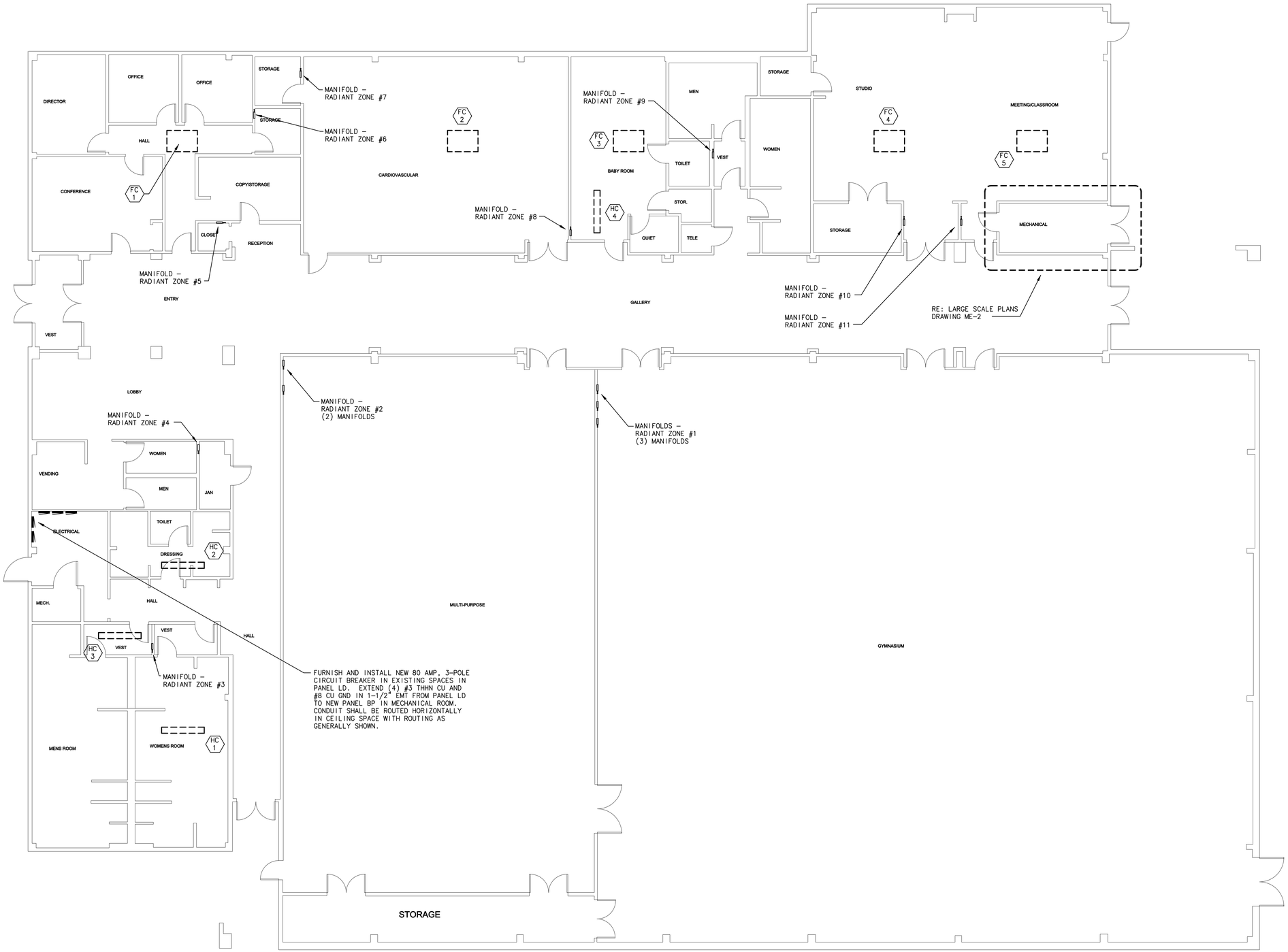

BALANCING NOTES – ADD ALTERNATE #3

BALANCER SHALL PROVIDE SERVICES AS REQUIRED TO BALANCE EXISTING EQUIPMENT TO THE FOLLOWING AIR AND WATER FLOWS:

UNIT #	OUTSIDE AIR FLOW	HEATING WATER FLOW
FC-1	240 CFM	3.0 GPM
FC-2	690 CFM	4.5 GPM
FC-3	220 CFM	3.0 GPM
FC-4	600 CFM	5.9 GPM
FC-5	600 CFM	5.9 GPM
AHU-1	3,750 CFM	25.8 GPM
AHU-2	1,875 CFM	11.7 GPM
AHU-3	1,500 CFM	10.2 GPM
AHU-4	690 CFM	3.0 GPM
RADIANT FLOOR MANIFOLD #1		20.6 GPM
RADIANT FLOOR MANIFOLD #2		7.5 GPM
RADIANT FLOOR MANIFOLD #3		2.1 GPM
RADIANT FLOOR MANIFOLD #4		1.3 GPM
RADIANT FLOOR MANIFOLD #5		6.8 GPM
RADIANT FLOOR MANIFOLD #6		3.1 GPM
RADIANT FLOOR MANIFOLD #7		2.9 GPM
RADIANT FLOOR MANIFOLD #8		0.8 GPM
RADIANT FLOOR MANIFOLD #9		1.1 GPM
RADIANT FLOOR MANIFOLD #10		1.6 GPM
RADIANT FLOOR MANIFOLD #11		1.3 GPM

MECHANICAL / ELECTRICAL FLOOR PLAN

SCALE: 1/8"=1'-0"

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REVISION NO.	DATE

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DRAWN BY: BAI
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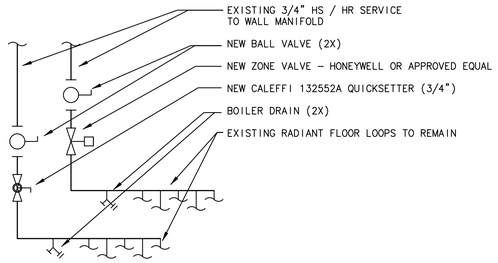
DRAWING NO.
ME-1
OF 2



RADIANT FLOOR MANIFOLD PIPING MODIFICATIONS

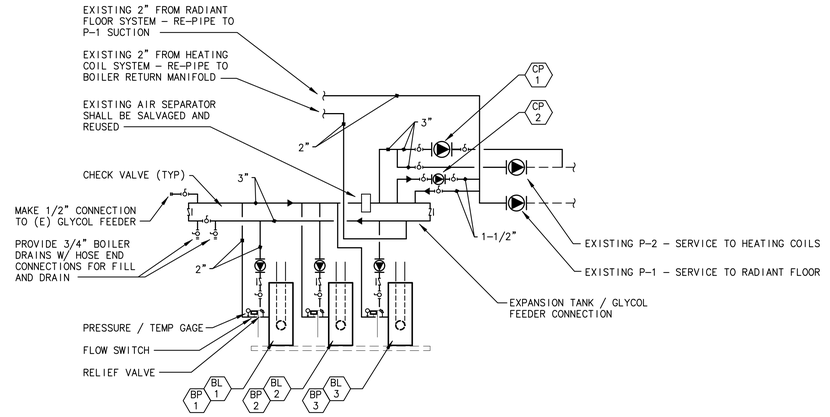
NOT TO SCALE

ALTERNATE BID ITEM #2

MODIFICATION INTENT IS TO:

1) PROVIDE CAPABILITY FOR INDIVIDUAL MANIFOLD DRAIN AND PURGE
2) PROVIDE FOR INSTALLATION OF NEW ZONE CONTROL VALVE
3) PROVIDE FOR ZONE AND LOOP BALANCING CAPABILITY

MODIFICATION IS TYPICAL FOR 11 MANIFOLDS. RE: BUILDING PLAN, DRAWING ME-1 FOR MANIFOLD LOCATIONS.



HEATING WATER PIPING SCHEMATIC

NOT TO SCALE

MECHANICAL EQUIPMENT LIST

BL-1 HEATING WATER BOILER
LOCHINVAR MODEL KBN 801
800 MBH INPUT – NATURAL GAS
582.8 MBH OUTPUT – 7,500 FT. ELEV.

PROVIDE COMPLETE WITH:

- M13 FIRING CODE (CSD1 / FM)
- CONDENSATE NEUTRALIZATION KIT
- BMS GATEWAY FOR BACNET
- HIGH AND LOW GAS PRESSURE SWITCHES W/ MANUAL RESET
- LOW WATER CUTOFF W/ MANUAL RESET AND TEST

BL-2 AND BL-3 ARE TYPICAL

BP-1 BL-1 HEATING WATER CIRCULATING PUMP
GRUNDFOS MODEL UPS 32-160/2
42 GPM, 20 FT. HD.
3/4 HP, 120 VOLT

BP-2 AND BP-3 ARE TYPICAL

CP-1 PRIMARY HEATING WATER CIRCULATING PUMP
GRUNDFOS MODEL MAGNA3 65-150F
50 GPM, 50 FT. HD.
2 HP, 240 VOLT – 1 PHASE

CP-2 RADIANT FLOOR HEATING WATER INJECTION PUMP
GRUNDFOS UP 26-96 F/VS
10 GPM, 10 FT. HD.
1/12 HP, 120 VOLT

DEDUCTIVE PRICING ALTERNATE #1

BL-1 HEATING WATER BOILER
LOCHINVAR MODEL KBN 401
399 MBH INPUT – NATURAL GAS
291.4 MBH OUTPUT – 7,500 FT. ELEV.

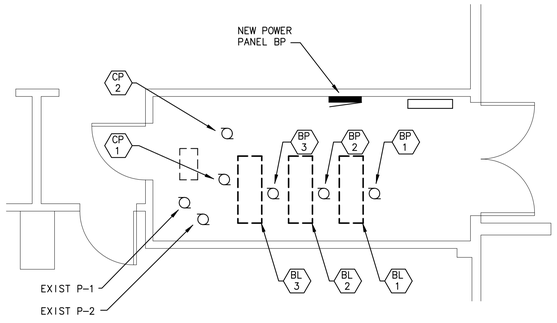
PROVIDE COMPLETE WITH:

- M9 FIRING CODE (STANDARD)
- CONDENSATE NEUTRALIZATION KIT
- BMS GATEWAY FOR BACNET
- LOW WATER CUTOFF W/ MANUAL RESET AND TEST
- STACK FRAME FOR BL-1/2 AND BL-3/4

BL-2, 3, 4 AND 5 ARE TYPICAL

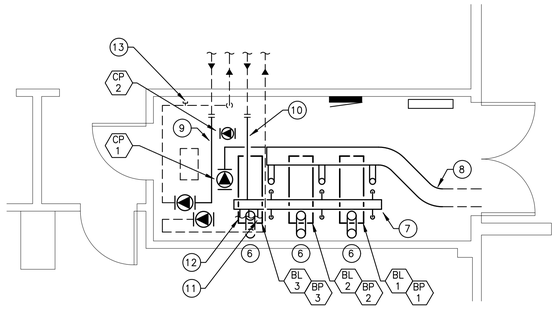
BP-1 BL-1 HEATING WATER CIRCULATING PUMP
GRUNDFOS MODEL UP 26-96 F
20 GPM, 10 FT. HD.
1/6 HP, 120 V9LT

BP-2, 3, 4, AND 5 ARE TYPICAL



PARTIAL FLOOR PLAN – MECH ROOM ELECTRICAL

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



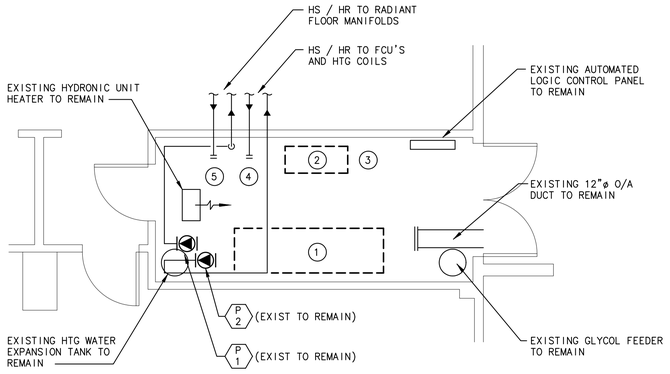
PARTIAL FLOOR PLAN – MECH ROOM NEW WORK

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

PANEL SCHEDULE - BP — MECH ROOM EQUIPMENT PANEL

PANEL TYPE:	PANELBOARD	PHASES:	3	VOLTAGE:	120/208 V	PHASE A CONNECTED:	XXX W
MAIN BREAKER:	100A	WIRES:	4	CONNECTED:	XXX W	PHASE B CONNECTED:	XXX W
BUS SIZE:	100 A	MOUNTING:	FLUSH	DEMAND:	XXX W	PHASE C CONNECTED:	XXX W

LOAD TYPE AND DESCRIPTION	AMPS	POLES	CKT #	PHASE	CKT #	POLES	AMPS	LOAD TYPE AND DESCRIPTION
MECH- HEAT: BL-1	20A	1P	1	A	2	—	——	MECH- HEAT: ——
MECH- HEAT: BP-1	20A	1P	3	B	4	3P	20A	MECH- HEAT: CP-1
MECH- HEAT: BL-2	20A	1P	5	C	6	—	——	MECH- HEAT: ——
MECH- HEAT: BP-2	20A	1P	7	A	8	1P	20A	MECH- HEAT: CP-2
MECH- HEAT: BL-3	20A	1P	9	B	10	1P	20A	MISC: CONTROLS
MECH- HEAT: BP-3	20A	1P	11	C	12	1P	20A	SPARE: UNALLOCATED FUTURE
SPACE: ——	——	—	13	A	14	—	——	SPACE: ——
SPACE: ——	——	—	15	B	16	—	——	SPACE: ——
SPACE: ——	——	—	17	C	18	—	——	SPACE: ——
SPACE: ——	——	—	19	A	20	—	——	SPACE: ——
SPACE: ——	——	—	21	B	22	—	——	SPACE: ——
SPACE: ——	——	—	23	C	24	—	——	SPACE: ——
SPACE: ——	——	—	25	A	26	—	——	SPACE: ——
SPACE: ——	——	—	27	B	28	—	——	SPACE: ——
SPACE: ——	——	—	29	C	30	—	——	SPACE: ——



PARTIAL FLOOR PLAN – MECH ROOM DEMOLITION

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

PLAN NOTES

1. EXISTING HEATING WATER BOILER AND ALL POWER, VENTING, PIPING AND CONTROLS TO BE REMOVED.
2. EXISTING FLAT PLATE HEAT EXCHANGER TO BE REMOVED. REMOVE ALL PIPING BETWEEN THE HEAT EXCHANGER AND THE HEATING WATER SYSTEM.
3. GROUND WATER CONNECTIONS TO FLAT PLATE HEAT EXCHANGER SHALL BE REMOVED BACK TO AN EXISTING VALVED POINT AS CLOSE AS POSSIBLE TO THE BUILDING ENTRY.
4. ALL FCU / COIL HEATING WATER RETURN PIPING SHALL BE REMOVED FROM THE POINT OF ROOM ENTRY BACK TO THE POINT OF CONNECTION WITH THE BOILER RETURN.
5. ALL RADIANT FLOOR HEATING WATER RETURN PIPING SHALL BE REMOVED FROM THE POINT OF ROOM ENTRY BACK TO THE POINT OF CONNECTION WITH THE BOILER RETURN.
6. EXTEND 6" PVC BOILER VENT UP THROUGH ROOF – APPROXIMATELY 30' VERTICAL RISE. OFFSET AWAY FROM WALL TO ALLOW FOR 24" MINIMUM SEPARATION FROM UPPER GALLERY WALL ABOVE ROOF.
7. INSTALL 3" HEATING WATER LOOP. MAKE BOILER SUPPLY AND RETURN CONNECTIONS AND SERVICE WATER SUPPLY AND RETURN CONNECTIONS TO LOOP PER HEATING WATER PIPING SCHEMATIC THIS SHEET.
8. MAKE CONNECTION TO EXISTING 12" COMBUSTION AIR DUCT AND EXTEND HORIZONTALLY INTO MECHANICAL ROOM CEILING SPACE. MAKE 4" PVC COMBUSTION AIR CONNECTIONS FROM DUCT TO BOILERS.
9. MAKE 2" PIPING CONNECTION FROM EXISTING RADIANT FLOOR HEATING WATER RETURN LINE TO SUCTION SIDE OF EXISTING CIRCULATING PUMP P-1. INSTALL "T"s AS REQUIRED TO ALLOW FOR CP-5 HEATING WATER INJECTION INSTALLATION (RE: HEATING WATER PIPING SCHEMATIC, THIS SHEET.
10. MAKE 2" PIPING CONNECTION TO EXISTING HEATING WATER COIL PIPING RETURN AND EXTEND TO CONNECTION WITH HEATING WATER LOOP PER HEATING WATER PIPING SCHEMATIC THIS SHEET.
11. MAKE 3" HIGH TEMPERATURE COIL SUPPLY WATER CONNECTION TO 3" HEATING WATER LOOP. RE: HEATING WATER PIPING SCHEMATIC THIS SHEET.
12. MAKE 1-1/2" RADIANT FLOOR INJECTION SUPPLY AND RETURN WATER CONNECTIONS TO 3" HEATING WATER LOOP. RE: HEATING WATER PIPING SCHEMATIC THIS SHEET.
13. EXISTING RADIANT FLOOR TEMPERATURE SENSOR LOCATION. PROVIDE NEW SENSOR IN THIS LOCATION FOR TEKMAR 356 MIXING CONTROL INPUT.

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DRAWN BY: BAI
CHK'D BY: MAB

DRAWING NO.
ME-2
OF 2

DIVISION 15 - GENERAL CONDITIONS

A. GENERAL

1. THE DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY. WHAT IS CALLED FOR IN EITHER IS BINDING FOR BOTH.

2. COMPLIANCE: ALL WORK SHALL COMPLY WITH LOCAL CODES AND STANDARDS, LATEST EDITIONS, AS APPLICABLE, WHERE NO CONFLICT DEVELOPS BETWEEN LAWS, ORDINANCES, STANDARDS OR THIS SPECIFICATION. WHERE DIFFERENCES OCCUR, THE MOST DEMANDING AND THE HIGHEST LEVEL OF MATERIAL OR WORKMANSHIP SHALL APPLY AS DETERMINED BY THE ARCHITECT.

3. NOTIFY PROPER AUTHORITIES WHEN WORK IS READY FOR IN-SECTIONS REQUIRED BY APPLICABLE CODES, RULES AND REGULATIONS, ALLOWING SUFFICIENT TIME FOR INSPECTIONS. RECEIVE, RECORD AND SUBMIT WRITTEN APPROVALS OF AUTHORITIES TO ARCHITECT WITHIN TEN DAYS OF EACH INSPECTION.

4. MANUFACTURER'S MATERIAL OR EQUIPMENT LISTED IN SCHEDULES OR ON DRAWINGS ARE TYPES TO BE PROVIDED FOR ESTABLISHMENT OF SIZE, CAPACITY, GRADE, AND QUALITY. OTHER MANUFACTURERS MAY BE USED PROVIDED THAT THE EQUIPMENT IS EQUAL IN QUALITY AND CAPACITY TO THE SPECIFIED EQUIPMENT. THE BURDEN OF PROOF FOR EQUALITY OF EQUIPMENT SHALL REST WITH THE CONTRACTOR. IF OTHER ACCEPTABLE MANUFACTURERS ARE USED, COST OF ANY CHANGE IN CONSTRUCTION REQUIRED BY THEIR USE SHALL BE BORNE BY CONTRACTOR.

B. SCOPE OF WORK

1. MECHANICAL CONTRACTOR SHALL BE PRIME AND SHALL COORDINATE ALL SUB-CONTRACTOR SERVICES AND PAYMENTS AS REQUIRED TO COMPLETE THE WORK OF THIS PROJECT.

2. MECHANICAL CONTRACTOR SHALL PROVIDE FOR REMOVAL AND REINSTALLATION OF HEATING WATER BOILERS, PUMPS AND CONTROLS AS SHOWN AND SPECIFIED.

3. DEMOLISH, REMOVE, DEMON AND DISCONNECT ABANDONED MECHANICAL AND ELECTRICAL MATERIALS AND EQUIPMENT EITHER INDICATED TO BE REMOVED OR NOT REQUIRED AS A PART OF THE FINAL INSTALLATION AND NOT INDICATED TO BE SALVAGED OR SAVED. REMOVE FROM SITE AND LEGALLY DISPOSE OF ALL DEMOLISHED MATERIALS AND EQUIPMENT NOT INDICATED TO BE SALVAGED.

4. THE ELECTRICAL SUB-CONTRACTOR SHALL PROVIDE FOR REMOVAL AND/OR RELOCATION OF EXISTING CONDUITS, CONDUCTORS, AND DEVICES AS REQUIRED TO COORDINATE AND ADAPT THE EXISTING ELECTRICAL SYSTEM TO THE WORK OF THIS PROJECT. UN-USED CONDUITS, CONDUCTORS AND DEVICES SHALL BECOME THE PROPERTY OF THE SUBCONTRACTOR AND SHALL BE REMOVED FROM THE PROJECT UNLESS SPECIFICALLY INDICATED FOR SALVAGE BY THE OWNER.

5. MAKE ALL CONNECTIONS TO EXISTING BUILDING UTILITIES AS SHOWN OR OTHERWISED REQUIRED INCLUDING BUT NOT LIMITED TO DOMESTIC COLD WATER, DOMESTIC HOT WATER, HEATING WATER SUPPLY AND RETURN, NATURAL GAS, AND LINE VOLTAGE POWER.

6. PROVIDE LOW VOLTAGE CONTROLS AS REQUIRED ACCOMPLISH THE SPECIFIED SEQUENCE OF CONTROL.

C. MECHANICAL CONTRACTOR QUALIFICATIONS

1. THE MECHANICAL CONTRACTOR SHALL PROVIDE ACCEPTABLE PROOF OF EXPERIENCE BY SHOWING PROVIDING A LIST OF AT LEAST THREE (3) COMPARABLE PROJECTS COMPLETED WITHIN THE LAST 5 YEARS.

2. FOR THE ACTUAL FABRICATION, INSTALLATION, AND TESTING OF THE WORK OF THIS SECTION, THE CONTRACTOR SHALL USE ONLY THOROUGHLY TRAINED AND EXPERIENCED PERSONNEL WHO ARE COMPLETELY FAMILIAR WITH THE REQUIREMENTS FOR THIS WORK AND WITH THE INSTALLATION RECOMMENDATIONS OF THE MANUFACTURERS OF THE SPECIFIED ITEMS.

3. CONTRACTORS SHALL HAVE IN CHARGE OF THE WORK AT ALL TIMES DURING CONSTRUCTION, A THOROUGHLY COMPETENT SUPERINTENDENT WITH EXPERIENCE IN THE TYPE OF WORK TO BE INSTALLED UNDER THESE SPECIFICATIONS. CHANGES IN JOB SUPERINTENDENTS SHALL BE MADE ONLY UPON WRITTEN CONSENT OF THE ARCHITECT / ENGINEER.

4. IN ACCEPTANCE OR REJECTION OF INSTALLED SYSTEMS, NO ALLOWANCE WILL BE MADE FOR LACK OF SKILL ON THE PART OF THE INSTALLERS.

D. ROUGHEN

1. VERIFY FINAL LOCATIONS FOR ROUGH-INS WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT TO BE CONNECTED.

E. MECHANICAL INSTALLATIONS

1. GENERAL: SEQUENCE, COORDINATE, AND INTEGRATE THE VARIOUS ELEMENTS OF MECHANICAL SYSTEMS, MATERIALS, AND EQUIPMENT. COMPLY WITH THE FOLLOWING REQUIREMENTS:

a. EXAMINE SUBSTRATES, AREAS, AND CONDITIONS FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING INSTALLATION AND APPLICATION OF MECHANICAL EQUIPMENT. DO NOT PROCEED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

b. COORDINATE MECHANICAL SYSTEMS, EQUIPMENT, AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS AND EXISTING CONDITIONS.

c. VERIFY ALL DIMENSIONS BY FIELD MEASUREMENTS.

d. SEQUENCE, COORDINATE, AND INTEGRATE INSTALLATIONS OF MECHANICAL MATERIALS AND EQUIPMENT FOR EFFICIENT FLOW OF THE WORK. GIVE PARTICULAR ATTENTION TO LARGE EQUIPMENT REQUIRING POSITIONING OR REMOVAL.

e. WHERE MOUNTING HEIGHTS ARE NOT DETAILED OR DIMENSIONED, INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT TO PROVIDE THE MAXIMUM HEADROOM POSSIBLE.

f. COORDINATE CONNECTION OF MECHANICAL SYSTEMS WITH EXTERIOR SERVICES AS REQUIRED. COMPLY WITH REQUIREMENTS OF GOVERNING REGULATIONS, FRANCHISED SERVICE COMPANIES, AND CONTROLLING AGENCIES.

g. INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT AS REQUIRED TO CONFORM WITH MANUFACTURER'S INSTRUCTIONS AND APPROVED SUBMITTAL DATA, INCLUDING COORDINATION DRAWINGS, TO GREATEST EXTENT POSSIBLE. CONFORM TO ARRANGEMENTS INDICATED BY THE CONTRACT DOCUMENTS, RECOGNIZING THAT PORTIONS OF THE WORK ARE SHOWN ONLY IN DIAGRAMMATIC FORM. VERIFY AND COORDINATE CONNECTION REQUIREMENTS WITH OTHER TRADES AND WITHIN DIVISION 15. WHERE COORDINATION REQUIREMENTS CONFLICT WITH INDIVIDUAL SYSTEM REQUIREMENTS, REFER CONFLICT TO THE ARCHITECT OR ENGINEER.

h. INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT LEVEL AND PLUMB, PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, WHERE INSTALLED EXPOSED IN FINISHED SPACES.

i. INSTALL MECHANICAL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE, AND REPAIR OR REPLACEMENT OF EQUIPMENT COMPONENTS. AS MUCH AS PRACTICAL, CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH MINIMUM OF INTERFERENCE WITH OTHER INSTALLATIONS.

j. INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT GIVING RIGHT-OF-WAY PRIORITY TO SYSTEMS REQUIRED TO BE INSTALLED AT A SPECIFIED SLOPE.

F. PIPING

1. HOT WATER HEATING: STEEL, SCHEDULE 40, BLACK, ASTM A-53, COPPER, TYPE L, HARD DRAWN.

G. FITTINGS

1. MALLEABLE-IRON THREADED FITTINGS: ANSI B16.3, CLASS 150, STANDARD PATTERN, FOR THREADED JOINTS. THREADS SHALL CONFORM TO ANSI B1.20.1.

2. WROUGHT-COPPER FITTINGS: ANSI B16.22, STREAMLINED PATTERN.

H. JOINING MATERIALS

1. SOLDERING MATERIALS: USE 15% SILVER BRAZING ALLOY AND SILVER BRAZING FLUX ON BELOW-GRADE JOINTS. USE 95% TIN, 5% ANTIMONY LEAD-FREE SOLDER AND ASTM B813-91 NON-CORROSIVE STM 1.0 FLUX ON OTHER JOINTS. APPLY FLUX ON CLEANED END OF PIPE AND INSIDE FITTINGS WITH SMOOTH EVEN COATS.

2. SCREWED FITTINGS: 1/2" TEFLON TAPE APPLIED TO MALE THREADS ONLY.

I. PIPING INSTALLATIONS

1. GENERAL LOCATIONS AND ARRANGEMENTS: DRAWINGS (PLANS, SCHEMATICS, AND DIAGRAMS) INDICATE THE GENERAL LOCATION AND ARRANGEMENT OF THE PIPING SYSTEMS. LOCATION AND ARRANGEMENT OF PIPING LAYOUT TAKE INTO CONSIDERATION PIPE SIZING AND FRICTION LOSS, EXPANSION, PUMP SIZING, AND OTHER DESIGN CONSIDERATIONS. SO FAR AS PRACTICAL, INSTALL PIPING AS INDICATED.

2. INSTALL PIPING FREE OF SAGS OR BENDS AND WITH AMPLE SPACE BETWEEN PIPING TO PERMIT PROPER INSULATION APPLICATIONS.

3. INSTALL EXPOSED PIPING AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE NOT PERMITTED, UNLESS EXPRESSLY INDICATED ON THE DRAWINGS.

4. FLUSH EACH PIPING SYSTEM AND PROVE CLEAN.

J. PIPING FIELD QUALITY CONTROL

1. PREPARATION FOR TESTING:

a. LEAVE JOINTS UN-INSULATED AND EXPOSED FOR EXAMINATION DURING THE TEST.

b. FLUSH SYSTEM WITH CLEAN WATER. CLEAN STRAINERS.

c. ISOLATE EQUIPMENT THAT IS NOT TO BE SUBJECTED TO THE TEST PRESSURE FROM THE PIPING. IF A VALVE IS USED TO ISOLATE THE EQUIPMENT, ITS CLOSURE SHALL BE CAPABLE OF SEALING AGAINST THE TEST PRESSURE WITHOUT DAMAGE TO THE VALVE.

d. INSTALL RELIEF VALVE SET AT A PRESSURE NO MORE THAN 1/3 HIGHER THAN THE TEST PRESSURE, TO PROTECT AGAINST DAMAGE BY EXPANSION OF LIQUID OR OTHER SOURCE OF OVERPRESSURE DURING THE TEST.

2. TESTING: TEST HYDRAULIC PIPING AS FOLLOWS:

a. USE AMBIENT TEMPERATURE WATER AS THE TESTING MEDIUM, EXCEPT WHERE THERE IS A RISK OF DAMAGE DUE TO FREEZING. ANOTHER LIQUID MAY BE USED IF IT IS SAFE FOR WORKMEN AND COMPATIBLE WITH THE PIPING SYSTEM COMPONENTS.

b. USE VENTS INSTALLED AT HIGH POINTS IN THE SYSTEM TO RELEASE TRAPPED AIR WHILE FILLING THE SYSTEM. USE DRAINS INSTALLED AT LOW POINTS FOR COMPLETE REMOVAL OF THE THAT LIQUID.

c. EXAMINE SYSTEM TO SEE THAT EQUIPMENT AND PARTS THAT CANNOT WITHSTAND TEST PRESSURES ARE PROPERLY ISOLATED. EXAMINE TEST EQUIPMENT TO ENSURE THAT IT IS TIGHT AND THAT LOW PRESSURE FILLING LINES ARE DISCONNECTED.

d. SUBJECT PIPING SYSTEM TO A HYDROSTATIC TEST PRESSURE WHICH AT EVERY POINT IN THE SYSTEM IS NOT LESS THAN 100 PSIG. THE TEST PRESSURE SHALL NOT EXCEED THE MAXIMUM PRESSURE FOR ANY VESSEL, PUMP, VALVE, OR OTHER COMPONENT IN THE SYSTEM UNDER TEST.

e. AFTER THE HYDROSTATIC TEST PRESSURE HAS BEEN APPLIED FOR AT LEAST 30 MINUTES, EXAMINE PIPING, JOINTS, AND CONNECTIONS FOR LEAKAGE. ELIMINATE LEAKS BY TIGHTENING, REPAIRING, OR REPLACING COMPONENTS AS APPROPRIATE, AND REPEAT HYDROSTATIC TEST UNTIL THERE ARE NO LEAKS.

K. FITTINGS AND SPECIALTIES

1. USE FITTINGS FOR ALL CHANGES IN DIRECTION AND ALL BRANCH CONNECTIONS.

2. REMAKE LEAKING JOINTS USING NEW MATERIALS.

3. INSTALL UNIONS ADJACENT TO EACH VALVE, AND AT THE FINAL CONNECTION TO EACH PIECE OF EQUIPMENT AND PLUMBING FIXTURES HAVING 2" AND SMALLER CONNECTIONS, AND ELSEWHERE AS INDICATED.

4. INSTALL DIELECTRIC FITTINGS TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS.

L. VALVES

1. SHUT-OFF AND BALANCING VALVES SHALL BE INSTALLED FOR ALL PIECES OF EQUIPMENT.

2. GENERAL APPLICATION: USE BALL VALVES FOR SHUT- OFF DUTY.

3. LOCATED VALVES FOR EASY ACCESS AND PROVIDE SEPARATE SUPPORT WHERE NECESSARY.

4. INSTALL VALVES AND UNIONS FOR EACH FIXTURE AND PIECE OF EQUIPMENT ARRANGED TO ALLOW EQUIPMENT REMOVAL WITHOUT SYSTEM SHUTDOWN. UNIONS ARE NOT REQUIRED ON FLANGED DEVICES.

5. INSTALL VALVES IN HORIZONTAL PIPING WITH STEM AT OR ABOVE THE CENTER OF THE PIPE.

6. INSTALL VALVES IN A POSITION TO ALLOW FULL STEM MOVEMENT.

M. MECHANICAL IDENTIFICATION

1. ALL EQUIPMENT SHALL BE APPROPRIATELY IDENTIFIED WITH PERMANENT MARKERS.

N. WATER TREATMENT

1. ALL INTERIOR HEATING WATER SYSTEMS SHALL HAVE A FINAL FILL OF 35% PROPYLENE GLYCOL.

O. INSULATION

1. INSULATE 1-1/2" AND SMALLER HEATING WATER PIPING WITH 1-1/2" PIPE INSULATION. INSULATE 2" HEATING WATER PIPING WITH 2" PIPE INSULATION. PIPE INSULATION SHALL BE ONE-PIECE FIBERGLASS PIPING INSULATION (MINIMUM R 3.7 / INCH) WITH FACTORY APPLIED VAPOR BARRIER JACKET WITH DOUBLE ADHESIVE SELF SEALING LAP.

P. SUBMITTALS

1. SUBMITTALS (SHOP DRAWINGS) SHALL BE REQUIRED FOR ALL HVAC AND PLUMBING EQUIPMENT, AND TEMPERATURE CONTROLS.

Q. OPERATION AND MAINTENANCE MANUALS

1. OPERATION AND MAINTENANCE MANUALS FOR THE TEMPERATURE CONTROL SYSTEM AND THE ENTIRE MECHANICAL SYSTEM SHALL BE PREPARED BY THE CONTRACTOR; THE OWNER SHALL BE FULLY INSTRUCTED IN THE OPERATION AND MAINTENANCE OF THE ENTIRE SYSTEM BY THE CONTRACTOR.

S. TESTING AND BALANCING - ADD ALTERNATE #3

1. THE HEATING WATER DISTRIBUTION SYSTEMS SHALL BE TESTED AND BALANCED BY AN INDEPENDENT TEST AND BALANCE CONTRACTOR.

DIVISION 15 - PLUMBING INSTALLATIONS

A. ALL GENERAL CONDITIONS LISTED ON THE MECHANICAL DRAWINGS SHALL APPLY TO THE WORK OF THE PLUMBING SUB.

B. NATURAL GAS PIPE INSTALLATION

1. INSTALL STEEL PIPE WITH THREADED JOINTS AND MALLEABLE IRON FITTINGS FOR 2 INCH AND SMALLER.

2. DRIPS AND SEDIMENT TRAPS: INSTALL A DRIP LEG AT POINTS WHERE CONDENSE MAY COLLECT, AT THE OUTLET OF THE GAS METER, AND IN A LOCATION READILY ACCESSIBLE TO PERMIT CLEANING AND EMPTYING. DO NOT INSTALL DRIPS WHERE CONDENSE IS LIKELY TO FREEZE.

a. CONSTRUCT DRIPS AND SEDIMENT TRAPS USING A TEE FITTING WITH THE BOTTOM OUTLET PLUGGED OR CAPPED. USE A MINIMUM OF 3 PIPE DIAMETERS IN LENGTH FOR THE DRIP LEG. USE SAME SIZE PIPE FOR DRIP LEG AS THE CONNECTED PIPE.

3. CONNECT BRANCH OUTLET PIPES FROM THE TOP OR SIDES OF HORIZONTAL LINES, NOT FROM THE BOTTOM.

4. INSTALL UNIONS IN PIPES 2 INCH AND SMALLER, ADJACENT TO EACH VALVE AND AT FINAL CONNECTIONS EACH PIECE OF EQUIPMENT.

C. FIELD QUALITY CONTROL - NATURAL GAS PIPING

1. PIPING TESTS: INSPECT, TEST, AND PURGE NATURAL GAS SYSTEMS IN ACCORDANCE WITH NFPA 54 AND LOCAL UTILITY REQUIREMENTS.

ELECTRICAL GENERAL NOTES:

1. PROVIDE LABOR AND MATERIAL REQUIRED FOR COMPLETE AND OPERATIONAL ELECTRICAL SYSTEMS.

2. PERFORM WORK IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND ALL FEDERAL, STATE, AND LOCAL CODES AND ORDINANCES.

3. COORDINATE WORK WITH OTHER TRADES TO ELIMINATE CONFLICTS. CONFIRM MECHANICAL EQUIPMENT LOCATIONS AND ELECTRICAL LOADS PRIOR TO ROUGH-IN.

4. ALL WORK SHALL BE SUBJECT TO INSPECTION AT ANY TIME BY THE ARCHITECT, OWNER, OR ENGINEER.

5. NOTIFY PROPER AUTHORITIES WHEN WORK IS READY FOR ANY INSPECTIONS REQUIRED.

6. ALL WORK, MATERIAL, AND EQUIPMENT SHALL BE PROTECTED FROM DAMAGE OR LOSS DUE TO THEFT, WEATHER, ETC., UNTIL FINAL WRITTEN ACCEPTANCE BY THE OWNER.

7. POST DANGER SIGNS AND PHYSICAL BARRIERS TO PROTECT PEOPLE AGAINST HAZARDS CREATED BY THE WORK.

8. ALL EQUIPMENT SHALL BE INSTALLED AS RECOMMENDED BY THE MANUFACTURER UNLESS SPECIFICALLY INDICATED OTHERWISE.

9. ALL ELECTRICAL MATERIALS AND EQUIPMENT SHALL BE OF THE TYPE AND QUALITY SPECIFIED, NEW, AND, WHEN LISTED BY UNDERWRITERS LABORATORIES, SHALL MEET THEIR REQUIREMENTS AND BEAR THEIR LABEL WHEREVER STANDARDS HAVE BEEN ESTABLISHED AND LABEL SERVICE REGULARLY FURNISHED.

10. ALL NEW CONDUCTORS SHALL INSTALLED IN PROPERLY SIZED RACEWAYS. RACEWAYS SHALL BE ELECTRICAL METALLIC TUBING (EMT).

11. FLEXIBLE CONDUIT MAY BE USED WHERE CONDITIONS WARRANT.

12. UNLESS INDICATED OTHERWISE, ALL CONDUCTORS SHALL BE HIGH-CONDUCTIVITY COPPER, #12 OR LARGER, WITH 600 VOLT INSULATION, SIZED AS INDICATED.

a. #12 THROUGH #6, DRY LOCATIONS: TYPE THHN, 90 DEGREE C.

b. WIRE #10 AND SMALLER: SOLID.

c. WIRE #8 AND LARGER: STRANDED.

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ALAMOSA RECREATION CENTER
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REVISION NO.	DATE

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