

MECHANICAL ABBREVIATIONS			
AFF	ABOVE FINISHED FLOOR	KW	KILOWATT
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS	KWH	KILOWATT HOUR
BTU	BRITISH THERMAL UNITS	LAT	LEAVING AIR TEMPERATURE
BTUH	BTUS PER HOUR	LWT	LEAVING WATER TEMPERATURE
CA	COMBUSTION AIR	MAX	MAXIMUM
CFM	AIR FLOW RATE (CUBIC FEET PER MINUTE)	MCA	MINIMUM CIRCUIT AMPS
CLS	CEILING	MOCOP	MAXIMUM OVERCURRENT PROTECTION
CW	COLD WATER	MIN	MINIMUM
DEG or °	DEGREE	NC	NOISE CRITERIA
DIA or Ø	DIAMETER	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
DB	DRY BULB	NTS	NOT TO SCALE
ESP	EXTERNAL STATIC PRESSURE	OSA	OUTSIDE AIR
EWT	ENTERING WATER TEMPERATURE	PD	PRESSURE DROP
FLA	FULL LOAD AMPS	PH or Ø	PHASE
FLR	FLOOR	PRV	PRESSURE REDUCING VALVE
PPM	FEET PER MINUTE	RPM	REVOLUTIONS PER MINUTE
FT	FEET	SP	STATIC PRESSURE
GA	GAUGE	SYM	SYMBOL
GPM	WATER FLOW RATE (GALLONS PER MINUTE)	T & P	TEMPERATURE AND PRESSURE
HC	HEATING COIL	TEMP	TEMPERATURE
HP	HORSE POWER	TYP	TYPICAL
HVAC	HEATING, VENTILATING, AIR CONDITIONING	UMC	UNIFORM MECHANICAL CODE
HW	HOT WATER	UPC	UNIFORM PLUMBING CODE
HWR	HOT WATER RETURN	V	VOLTS
HWS	HOT WATER SUPPLY	W/	WITH
IBC	INTERNATIONAL BUILDING CODE	WB	WET-BULB
IECC	INTERNATIONAL ENERGY CONSERVATION CODE	WC	WATER CLOSET
IFC	INTERNATIONAL FIRE CODE		
IFGC	INTERNATIONAL FUEL GAS CODE		
IMC	INTERNATIONAL MECHANICAL CODE		
IPC	INTERNATIONAL PLUMBING CODE		

NOTE: THIS IS A STANDARD LIST OF COMMONLY USED MECHANICAL ABBREVIATIONS. SOME OF THE ABBREVIATIONS SHOWN ABOVE MAY NOT BE USED IN THIS DRAWING PACKAGE.

- ### MECHANICAL GENERAL NOTES
- ALL MECHANICAL EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST ADOPTED MECHANICAL CODE, AND ALL LOCAL & STATE CODES.
 - ALL PLUMBING EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST ADOPTED PLUMBING CODE, AND ALL LOCAL & STATE CODES.
 - ALL MECHANICAL AND PLUMBING EQUIPMENT SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS.
 - MECHANICAL CONTRACTORS SHALL RECEIVE PRIOR APPROVAL FROM THE STRUCTURAL ENGINEER BEFORE MAKING CUTS THROUGH ANY STRUCTURAL MEMBER.
 - MECHANICAL CONTRACTORS SHALL COORDINATE INSTALLATION WITH CONSTRUCTION SUPERVISOR AND WITH ALL OTHER TRADES TO AVOID CONFLICTS.
 - THE MECHANICAL CONTRACTORS SHALL VERIFY MOTOR VOLTAGES WITH THE ELECTRICAL DRAWINGS BEFORE ORDERING MOTORIZED EQUIPMENT AND CONTROLS.
 - SEE MECHANICAL SCHEDULE SHEET FOR SCHEDULED CAPACITIES OF ALL MECHANICAL EQUIPMENT AND MATERIALS SPECIFIED.
 - ALL MECHANICAL EQUIPMENT TO BE PROPOSED MUST BE ON THE APPROVED LIST PRIOR TO SUBMITTALS. ALL APPROVED MANUFACTURERS MUST BE CAPABLE OF MEETING THE REQUIREMENTS OF THE SPECIFIED EQUIPMENT.
 - RUNOUT AND HOOKUP SIZES TO INDIVIDUAL PLUMBING FIXTURE CAN BE FOUND ON THE PLUMBING FIXTURE SCHEDULE.
 - PAINT ALL VTRS, FLUES, EXHAUST CAPS, AND OTHER MECHANICAL ITEMS ON THE ROOF TO MATCH THE ROOF COLOR.
 - INSULATED FLEXIBLE DUCTWORK MAY BE USED FOR RUNOUTS TO GRILLES AND DIFFUSERS, IN LENGTHS OF 6'-0" OR LESS.
 - MAINTAIN MINIMUM OF 10'-0" DISTANCE BETWEEN ALL FRESH AIR INTAKES AND EXHAUST OR GAS FLUE DISCHARGES.
 - LOCATE ACCESS HATCHES SO AS TO PROVIDE OPTIMUM SERVICEABILITY TO EQUIPMENT AND/OR VALVING. SEE ARCHITECTURAL SPECIFICATION FOR TYPE AND COLOR. COORDINATE LOCATION WITH STRUCTURAL & LIGHTING.
 - WHENEVER THERE IS A DISCREPANCY BETWEEN THE RUNOUT DUCT SIZE SHOWN ON THE PLANS AND THAT SHOWN IN THE SCHEDULE, ALWAYS USE THE LARGER OF THE TWO DUCT SIZES.
 - THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR VERIFICATION OF EXISTING JOB CONDITIONS PRIOR TO BID. NO ADDITIONAL COST SHALL BE AWARDED TO THE SUCCESSFUL CONTRACTOR (OR THEIR SUBCONTRACTORS) AFTER BIDS HAVE BEEN SUBMITTED AND CONTRACTS AWARDED FOR FAILURE TO VERIFY EXISTING FIELD CONDITIONS. DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION FOR ALTERNATIVE METHODS OF INSTALLATION PRIOR TO THE BIDDING OF THIS PROJECT.
 - UNLESS OTHERWISE NOTED ALL EXISTING MECHANICAL EQUIPMENT, PIPING, ETC. TO BE REMOVED SHALL BE DISPOSED OF BY THE CONTRACTOR UNDER THIS CONTRACT. THE OWNER SHALL RETAIN THE RIGHT TO KEEP ANY REMOVED ITEMS.
 - HOLES IN EXISTING WALL OR FLOORS SHALL BE PATCHED TO MATCH EXISTING WHERE PIPING, DUCTWORK, ETC. WERE REMOVED OR ADDED DURING THIS PROJECT.
 - DAMAGE TO THE EXISTING FACILITY DURING THE CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.

MECHANICAL AND PLUMBING DRAWINGS LEGEND

	DUCTWORK OR PIPING RISE		DOUBLE CHECK BACKFLOW PREVENTER
	CONCENTRIC SQUARE TO ROUND TRANSITION		UNION
	MOTORIZED DAMPER		AIR VENT
	MANUAL VOLUME DAMPER		TRIPLE DUTY VALVE
	SPIN-IN FITTING W/ AIR EXTRACTOR AND HAND DAMPER		THREE WAY CONTROL VALVE
	HIGH EFFICIENCY FITTING W/ HAND DAMPER		TWO WAY CONTROL VALVE
	SWITCH		PRESSURE REDUCING VALVE
	THERMOSTAT		GATE VALVE
	TEMPERATURE SENSOR		REDUCER
	EQUIPMENT CALLOUT		GLOBE VALVE
	TURNING VANES		BALL VALVE
	INTAKE OR EXHAUST		BUTTERFLY VALVE
	DIRECTION OF AIRFLOW		BALANCE VALVE
	SUPPLY DIFFUSER		CHECK VALVE
	RETURN GRILLE		FLOOR CLEANOUT
	EXHAUST GRILLE		FLOOR DRAIN
	FLOOR GRILLE		FLOOR SINK
	CEILING EXHAUST FAN		GAS PRESSURE REGULATOR W/ GAS COCK
	TEMPERATURE GAUGE		PRESSURE RELIEF VALVE
	PRESSURE GAUGE (LIQUID FILLED W/ ISOLATION VALVE)		VENT-THROUGH-ROOF
	TEMPERATURE SENSOR (DUCT OR PIPING)		VENT
	FLOW SWITCH		SOIL, WASTE, OR SANITARY SEWER
	STAINLESS STEEL BRAIDED FLEX CONNECTION		CONDENSATE DRAIN LINE
	ELASTOMERIC FLEX CONNECTOR		DOMESTIC COLD WATER (CW)
	SUCTION DIFFUSER		MEDIUM PRESSURE NATURAL GAS
	Y TYPE STRAINER (1 1/2" OR LARGER PROVIDED W/ BLOW DOWN VALVE)		LOW PRESSURE NATURAL GAS
	FLOW DIRECTION		HEATING WATER SUPPLY
	DEMOLITION / EQUIPMENT TO BE REMOVED		HEATING WATER RETURN
	NEW TO EXISTING CONNECTION POINT		SLOPE PIPE IN DIRECTION OF ARROW
	EXISTING		PIPE ANCHOR
	NEW		PIPE GUIDE
	REDUCED PRESSURE BACKFLOW PREVENTER		CAP

NOTE: THIS IS A LIST OF COMMONLY USED MECHANICAL AND PLUMBING SYMBOLS. SOME OF THE SYMBOLS SHOWN ABOVE MAY NOT BE USED IN THIS DRAWING PACKAGE.

ENERGY CODE COMPLIANCE

A. COMPLIANCE WITH THE LATEST ADOPTED EDITION OF THE INTERNATIONAL ENERGY CONSERVATION CODE IS REQUIRED FOR THIS PROJECT. THESE NOTES COVER MANDATORY REQUIREMENTS OF THE CODE. ADDITIONAL REQUIREMENTS ARE NOTED ON THE DRAWINGS AND IN THE SPECIFICATIONS.

B. ALL DUCT JOINTS, SEAMS, AND CONNECTIONS SHALL BE FASTENED AND SEALED WITH WELDS, GASKETS, ADHESIVES, MASTIC-PLUS-EMBEDDED-FABRIC SYSTEMS, OR TAPES. TAPES AND MASTICS SHALL BE LISTED AND LABELED PER UL 181A OR UL 181B. DUCT TAPE IS NOT PERMITTED AS A SEALANT ON ANY METAL DUCTS. DUCT CONNECTIONS TO FLANGES OR EQUIPMENT SHALL BE SEALED AND MECHANICALLY FASTENED.

C. MINIMUM REQUIREMENTS (THICKNESS) FOR PIPING INSULATION SHALL BE AS FOLLOWS:

FLUID	NOMINAL PIPE DIAMETER	INSULATION THICKNESS
1. HEATING WATER	1/2" TO < 1 1/2"	1 1/2"
	1 1/2" TO < 4"	2"
4" AND ABOVE	4"	2"
	4" AND ABOVE	2"

THE ABOVE INSULATION IS BASED ON HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 BTU-INCH/HOUR-FT²-F.

D. AN OPERATING AND MAINTENANCE MANUAL SHALL BE PROVIDED PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY. THE O&M MANUAL SHALL CONTAIN THE FOLLOWING INFORMATION AS A MINIMUM:

- EQUIPMENT CAPACITY (INPUT & OUTPUT).
- EQUIPMENT OPERATING AND MAINTENANCE INSTRUCTIONS.
- CONTROL SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCES.
- CONTROL SYSTEM SETPOINTS SHALL BE SHOWN ON CONTROL DRAWINGS OR AT CONTROL DEVICES.
- A COMPLETE WRITTEN NARRATIVE ON HOW EACH MECHANICAL SYSTEM IS INTENDED TO OPERATE.

ENERGY COMCHECK

COMcheck Software Version COMcheckWeb
Mechanical Compliance Certificate

Project Information

Energy Code:	2018 IECC
Project Title:	ITD D4 Supply Operations Boiler Replacement
Location:	Shoshone, Idaho
Climate Zone:	5b
Project Type:	Alteration

Construction Site: _____ Owner/Agent: _____ Designer/Contractor: _____

Mechanical Systems List

Quantity System Type & Description

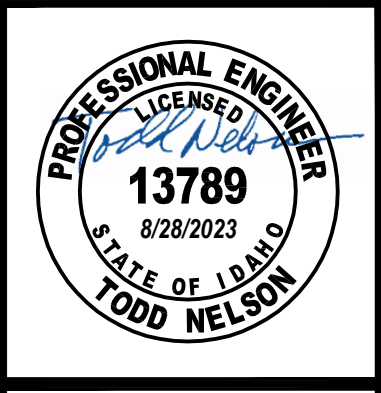
1	B-1:	Heating: Hot Water Boiler, Capacity 155 kBtu/h, Gas
		Proposed Efficiency: 95.00 % AFUE, Required Efficiency: 82.00 % AFUE

Mechanical Compliance Statement

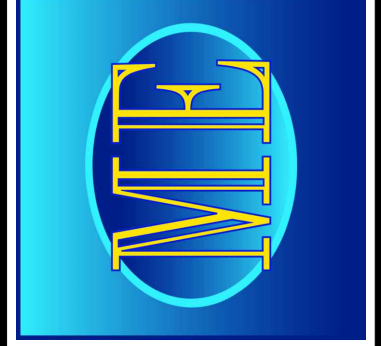
Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2018 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Chris Dyke, PE _____ 8/25/2023
Name - Title _____ Signature _____ Date _____

NO.	REVISIONS	DATE



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OVER 40 YEARS OF EXCELLENCE



IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 4 SUPPLY OPERATIONS
BOILER REPLACEMENT - FM42403
SHOSHONE, IDAHO

PROJECT	23-256
DRAWN	CD
CHECKED	TN
DATE	23-08-21
SCALE	SEE PLANS
SHEET	

MO.O

SECTION 15100 – MECHANICAL GENERAL PROVISIONS

PART 1 – GENERAL

1.1 SCOPE

A. General:

- 1. The Bidding Requirements, Contract Requirements, and the General Requirements of these specifications shall govern all parts of the work.

B. Work Included:

- 1. Install work in accordance with these specifications and the accompanying plans. Furnish all labor, material, and equipment together with all incidental items not specifically shown or specified which are required by good practice to provide the complete mechanical systems as described.
2. The HVAC Contractor(s) and all sub-tier Contractors shall provide installed equipment cut sheets and purchase orders required for utility rebates.
3. Coordination and Site Visits:

- 1. This section of the work requires examination of and reference to all architectural, structural, and electrical drawings for construction conditions that may affect the work. Inspect the building site and existing facilities for verification of existing conditions. Base all measurements from established benchmarks. Any discrepancy between actual measurements and those indicated, which prevents following good practices or the intent of the drawings and specifications, shall be reported to the Architect/Engineer, and work halted until instructions are received from the Architect/Engineer.

1.2 CODES, PERMITS, FEES:

- A. Install all work in accordance with applicable codes and standards. Obtain all required permits, pay all required fees including utility connections or extensions, in connection with this portion of the construction. Obtain all required certificates of inspections for the work.

PART 2 – PRODUCTS

2.1 MATERIALS AND WORKMANSHIP:

A. Materials:

- 1. All materials and equipment shall be of first quality, new, full size and weight, standard in every respect, and suitable for the space required. Use the same manufacturer for products of similar class or service, such as valves, pumps, controls, and air handlers. Reject all materials against loss, theft, or damage before and after installation.
2. Furnish equipment that will operate under all conditions of load without any sound or vibration that is objectionable in the opinion of the Architect/Engineer. Vibration or noise considered objectionable will be corrected by the Subcontractor at his expense.
3. Furnish and install all necessary foundations, supports, pads, bases, and piers required for all materials and equipment furnished under this contract.
4. Provide all required fire stopping at piping and duct penetrations of fire rated walls, floors, ceilings, and roofs. Fire stopping shall be Dow Corning Fire Stop Sealant 2000 or Fire Stop Foam 2001, or approved equal.

B. Workmanship:

- 1. All materials and equipment shall be installed in a neat and workmanlike manner by competent specialists for each sub trade. Work shall be installed to the satisfaction of the Architect/Engineer with unsatisfactory work removed and reinstalled to his satisfaction at no extra cost to the Owner.
2. Provide all cutting and patching necessary to install the work specified in this section. Patching shall match adjacent surfaces. No structural members shall be cut without the approval of the Architect/Engineer. Provide all sleeves and inserts required before the floors and walls are built.
3. Locate all equipment that must be serviced in fully accessible positions. Provide clearance for removal of replacement parts and components, and with necessary couplings or flanges to remove the component for maintenance.

2.2 SUBMITTALS AND SUBSTITUTIONS:

A. Prebid Approval:

- 1. Manufacturer's trade names and catalog numbers stated herein are intended to indicate the quality of equipment or materials desired. All manufacturers not specifically listed require prior approval. Submit catalog data, including specifications, of the proposed equipment to the Architect/Engineer for his approval at least 10 calendar days prior to bid opening. Notice of such approvals will be published in an addendum. Approval of listed alternate equipment manufacturers is for bidding only. Final approval is to be based on requirements of the plans and specifications.

B. Submittals:

- 1. Within thirty days after award of this contract, provide six copies of a complete list of all materials and equipment proposed for this project. List shall contain make, type, manufacturer's name, and trade designation of all materials and equipment. Submittal shall also include manufacturer's complete specification for each item, including capacities, ratings, etc., and dimensions as required to check space requirements. Provide six copies of all submittals. The scheduled equipment is the basis of design for capacity, weights, physical size, etc. Alternate manufacturers shall not exceed the weight or physical size. Any changes to the Architectural, Structural, Mechanical, Electrical, and Control systems due to alternate manufacturers shall be the responsibility of the Contractor and Supplier.
2. Approval of submittals shall not relieve the contractor from responsibility for deviations from the plans or specifications, unless he has, in writing, called the Architect's Engineer's attention to deviations at the time of submission, and obtained his written approval. Approval of submittals does not relieve the contractor from responsibility for errors in shop drawings or literature.
3. Equipment Requiring Submittals
a. Boiler
b. Thermostatic Control Valve

PART 3 EXECUTION

3.1 ACCESSIBILITY & SAFETY

A. Accessibility:

- 1. All equipment which must be serviced or operated shall be located in fully accessible position. Minor changes from the drawings may be made to allow for better accessibility. All changes shall be approved prior to actual installation.
2. Access panels shall be provided if required for accessibility. Subcontractor shall furnish the required panels to the General Contractor and the required location for all access panels. Panels shall be installed by the General Contractor.
3. Safety:
1. Subcontractor shall provide guards for all belt drives and rotating machinery. No water piping shall run immediately over or within a 3-foot plan view clearance of any electrical panel or motor starter. Where piping must be located within these zones, install piping inside a conduit to prevent water access to electrical equipment.

3.2 COORDINATION:

- A. Coordinate all work with the various trades involved to provide a complete and satisfactory installation. The exact details of piping, ductwork, and equipment are not shown. No additional compensation will be made for offsets or relocation required in coordination with other trades.
B. Alterations required due to improper supervision by the subcontractor shall be made at no extra cost, to the satisfaction of the Architect/Engineer.

3.3 ELECTRICAL:

- A. Electric motors required for equipment specified in this section shall be provided and installed by this subcontractor. Motor starters, disconnects, relays, pilot lights, etc., are in general, to be furnished and installed by the Electrical Contractor.
B. Starters, relays, controls, etc., which are factory assembled into packaged equipment shall be furnished by the Mechanical Contractor under this section of the specifications.
C. All motors shall be provided with adequate starting and protective equipment as specified or required. Motor capacity shall be sufficient to operate driven device under all conditions of operation and load without overload. Minimum horsepower shall be as specified.

3.4 IDENTIFICATION AND CODING:

A. Painting:

- 1. All painting of mechanical equipment, accessories, ductwork, and piping shall be furnished and applied under the Architectural section of these specifications. All painting shall be completed before any identification markings are applied.
B. Equipment:
1. Identify all equipment with a black Formica label, with white reveal when engraved. Lettering to be 3/16 inch high minimum. In general, identify equipment as to area served in addition to title and code number of the equipment as taken from the plans.
C. Piping:
1. Identify all piping as to the service of the pipe and the direction of flow. The letters shall be 1/2 inch high on piping 1-1/4 inches or smaller, 3/4 inch high on piping 1-1/2 to 2 inches, 1-1/4 inches high on piping up to six inches, and 2-1/2 inches high on 8 inch piping or larger. Flow arrows shall be at least six inches long. The letters and flow arrows shall be made by precut stencils or oil base paint, one inch high and black, or factory fabricated plastic pipe markers. Piping shall be identified at 25 foot maximum intervals, on long continuous lines, adjacent to each item of equipment, on each riser and junction, and on both sides of all wall and floor penetrations. Underground piping shall be identified with bright colored continuously printed plastic tape of not less than 6" wide by 4 mil thick, manufactured for direct burial service.

Install directly above all buried pipe, 6 to 8 inches below finished grade. All piping shall be labeled per the Uniform Plumbing Code, latest edition.

D. Valves:

- 1. Regardless of size, all valves shall be tagged with a numbered brass tag, 1-1/2 inches by 3 inches minimum in size and 0.051 inch thick. A valve chart indicating valve tag number, location, service, and normal position shall be mounted in a suitable framed and glassed cover in the main mechanical room or as directed. Valve chart shall be duplicated in the Maintenance and Operations Manual.

3.5 TESTING:

A. Piping:

- 1. All plumbing piping (gas) shall be tested in accordance with the requirements of the Idaho State Plumbing Code, latest edition. Other piping systems shall be tested hydrostatically, to 1.5 times the operating pressure, but not less than 100 psi, for a minimum period of two hours. If the test pressure falls more than 5 percent during the test period, the leak shall be located, repaired, and the test repeated.
2. A test report shall be submitted for each piping system test. Test report forms are part of Specifications Section 15200, or are available from the Engineer.

B. Systems:

- 1. All systems, including heating, ventilating, air conditioning, and plumbing systems, shall be tested at the completion of the building to establish that the systems operate as specified and required. Testing shall be performed after air and water balancing is completed.
2. All controls shall be calibrated accurately and all equipment shall be adjusted for satisfactory operation. Excessive vibration or noise from any system shall be corrected.

3.6 BALANCING:

A. Scope:

- 1. Prior to final acceptance by the Owners, all water systems shall be balanced to deliver the quantities as specified or directed. The air balance shall be performed by an independent agency specializing in testing, adjusting, and balancing, and is certified by the Testing, Adjusting, and Balancing Bureau (TAB), and the National Environmental Balancing Bureau (NEBB). Total system balance shall be in accordance with TAB.
2. Balance contractor's main office shall be located within 100 miles from the project site. Approved balance contractors are Evolve Engineering, NWESE, Building Systems technologies, and Blue-Sky Commissioning. All other contractors must receive prior approval from the Engineer, in writing, before bidding the project.

3.7 CLEANING AND ADJUSTING:

- A. Thoroughly clean all parts of the system at the completion of the work. Flush all water circulating systems with fresh water and then drain. Clean all strainers and refill system. Install new, clean air filters in all systems. Adjust all devices for proper operation and lubricate all equipment as required. Repaint any painted surface that has been damaged.

3.8 PROJECT CLOSEOUT:

- A. Operations & Maintenance Manual:
1. The Contractor shall provide an operations and maintenance manual at least thirty days prior to completion of work. The manual shall be of the three ring binder type, entitled "Operations and Maintenance Manual", with the job name and year of completion also included. The manual shall include, as a minimum:
1. Maintenance instructions for all equipment, including lubrication requirements.
2. Equipment suppliers names, addresses, and telephone numbers.
3. Equipment catalog cuts, ratings tables, model numbers, serial numbers, and accessories.
4. Parts numbers for all replaceable parts.
5. Air systems balance report as hereinbefore specified.
6. Control diagram or drawing or operation sequence.
7. Valve tagging chart as hereinbefore specified.
8. Filter chart listing unit callout, size of filters, and quantity of filters.
9. Guarantee letter as specified below.
10. Any additional information required to enable the Owner to properly maintain the building mechanical system.
11. After approval of the Operations and Maintenance Manual by the Architect/Engineer, the contractor shall furnish two copies of the manual to the Owner.
B. Mechanical System Training Period:
1. After the mechanical system is completely installed and operational, the mechanical contractor shall provide a minimum of 2 hours training and instruction time for the building Owner or his representative. During this period, the contractor shall instruct the Owner in the operation and maintenance of all parts of the mechanical system, using the O & M manual where applicable.

C. As-Built Drawings:

- 1. Provide two sets of blue-line mechanical drawings showing the work as it was actually installed. The drawings shall indicate all departures from the contract drawings, and shall locate all underground utility lines with dimensions from established building lines. Make all notations neat and legible, with red indelible pencil. At the completion of the work, these as-built drawings shall be signed and dated by the Mechanical Contractor, and returned to the Architect/Engineer.
2. Guarantee:
1. All work furnished under this section shall be guaranteed in writing to be free from defective work or materials for a period of one year after acceptance of the contract. All repairs or replacements because of defective materials or workmanship or noncompliance with code shall be provided without additional cost to the Owner. Contractor shall furnish a letter indicating above guarantee with space for date of acceptance and expiration of guarantee. Letter shall be included in O & M Manual.

END OF SECTION 15100

SECTION 15200 – PLUMBING

PART 1 – GENERAL

1.1 SCOPE:

- A. This section covers the work necessary for the plumbing system, complete. The Mechanical General Provisions, Section 15100 are to be included as a part of this section of the specifications.

1.2 CODES:

- A. The plumbing system shall be installed in accordance with the Idaho State Plumbing Code, latest edition, International Fuel Gas Code, latest edition, and all local and State Codes.

PART 2 – PRODUCTS

2.1 PLUMBING FIXTURES & TRIM:

- A. All plumbing fixtures shall be provided complete with all required trim for a complete and operational system. All exposed trim shall be chrome plated. All piping penetrations through finished walls shall be provided with chrome escutcheons. All plumbing fixtures shall be caulked and sealed to surrounding surfaces. All sink traps shall be provided with a clean out plug in the bottom of the trap. Interior exposed pipe, valves, and fixture trim, including trim behind all casework doors, shall be chrome plated. Each fixture shall be provided with stop valves and the stop valves shall be quarter-turn brass ball type. All fixtures and trim must be lead free. All floor drains and floor sinks shall be provided with trap primers (PPP, or Zum as needed for appropriate use. Provide ball valve type shut-off valve upstream of all trap primer valves).

2.2 PIPING AND FITTINGS:

A. General:

- 1. Connections between piping of dissimilar materials shall be made with dielectric waterway fittings or unions.
2. Provide standard manufactured water hammer arresters at all flush valves. Size and locate per manufacturers recommendations. Provide access panels for access to all water hammer arresters.
3. All 90 degree waste line elbows shall be per the latest issue of the Idaho State Plumbing Code, latest edition.
B. Natural Gas:
1. Piping shall be Schedule 40 black steel pipe, ASTM A53. Exposed fittings 2 inches and smaller shall be ANSI/ASME B16.3, screwed, black malleable iron.
2. Fittings larger than 2 inches and all underground fittings shall be Schedule 40 steel buttwelded type. Underground piping shall be provided with a polyethylene jacket, ANSII/AWWA C105, or shall be wrapped with double layer, half-lapped, 10 mil polyethylene tape.
3. All exterior piping exposed to the weather shall be coated with a rust inhibitor - Rustoleum #666 Pro-Guard Primer - red or gray color - or approved equal.

C. Condensate Drain Piping:

- 1. Exterior to building, or located in plenum: Piping shall be Type L hard drawn copper, ASTM B88 with solder joints. Copper piping shall not be used on 90% condensing type equipment.
2. Interior: Piping shall by Type L hard drawn copper, ASTM B88, with solder joints, grade 95TA, or shall be Schedule 40 PVC. Copper piping shall not be used on 90% condensing type equipment. Provide a neoprene or rubber gasket at all copper piping support hangers to inhibit corrosion.
D. Hanger and Supports:
1. Pipe hangers shall be provided to adequately support all piping systems. Hangers shall be vertically adjustable to provide for proper pitch and drainage. Hangers shall allow for

expansion and contraction of the piping system. Reference "General Regulations" of the latest edition of the Idaho State Plumbing Code.

- 2. Hangers for pipe sizes 1/2 to 6 inches shall be adjustable clevis type, or unistrut saddles with all-thread hanger rod.
3. Hangers for hot pipe, sizes 6 inches and over shall be adjustable steel yoke, cast iron roll, double hanger type.
4. Vertical pipes shall be supported with steel riser clamps. Spacing interval requirements per "General Regulations" of the latest edition of the Idaho State Plumbing Code.
5. All insulated piping shall be provided with minimum 18 gauge galvanized insulation shields, 12 inches long, and oversized hangers. Pipe sizes 2 inches and over shall also be provided with 12 inch long calcium silicate insulating blocks between the piping and the galvanized insulation shield.
6. Hanger rod sizing and spacing for pipe shall be as follows:

Table with 4 columns: Pipe Size, Minimum Rod Diameter, Maximum Spacing, To 1-1/4 inches. Rows include 1/2 inch, 3/8 inch, 1/2 inch, 5/8 inch, 7/8 inch, 1 inch, 1 1/4 inch, 1 1/2 inch, 2 inches, 2 1/2 inches, 3 inches, 4 inches, 5 inches, 6 inches.

- 7. Provide hangers within 12 inches of each horizontal elbow.
8. Provide hangers with minimum 1-1/2 inches vertical adjustment.

2.3 VALVES AND STRAINERS:

A. Ball Valves:

- 1. Valves 2-inches and smaller shall be cast brass body, chrome-plated brass ball, teflon seats, and lever handle, 600 psi CWP. Valves shall comply with MSS SP-110. Valves over 2-inches shall be ductile iron or cast steel body, chrome plated steel ball, teflon seats, and lever handle, Victaulic series 726, Arvill Grunlov, Grimmell, or Shurjoint ball valves are acceptable if grooved piping is used.
B. Check Valves:
1. Valves 2-inches and smaller shall be bronze body Y-pattern, ASTM B-62, swing check, bronze disc, 200 psi WOC. Valves shall comply with MSS SP-80. Valves, over 2-inches shall be iron body, ASTM A-126, bronze trim, swing check, renewable disc and seat.
2. Swing check valves with outside lever and spring (not center guided) is to be used on sewage ejector or storm-water sump pumps.
C. Pressure Reducing Valves:
1. Valves 2-inches and smaller shall be bronze body, stainless steel and thermoplastic internal parts, fabric reinforced diaphragm, strainer, and single union end.
D. Strainers:
1. Strainers shall be cast steel body, Y-pattern, 20-mesh stainless screen.

PART 3 - EXECUTION

3.1 WORKMANSHIP:

A. General:

- 1. Install all piping, fixtures, equipment, and accessories as shown, and in strict accordance with the plumbing laws, rules, and regulations of the State and/or City. All work shall be done in a neat and orderly fashion, and left in a condition satisfactory to the Architect/Engineer.
B. Piping:
1. All piping shall be run parallel or perpendicular to established building lines. Install piping so as to allow for expansion. Waste and vent piping occurring above floor slab shall be installed true and plumb. Extend all vents at least 1 foot above roof, or to the top of the closest adjacent parapet wall, whichever is greater, and provide watertight flashing sleeves. Excavation and backfill shall be in accordance with Section 15100 of these specifications.
C. Fixtures:
1. Install fixtures true and plumb with building walls. Caulk all plumbing fixtures at joints along walls, countertops, and other intersecting surfaces. Locate fixtures as shown and per manufacturer's instructions. Furnish all required trim for fixtures to provide a complete and workable installation.

3.2 TESTS:

A. General:

- 1. All piping, fixtures, and equipment shall be inspected and approved before concealing or covering. All work shall be tested as required by Section 15100 of these specifications, and shall be leak proof before inspection is requested. All tests shall be repeated if required by those making the inspection.
2. All potable water systems shall be flushed and disinfected in accordance with Section 15100 of these specifications. Following disinfection, system shall be flushed and water sampled to show compliance with requirements of public health authority having jurisdiction. If tested water does not meet requirements, disinfecting shall be repeated until water quality meets requirements.
B. Fixtures and Equipment:
1. Fill all plumbing fixtures with water and check for leaks or retarded flow. Repair as required. Adjust each piece of plumbing equipment as required to insure proper functioning. Leave all fixtures and equipment in first class operating condition.
2. The Plumbing Contractor is responsible for all backflow devices to be inspected by a certified backflow technician before the use of the building potable water system.
END OF SECTION 15200

SECTION 15300 – HEATING, VENTILATING, AND AIR CONDITIONING

PART 1 – GENERAL

1.1 SCOPE:

- A. This section covers the work necessary for the heating, ventilating, and air conditioning system, complete. The Mechanical General Provisions, Section 15100, is to be included as a part of this section of the specifications.

1.2 CODES & STANDARDS:

- A. The heating, ventilating, and air conditioning system shall be installed in accordance with the latest edition of the following codes and standards:
1. International Mechanical Code (IMC)
2. International Building Code (IBC)
3. American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)
4. National Fire Protection Association (NFPA)
5. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)

PART 2 – PRODUCTS

2.1 HEAT GENERATION:

- A. The boiler shall bear the ASME "H" stamp for 80 psi working pressure and shall be National Board listed. The boiler shall have a fully welded, stainless steel, fire tube heat exchanger. There shall be no banding material, bolts, gaskets or "O" rings in the pressure vessel construction. The heat exchanger shall be designed for a single-pass water flow to limit the water side pressure drop. The condensate collection basin shall be constructed of welded stainless steel. The complete heat exchanger assembly shall carry a fifteen (15) year limited warranty.
B. The boiler shall bear the ASME "H" stamp for 80 psi working pressure and shall be National Board listed. The boiler shall have a fully welded, stainless steel, fire tube heat exchanger. There shall be no banding material, bolts, gaskets or "O" rings in the pressure vessel construction. The heat exchanger shall be designed for a single-pass water flow to limit the water side pressure drop. The condensate collection basin shall be constructed of welded stainless steel. The complete heat exchanger assembly shall carry a fifteen (15) year limited warranty.
C. The boiler shall have a heat exchanger no less than 4.9 gallons.
D. The boiler shall have a minimum of a 10:1 turndown ratio.
E. The boiler shall be certified and listed by C.S.A. International under the latest edition of the harmonized ANSI Z21.13 test standard. The boiler shall operate at a minimum of 86% AFUE Efficiency (KHBVH055-285) and 94.4% THERMAL EFFICIENCY (WHB399) as registered with AHRI. The boiler shall be certified for indoor installation.
F. The boiler shall be constructed with a heavy gauge steel jacket assembly, primed and pre-painted on both sides. The combustion chamber shall be sealed and completely enclosed, independent of the outer jacket assembly, so that integrity of the outer jacket does not affect a proper seal. A burner/flame observation port shall be provided for observing the burner flame and combustion chamber. The burner shall be a premix design constructed of high temperature stainless steel with a woven Ferralloy outer covering to provide smooth operation at all modulating firing rates. The boiler shall be supplied with a negative pressure regulation gas valve and be equipped with a pulse width modulation blower system to precisely control the fuel/air mixture to the burner. The boiler shall operate in a safe condition with gas supply pressures as low as 4 inches of water column. The burner flame shall be ignited by direct spark ignition with flame monitoring via a flame sensor.

G. The boiler shall utilize a 24 VAC control circuit and components. The control system shall have a factory installed display for boiler set-up, boiler status, and boiler diagnostics. All components shall be easily accessed and serviceable from the front and top of the jacket. The boiler shall be equipped with a temperature/pressure gauge, high limit temperature control with manual reset; ASME certified pressure relief valve set for 30 psi (standard); outlet water temperature sensor with a dual thermostat to verify accuracy; system supply water temperature sensor; outdoor air sensor; flue temperature sensor with dual thermostat to verify accuracy; low water cut off with manual reset, blocked drain switch and a condensate trap for the heat exchanger condensate drain.

H. The boiler shall feature the "SMART SYSTEM"™ control which is standard and factory installed with 128 x 128 resolution display, password security, outdoor air reset, pump delay with freeze protection, pump exercise, ramp delay featuring six steps, domestic hot water prioritization with limiting capabilities, USB drive for simple uploading of parameters and a PC port connection for connection to a local computer for programming and trending. A standard operating control that is field mounted outside or inside the appliance is not acceptable. The boiler shall have alarm contacts for any failure, runtime contacts and data logging of runtime at given modulation rates, ignition attempts and ignition failures.

I. The "SMART SYSTEM"™ control shall increase fan speed to boost flame signal when a weak flame signal is detected during normal operation. A 0-10 VDC output signal shall control a constant speed boiler pump (pump shall be supplied by contractor) to keep a fixed Delta T across the boiler regardless of the modulation rate.
J. The boiler shall be equipped with two terminal strips for electrical connection. A low voltage connection board with 46 connection points for safety and operating controls, i.e., Alarm Contacts, Runtime Contacts, Low Water Cut Off, Louver Proving Switch, Tank Thermostat, Domestic Hot Water Building Recirculation Pump Contacts, Domestic Hot Water Building Recirculation Temperature Sensor Contacts, Remote Enable/Disable, System Supply Temperature Sensor, Outdoor Temperature Sensor, Tank Temperature Sensor, Modbus Building Management System Signal and Cascade Control Circuit. A high voltage terminal strip shall be provided for supply voltage. Supply voltage shall be 120 volt / 60 hertz / single phase on all models. The high voltage terminal strip plus integral relays are provided for independent pump control of the System pump, the Boiler pump and the Domestic Hot Water pump.

K. The boiler shall be installed and vented with a direct vent system with vertical roof termination of both the exhaust vent and combustion air. The flue shall be Category IV approved material constructed of PVC, CPVC, Polypropylene or Stainless Steel. A separate pipe shall supply combustion air directly to the boiler from the outside. The boiler's total combined air intake length shall not exceed 100 equivalent feet. The boiler's total combined exhaust venting length shall not exceed 100 equivalent feet. The air inlet must terminate on the rooftop with the exhaust.
L. The boiler shall have an independent laboratory rating for Oxides of Nitrogen (NOx) to meet the requirements of South Coast Air Quality Management District in Southern California and the requirements of Texas Commission on Environmental Quality. The manufacturer shall verify proper operation of the burner, all controls and the integrity of the heat exchanger by connection to water and venting for a factory fire test prior to shipping.
M. The boiler shall operate at altitudes up to 4,500 feet above sea level without additional parts or adjustments. The boiler shall be certified for operation at elevations of 4,500 feet, and above, by a 3rd party organization.

2.2 PIPING SYSTEMS:

A. Refrigerant Piping:

- 1. Refrigerant piping shall be Type L hard drawn copper, ASTM B280, with wrought copper fittings and Svalbyrig Support.
2. Refrigerant piping shall be manufacturer's standard line sets, in lengths as required for proper installation. Coiling of excess tubing will not be acceptable.
B. Condensate Drain Piping:
1. See Section 15200 for piping requirements.
C. Pipe Hangers and Supports:
1. See Section 15200 for hanger and support requirements for piping systems. See drawings for seismic support requirements for piping systems.

2.3 VIBRATION ISOLATION:

A. General:

- 1. All rotating equipment and appurtenances connected to rotating equipment shall be vibration isolated from the supporting structure. No metal to metal contact will be permitted between fixed and floating parts. All metal isolators exposed to weather shall be hot dipped galvanized after fabrication. Piping connected to rotating equipment shall be hung with spring hangers for first 50 pipe diameters.
B. Floor Mounted Spring Isolators:
1. Isolators shall be free standing, laterally stable, and include acoustical friction pads and leveling bolts. Isolators shall have a minimum ratio of spring diameter to operating spring height of 1.0 and an additional travel to solid equal to 50% of rated deflection.
C. Floor Mounted Neoprene Pads:
1. Isolators shall be neoprene waffle, or combination neoprene and cork sandwich. Pads shall be sized and selected as per manufacturers loading requirements.

2.4 SEISMIC SUPPORTS:

- A. All equipment, ductwork, and piping shall be seismically supported as required by the International Building Code, latest edition. Support details shall be as indicated on the Drawings.

2.5 CONTROL SYSTEM:

A. General:

- 1. The Mechanical Contractor shall be responsible for a complete and operable control system, including equipment, installation, and accessories required to perform the required control functions. All control conduit and wiring shall be furnished by the Electrical Contractor. Thermostats, sub-base switches, remote control devices, etc., shall be supplied by the Mechanical Contractor and installed and connected by the Mechanical Contractor. The Mechanical Contractor shall furnish the Electrical Contractor with wiring diagrams for all mechanical equipment and controls.
2. The control system shall be basically electric, with supplementary electronic devices as required.
B. Control Equipment and Accessories:
1. Equipment Control Schematics:
a. See plans for schematics and sequence of operations.

PART 3 – EXECUTION

3.1 WORKMANSHIP:

A. General:

- 1. Install all materials and equipment as shown and in strict accordance with the applicable codes for the State and/or city. Plans do not attempt to show exact details of all piping and ductwork, and no extra payment will be allowed for offsets required due to obstructions by other trades. All work shall be done in a neat and orderly fashion and left in a condition satisfactory to the Architect/Engineer.
2. All piping shall be run parallel or perpendicular to established building lines. Install piping so as to allow for expansion. Install all valves with stems horizontal or above. Install air vents at all high points. Provide all piping which passes through walls, floors, or ceilings with standard weight pipe sleeves.

B. Insulation:

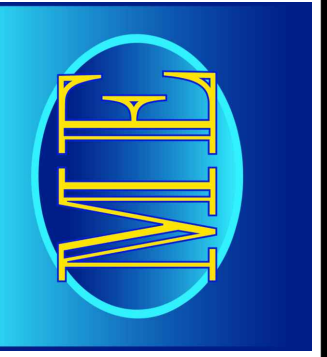
- 1. All piping insulation shall be applied over clean, dry surfaces after system has been pressure tested and any leaks corrected. Finished appearance of all insulation shall be smooth and continuous. Provide coat of insulating cement where needed to obtain this result.

END OF SECTION 15300

Table with columns: NO., REVISIONS, DATE.



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IDAHO TRANSPORTATION DEPARTMENT DISTRICT 4 SUPPLY OPERATIONS BOILER REPLACEMENT - FM42403 SHOSHONE, IDAHO OVER 40 YEARS OF EXCELLENCE

Table with columns: PROJECT, DRAWN, CHECKED, DATE, SCALE, SHEET.

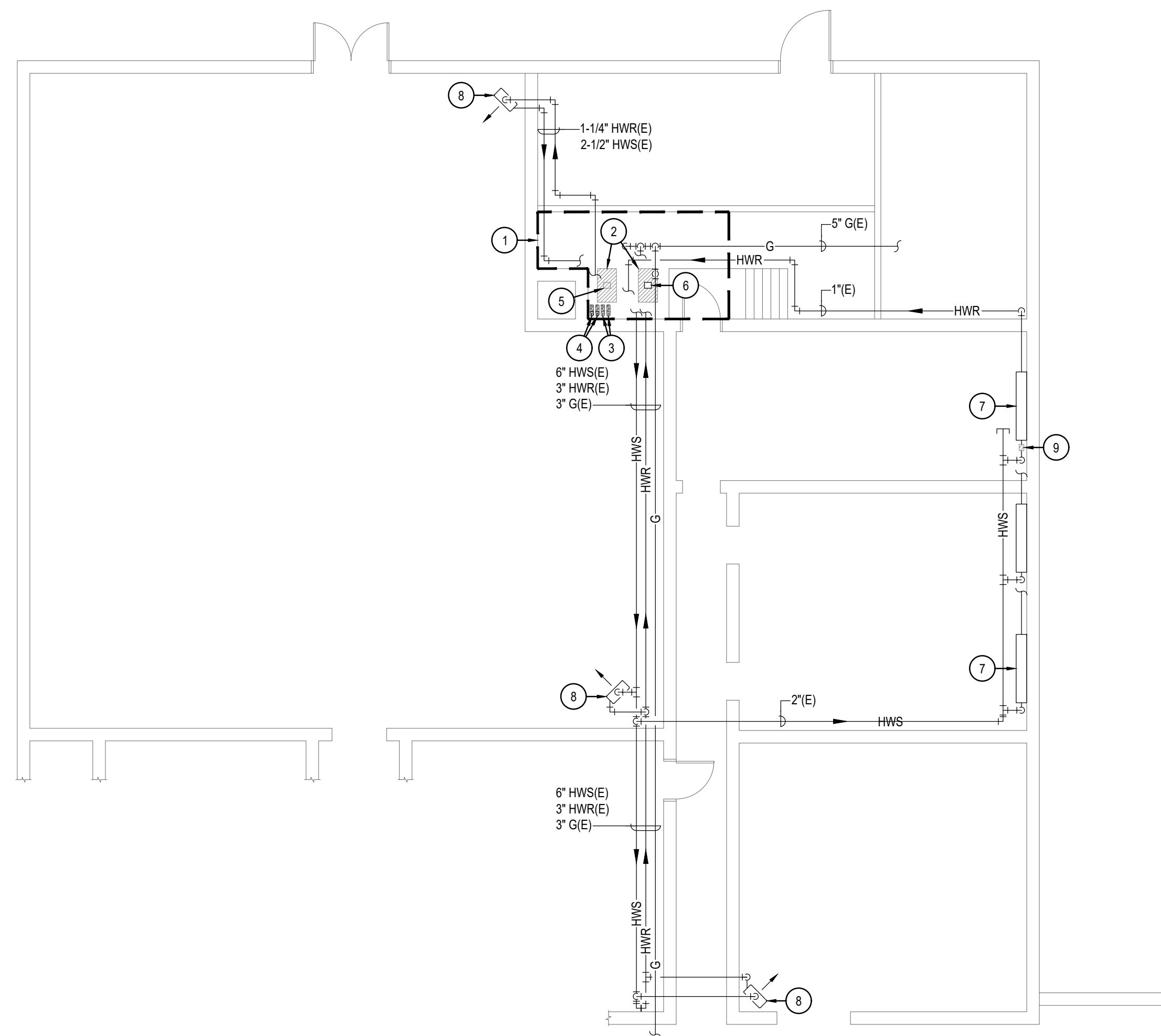
MO.1

DEMOLITION KEYED NOTES:

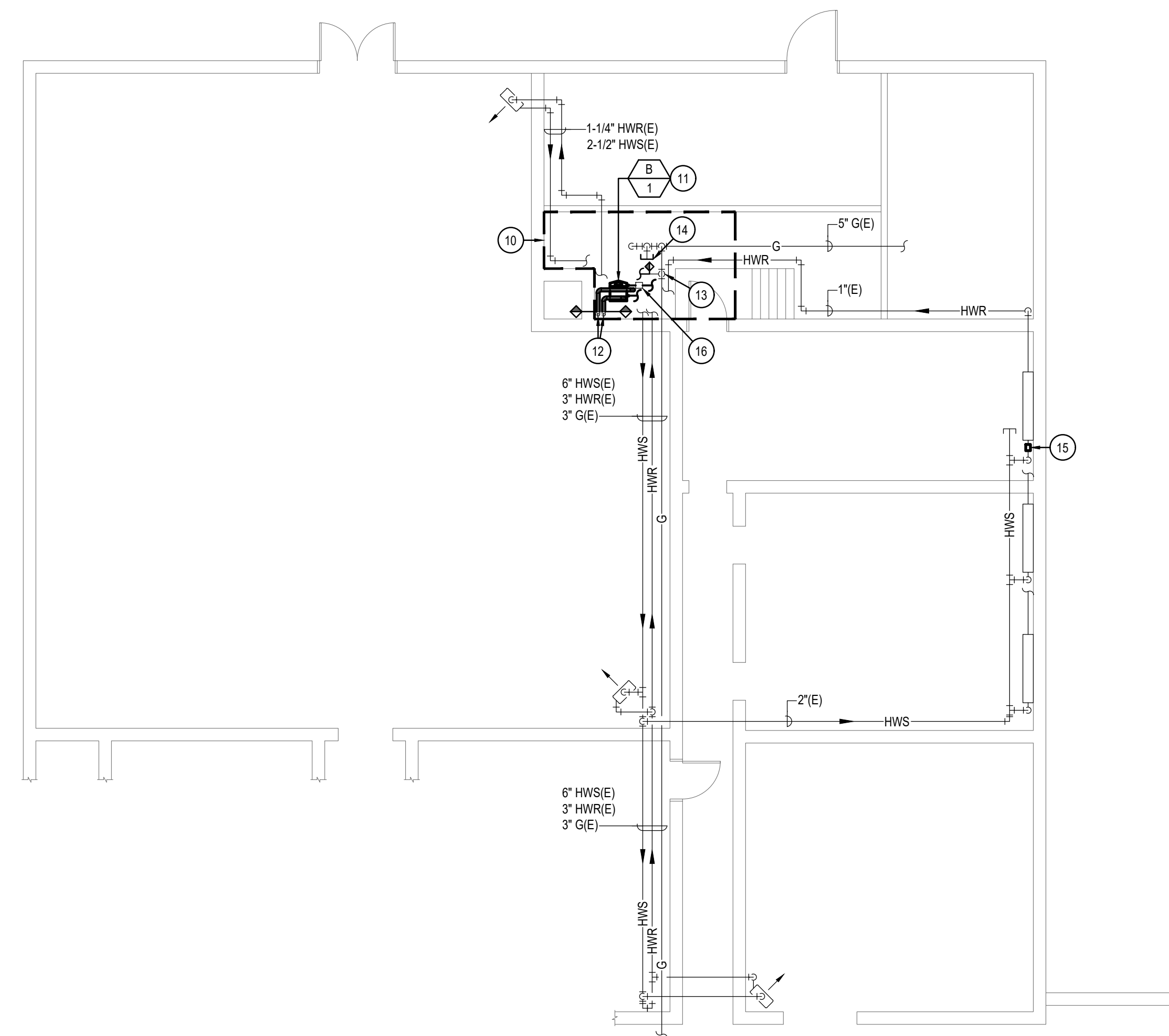
- # SYMBOL USED FOR NOTE CALLOUT.
- SEE DETAIL #1 ON SHEET M2.0 FOR DEMOLITION PIPING SCHEMATIC.
 - DISCONNECT AND REMOVE BOILER, DRAIN, AND ALL ASSOCIATED CONTROLS.
 - DISCONNECT AND CAP EXISTING 3"Ø INTAKE AND 3"Ø VENT.
 - DISCONNECT EXISTING 3"Ø INTAKE AND 3"Ø VENT. INTAKE AND VENT TO BE REUSED.
 - DISCONNECT AND REMOVE EXISTING BOILER PUMP.
 - EXISTING BOILER PUMP TO REMAIN AND BE REUSED.
 - EXISTING HOT WATER CONVECTOR TO REMAIN.
 - EXISTING HOT WATER UNIT HEATER TO REMAIN.
 - DISCONNECT AND REMOVE THERMOSTATIC CONTROL VALVE.

NEW WORK KEYED NOTES:

- # SYMBOL USED FOR NOTE CALLOUT.
- SEE DETAIL #2 ON SHEET M2.0 FOR NEW WORK PIPING SCHEMATIC.
 - INSTALL NEW HOT WATER BOILER ON EXISTING CONCRETE PAD. SEE DETAIL #3 ON SHEET M2.0 FOR ADDITIONAL INSTALLATION REQUIREMENTS. MAINTAIN ALL MANUFACTURER REQUIRED CLEARANCES.
 - ROUTE AND EXTEND EXISTING 3"Ø FLUE AND 3"Ø INTAKE TO NEW BOILER.
 - EXTEND EXISTING 3/4"Ø LOW PRESSURE GAS LINE TO NEW BOILER. PROVIDE 1/2"Ø REDUCER AND CONNECT TO NEW BOILER.
 - CAP EXISTING BOILER GAS LINE.
 - INSTALL NEW THERMOSTATIC CONTROL VALVE. BASIS OF DESIGN: WHITE-RODGERS, ZONE-A-FLOW WATER VALVE, MODEL 1361-103, 1" LINE (TWO WIRE).
 - EXISTING INLINE CIRCULATOR PUMP TO BE REUSED.



1 MAIN FLOOR MECHANICAL DEMOLITION FLOOR PLAN
SCALE: 1/8" = 1' - 0"
NORTH

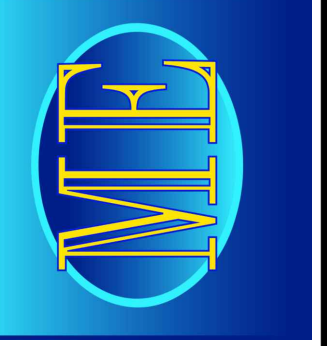


2 MAIN FLOOR MECHANICAL NEW WORK FLOOR PLAN
SCALE: 1/8" = 1' - 0"
NORTH

NO.	REVISIONS	DATE



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IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 4 SUPPLY OPERATIONS
BOILER REPLACEMENT - FM42403
SHOSHONE, IDAHO

PROJECT	23-256
DRAWN	CD
CHECKED	TN
DATE	23-08-21
SCALE	SEE PLANS
SHEET	

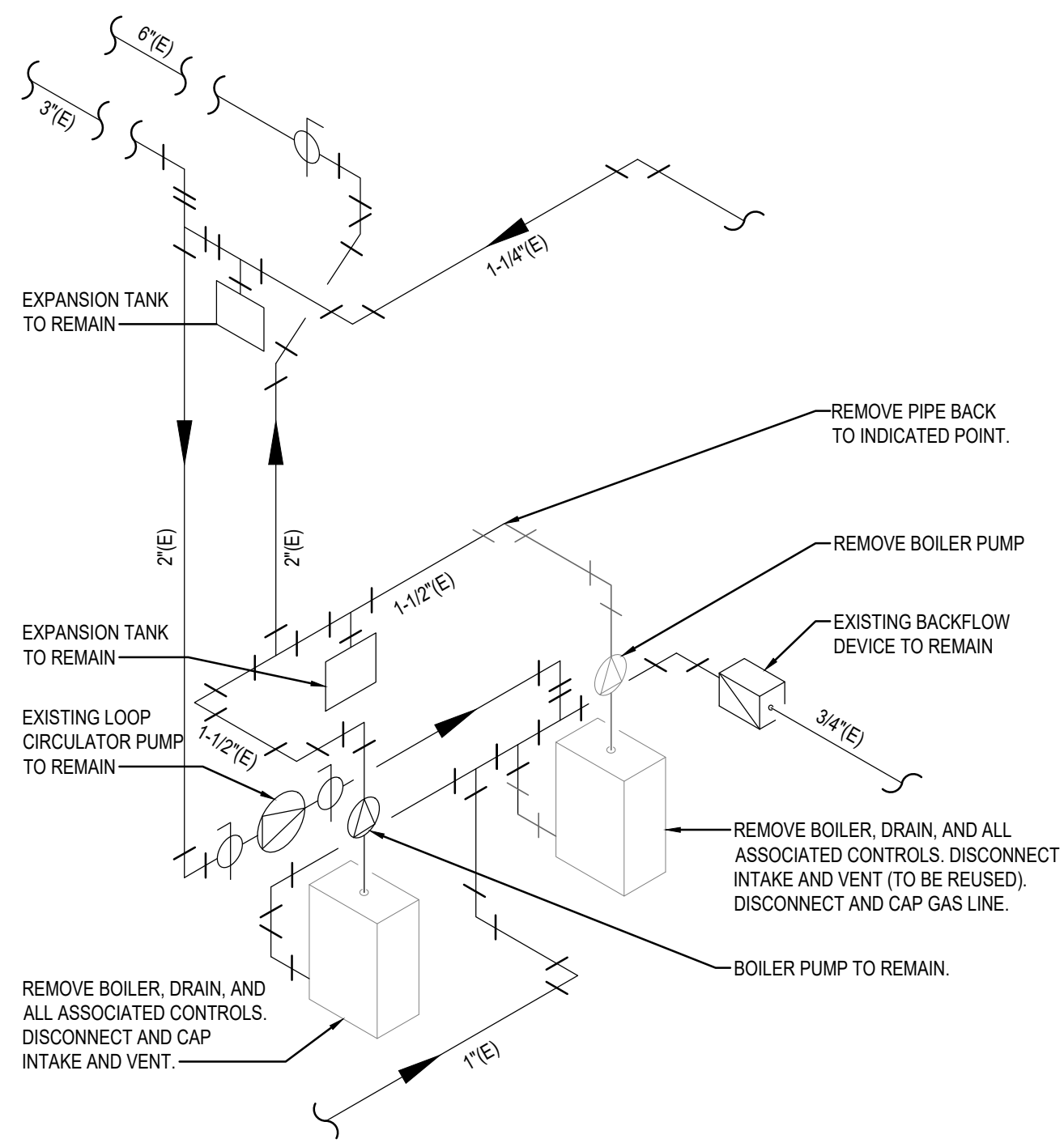
M1.0

OVER 40 YEARS OF EXCELLENCE

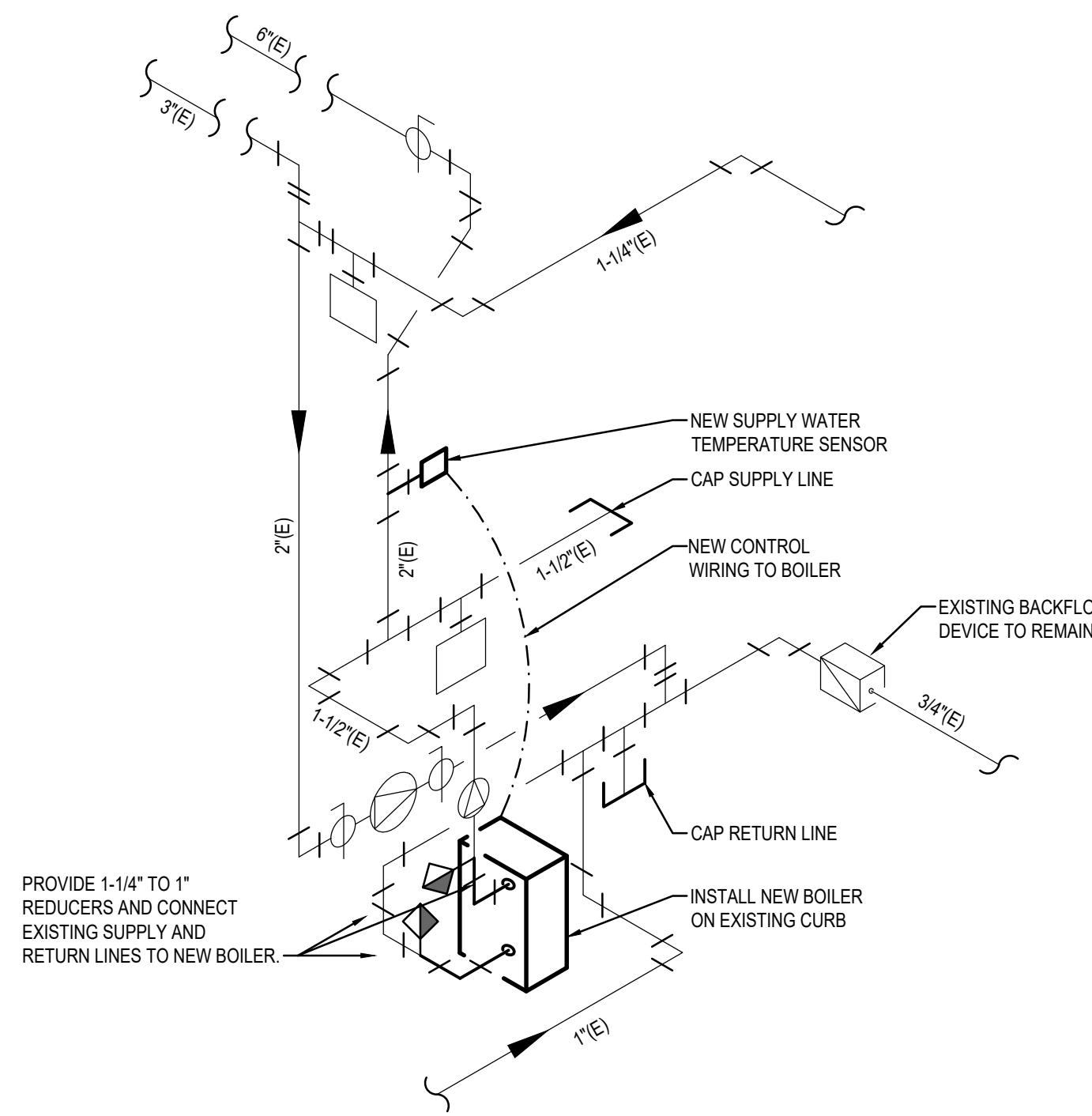
CONDENSING HOT WATER BOILER SCHEDULE											
SYMBOL	AREA SERVED	THERMAL EFFICIENCY	FUEL	EWT (°F)	LWT (°F)	BOILER FLOW (GPM)	MAX P.D. (FT H ₂ O)	CAPACITY		MANUFACTURER AND MODEL	REMARKS
								INPUT MBH	OUTPUT MBH		
B-1	HOT WATER LOOP	95%	NATURAL GAS	120	160	8.0	2.0	155	147	LOCHINVAR KHB-155	1, 2, 3

REMARKS:

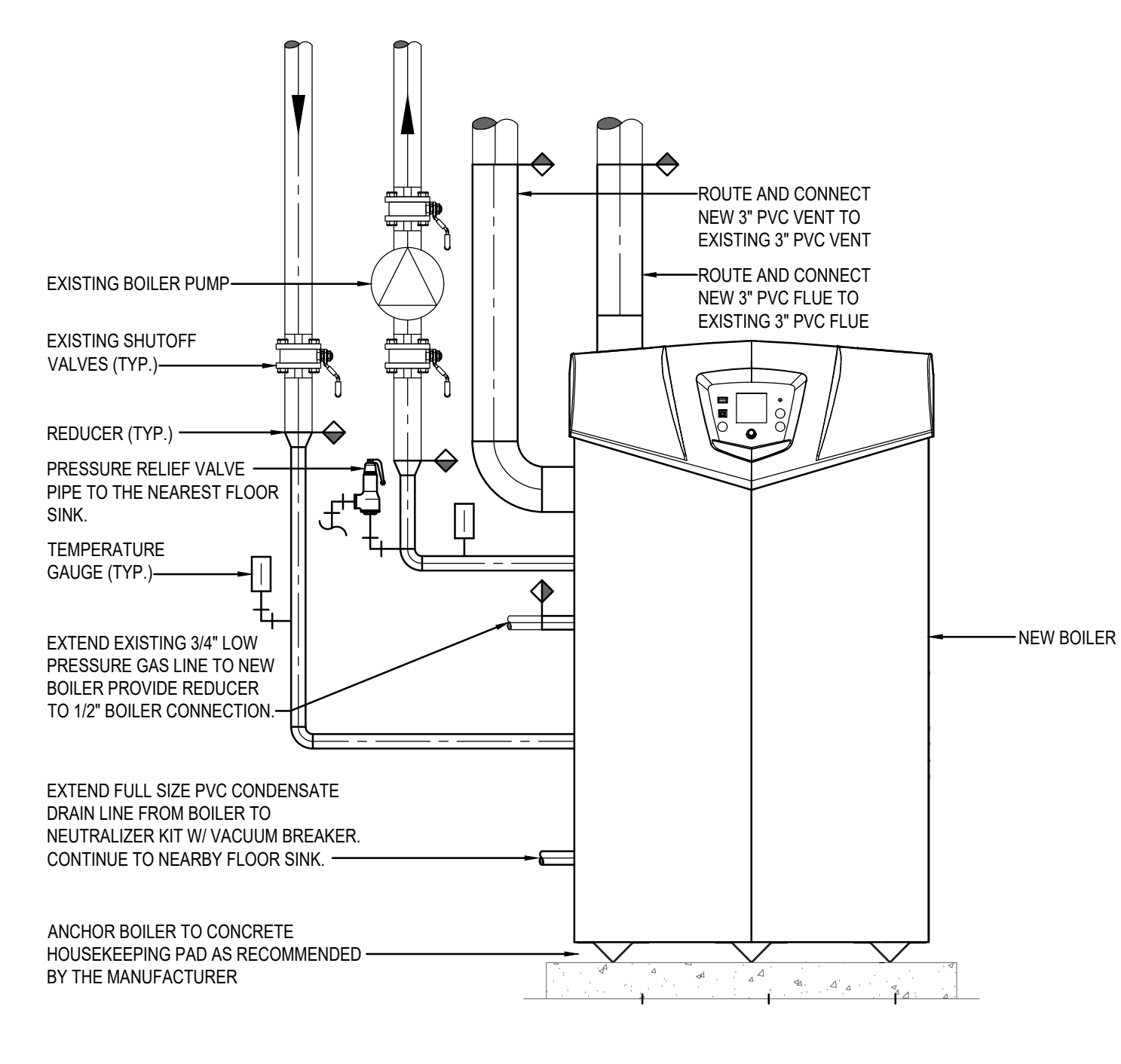
- APPROVED ALTERNATE MANUFACTURERS: CLEAVER BROOKS CLEARFIRE, LAARS, AND AERCO BENCHMARK.
- PROVIDE BOILER VENTING KIT, CONDENSATE NEUTRALIZING KIT, COMBUSTION AIR INTAKE KIT, PRESSURE RELIEF VALVE (SIZED PER MANUFACTURER'S REQUIREMENTS), LOW WATER CUT-OFF, FLOW SWITCH, MODULATING GAS BURNER, CONDENSATE TRAP, 316L STAINLESS STEEL COMBUSTION CHAMBER, AND PVC VENT/INTAKE TERMINATIONS.
- BOILER SHALL BE PROVIDED W/FACTORY START-UP. START-UP IS NOT COMPLETE UNTIL ALL BURNERS AND BLOWER ARE CALIBRATED FOR PEAK PERFORMANCE AND AT COMPLETION OF PROJECT ALL BURNERS, BLOWERS, HEAT EXCHANGERS, AND OTHER INTERNAL PARTS SHALL BE THOROUGHLY CLEANED OF CONSTRUCTION DEBRIS.
- SEE BOILER SEQUENCE OF OPERATION ON THIS SHEET.



1 BOILER SYSTEM DEMOLITION PIPING SCHEMATIC
NOT TO SCALE



2 BOILER SYSTEM NEW WORK PIPING SCHEMATIC
NOT TO SCALE



3 BOILER PIPING SCHEMATIC
NOT TO SCALE

- NOTES:
- PIPING SHALL BE SUPPORTED INDEPENDENTLY FROM THE CONNECTIONS TO THE BOILER.
 - INSTALL ALL VALVES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE PURPOSES.
 - INSTALL ALL GAUGES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE / VIEWING PURPOSES.
 - ALL BUTTERFLY VALVES MOUNTED HIGHER THAN ABOVE 7'-0" A.F.F SHALL BE PROVIDED W/ A CHAIN WHEEL AND GUIDES.

A QUALIFIED WATER TREATMENT CONTRACTOR SHALL BE UTILIZED TO FURNISH THE CLEANING MATERIAL AND SUPERVISE THE FLUSHING AND TREATMENT OF THE SYSTEM. APPROVED WATER TREATMENT CONTRACTORS MUST SHOW PROOF OF SIMILAR SERVICE FOR NO LESS THAN 3 YEARS, AND SHALL HAVE FULL-TIME SERVICE PERSONNEL LOCATED WITHIN THREE-HOURS FROM THE JOB SITE. MONITORING AND TREATMENT OF THE SYSTEM SHALL BE PROVIDED FOR A PERIOD OF ONE YEAR FOLLOWING FINAL ACCEPTANCE OF BUILDING AND SYSTEM.

DESCRIPTION OF WORK

- LEAK CHECK AND INITIAL SYSTEM CLEANING:

ONCE THE ENTIRE SYSTEM HAS BEEN COMPLETELY INSTALLED, THE HEATING WATER DISTRIBUTION SYSTEM SHALL BE COMPLETELY CLEANED AND CHECKED FOR LEAKS. THE WATER TREATMENT CONTRACTOR SHALL ADD INITIAL CHEMICAL CLEANING AGENT TO FACILITATE FLUSHING AND TO PREVENT CORROSION DURING THE LEAK CHECK PROCESS. THE SYSTEM SHALL BE FREE OF ALL CUTTING OILS AND OTHER DEBRIS. THE WATER TREATMENT CONTRACTOR SHALL FILL THE HEATING SYSTEM WITH CLEAN, FRESH WATER AND THOROUGHLY CHECK SYSTEM PIPING FOR LEAKS. FOLLOWING THE LEAK CHECK, THE CLOSED SYSTEM SHALL BE FLUSHED UNTIL THE LEAVING WATER RUNS CLEAR. THE WATER TREATMENT CONTRACTOR SHALL ENSURE THAT SYSTEMS NOT BE LEFT DRY DURING SYSTEM DRAIN-DOWN.
- HEATING WATER SYSTEM CHEMICAL TREATMENT:
 - FILL SYSTEM WITH A SOLUTION OF 10% BY WEIGHT OF A HEAVY DUTY ALKALINE LIQUID CLEANER. THE CLEANER SHALL BE CAPABLE OF WETTING AND PENETRATING HEAVY SOIL DEPOSITS OF OIL OR GREASE, AND OF KEEPING THESE PRODUCTS IN SUSPENSION.
 - HEAT SOLUTION TO 180° F AND CIRCULATE FOR A MINIMUM OF 8 HOURS, THEN FLUSH SYSTEM WITH CLEAN FRESH WATER UNTIL ALL SOLIDS HAVE BEEN CLEANED FROM THE SYSTEM. CLEAN ALL STRAINERS IN SYSTEM.
 - THE WATER TREATMENT CONTRACTOR SHALL REFILL SYSTEM WITH A MIXTURE OF CLEAN WATER AND CHEMICAL INHIBITOR. ADD NITRITE TO SYSTEM TO MAINTAIN A NITRITE LEVEL OF 800-1000 PPM. TEST FOR NITRITE USING A "DROP TEST" KIT.
- AT THE CONCLUSION OF CLEANING AND TREATING, THE WATER TREATMENT CONTRACTOR SHALL CERTIFY IN WRITING THAT THE SYSTEM HAS BEEN CLEANED AND TREATED AS SPECIFIED.
- AT THE END OF ONE YEAR, THE SYSTEM SHALL AGAIN BE CHECKED AND REFILLED AS REQUIRED TO MEET THE ABOVE SPECIFICATIONS. SERVICE DURING THE ONE-YEAR WARRANTY PERIOD SHALL BE AS REQUIRED TO MAINTAIN ABOVE SPECIFICATIONS.

4 HEATING WATER FLUSH TREATMENT

THE NEW BOILER SYSTEM SHALL INCLUDE ONE HYDRONIC HOT WATER BOILER WITH. THE MECHANICAL CONTRACTOR SHALL PROGRAM THE NEW BOILER.

HEATING MODE OF OPERATION:
THE HEATING MODE OF OPERATION SHALL BE ENABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

- THE HEATING WATER LOOP TEMPERATURE FALLS BELOW THE HEATING WATER TEMPERATURE SETPOINT.

WHEN THE ABOVE CONDITION EXISTS, THE BOILER UNIT CONTROL PANEL SHALL SEQUENCE THE FOLLOWING:

- SEND AN ENABLE COMMAND TO THE BOILER (B-1).

THE HEATING MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

- THE HEATING WATER LOOP TEMPERATURE RISES ABOVE THE HEATING WATER TEMPERATURE SETPOINT.

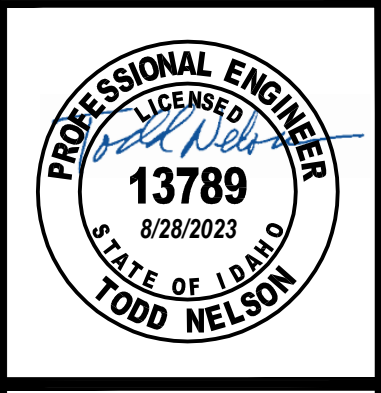
WHEN THE ABOVE CONDITION EXISTS, THE BOILER UNIT CONTROL PANEL SHALL SEQUENCE THE FOLLOWING:

- SEND AN DISABLE COMMAND TO THE BOILER (B-1).

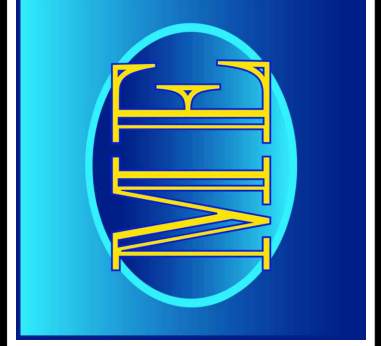
THE HEATING WATER TEMPERATURE SET POINT SHALL BE 160°F (ADJUSTABLE).

5 BOILER SEQUENCE OF OPERATION

NO.	REVISIONS	DATE



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 OVER 40 YEARS OF EXCELLENCE



IDAHO TRANSPORTATION DEPARTMENT
 DISTRICT 4 SUPPLY OPERATIONS
 BOILER REPLACEMENT - FM42403
 SHOSHONE, IDAHO

PROJECT	23-256
DRAWN	CD
CHECKED	TN
DATE	23-08-21
SCALE	SEE PLANS
SHEET	

M2.0

ELECTRICAL LEGEND - LIGHTING

REFERENCE FIXTURE SCHEDULE FOR MOUNTING TYPE, MOUNTING HEIGHT, AND FIXTURE TYPE.

	DOUBLE FACE EXIT SIGN, CEILING MOUNTED, PROVIDE UNSWITCHED CONDUCTOR.
	WALL MOUNTED DOUBLE FACE EXIT SIGN PROVIDE UNSWITCHED CONDUCTOR. MOUNT AT +8'-0" UNO.
	SINGLE FACE EXIT SIGN, CEILING MOUNTED PROVIDE UNSWITCHED CONDUCTOR.
	WALL MOUNTED SINGLE FACE EXIT SIGN PROVIDE UNSWITCHED CONDUCTOR. MOUNT AT +8'-0" UNO.
	ARROW INDICATES DIRECTION TO BE SHOWN ON SIGN.
	1'X1' LIGHT FIXTURE.
	1'X1' LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
	TRACK LIGHT
	1'X4' LIGHT FIXTURE.
	1'X4' LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
	2'X4' LIGHT FIXTURE.
	2'X4' LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
	2'X2' LIGHT FIXTURE.
	2'X2' LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
	DIRECT/INDIRECT LIGHT FIXTURE. SEE SCHEDULE FOR LENGTH.
	DIRECT/INDIRECT LIGHT FIXTURE. SEE SCHEDULE FOR LENGTH. PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR
	STRIP LIGHT FIXTURE. SEE SCHEDULE FOR LENGTH.
	STRIP LIGHT FIXTURE. SEE SCHEDULE FOR LENGTH. PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR
	WALL MOUNTED LIGHT FIXTURE.
	WALL MOUNTED LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
	RECESSED LIGHT FIXTURE
	RECESSED LIGHT FIXTURE. PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
	ROUND LIGHT FIXTURE
	ROUND EMERGENCY LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
	WALL MOUNTED LIGHT FIXTURE.
	WALL MOUNTED EMERGENCY LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
	POLE LIGHT 1 HEAD WITH POLE
	TIME CLOCK
	PHOTO CONTROL CELL LOCATED 12" ABOVE ROOF FACING NORTH.
	OCCUPANCY SENSOR. PROVIDE RELAYS AND POWER PACKS AS REQUIRED.
	LED DRIVER
	EMERGENCY EGRESS LIGHTING WITH OUT FIXTURE HEADS. CONNECT TO AN UNSWITCHED CONDUCTOR.
	EMERGENCY EGRESS LIGHTING. CONNECT TO AN UNSWITCHED CONDUCTOR.
	WALL MOUNTED SINGLE FACE EXIT SIGN WITH EMERGENCY EGRESS LIGHTING. PROVIDE UNSWITCHED CONDUCTOR. MOUNT AT +8'-0" UNO.
	CEILING MOUNTED SINGLE FACE EXIT SIGN WITH EMERGENCY EGRESS LIGHTING. PROVIDE UNSWITCHED CONDUCTOR.
	CEILING MOUNTED DOUBLE FACE EXIT SIGN WITH EMERGENCY EGRESS LIGHTING. PROVIDE UNSWITCHED CONDUCTOR.
	INDICATES FIXTURE TYPE. REFER TO FIXTURE SCHEDULE.
	EXTERIOR WALL PACK
	EMERGENCY EXTERIOR WALL PACK. PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR

DEVICES

	SWITCH, TYPE AS INDICATED. +46" AFF
	2 DOUBLE POLE
	3 3-WAY
	4 4-WAY
	K KEYED
	P PILOT LIGHT
	D DIMMER
	HP HORSEPOWER RATED
	TO THERMAL OVERLOAD
	LV LOW VOLTAGE
	OS OCCUPANCY SENSOR
	OR LOW VOLTAGE, MOMENTARY OVERRIDE
	VS VACANCY SENSOR
	a SUPERScript INDICATES LIGHTS TO BE SWITCHED TOGETHER
	SS DUAL LEVEL SWITCHING, INSIDE AND OUTSIDE LAMPS OF FIXTURE TO BE SWITCHED SEPARATELY.
	SS OS DUAL LEVEL SWITCHING WITH OCCUPANCY SENSOR, INSIDE AND OUTSIDE LAMPS OF FIXTURE TO BE SWITCHED SEPARATELY.
	SS OS OCCUPANCY SENSOR WITH MANUAL DIMMING, SET FOR 50% AUTOMATIC ON, AUTOMATIC OFF, WITH MANUAL DIMMING.
	Single CONVENIENCE OUTLET, +18" AFF UNO
	FLOOR MOUNT SINGLE CONVENIENCE OUTLET
	DUPLEX CONVENIENCE OUTLET, +18" AFF UNO
	FLOOR MOUNT DUPLEX CONVENIENCE OUTLET
	EMERGENCY DUPLEX CONVENIENCE OUTLET, +18" AFF UNO
	SWITCHED DUPLEX CONVENIENCE OUTLET, +18" AFF UNO
	FLOOR MOUNTED SWITCHED DUPLEX CONVENIENCE OUTLET
	USB DUPLEX CONVENIENCE OUTLET, +18" AFF UNO
	USB FOURPLEX CONVENIENCE OUTLET, +18" AFF UNO
	FOURPLEX CONVENIENCE OUTLET, +18" AFF UNO
	FLOOR MOUNT FOURPLEX CONVENIENCE OUTLET
	CONNECTION POINT TO EQUIPMENT SPECIFIED, ELECTRICAL CONTRACTOR TO SUPPLY RACEWAY AND CONDUCTORS AND MAKE FINAL CONNECTION TO EQUIPMENT UNDER THIS SECTION. UNO
	FLOOR MOUNTED CONNECTION POINT, SEE NOTE ABOVE FOR REQUIREMENTS
	JUNCTION BOX
	WALL MOUNTED PUSH BUTTON, MOUNT AT SWITCH HEIGHT UNO
	WALL MOUNTED PUSH BUTTON, HANDICAPPED MOUNT AT SWITCH HEIGHT UNO
	WALL MOUNTED PUSH BUTTON, MOUNT AT SWITCH HEIGHT UNO
	MOTOR STARTER/CONTACTOR, SIZE/POLES NEMA 1 UNO AS INDICATED
	COMBINATION STARTER AND DISCONNECT, SIZE/POLES, STARTER SIZE AS INDICATED, NEMA 1 UNO
	FUSED DISCONNECT SWITCH, SIZE/POLES, FUSE SIZES AS INDICATED, NEMA 1 UNO
	NON-FUSED DISCONNECT SIZE/ POLES AS INDICATED, NEMA 1 UNO
	THERMOSTAT, +46" AFF PROVIDE CONDUIT, J-BOX, CONDUCTORS AS REQUIRED TO CONTROL ASSOCIATED UNITS. UNO COORDINATE WITH DIVISION 15.
	HUMIDISTAT, +46" AFF PROVIDE CONDUIT, J-BOX, CONDUCTORS AS REQUIRED TO CONTROL ASSOCIATED UNITS.
	POWER POLE - DUAL CHANNEL
	RECESSED ENTERTAINMENT BOX
	TRANSFORMER
	PANELBOARD, SEE SCHEDULE FOR TYPE.
	EQUIPMENT CABINET, SURFACE MOUNTED
	EQUIPMENT CABINET FLUSH MOUNTED
	SURFACE MULTI-OUTLET RACEWAY
	MECHANICAL EQUIPMENT CALL OUT
	KITCHEN EQUIPMENT CALLOUT

ONE LINE

	DELTA WYE TRANSFORMER UNO
	PANEL BOARD, SEE SCHEDULE FOR TYPE AND SIZE
	CIRCUIT BREAKER, SIZE AND POLES INDICATED
	FUSE, SIZE AND TYPE INDICATED, PROVIDE FUSE FOR EACH POLE
	INTERRUPTER SWITCH, SIZE AND POLES INDICATED
	FUSED SWITCH, SIZE/POLES AND FUSE SIZE INDICATED
	DRAW OUT CIRCUIT BREAKER, SIZE AND POLES INDICATED
	INDIVIDUAL BREAKER WITH SHUNT TRIP, SIZE AND POLES INDICATED. NEMA 1 UNO
	INDIVIDUAL BREAKER, SIZE AND POLES INDICATED. NEMA 1 UNO
	GROUND FAULT PROTECTION
	TRANSIENT VOLTAGE SURGE SUPPRESSION
	ADJUSTABLE BREAKER SETTINGS (PER SPECIFICATIONS): L'-LONG TIME S'-SHORT TIME T'-INSTANTANEOUS G'-GROUND FAULT R'-ENERGY REDUCING MAINTENANCE SWITCH/WSTATUS INDICATOR
	GROUND
	SHUNT TRIP COIL
	MOTOR
	DISCONNECT SWITCH, SIZE AND POLES INDICATED. NEMA 1 UNO
	OVERHEAD SERVICE DROP
	GENERATOR SET, MAIN BREAKER SIZE INDICATED
	AUTOMATIC TRANSFER SWITCH (ATS)
	METER AND BASE
	NEUTRAL
	DRY TYPE TRANSFORMER
	PAD MOUNT TRANSFORMER

NOTE: THIS IS A STANDARD LIST OF COMMONLY USED ELECTRICAL SYMBOLS. SOME OF THE SYMBOLS SHOWN MAY NOT HAVE BEEN USED IN THIS DRAWING PACKAGE.

ELECTRICAL ABBREVIATIONS

A	AMPERES
AC	6" ABOVE BACKSPLASH ABOVE FINISHED FLOOR
AF	ABOVE FINISHED GRADE
AFG	AMP FRAME
AFIC	AMPS INTERRUPTING CAPACITY
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BD	BOTTOM OF DECK
BS	BOTTOM OF STRUCTURE
C	CEILING MOUNTED
CC	CONDUIT
CB	CIRCUIT BREAKER
CF	COMPACT FLUORESCENT
CKT	CIRCUIT
CO	CONDUIT ONLY, PROVIDE PULL-LINE
CT	CURRENT TRANSFORMER CONTROL
CTL	CONTROL
DC	DIRECT CURRENT
(D)	DEMOLITION
DEMO	DEMOLITION
DET	DETAIL
DTT	DOUBLE TWIN TUBE
E	EMERGENCY
(E)	EXISTING
EC	ELECTRICAL CONTRACTOR
EL	EMERGENCY LIGHT
F	FUSE
(F)	FUTURE
FACP	FIRE ALARM CONTROL PANEL
G/GND	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
HH	HAND HOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTO
HPS	HIGH PRESSURE SODIUM
HVAC	HEATING, VENTILATION, & AIR CONDITIONING
IG	ISOLATED GROUND
IPCO	IDaho POWER COMPANY
J-BOX	JUNCTION BOX
KA	KILOAMP
KVA	KILO VOLT-AMP
KW	KILOWATT
KWH	KILOWATT HOUR
LCP	LIGHTING CONTROL PANEL
MB	MAIN BREAKER
MBR	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUGS ONLY
MMC	MODULAR METERING CENTER
MH	METAL HALIDE
MSB	MAIN SWITCH BOARD
MTG	MOUNTING
N	NEUTRAL
(N)	NEW
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OH	OVERHEAD
OS	OCCUPANCY SENSOR
P	POLES
PC	PHOTO-CONTROL
PVC	POLYVINYL CHLORIDE
PWR	POWER
RE:	REFERENCE
REC	RECEPTACLE
(R)	RELOCATED
SF	SQUARE FEET
TBD	TO BE DETERMINED
TDR	TIME DELAY RELAY
TK	TOE KICK
TSP	TWISTED SHIELDED PAIR
TRT	TRIPLE TUBE
TTB	TELEPHONE TERMINAL BOARD
(TYP.)	TYPICAL
UC	UNDERCABINET
UG	UNDERGROUND
U.N.O.	UNLESS NOTED OTHERWISE
V	VOLT
VA	VOLT-AMPERE
W	WATT
WG	WIRE GUARD
WP	WEATHER PROOF/NEMA 3R
PROVIDED/ PROVIDE BY	PROVIDE AND INSTALL / PROVIDED AND INSTALLED BY / PROVIDE AND INSTALL
INSTALLED/ INSTALL	

NOTE: THIS IS A STANDARD LIST OF COMMONLY USED ELECTRICAL ABBREVIATIONS. SOME OF THE ABBREVIATIONS SHOWN ABOVE MAY NOT BE USED IN THIS DRAWING PACKAGE.

ELECTRICAL GENERAL NOTES

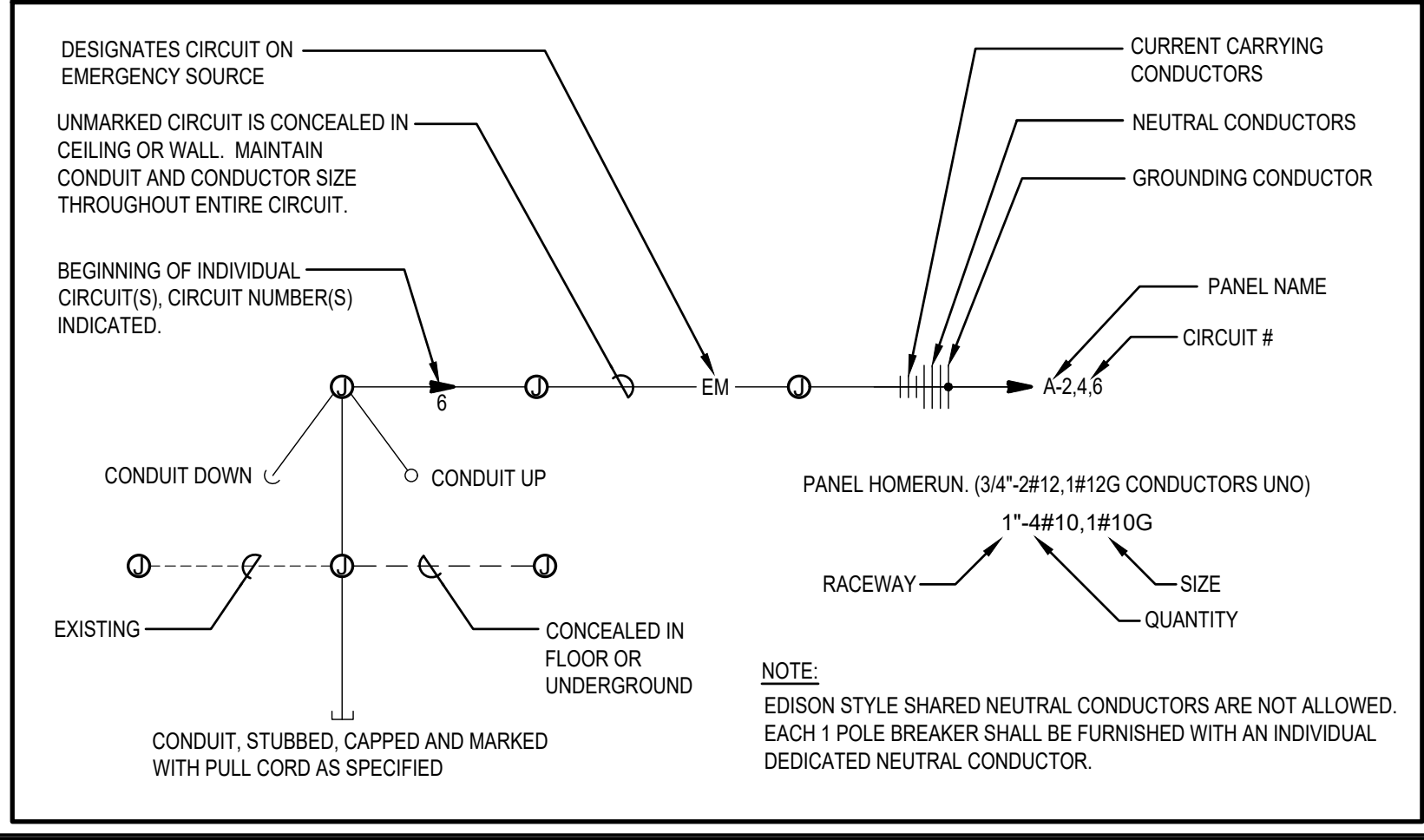
- THESE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE. THEREFORE, THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL ELECTRICAL EQUIPMENT AND DEVICE LOCATIONS WITH ARCHITECTURAL, MECHANICAL, AND PLUMBING DIVISIONS PRIOR TO ROUGH-IN. REFER TO AND COORDINATE WITH ARCHITECTURAL, MECHANICAL, AND PLUMBING DRAWINGS FOR ADDITIONAL WORK THAT IS REQUIRED BY THE ELECTRICAL CONTRACTOR.
- ALL CONDUIT AND JUNCTION BOXES ARE TO BE CONCEALED UNLESS LOCATED WITHIN DEDICATED ELECTRICAL OR MECHANICAL ROOMS. USE OF SURFACE MOUNTED RACEWAYS IN ALL OTHER SPACES MUST BE APPROVED BY THE ARCHITECT FOR EACH LOCATION. WHERE SURFACE RACEWAYS ARE APPROVED, UTILIZE WIREMOLD, OR APPROVED EQUAL. SURFACE MOUNTED RACEWAYS PAINTED TO MATCH SURROUNDING WALLS.
- REFER TO ARCHITECTURAL ELEVATIONS FOR OUTLET HEIGHTS WHERE THE SPECIFIC OUTLET HEIGHT IS NOT INDICATED. REFER TO THE ELECTRICAL LEGEND FOR THE DEFAULT OUTLET HEIGHT WHEN NOT INDICATED ON ELEVATIONS OR ON THE DEVICES.
- PROVIDE PULL-LINE IN ALL EMPTY CONDUITS.
- TERMINATE ALL LOW-VOLTAGE CONDUITS WITH INSULATED THROAT BUSHING.
- MECHANICAL EQUIPMENT INDICATED IS SHOWN IN AN APPROXIMATE LOCATION. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

ELECTRICAL SPECIFICATIONS

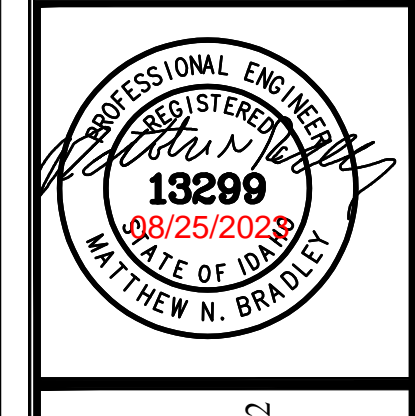
- ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE LOCALLY ADOPTED ELECTRICAL CODE, ALL LOCAL CODES, AND TO THE FULL ACCEPTANCE OF THE AUTHORITY HAVING JURISDICTION.
- OBTAIN ALL PERMITS, COORDINATE, FURNISH, INSTALL, CONNECT AND TEST ALL ELECTRICAL EQUIPMENT REQUIRED FOR ALL THE SYSTEMS INSTALLED UNDER THIS CONTRACT TO INSURE COMPLETE AND FULLY OPERATIONAL SYSTEMS.
- CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF AS-BUILT DRAWINGS. AS-BUILT SET OF DRAWINGS SHALL BE UPDATED DAILY AND SHALL DOCUMENT THE ACTUAL INSTALLED CONDITION OF THE ENTIRE ELECTRICAL INSTALLATION. AS-BUILT SET OF DRAWINGS SHALL BE AVAILABLE AT ALL TIMES ON THE SITE FOR INSPECTION BY CODE OFFICIALS, OWNER, ARCHITECT, AND ENGINEER.
- PROTECT ALL EXISTING WORK FROM DAMAGE DURING CONSTRUCTION.
- DESIGN IS BASED ON BEST AVAILABLE INFORMATION. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS TO DETERMINE STATUS OF ACTUAL CONDITIONS AS THEY RELATE TO THE SCOPE OF WORK AS SHOWN ON THESE PLANS.
- COORDINATE ALL ELECTRICAL WORK WITH ALL OTHER TRADES.
- COORDINATE EXACT LOCATION AND MOUNTING HEIGHTS OF ALL ELECTRICAL EQUIPMENT AND DEVICES WITH THE ARCHITECTURAL ELEVATIONS AND DETAILS PRIOR TO ROUGH-IN.
- DEMOLITION WORK IS A PART OF THIS PROJECT. SEE DRAWINGS FOR EXISTING ELECTRICAL DEVICES TO BE REMOVED. REMOVE ASSOCIATED BOXES, RACEWAYS AND CONDUCTORS BACK TO SOURCE, AND MAKE SAFE.
- ALL MATERIALS AND EQUIPMENT FURNISHED TO THE PROJECT SHALL BE NEW AND SHALL BEAR THE LISTING LABEL OF A NATIONALLY RECOGNIZED TESTING LAB AS DEFINED BY OSHA.
- ALL ELECTRICAL DEVICES AND TERMINALS SHALL BE RATED 75°C MINIMUM.
- ALL CONDUCTORS SHALL BE STRANDED COPPER, 600 VOLT RATED. INSULATION TYPE SHALL BE THINWALL, FULLY COLOR CODED WITH GAUGE, TYPE AND MANUFACTURER MARKED EVERY 24" ALONG. CONDUCTOR COLOR CODE SHALL BE AS FOLLOWS:

200Y/120 VOLT SYSTEM	480Y/277 VOLT SYSTEM
PHASE A - BLACK	PHASE A - BROWN
PHASE B - RED	PHASE B - ORANGE
PHASE C - BLUE	PHASE C - YELLOW
NEUTRAL - WHITE	NEUTRAL - GRAY
GROUND - GREEN	GROUND - GREEN
- MINIMUM SIZE WIRE FOR POWER AND LIGHTING CIRCUITS SHALL BE #12 AWG. ALL POWER AND LIGHTING CONDUCTORS SHALL BE ROUTED IN 3/4" CONDUIT MINIMUM.
- EMT OR MC TYPE CABLE IS ALLOWED WHEN CONCEALED IN INTERIOR SPACES. MC TYPE CABLE IS NOT ALLOWED FOR HOMERUNS.
- MAKE ALL CONNECTIONS TO EQUIPMENT PER MANUFACTURERS REQUIREMENTS.
- ALL EQUIPMENT, SWITCHING DEVICES AND PANELS SHALL BE MOUNTED SO AS TO BE ACCESSIBLE AND SHALL BE MOUNTED PLUMB AND SQUARE WITH WALLS.
- DEVICES AND RACEWAYS PENETRATING FIRE RATED WALLS AND FLOORS SHALL BE SEALED WITH FIRE RESISTIVE MATERIAL, COMPATIBLE WITH CONSTRUCTION PENETRATED, TO MAINTAIN RATING OF THE WALL. SEALANT SYSTEM SHALL BE A U.L. APPROVED SYSTEM AND INSTALLED PER MANUFACTURERS INSTRUCTIONS.
- FURNISH AND INSTALL PULL CORD IN ALL EMPTY CONDUITS.
- ALL JUNCTION BOX COVERS WITH POWER WIRING SHALL HAVE THE PANEL AND CIRCUIT LABELED ON THE OUTSIDE SURFACE. ALL LABELS FOR EXPOSED JUNCTION BOXES IN "FINISHED AREAS" SHALL BE LABELED UTILIZING SELF ADHESIVE LABELS PRODUCED BY A MECHANICAL LABELING MACHINE. LABELS FOR JUNCTION BOX COVERS IN CONCEALED LOCATIONS SHALL CONSIST OF THE INFORMATION BEING NEATLY HANDWRITTEN ON THE OUTSIDE SURFACE OF THE COVER WITH A PERMANENT STYLE MARKER.
- CLEARLY LABEL ALL ACCESSIBLE CONDUIT STUBS WITH SYSTEM NAME AND LOCATION (ROOM NUMBER) WHERE THE OTHER END OF THE CONDUIT TERMINATES. USE INDELIBLE INK. THE LABELS SHALL BE LOCATED ON THE CONDUIT IN A POSITION THAT CAN BE EASILY READ.
- ALL 1 POLE BREAKER CIRCUITS SHALL HAVE AN INDEPENDENT NEUTRAL CONDUCTOR. NO EDISON STYLE SHARED NEUTRAL CONDUCTORS ARE ALLOWED.
- ALL CONDUCTORS IN ELECTRICAL PANELS, CABINETS AND EQUIPMENT SHALL BE NEATLY TRAINED AND LACED.
- THE CONTRACTOR SHALL PROVIDE UPDATED CIRCUIT PANEL DIRECTORIES FOR ALL PANELS. DIRECTORIES SHALL BE TYPED.
- PROVIDE ELECTRICAL SUBMITTALS FOR EQUIPMENT SHOWN AS REQUIRED BY DIVISION 1 SPECIFICATIONS.
- ELECTRICAL CONTRACTOR SHALL OBTAIN THE AVAILABLE FAULT CURRENT VALUE FROM THE LOCAL UTILITY OR THE ONE-LINE DIAGRAM AND LABEL THE MAIN BREAKER WITH THAT VALUE.
- SWITCH AND RECEPTACLE LABELING: IDENTIFY PANELBOARD AND CIRCUIT NUMBER FROM WHICH DEVICES ARE SERVED. USE MACHINE PRINTED LABEL AND 1/8" TEXT. INSTALL ON THE OUTSIDE OF THE FACEPLATE FOR RECEPTACLES AND INSIDE THE FACEPLATE FOR SWITCHES.

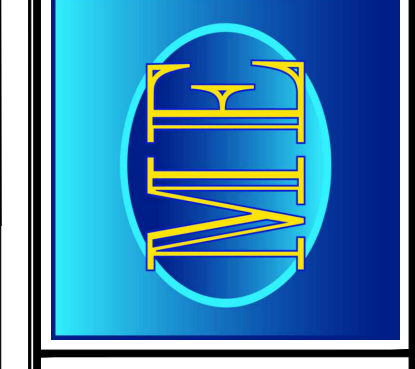
CIRCUITING SYMBOLS



DATE	
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 DISTRICT 4 SUPPLY OPERATIONS
 BOILER REPLACEMENT - FM42403
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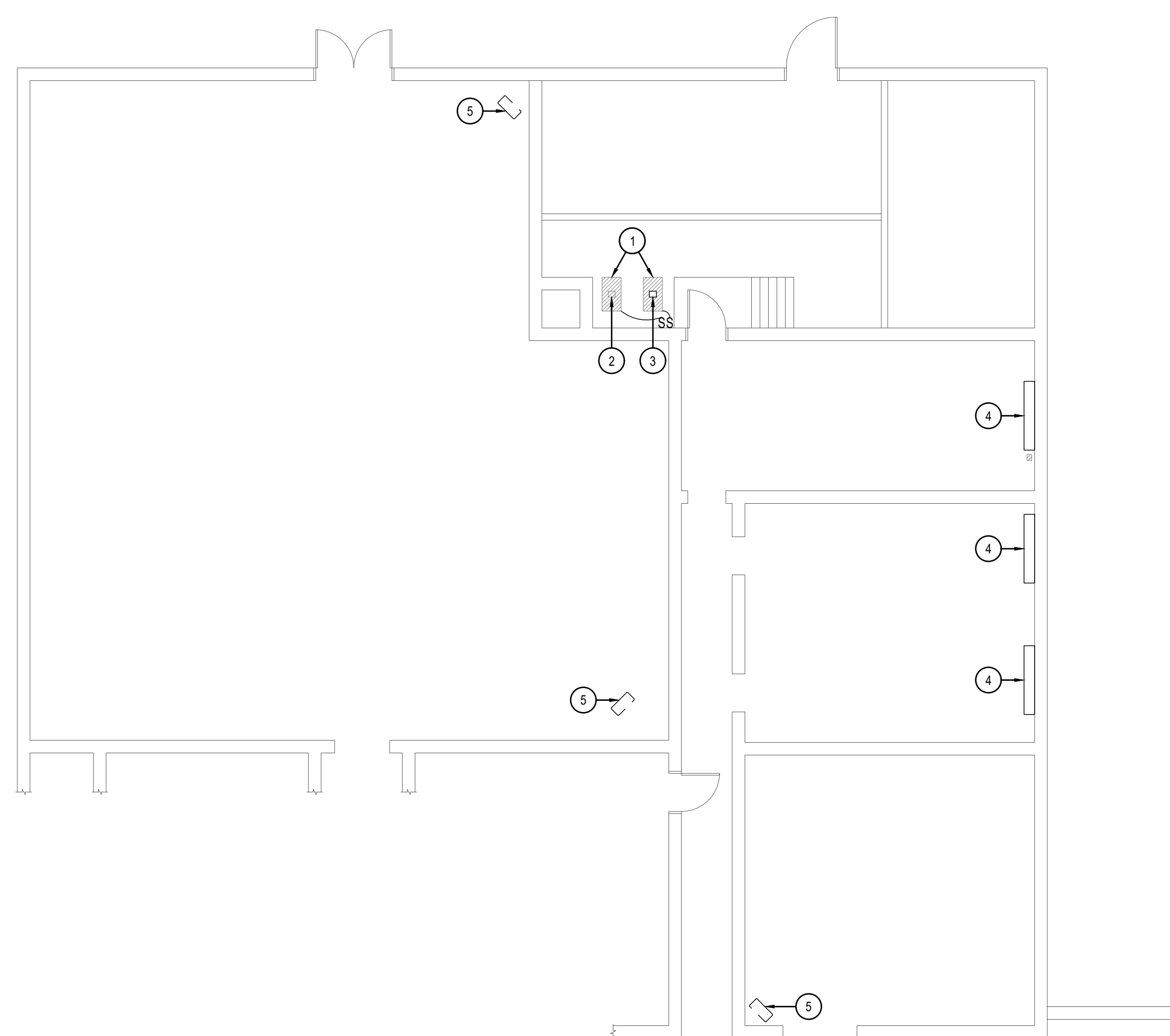
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CHECKED	MB
DATE	23-08-21
SCALE	SEE PLANS
SHEET	

E.O.O

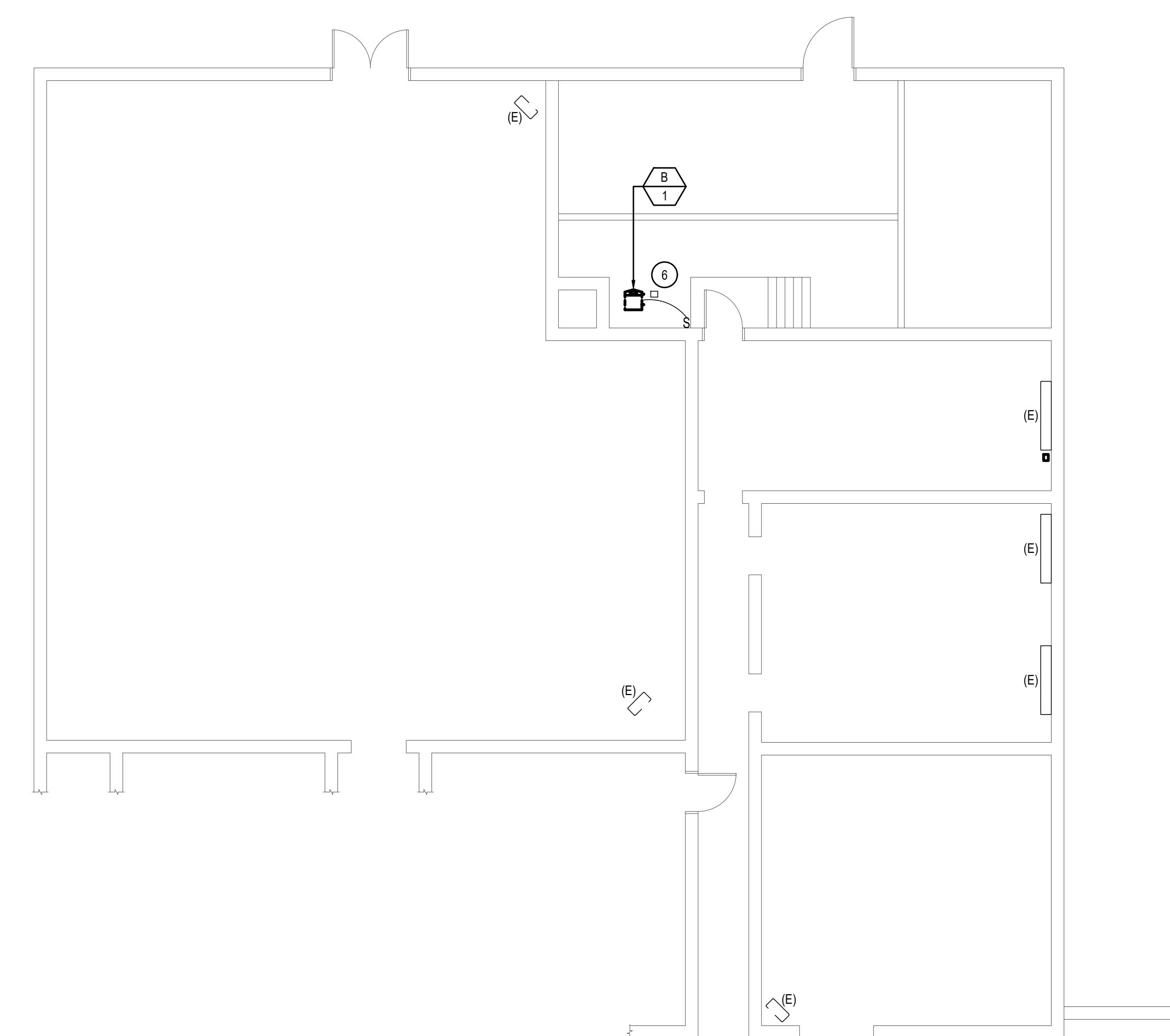
KEYED NOTES:

SYMBOL USED FOR NOTE CALLOUT.

1. DISCONNECT AND REMOVE BOILER AND BRANCH CIRCUIT BACK TO DISCONNECT SWITCH. REMOVE DISCONNECT SWITCHES.
2. DISCONNECT AND REMOVE EXISTING BOILER PUMP AND BRANCH CIRCUIT. CAP CONDUCTORS AND INSTALL NEW BLANK COVER OVER POWER LOCATION JUNCTION BOX.
3. EXISTING BOILER PUMP TO REMAIN AND BE REUSED.
4. EXISTING HOT WATER CONVECTOR TO REMAIN.
5. EXISTING HOT WATER UNIT HEATER TO REMAIN.
6. INSTALL NEW BRANCH CIRCUIT CONDUCTORS TO NEW BOILER. INSTALL NEW DISCONNECT SWITCH AND INSTALL NEW SINGLE GANG COVER PLATE. REPLACE JUNCTION BOX OR INSTALL KNOCKOUT PLUGS.



1 MAIN FLOOR ELECTRICAL DEMOLITION FLOOR PLAN
SCALE: 1/8" = 1' - 0"
NORTH



2 MAIN FLOOR ELECTRICAL NEW WORK FLOOR PLAN
SCALE: 1/8" = 1' - 0"
NORTH

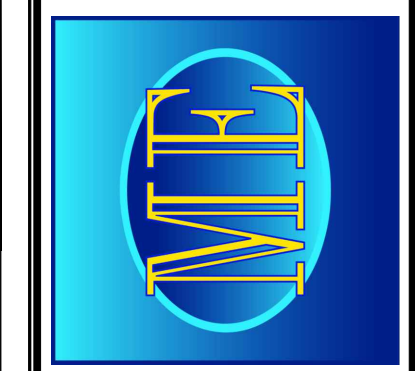
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