 160°F DOMESTIC HOT WATER PIPING TO EXISTING 2 1/2" 160° HOT WATER PIPING.
- ⑮ CONNECT NEW 1" 160°F DOMESTIC HOT WATER RETURN PIPING TO EXISTING 1" 160° HOT WATER RETURN PIPING.
- ⑯ CONNECT NEW 4" DOMESTIC COLD WATER PIPING TO EXISTING 4" COLD WATER PIPING.
- ⑰ CONNECT NEW 2 1/2" 120°F DOMESTIC HOT WATER RETURN PIPING TO EXISTING 1 1/2" 120° HOT WATER RETURN PIPING.
- ⑱ FURNISH AND INSTALL NEW FLOOR DRAIN WITH DEEP SEAL TRAP AND TRAP SEAL.
- ⑲ NEW SANITARY PIPING BELOW FLOOR.(TYP.)
- ⑳ ROUTE NEW SANITARY PIPING BELOW GRADE INTO EXISTING BASEMENT WATER ROOM. SEAL OPENING IN WALL AROUND PIPE WITH LINK SEAL.
- ㉑ CONNECT NEW 1 1/4" 160° DOMESTIC HOT WATER PIPING TO EXISTING 1 1/4" 160° HOT WATER PIPING.
- ㉒ ROUTE NEW PIPING THROUGH EXISTING WALL INTO ARCADE AREA.
- ㉓ ROUTE CONDENSATE FROM WATER HEATER AND AIR GAP AT FLOOR DRAIN. INSTALL PIPING AS NOT TO CAUSE A TRIP HAZARD.
- ㉔ ROUTE 4" PIPING DOWN TO ELECTRONIC TEMPERING STATION/MIXING VALVE. TRANSITION 4" PIPING TO CONNECTION SIZE OF ELECTRONIC TEMPERING STATION AS CLOSE TO ELECTRONIC TEMPERING STATION AS POSSIBLE.



GENERAL NOTES

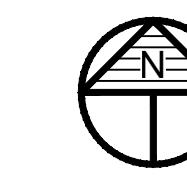
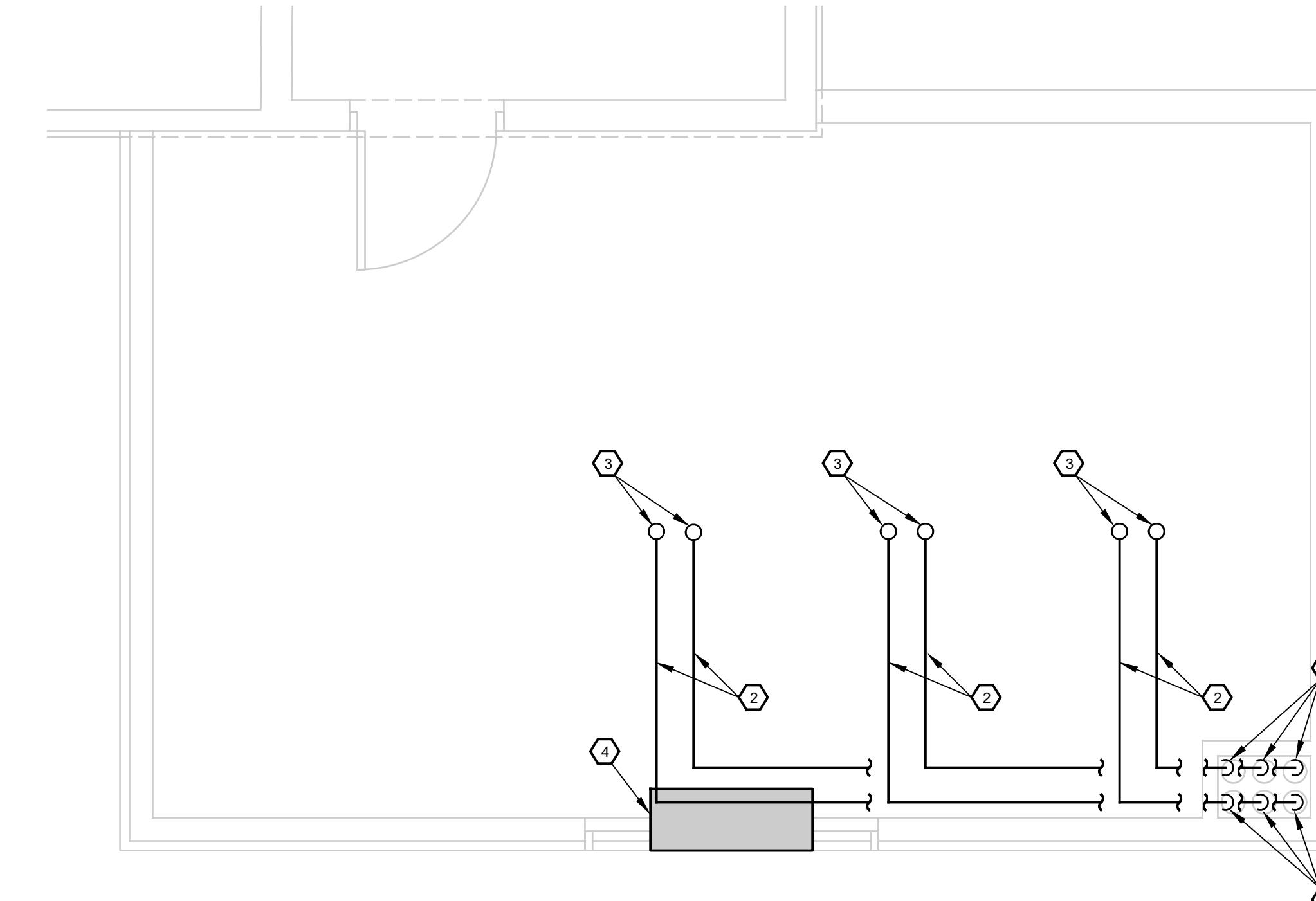
1. TERMINATE SEPARATED BOILER COMBUSTION AIR INTAKES WITH THE OPENING OF THE PIPING DOWN TURNED 180 DEGREES. THE OPENING OF THE COMBUSTION AIR INTAKE SHALL BE A MINIMUM OF 22° ABOVE THE ROOF.
2. TERMINATE SEPARATED BOILER AND WATER HEATER FLUE VENTS A MINIMUM OF 24" ABOVE THE INLET OF THE COMBUSTION AIR INTAKE.
3. FURNISH AND INSTALL GAS TRAIN PRESSURE RELIEF VALVE AND VENT PIPING AS REQUIRED. INSTALL A NATURAL GAS PRESSURE REGULATOR AT EACH WATER HEATER. INSTALL PER WATER HEATER MANUFACTURER'S INSTRUCTIONS. ROUTE GAS PRESSURE REGULATOR VENT PIPING TO OUTSIDE AS REQUIRED.
4. DO NOT ROUTE ANY PIPING DIRECTLY ABOVE OR WITHIN 42" OF THE FACE OF ELECTRICAL DISCONNECTS, OR CONTROL PANELS, OR ELECTRICAL EQUIPMENT.
5. WORK SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL CODES AND REGULATIONS. ALL INSTALLATIONS SHALL FOLLOW INDUSTRY STANDARD BEST PRACTICES AND MANUFACTURER'S IOM AND RECOMMENDED PROCEDURES.
6. COORDINATE ROUTING AND LOCATIONS OF PIPING PRIOR TO INSTALLING. THE MECHANICAL TRADE SHALL BE RESPONSIBLE FOR REMOVAL AND REINSTALLATION OF ANY PIPING, DUCTWORK, ETC. THAT HAS NOT BEEN PROPERLY COORDINATED AS NECESSARY, TO ALLOW PROPER COORDINATION/LOCATION OF ALL SYSTEMS.
7. FURNISH AND INSTALL ISOLATION BALL VALVES ON ALL BRANCH CW AND HW PIPING SERVING EACH FIXTURE OR PIECE OF EQUIPMENT.
8. MOUNT THERMOSTATS AT 48° A.F.F.

CONSTRUCTION PHASING NOTE

THE INTENT IS FOR THE EXISTING DOMESTIC WATER HEATER SYSTEM TO REMAIN OPERATIONAL UNTIL THE NEW DOMESTIC WATER HEATER SYSTEM IS INSTALLED AND READY FOR SWITCHOVER. THE BUILDING WILL REMAIN OCCUPIED AND THE INTENT IS TO HAVE MINIMUM DOWNTIME TO SWITCHOVER FROM THE EXISTING DOMESTIC WATER HEATER SYSTEM TO THE NEW DOMESTIC WATER HEATER SYSTEM. ALL NEW PIPING SHALL BE ROUTED TO THE LOCATION AS SHOWN ON REVISION SHEETS AND READY FOR CONNECTION TO EXISTING PIPING TO REDUCE SYSTEM SWITCHOVER TIME. PROVIDE A MINIMUM OF TWO WEEKS NOTICE TO OWNER BEFORE ANY SYSTEM SHUTDOWNS. IN GENERAL, PHASING FOR DOMESTIC WATER HEATER SYSTEM REVISIONS PORTION OF PROJECT SHALL BE AS FOLLOWS WITH FINAL PHASING PLAN TO BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR IN COORDINATION WITH THE OWNER:

1. REROUTE EXISTING 6" COMBUSTION AIR VENTING FOR EXISTING WATER HEATERS AS NECESSARY BEFORE NEW ADDITION CONSTRUCTION IS STARTED. THE INTENT IS TO REROUTE THESE COMBUSTION AIR VENTS TO ALLOW OPERATION OF THE EXISTING WATER HEATER SYSTEM WHILE THE NEW SYSTEM IS BEING INSTALLED. REFER TO NOTES ON REVISIONS DRAWING.
2. ROUTE NEW DOMESTIC HOT WATER PIPING AND HOT WATER RETURN PIPING UP TO CONNECTION POINTS OF EXISTING PIPING.
3. INSTALL NEW DOMESTIC HOT WATER HEATER SYSTEM. ALL ASSOCIATED COMPONENTS, CONTROLS, PIPING, VENTING, ETC., THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR TO ALLOW THE PROJECT TO BE PHASED PROPERLY (I.E. ELECTRICAL CIRCUITS FROM EXISTING EQUIPMENT WILL NOT BE ABLE TO BE REUSED FOR THE NEW EQUIPMENT). INSTALL THE NEW SYSTEM TO BE FULLY OPERATIONAL. PROVIDE TEMPORARY BYPASS PIPING WHERE THE EXISTING ELECTRONIC TEMPERING STATION/MIXING VALVE WILL BE RELOCATED AND INSTALLED WITHIN THE NEW MECHANICAL ROOM. ADDITION: SET WATER HEATER SYSTEM TO OPERATE AT 120 DEGREES F WHILE TEMPORARY BYPASS PIPING IS INSTALLED. DO NOT OPERATE THE SYSTEM AT 160 DEGREES F.
4. INSTALL BALANCING VALVES WITHIN THE DOMESTIC HOT WATER RETURN PIPING. INTENT IS TO INSTALL NEW BALANCING VALVES BEFORE SYSTEM IS SWITCHED TO ALLEVIATE DEBRIS FROM GETTING IN NEW SYSTEM. THERE WILL LIKELY NEED TO BE MULTIPLE SHUTDOWNS OF THE SYSTEM OVER MULTIPLE DAYS TO COMPLETE THE INSTALLATION.
5. SWITCHOVER FROM THE EXISTING WATER HEATER SYSTEM TO THE NEW WATER HEATER SYSTEM BY CONNECTING NEW PIPING TO EXISTING PIPING AT EACH CONNECTION POINT.
6. INSTALL NEW PIPING FROM EXISTING RELOCATED ELECTRONIC TEMPERING STATION/MIXING VALVE UP TO NEW CONNECTION POINT IN THE NEW SYSTEM FOR SWITCHOVER.
7. CONNECT EXISTING RELOCATED ELECTRONIC TEMPERING STATION/MIXING VALVE INTO NEW WATER HEATER SYSTEM. SET WATER HEATER TEMPERATURE TO STORE WATER AT 160 DEGREES F. SETUP THE RELOCATED ELECTRONIC TEMPERING STATION/MIXING VALVE TO DELIVER WATER TO KITCHEN AND LAUNDRY AREA AT 160 DEGREES F AND DELIVER 120 DEGREES F TO THE REST OF THE BUILDING.

DRAWN BY	STM
DATE	12/05/25
APPROVED	GRS
SHEET NO.	
M2.4	
PROJECT NO.	2529



PARTIAL SECOND FLOOR STORAGE ROOM PLAN -
HVAC AND VENTING REVISIONS

3/8"=1'-0"

KEYED NOTES

- ① NEW 6" COMBUSTION AIR AND VENT PIPING ROUTED UP THROUGH CHASE FROM WATER ROOM BELOW.
- ② NEW 6" COMBUSTION AIR AND VENT PIPING ROUTED THROUGH CEILING SPACE.
- ③ ROUTE NEW 6" COMBUSTION AIR AND VENT PIPING UP, PENETRATE ROOF AND TERMINATE PER MANUFACTURERS REQUIREMENTS. FLASH OPENINGS PER ROOF MANUFACTURER'S REQUIREMENTS.
- ④ INSTALL OWNER FURNISHED PTAC UNIT BELOW WINDOW. INSTALL PER MANUFACTURERS REQUIREMENTS. COORDINATE WITH OWNER.

GENERAL NOTES

1. TERMINATE SEPARATED BOILER COMBUSTION AIR INTAKES WITH THE OPENING OF THE PIPING DOWN TURNED 180 DEGREES. THE OPENING OF THE COMBUSTION AIR INTAKE SHALL BE A MINIMUM OF 22" ABOVE THE ROOF.
2. TERMINATE SEPARATED BOILER AND WATER HEATER FLUE VENTS A MINIMUM OF 24" ABOVE THE INLET OF THE COMBUSTION AIR INTAKE.
3. DO NOT ROUTE ANY PIPING DIRECTLY ABOVE OR WITHIN 42" OF THE FACE OF ELECTRICAL DISCONNECTS, OR CONTROL PANELS, OR ELECTRICAL EQUIPMENT.
4. WORK SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL CODES AND REGULATIONS. ALL INSTALLATIONS SHALL FOLLOW INDUSTRY STANDARD BEST PRACTICES AND MANUFACTURER'S IOM AND RECOMMENDED PROCEDURES.
5. COORDINATE ROUTING AND LOCATIONS OF PIPING PRIOR TO INSTALLING. THE MECHANICAL TRADE SHALL BE RESPONSIBLE FOR REMOVAL AND REINSTALLATION OF ANY PIPING, DUCTWORK, ETC. THAT HAS NOT BEEN PROPERLY COORDINATED AS NECESSARY, TO ALLOW PROPER COORDINATION/LOCATION OF ALL SYSTEMS.
6. SEE SHEET M2.4 FOR CONSTRUCTION PHASING INFORMATION.

ZEHNDER'S SPLASH VILLAGE

FRANKENMUTH, MI

TSSF ARCHITECTS, INC. ARCHITECTS INTERIORS 122 N. WASHINGTON AVENUE

MACHMILLAN ASSOCIATES CONSULTING ENGINEERS PLANNERS BAY CITY, MICHIGAN SINCE 1963

GENERAL MECHANICAL NOTES

- THE MECHANICAL TRADES SHALL FAMILIARIZE THEMSELVES WITH ALL EXISTING AND NEW CONDITIONS, THESE DRAWINGS, ADDENDA & RELATED SPECIFICATIONS. THEY SHALL COMPLETELY SATISFY THEMSELVES AS TO THE CONDITIONS TO WHICH THE WORK IS TO BE PERFORMED BEFORE SUBMITTING THEIR BID. NO ALLOWANCES OR CONSIDERATIONS WILL BE GIVEN AT A LATER DATE FOR ALLEGED MISUNDERSTANDINGS AS TO THE REQUIREMENTS OF THE WORK, MATERIALS TO BE FURNISHED, OR CONDITIONS REQUIRED BY THE NATURE OF THIS PROJECT SITE DUE TO NEGLECT ON THE BIDDERS PART TO MAKE SUCH AN EXAMINATION AND COORDINATION.
- DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW APPROXIMATE LOCATION AND GENERAL ARRANGEMENT OF SYSTEMS AND EQUIPMENT. DRAWINGS SHALL NOT BE SCALLED FOR LOCATION OF SYSTEMS, EQUIPMENT, ETC. ALL LOCATIONS OF SYSTEMS AND EQUIPMENT SHALL BE VERIFIED IN FIELD AND COORDINATED WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS. SOME SYSTEMS (PIPING, DUCTWORK, ETC.) AND EQUIPMENT LOCATIONS MAY REQUIRE CHANGES IN LOCATION DUE TO FIELD CONDITIONS AND COORDINATION WITH OTHER TRADES. THESE CHANGES SHALL BE MADE WITH NO ADDITIONAL COST TO THE OWNER. FAILURE TO VERIFY AND COORDINATE WILL BE NO REASON FOR ADDITIONAL COMPENSATION.
- THE INSTALLATION OF ALL SYSTEMS, EQUIPMENT, ETC., IS SUBJECT TO CLARIFICATION WITH SUBMITTED SHOP DRAWINGS AND FIELD COORDINATION REQUIREMENTS. EQUIPMENT OUTLINES SHOWN ON DRAWINGS OR DIMENSIONED ON DRAWINGS ARE LIMITING DIMENSIONS. ANY EQUIPMENT THAT REDUCES THE INDICATED CLEARANCES OR EXCEEDS SPECIFIED OR SCHEDULED EQUIPMENT DIMENSIONS SHALL NOT BE USED.
- THE MECHANICAL CONTRACTOR SHALL COORDINATE FINAL LOCATION OF ALL EQUIPMENT WITH PIPING, DUCTWORK, ETC., AT THE TIME OF ROUGH-IN. ALL EQUIPMENT TO BE SERVICABLE, ABOVE CEILING EQUIPMENT SHALL BE WITHIN 18" OF CEILING WITHOUT ANY OBSTRUCTIONS AND SHALL HAVE ALL SERVICE AND ACCESS SPACES KEPT CLEAR. PERFORM ABOVE CEILING COORDINATION WITH ALL TRADES.
- THESE DRAWINGS AND THE ASSOCIATED SPECIFICATIONS ARE INTENDED TO PROVIDE COMPLETELY FURNISHED, INSTALLED AND OPERATIONAL MECHANICAL SYSTEM (HEATING, VENTILATING, AIR CONDITIONING, PLUMBING AND PIPING, ETC.). IF THESE DRAWINGS AND ASSOCIATED SPECIFICATIONS HAVE INFORMATION OMITTED THAT WOULD NOT ALLOW A COMPLETELY OPERATIONAL SYSTEM AS IS THE INTENT OF THE ENGINEER, THE BIDDER SHALL NOTIFY THE ENGINEER A MINIMUM ONE WEEK PRIOR TO THE BID DATE TO ALLOW FOR ADDENDA. ONCE BIDS HAVE BEEN RECEIVED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIAL, LABOR, ETC., TO FURNISH AND INSTALL A COMPLETELY OPERATIONAL MECHANICAL SYSTEM AS IS THE INTENT OF THESE DRAWINGS AND ASSOCIATED SPECIFICATION. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS. IF ANY DISCREPANCIES ARE ON DRAWINGS, AS COMPARED TO MANUFACTURER'S INSTALLATION INSTRUCTIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND INSTALL EQUIPMENT AS REQUIRED AT NO ADDITIONAL COST TO THE PROJECT.
- THE MECHANICAL TRADES SHALL TAKE OUT ALL PERMITS AND ARRANGE FOR NECESSARY INSPECTIONS AND SHALL PAY ALL FEES AND COSTS.
- THE MECHANICAL TRADES SHALL VERIFY AMOUNT OF EXISTING PIPING, VALVES, DUCTWORK, ETC. TO BE REMOVED OR RELOCATED TO ALLOW FOR INSTALLATION OF NEW PIPING, DUCTWORK, VALVES, EQUIPMENT, WALLS, ETC. ALL ABANDONED PIPING, VALVES, ETC. SHALL BE REMOVED.
- THE MECHANICAL TRADES SHALL COORDINATE ALL WORK WITH OTHER TRADES AND SHALL COORDINATE ANY SYSTEMS SHUT-DOWN WITH THE ARCHITECT/ENGINEER AND OWNER.
- ALL EXISTING EQUIPMENT, PIPING, DUCTWORK, ETC. THAT IS TO BE REMOVED SHALL REMAIN THE PROPERTY OF THE OWNER. THE CONTRACTOR SHALL REMOVE AND LOCATE THIS MATERIAL THAT REMAINS THE PROPERTY OF THE OWNER TO A LOCATION DETERMINED BY THE OWNER SOMEWHERE ON SITE. IF THE OWNER DOES NOT WANT TO MAINTAIN POSSESSION OF THE REMOVED MATERIAL, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING MATERIAL FROM THE SITE AND DISPOSING OF THIS MATERIAL AS NECESSARY TO MEET ALL CODES AND REQUIREMENTS AND SHALL PAY ALL COSTS AS REQUIRED FOR ANY DISPOSAL FEES, INSPECTIONS, PERMITS, ETC.
- ATTACHMENTS OF MECHANICAL OR ELECTRICAL EQUIPMENT TO STRUCTURAL MEMBERS ARE THE RESPONSIBILITY OF THE INSTALLING TRADE. STRUCTURAL MEMBERS SHALL NOT BE CUT, WELDED OR OTHERWISE MODIFIED WITHOUT APPROVAL OF THE ARCHITECT/ENGINEER. ATTACHMENT TO STEEL JOISTS SHALL BE MADE AT PANEL POINTS WHENEVER POSSIBLE. STEEL JOISTS SHALL BE REINFORCED FOR NON-PARTITION LOADS IN ACCORDANCE WITH THE STRUCTURAL DETAILS. THIS WORK SHALL BE PERFORMED BY CERTIFIED WELDERS AND AT THE RESPONSIBILITY OF THE TRADE INSTALLING THE SUBJECT LOAD. STRUCTURAL MEMBERS SHALL NOT BE OVERLOADED AS A RESULT OF ATTACHMENTS.
- ATTACHMENT/EQUIPMENT LOADING FOR ALL TRADES RESULTING IN TOTAL LOAD GREATER THAN AN EQUIVALENT UNIFORM 5 PSF FOR ANY MEMBER SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR REVIEW.
- THE MECHANICAL TRADES SHALL FURNISH AND LOCATE CEILING AND/OR WALL ACCESS DOORS AS REQUIRED TO GIVE ACCESS TO VALVES, EQUIPMENT, ETC. COORDINATE WALL OR CEILING FIRE RATINGS AND FURNISH ACCESS DOOR WITH RATING AS NECESSARY. THE GENERAL TRADES SHALL INSTALL ACCESS DOORS.
- SEE SPECIFICATION FOR FURTHER INFORMATION.

SPECIFIED AND SCHEDULED EQUIPMENT NOTE

EQUIPMENT MANUFACTURERS AND MATERIALS SPECIFIED OR SCHEDULED ON THESE PROJECT DRAWINGS AND SPECIFICATIONS SHALL BE INCLUDED UNDER THE BASE BID PRICE. SUBSTITUTE OR ALTERNATE EQUIPMENT SHALL BE PRICED AS AN ADD OR DEDUCT PRICE TO THE CONTRACTOR'S BASE BID PRICE. IF ONE OR MORE SUBSTITUTIONS ARE ACCEPTED WITH THE PROPOSAL AT THE CORRESPONDING ALTERNATE PRICE, IT SHALL BE UNDERSTOOD THAT APPROVAL OF SAID EQUIPMENT SHALL BE SUBJECT TO STRICT ADHERENCE TO THE PLANS AND SPECIFICATIONS. SHOULD ANY OF THE SUBSTITUTE EQUIPMENT FAIL TO MEET THE SPECIFICATIONS AFTER THE PROPOSAL HAS BEEN ACCEPTED, REGARDLESS IF EQUIPMENT HAS BEEN SHIPPED TO THE SITE AND INSTALLED, THE CONTRACTOR SHALL FURNISH AT NO EXTRA COST TO THE OWNER, THE SPECIFIED EQUIPMENT MEETING THE REQUIREMENTS AS STATED IN THESE SPECIFICATIONS AND COVER ALL COSTS NECESSARY FOR REMOVAL AND REINSTALLATION OF EQUIPMENT.

1. BASE BID PRICING SHALL BE BASED AROUND THE SCHEDULED LOCHINVAR WATER HEATERS. VOLUNTARY ALTERNATIVE PRICING MAY BE SUBMITTED FOR ACCEPTABLE ALTERNATIVE MANUFACTURERS INCLUDING AERCO AND THERMAL SOLUTIONS.

2. WATER HEATER AND ACCESSORIES SHALL BE INSTALLED IN ACCORDANCE TO ALL APPLICABLE CODES, REQUIREMENTS AND MANUFACTURER'S RECOMMENDED INSTALLATION INSTRUCTIONS.

3. WATER HEATER SUPPLIER SHALL PROVIDE STARTUP, BOILOUT, COMBUSTION EFFICIENCY TEST, OPERATOR TRAINING AND ONE-YEAR WARRANTY SERVICE WITH MATERIAL AND LABOR.

4. WATER HEATER SUPPLIER SHALL PROVIDE INITIAL CHECK TEST AND START-UP OF BOILER, VERIFY PROPER OPERATION, INSTRUCT OWNER'S PERSONNEL ON PROPER OPERATION AND MAINTENANCE, WIRING DIAGRAM SHOWING BOTH FACTORY AND FIELD WIRING, ONE YEAR WARRANTY WITH MATERIAL AND LABOR, AND SHALL PROVIDE TECHNICAL ASSISTANCE AS REQUIRED TO ASSURE THAT THE SYSTEM IS WIRED AND OPERATING AS RECOMMENDED BY THE MANUFACTURER.

5. CONTRACTOR SHALL CLEAN STRAINERS AND FLUSH PIPING SYSTEM BEFORE PLACING IN OPERATION.

6. THE ELECTRICAL CONTRACTOR SHALL UTILIZE CONTACTS ON THE WATER HEATER TO ALLOW THE WATER HEATER TO CONTROL THE ASSOCIATED DOMESTIC HOT WATER CIRCULATION PUMP.

7. ENTIRE INSTALLATION SHALL BE IN ACCORDANCE WITH WATER HEATER MANUFACTURER'S RECOMMENDATIONS. SEE SPECIFICATION FOR FURTHER INFORMATION.

8. WATER HEATER SHALL HAVE 5 YEAR WARRANTY AND 150 PSI ASME PRESSURE RELIEF VALVE.

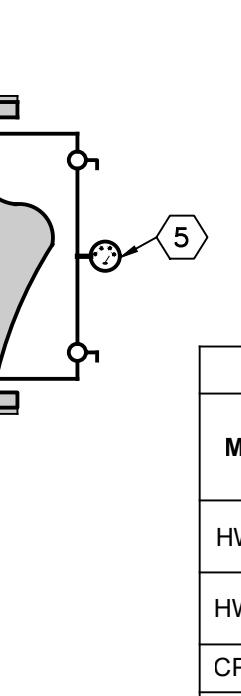
9. EACH WATER HEATER SHALL BE PROVIDED WITH A CONDENSATE NEUTRALIZATION KIT FROM MANUFACTURER.

10. WATER HEATERS SHALL BE PROVIDED WITH HIGH AND LOW PRESSURE GAS SWITCHES.

11. WATER HEATER SHALL BE PROVIDED WITH SMART TOUCH CONTROLS. THE MANUFACTURER SHALL PROVIDE A TANK SENSOR. THE MECHANICAL CONTRACTOR SHALL INSTALL THE TANK SENSOR IN ONE OF THE STORAGE TANKS PER MANUFACTURER'S RECOMMENDATIONS AND THEN CONNECT THE SENSOR TO THE LEAD WATER HEATER. CONNECT THE LEAD WATER HEATER AND MEMBER WATER HEATERS WITH 2-WIRE TWISTED SHIELDED PAIR COMMUNICATION CABLE. ALL CONTROL WIRING FOR WATER HEATERS AND SENSORS SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.

12. DESIGN INTENT IS FOR THE WATER HEATERS TO OPERATE STAND-ALONE WITH OEM CONTROLS. FURNISH WITH BACNET MSTP COMMUNICATION CARD FOR POSSIBLE CONNECTION IN FUTURE TO BUILDING MANAGEMENT SYSTEM.

STORAGE TANK SCHEDULE					
MARK	MANUFACTURER	MODEL	TANK VOLUME (GAL)	REMARKS	
ST-1,2	LOCHINVAR	RGA0504	504	LOCK TEMP BAFFLE, MAGNESIUM ANODE, ASME CERTIFIED, GLASS LINED, 150 PSI WORKING PRESSURE, 150 PSI TEMPERATURE AND PRESSURE RELIEF VALVE, TEMPERATURE AND PRESSURE GAUGE, LIFTING LUGS	



- IN-LINE PUMP SUPPORTED BY PIPING AS RECOMMENDED BY MANUFACTURER
- GRISWOLD QUICKSET MANUAL BALANCE VALVE
- CONCENTRIC REDUCER, IF REQUIRED, FROM PIPE LINE SIZE TO PUMP CONNECTION SIZE
- SHUT-OFF VALVE ON INLET PIPE
- LIQUID FILLED PRESSURE GAUGE WITH BALL SHUT-OFF VALVES
- CHECK VALVE

NOTE: FOR BOILER CIRCULATING PUMP APPLICATIONS PIPE LINE SIZE SHALL MATCH BOILER CONNECTION SIZE AT A MINIMUM THE FULL LENGTH OF PIPING PIPE LINE SIZE SHALL BE LARGER THAN BOILER CONNECTION SIZE IF NOTED SO ON DRAWINGS

TYPICAL IN-LINE CIRCULATING PUMP
NO SCALE Pump01 - TYP IN-LINE CIRC PUMP.dwg

MARK	SERVING	TYPE	KW	MBH	FAN HP	AMPS	VOLTS/PH/Hz	MANUFACTURER MODEL NUMBER	REMARKS
EUH-1	WATER ROOM	ELECTRIC	7.5	25.6	1/30	36.0	208/3/60	QMARK MUH07-8	1, 2, 3, 4

NOTES:

- FURNISH UNIT WITH FACTORY PROVIDED DISCONNECT. DISCONNECT SHALL BE INSTALLED BY ELECTRICAL CONTRACTOR.
- FURNISH ALL MOUNTING HARDWARE REQUIRED FOR WALL MOUNTED UNIT HEATER INSTALLATION.
- INSTALL UNIT HEATERS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND ALL APPLICABLE CODES.
- CONTROLS SHALL INCLUDE REMOTE MOUNTED 24V THERMOSTAT.

PUMP SCHEDULE										
MARK	MANUFACTURER	LOCHINVAR PART #	TYPE	DESIGN GPM	DESIGN HEAD (FT HD)	SUCTION SIZE	DISCHARGE SIZE	ELECTRICAL		
								VOLTS	LOAD	PHASE
HWRP-1	GRUNFOS	MAGNA3-40-120FN SS								
HWRP-2	GRUNFOS	MAGNA3-32-120FN SS								
CP-1,2,3	GRUNFOS	TP-50-80	IN-LINE	90	21'	2 1/2"	2 1/2"	120	3/4 HP	1

NOTES:

- ALL PUMPS, VALVES, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED INSTALLATION INSTRUCTIONS.
- FURNISH CONCENTRIC PIPE REDUCER AT PUMP DISCHARGE AND SUCTION AS REQUIRED TO REDUCE FROM LISTED PIPE SIZE ON DRAWINGS TO PUMP CONNECTORS.

EXPANSION TANK SCHEDULE									
MARK	SERVING	MANUFACTURER	MODEL	TANK VOLUME (GAL)	ACCEPTANCE VOLUME (GAL)	TYPE		REMARKS	
ET-1	WH-1, WH-2, WH-3	AMTROL	ST400CL	106	53	FLOOR MOUNTED	BLADDER TANK	ASME, PAINTED CARBON STEEL TANK, HEAVY-DUTY BUTYL BLADDER APPROVED FOR POTABLE HOT WATER SYSTEMS, THREE YEAR TANK WARRANTY. TANK COMES PRE-CRASHED AT 25 PSI. CURRENT INCOMING WATER PRESSURE IS ASSUMED TO BE 75 PSI. CONTRACTOR SHALL FIELD VERIFY INCOMING WATER PRESSURE AND ADJUST CHARGE TO MATCH.	

SUPPLY FAN SCHEDULE										ELECTRICAL		BASIS OF DESIGN	NOTES	
MARK	SERVING	TYPE	MAX CFM	BALANCED CFM	E.S.P. (IN. W.C.)	FAN RPM	DRIVE	SONE S	ELECTRICAL		BASIS OF DESIGN			
									BHP	HP	V/HZ/PH	FLA	MAKE	MODEL
SF-1	WATER ROOM	WALL MOUNTED	800	750	0.125	379	DIRECT	2.9	0.02	0.25	115/60/1	2.85	GREENHECK	AER-24-VG

NOTES:

- FURNISH WITH MOTORIZED DAMPER INSTALLED AT DISCHARGE OF FAN. DAMPER SHALL BE GREENHECK MODEL #VCD-23 DAMPER, 16 GA GALVANIZED STEEL 3V TYPE WITH THREE LONGITUDINAL GROOVES FOR REINFORCEMENT. BLADE SEALS SHALL BE TPE. LINKAGE SHALL BE BLADE TO BLADE CONCEALED IN JAMB. DAMPER FRAME SHALL BE 16 GA GALVANIZED STEEL FORMED INTO A STRUCTURAL HAT CHANNEL. BEARINGS SHALL BE CORROSION RESISTANT. DAMPER SHALL HAVE EXTERNAL MOUNT FOR ELECTRIC ACTUATOR. DAMPER SHALL BE NORMALLY CLOSED AND OPEN WHEN SF-1 IS OPERATING. ACTUATOR SHALL BE 120V.
- FURNISH SPEED CONTROLLER TO BE MOUNTED ON FAN HOUSING TO ALLOW AIR BALANCING OF EXHAUST FAN.
- FURNISH WITH 90° Weather Hood and Wall Housing with Inlet/Discharge Guard. Provide Wall Housing with Filter Bank and 2" Thick Aluminum Filters.
- FURNISH WITH GREENHECK HOA CONTROLLER AND 24V REVERSE ACTING THERMOSTAT TO TURN ON SF-1, OPEN MOTORIZED DAMPER ON SF-1 AND OPEN MOTORIZED DAMPER ON L-1 WHEN SPACE TEMP EXCEEDS 85°(adj).
- FANS SHALL BE RATED FOR CONTINUOUS OPERATION.
- FAN SHALL BE LISTED.

LOUVER SCHEDULE										ELECTRICAL		BASIS OF DESIGN	NOTES
MARK	SERVING	WIDTH (IN)	HEIGHT (IN)	DEPTH (IN)	CFM	PRESS DROP (IN. W.C.)	VELOCITY	BPWP	FREE AREA	FRAME	DAMPER	BASIS OF DESIGN	NOTES
							FPM	FPM	S.F.	TYPE	TYPE	MAKE	MODEL
L-1	WATER ROOM	24"	18"	4"	750	0.05	609	989	1.23	CHANNEL	MOTORIZED	GREENHECK	ESD-435

MECHANICAL SPECIFICATIONS									
REFERENCE INSTRUCTIONS TO BIDDERS, CONDITIONS OF THE CONTRACT, DIVISION 1, AND THIS SECTION SHALL APPLY TO THIS DIVISION.									
CODES, PERMITS & INSPECTIONS CONTRACTOR SHALL SECURE PERMITS, INSPECTIONS AND TESTS, PAY ALL FEES, DEPOSITS, AND COSTS FOR ALL MECHANICAL UTILITIES AND SERVICES INVOLVED AND PRESENT THE OWNER A CERTIFICATE OF INSPECTION AND APPROVAL FROM THE DEPARTMENT HAVING JURISDICTION OVER HIS WORK. SHOULD ANY CHANGE IN THE DRAWINGS AND SPECIFICATIONS BE REQUIRED TO COMPLY WITH ANY APPLICABLE CODES, RULES, REGULATIONS, ETC., CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE SUBMITTING BID. AFTER THE ENGINEER HAS APPROVED THE CONTRACT, ALL WORK NECESSARY TO MEET THE REQUIREMENTS SHALL BE COMPLETED WITHOUT ADDITION TO THE CONTRACT AMOUNT. WHERE WORK INDICATED IS MORE THAN REQUIRED BY CODES, ETC., SUCH WORK SHALL BE AS INDICATED.									
JOB OBSERVATION NOTWITHSTANDING ANY REFERENCE TO ANY CODE, RULE OR REGULATION, ENGINEER SHALL HAVE NO RESPONSIBILITY FOR SAFETY ON THE JOB SITE, SHALL HAVE NO RIGHT TO CHANGE OR STOP THE WORK, SHALL NOT CONTROL THE MEANS OF THE WORK, AND SHALL NOT HAVE ANY DUTY TO PROVIDE SUPERVISION OF MEANS, METHODS, PROCESSES OR PROCEDURES OF CONSTRUCTION.									
FIRST-CLASS WORKABLE SYSTEMS FIRST CLASS WORKABLE SYSTEMS SHALL BE PROVIDED BY THE CONTRACTOR. IF, IN THE OPINION OF THE CONTRACTOR, CHANGES IN THE DRAWINGS OR SPECIFICATIONS ARE REQUIRED TO PRODUCE FIRST-CLASS WORKABLE SYSTEMS, CONTRACTOR SHALL REQUEST AN INTERPRETATION FROM THE ENGINEER BEFORE PROCEEDING WITH THE WORK. IF THE CONTRACTOR FAILS TO MAKE SUCH A REQUEST, NO EXCUSE WILL THEREAFTER BE ENTERTAINED FOR FAILURE TO PROVIDE FIRST-CLASS WORKABLE SYSTEMS.									
DRAWINGS DRAWINGS ARE INTENDED TO SHOW THE GENERAL ARRANGEMENT, DESIGN, AND EXTENT OF THE WORK AND ARE DIAGRAMMATIC. THEY ARE NOT INTENDED TO BE SCALED FOR ROUGH-IN MEASUREMENTS NOR TO SERVE AS SHOP DRAWINGS. THE ENGINEERS AND OWNER RESERVE THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF EQUIPMENT, DUCTWORK, PIPING, ETC. AT THE TIME OF ROUGH-IN WITHOUT ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, LOCATIONS, ETC. FOR ACCURACY AND POSSIBILITY OF INTERFERENCES DUE TO FIELD CONDITIONS AND ACTUAL BUILDING STRUCTURE. FAILURE TO CHECK WILL BE NO REASON FOR ADDITIONAL COMPENSATION.									
SHOP DRAWINGS SUBMIT ELECTRONIC SET OF COMPLETE SHOP DRAWINGS FOR ALL MECHANICAL EQUIPMENT AND MATERIALS TO THE ENGINEER FOR REVIEW BEFORE FABRICATION OF WORK OR ORDERING OF EQUIPMENT. DRAWINGS MUST BE REVIEWED BY THE ENGINEER BEFORE ORDERING EQUIPMENT. ALL SHOP DRAWINGS REJECTED SHALL BE CORRECTED AND RESUBMITTED TO THE ENGINEER BEFORE ORDERING.									
STANDARDS OF INDUSTRY STANDARDS OF INDUSTRY SHALL BE FOLLOWED WHEN APPLICABLE.									
GUARANTEE CONTRACTOR SHALL GUARANTEE EQUIPMENT, MATERIALS AND WORKMANSHIP IN HIS CONTRACT AND SHALL MAKE GOOD AT HIS OWN EXPENSE ANY DEFECTS WHICH MAY DEVELOP WITHIN ONE YEAR AFTER START-UP OF EACH PIECE OF EQUIPMENT, OCCUPANCY BY OWNER, OR FINAL ACCEPTANCE OF THE JOB, WHICHEVER OCCURS FIRST.									
CONTRACTORS RECORD/A-S BUILT DRAWINGS CONTRACTOR SHALL MAINTAIN AND KEEP AN UP-TO-DATE SET OF 'RECORD' DRAWINGS REFLECTING 'AS-BUILT' CONDITIONS OF THEIR WORK. CONTRACTOR SHALL INDICATE EXACT DIMENSIONS AND ELEVATIONS FOR ALL UNDERGROUND WORK. UPON COMPLETION OF THIS PROJECT, THE CONTRACTOR SHALL DELIVER TO THE ENGINEER THE "RECORD" DRAWINGS.									
LOCAL CONDITIONS BEFORE SUBMITTING BIDS AND/OR PROCEEDING WITH THE PROJECT, THE CONTRACTOR SHALL EXAMINE ALL DRAWINGS, SPECIFICATIONS AND ADDENDA ISSUED FOR THE PROJECT AND SHALL EXAMINE THE PROJECT SITE. THE CONTRACTOR SHALL THOROUGHLY INVESTIGATE THE PROJECT SITE AND BECOME FULLY INFORMED AS TO THE EXTENT OF HIS WORK AND COORDINATION OF THIS WORK WITH ALL OTHER TRADES AND INCLUDE ALL COST TO PERFORM AND COMPLETE WORK FOR THIS PROJECT PER DRAWINGS AND SPECIFICATION AND ALL CODES.									
OPERATION AND MAINTENANCE MANUALS CONTRACTOR SHALL FURNISH ONE COPY OF THE ARCHITECT/ENGINEER TWO (2) COPIES OF AN APPROVED ROUND DRIVING BINDER BOOK WITH TABS FOR SECTIONS COVERING EACH ITEM OF EQUIPMENT. THESE NOTEBOOKS SHALL INCLUDE SHOP DRAWINGS, MAINTENANCE MANUALS, OPERATING MANUALS AND PARTS LIST AS NECESSARY TO INSTRUCT THE OWNER ON PROPER OPERATION AND USE AS WELL AS MAINTENANCE FOR EACH PIECE OF EQUIPMENT FOR THIS PROJECT. THESE BOOKS SHALL ALSO INCLUDE CONTRACTOR'S, SUBCONTRACTOR'S AND MANUFACTURER'S NAMES, TELEPHONE NUMBERS AND ADDRESSES. MANUALS SHALL ALSO INCLUDE SEQUENCE OF OPERATION, CONTROL EQUIPMENT LITERATURE, WIRING AND CONTROL DIAGRAMS, CERTIFICATES OF GUARANTEES, CERTIFICATES OF INSPECTION, MECHANICAL SYSTEM TEST AND BALANCING REPORTS. THE CONTRACTOR SHALL ACCUMULATE AND SUMMARIZE THE CONTROL AND MAINTENANCE SEQUENCE IN TYPED SHEET TO BE INCLUDED IN THE REPORT. THESE MANUALS SHOULD BE HARD BOUND IN BEST QUALITY BINDERS AND TURNED OVER TO THE ARCHITECT/ENGINEER FOR APPROVAL AT COMPLETION OF PROJECT.									
START-UP SERVICE CONTRACTOR SHALL ARRANGE WITH EQUIPMENT MANUFACTURERS FOR PROVIDING COMPLETE START-UP SERVICE FOR ALL EQUIPMENT ON THIS PROJECT. ALL START-UP SERVICES SHALL BE PERFORMED IN THE PRESENCE OF THE OWNER AND/OR ENGINEER. A WRITTEN REPORT SHALL BE SUBMITTED TO THE ENGINEER STATING DATE OF START-UP, MANUFACTURER APPROVAL OF SYSTEM OPERATION AND INSTALLATION.									
CUTTING AND PATCHING CUTTING AND PATCHING SHALL BE BY TRADES REGULARLY ENGAGED IN THIS TYPE OF WORK, EXCEPT DRILLING OF HOLES SHALL BE DONE BY THE TRADES REQUIRING SAME. STRUCTURAL MEMBERS SHALL NOT BE CUT OR DRILLED.									
SALVAGEABLE MATERIAL SALVAGEABLE MATERIAL SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE STORED AT LOCATIONS AS DIRECTED BY THE OWNER, EXCEPT THE OWNER RESERVES THE RIGHT TO DESIGNATE CERTAIN ITEMS OF SALVAGEABLE MATERIAL TO BE REMOVED FROM THE PROJECT SITE.									
RIGGING AND HOISTING PERFORM ALL REQUIRED RIGGING, HOISTING, TRANSPORTATION, MOVING, ETC. OF ALL EQUIPMENT, MATERIALS, ETC. TO BE FURNISHED AND/OR INSTALLED AS SHOWN ON DRAWINGS, WHETHER FURNISHED BY THIS CONTRACTOR OR BY THE OWNER OR OTHER TRADES.									
STORAGE FACILITY FURNISH AND MAINTAIN A WEATHERPROOF STORAGE FACILITY ON THE SITE OF ADEQUATE SIZE TO STORE MISCELLANEOUS EQUIPMENT AND/OR MATERIALS TO PREVENT EXPOSURE TO THE WEATHER. LOCATION OF SHED SHALL BE DETERMINED BY THE OWNER AND ARCHITECT/ENGINEER. THE OWNER RESERVES THE RIGHT TO DENY STORAGE OF MATERIALS OR EQUIPMENT IN ANY EXISTING OR NEW BUILDINGS.									
PROTECTION FROM DAMAGE THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIALS, EQUIPMENT, ETC. AND ALL WORK INSTALLED BY HIMSELF AND SHALL PROTECT IT FROM DAMAGE UNTIL FINAL ACCEPTANCE OF THIS PROJECT BY THE OWNER.									
FURNISH ALL COVERINGS AND PROTECTION FROM DIRT, DUST, RAIN, STORM, HEAT, TRAFFIC, WEAR, ETC. AND ALL POSSIBLE INJURY INCLUDING THAT BY OTHER WORKMEN, ANY EQUIPMENT, WORKMANSHIP, MATERIALS, ETC. DAMAGED PRIOR TO FINAL ACCEPTANCE BY THE OWNER OF THIS PROJECT SHALL BE PROPERLY REPAIRED AT NO EXPENSE TO THE OWNER.									
PROTECT ALL PLUMBING FIXTURES AND OTHER EQUIPMENT FROM DAMAGE BY COVERING OR COATING. ANY DENTED, SCRATCHED, RUSTED OR MARRED SURFACE FINISHES WILL NOT BE ACCEPTED.									
PROTECT ALL EQUIPMENT, MATERIALS, ETC. FROM FREEZING.									
PLUMBING AND PIPING BASIC MATERIALS AND METHODS:									
BELOW GROUND SANITARY, STORM AND DRAINAGE (MUST BE APPROVED BY GOVERNING AUTHORITIES) UNDER BUILDING AND TO 5'-0" OUTSIDE THE BUILDING, SCHEDULE 40 PVC OR SERVICE WEIGHT CAST IRON. FROM 5'-0" OUTSIDE THE BUILDING, SCHEDULE 40 PVC EXCEPT DRAINS UNDER DRIVE OR PARKING AREAS SHALL BE CAST IRON UNLESS NOTED OTHERWISE.									
ABOVE GROUND SANITARY, STORM AND DRAINAGE (MUST BE APPROVED BY GOVERNING AUTHORITIES) SCHEDULE 40 PVC FOR 3" AND LARGER SERVICE WEIGHT CAST IRON HUBLESS WITH SS CLAMP-AND-SHIELD ASSEMBLIES OR HUB AND SPIGOT WITH NEOPRENE JOINING GASKET AND FOR 2 1/2" AND SMALLER SCHEDULE 40 GALVANIZED PIPE WITH SCREWED FITTINGS. NOTE: LOCAL AUTHORITY APPROVAL (INCLUDING FIRE MARSHAL) SHALL BE OBTAINED IN WRITING FOR USE OF PVC PIPING ABOVE GRADE.									
DOMESTIC WATER PIPING, ABOVE GRADE INSIDE BUILDING (MUST BE APPROVED BY GOVERNING AUTHORITIES)									
DOMESTIC WATER PIPING INCLUDES COLD WATER, HOT WATER AND HOT WATER RETURN PIPING.									
PIPING: 6" AND SMALLER SHALL BE: COPPER TUBING: ASTM B88, TYPE L, HARD DRAWN, SEAMLESS. FITTINGS: ASME B16.18 CAST BRONZE TEE TAP OR ASME B16.22 WROUGHT COPPER WITH ASTM B32 SOLDER JOINTS AND LEAD FREE GRADE 95-A TIN - ANTIMONY OR TIN AND SILVER WITH MELTING RANGE 430 TO 535 DEGREES F OR AWS A5CUP SILVER BRAZE.									
NATURAL GAS PIPING, ABOVE GRADE INSIDE BUILDING NATURAL GAS PIPING 2" AND SMALLER SHALL BE SCHEDULE 40 BLACK CARBON STEEL ASTM A53, SEAMLESS WITH BLACK MALLEABLE IRON FITTINGS, 150 PSIG SCREWED ASME B16.3.									
NATURAL GAS PIPING 2 1/2" AND LARGER SHALL BE SCHEDULE 40 BLACK CARBON STEEL ASTM A53 SEAMLESS WITH WELDED FITTINGS ASTM A234.									
PIPING FOR 1 PSIG OR HIGHER GAS PRESSURE SHALL BE IN ACCORDANCE WITH CODE FOR PRESSURE PIPING ANSI B31.1.									
FURNISH LUBRICATED PLUG SHUT-OFF VALVES ON MAIN BRANCHES AND AT DOMESTIC PRESSURE REGULATORS. LOCATE WRENCH NEAR METER. STOP VALVES AT EQUIPMENT AND OUTLETS SHALL BE BALVE VALVES WHERE 2" AND SMALLER. GAS PIPING SHALL HAVE DIPS AT BOTTOM OF RISERS WITH BRANCHES TAKEN FROM TOP OR SIDE OF HORIZONTAL PIPE. CAP ALL GAS PIPE OUTLETS UNTIL CONNECTED TO GAS EQUIPMENT. ALL GAS PIPING SHALL BE RUN IN SPACES WHICH ARE ACCESSIBLE FOR INSPECTION AND SERVICE.									
PIPE SUPPORTS AND ANCHORS: CONFORM TO ASME B31.5, ASTM F708, MSS SP59, MSS SP69 AND MSS SP86. HANGERS FOR PIPE SIZES 1/2 TO 1 1/2 INCH MALLEABLE IRON, ADJUSTABLE SWIVEL, SPLIT RING. HANGERS FOR PIPE SIZES 2 INCHES AND OVER: CARBON STEEL, ADJUSTABLE, CLEVIS. MULTIPLE OR TRAPEZE HANGERS: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS. WALL SUPPORT FOR PIPE SIZES 2 TO 4 INCHES: CAST IRON HOOD.									
FLOOR SUPPORT: CAST IRON ADJUSTABLE PIPE SADDLE, LOCK NUT, NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.									
FIELD INSPECTION AND TESTING WILL BE PERFORMED. TEST REFRIGERATION SYSTEM IN ACCORDANCE WITH ASME B31.5. PRESSURE TEST SYSTEM WITH DRY NITROGEN TO 200 PSIG. PERFORM FINAL TESTS AT 27 INCHES VACUUM AND 200 PSIG USING HALIDE TORCH. TEST TO NO LEAKAGE.									

VALVES									
SWING CHECK VALVES: UP TO AND INCLUDING 3 INCHES: BRONZE BODY, BRONZE TRIM, BRONZE ROTATING SWING DISC, WITH COMPOSITION DISC, SOLDER OR THREADED ENDS. OVER 3 INCHES: IRON BODY, BRONZE TRIM, BRONZE OR BRONZE FACED ROTATING SWING DISC, RENEWABLE DISC AND SEAT, FLANGED ENDS OR GROOVED ENDS IF VICTAULIC GROOVED END FITTINGS ARE USED.									
BALL VALVES: UP TO AND INCLUDING 2 INCHES: BRONZE ONE PIECE BODY, STAINLESS STEEL BALL, TEFLOON SEATS AND STUFFING BOX RING, LEVER HANDLE WITH BALANCING STOPS, SOLDER OR THREADED ENDS. OVER 2 INCHES: CAST STEEL BODY, CHROME PLATED STEEL BALL, TEFLOON SEAT AND STUFFING BOX SEALS, LEVER HANDLE, OR GEAR DRIVE HANDWHEEL, FOR SIZES 10 INCHES AND OVER, FLANGED. DUCTILE IRON BODY, CHROME PLATED CARBON STEEL BALL AND STEM, TFE SEATS, LEVER HANDLE OR GEAR OPERATOR, GROOVED ENDS. VICTAULIC SERIES T26.									
PLUG VALVES: UP TO AND INCLUDING 3 INCHES: BRONZE BODY, BRONZE TAPERED PLUG, FULL PORT OPENING, NON-LUBRICATED, TEFLOON PACKING, THREADED ENDS. OPERATOR: ONE PLUG VALVE WRENCH FOR EVERY TEN PLUG VALVES MINIMUM OF ONE. OVER 3 INCHES: CAST IRON BODY AND PLUG, FULL PORT OPENING, PRESSURE LUBRICATED, TEFLOON PACKING, FLANGED ENDS OR GROOVED ENDS IF VICTAULIC GROOVED END FITTINGS ARE USED. DUCTILE IRON BODY AND PLUG, STANDARD PORT OPENING, NON-LUBRICATED ECCENTRIC-TYPE, WELDED-IN NICKEL SEAT, GROOVED ENDS. VICTAULIC SERIES 377. OPERATOR: EACH PLUG VALVE SHALL HAVE A WRENCH HANDLE WITH SET SCREW.									

