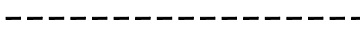
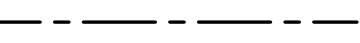
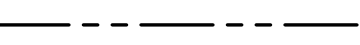





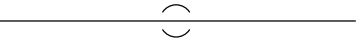



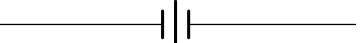
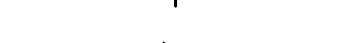






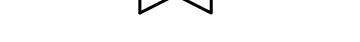








0"
1"
2"
3"

LEGEND		ABBREVIATIONS			
	DENOTES DEMOLITION	ABV	ABOVE	MIN.	MINIMUM
	COLD WATER	AD	ACCESS DOOR	MTD	MOUNTED
	HOT WATER	AFF	ABOVE FINISHED FLOOR	NC	NOISE CRITERIA
	SEE ABBREVIATIONS FOR MEDIA	AHAP	AS HIGH AS POSSIBLE	NO.	NUMBER
	PIPE UP	AMPS	AMPERES	NTS	NOT TO SCALE
	PIPE DOWN	APD	AIR PRESSURE DROP	PD	PRESSURE DROP
	TEE UP	ARCH	ARCHITECTURAL	PG	PROPYLENE GLYCOL
	TEE DOWN	BLDG	BUILDING	PH	PHASE
	CAP	BOD	BOTTOM OF DUCT	PSI	POUND PER SQUARE INCH
	BALL/BUTTERFLY VALVE	BTUH	BRITISH THERMAL UNIT/HOUR	SP	STATIC PRESSURE
	UNION	CFM	CUBIC FEET PER MINUTE	TYP	TYPICAL
	DIRECTION OF FLOW	CIRC	CIRCULATING	UPC	UNIFORMED PLUMBING CODE
	BALL/BUTTERFLY VALVE	CLG	CEILING	W/	WITH
	2-WAY CONTROL VALVE	CONT	CONTINUED	W.C.	WATER COLUMN
	3-WAY CONTROL VALVE	CONN	CONNECTION		
	CHECK VALVE	CP-X	CIRCULATION PUMP DESIGNATOR		
	BALANCE VALVE	CU	COPPER		
	PRESSURE REDUCING VALVE	CW	COLD WATER		
	FLEXIBLE PIPING CONNECTOR	DB	DECIBLES		
	PRESSURE/TEMPERATURE RELIEF VALVE	DEG	DEGREE		
	ROUND DUCT UP & DOWN	DIA	DIAMETER		
	POINT OF CONNECTION	DIM	DIMENSION		
	SHEET NOTE DESIGNATOR	DN	DOWN		
	SOLAR OPERATED THERMOSTAT	DWG	DRAWING		
	HOSE BIBB	(E)	EXISTING		
	PUMP	E/A	EXHAUST AIR		
	STRAINER W/ BLOWDOWN	EAT	ENTERING AIR TEMPERATURE		
		EFF	EFFICIENCY		
		ENT	ENTERING		
		ESP	EXTERNAL STATIC PRESSURE		
		EXH	EXHAUST		
		FD	FLOOR DRAIN		
		F	FAHRENHEIT		
		FIN	FINISHED		
		FLR	FLOOR		
		FPM	FEET PER MINUTE		
		FT	FEET		
		G	NATURAL GAS		
		GA	GAUGE		
		GAL	GALLONS		
		GPM	GALLONS PER MINUTE		
		GPH	GALLON PER HOUR		
		HGS	HEATING GLYCOL SUPPLY		
		HGR	HEATING GLYCOL RETURN		
		HW	HOT WATER		
		HWC	HOT WATER CIRCULATING		
		HWG-X	HOT WATER GENERATOR DESIGNATOR		
		HP	HORSE POWER		
		IN	INCHES		
		LAT	LEAVING AIR TEMPERATURE		
		LF	LINEAL FEET		
		MFGR	MANUFACTURER		

HOT WATER GENERATOR SCHEDULE

			DOMESTIC HOT WATER					HEATING WATER							
				RECOVERY	CAPACITY	EW	LWT		FLOW	WPD	EW	LWT			
SYMBOL	MANUFACTURER	MODEL	MEDIUM	GPH	(GAL)	DEG F	DEG F	MEDIUM	GPM	FT HD	DEG F	DEG F	LABEL	ELECTRICAL	REMARKS
HWG-1,2,3,4	AMTROL PREMIER	WHS-120ZCDW	WATER	275	119	40	140	WATER	11.5	20	180	160	IAPMO	120V/1PH	INTEGRAL AQUASTAT.

PUMP SCHEDULE

				PUMPED		HEAD	MOTOR DATA		REMARKS
SYMBOL	MANUFACTURER	MODEL	FUNCTION	MEDIUM	GPM	FEET	WATTS	POWER	
CP-21	GRUNDFOS	MAGNA 40-180F	HEATING HWG'S	50% P.G	46	35	591	120/1	
CP-22	GRUNDFOS	UPS 26-150SF	DOMESTIC RECIRC	50% P.G	5	22	231	120/1	FOR DOMESTIC USE.

EXPANSION TANK SCHEDULE

						TANK VOLUME				
SYMBOL	MANUFACTURER	MODEL	FUNCTION	MEDIUM	MATERIAL	TOTAL (GAL)	ACCEPTANCE (GAL)	DIMENSIONS	LABEL	REMARKS
ET-1	AMTROL	ST-30V	DOMESTIC WATER EXPANSION	WATER	BUTYL/STEEL	14	0.81	16" DIA X 24" H	IAPMO	PRECHARGE TO INCOMING WATER PRESSURE. PROVIDE SEISMIC RESTRAINT.



MECHANICAL AND ELECTRICAL
ENGINEERING BY:



AMCC WATER HEATER REPLACEMENT

NOME, ALASKA - 99762

REVISIONS:

DESIGNED BY: SR
CHECKED BY: JAB
DATE: 10-1-2015
JOB NUMBER: L5219.00
DWG FILE: L5219_MSERIES

DRAWING TITLE:
MECHANIAL LEGEND,
ABBREVIATIONS,
SCHEDULE

SHEET:
M0.1

GENERAL NOTES

PLANS – THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR NECESSARY FOR A COMPLETE AND OPERABLE SYSTEM. THE DRAWINGS ARE PARTLY DIAGRAMMATIC, NOT NECESSARILY SHOWING ALL CONTRACTOR TO COORDINATE EQUIPMENT LOCATION WITH ELECTRICAL PLANS TO AVOID CONFLICT.

COMPLETE PROJECT – THE INTENT OF THIS PROJECT IS TO LET ONE CONTRACT WHICH INCLUDES ALL WORK REQUIRED FOR A COMPLETE JOB. THIS INCLUDES ALL ELECTRICAL, CARPENTRY, PLUMBING, SHEET METAL, PAINTING, CLEAN UP, ETC. AS REQUIRED.

CODE – ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE INTERNATIONAL BUILDING CODE (IBC), INTERNATIONAL MECHANICAL CODE (IMC), UNIFORM PLUMBING CODE (UPC) AND NATIONAL ELECTRICAL CODE (NEC) CODE (IBC), INTERNATIONAL MECHANICAL CODE (IMC), UNIFORM PLUMBING CODE (UPC) AND NATIONAL ELECTRICAL CODE (NEC) AS AMENDED BY THE STATE OF ALASKA AND LOCAL JURISDICTION.

WARRANTY – ALL WORK PERFORMED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM ACCEPTANCE. ANY FAULTY MATERIALS OR WORKMANSHIP SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER DURING THE GUARANTEE PERIOD.

ELECTRICAL WORK – ALL ELECTRICAL WORK IS TO BE PERFORMED BY A LICENSED ELECTRICIAN.

EQUIPMENT SUBSTITUTIONS – ALL EQUIPMENT LISTED IS REPRESENTATIVE OF THE STANDARD SIZE, WEIGHT AND QUALITY OF EQUAL SUBSTITUTIONS WILL BE CONSIDERED IF THE SUBSTITUTES ARE SHOWN TO BE EQUAL OR BETTER QUALITY, INCLUDING EFFICIENCY OF PERFORMANCE.

MATERIALS – ALL MATERIALS SHALL BE NEW AND UNUSED, INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS AND IN THE BEST PRACTICE OF THE CRAFT. OBTAIN OWNER'S APPROVAL OF ALL PRODUCTS PRIOR TO ORDERING OR INSTALLING ANY PART OF ANY SYSTEM.

SUBMITTALS – SUBMITTALS SHALL BE IN ELECTRONIC FORM. THE DATA SHALL BE ARRANGED AND INDEXED UNDER BASIC CATEGORIES. ARRANGE EQUIPMENT IN THE SAME ORDER AS THE SCHEDULES ON SHEET M1 IN ADDITION PROVIDE SUBMITTALS FOR VALVES, PIPING, UNIONS, FLANGES, AND INSULATION.

OPERATION AND MAINTENANCE MANUAL – PROVIDE THE OWNER WITH AN OPERATING AND MAINTENANCE MANUAL, TO INCLUDE MANUFACTURER'S SPECIFICATIONS, OPERATING AND MAINTENANCE INSTRUCTIONS, WARRANTY INFORMATION ON EACH PIECE OF EQUIPMENT, AND SCHEMATIC DIAGRAMS OF CONTROL SYSTEMS AS–BUILT, AS WELL AS A SOURCE OF SUPPLY FOR SPARE PARTS AND SERVICE.

ACCESS – PROVIDE WORKABLE ACCESS TO ALL SERVICEABLE AND/OR OPERABLE EQUIPMENT.

EQUIPMENT INSTALLATION – INSTALL ALL EQUIPMENT WHERE NOTED ON THE DRAWINGS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. PROVIDE MISCELLANEOUS APPURTENANCES, ACCESSORIES, SUPPORTS AND CONTROL CONNECTIONS REQUIRED FOR COMPLETE AND OPERATING SYSTEMS. MAINTAIN MANUFACTURER'S RECOMMENDED SERVICE CLEARANCES.

PERMITS & INSPECTIONS – OBTAIN AND PAY FOR ALL REQUIRED PERMITS, INSPECTIONS, TESTS, AND APPROVALS AS REQUIRED BY AUTHORITIES HAVING JURISDICTION.

PIPING

DOMESTIC WATER & HYDRONIC PIPING – COPPER TUBING: ASTM B88, TYPE L, HARD DRAWN. FITTINGS: ASME B16.18 CAST BRONZE OR ASME B16.22 WROUGHT COPPER. JOINTS: ASTM B32, LEAD FREE SOLDER, WATER SOLUBLE FLUX.

HYDRONICS

VARIABLE SPEED IN–LINE CIRCULATORS – MAINTENANCE FREE, SELF–LUBRICATED, PUMP MOUNTED SPEED CONTROLLED INDUSTRIAL/COMMERCIAL SINGLE STAGE, DIRECT DRIVE CIRCULATOR.
SENSORS: DIFFERENTIAL PRESSURE MONITORING.
CASING: CAST IRON.
IMPELLER: TYPE 304 STAINLESS STEEL.
BEARINGS: UPPER AND LOWER RADIAL BEARINGS TO BE ALUMINUM OXIDE CERAMIC, TUNGSTEN CARBIDE SHAFT BEARING SURFACES.
SHAFT: STAINLESS STEEL WITH TYPE 430F.
WHERE REQUIRED PROVIDE PUMP SEALS COMPATIBLE WITH PROPYLENE GLYCOL (EPDM).
PUMP MANUFACTURED BY GRUNDFOS, MAGNA SERIES.

AIR VENTS – MANUAL TYPE: DISK TYPE VENT WITH BUILT–IN CHECK VALVE FOR MANUAL OR AUTOMATIC OPERATION, DISCS REPLACEABLE WITHOUT DRAINING SYSTEM, 1/8 INCH SHANK, RATED AT 50 PSI; HOFFMAN NO. 500 OR APPROVED EQUAL. FLOAT TYPE: BRASS OR SEMI–STEEL BODY, COPPER FLOAT, STAINLESS STEEL VALVE AND VALVE SEAT; 1/8 INCH NPT CONNECTION TO ATMOSPHERE WITH DRAIN PIPING SUITABLE FOR SYSTEM OPERATING TEMPERATURE AND PRESSURE; WITH ISOLATING VALVE. HOFFMAN NO. 79 OR APPROVED EQUAL. HIGH CAPACITY AUTOMATIC AIR VENT: CAST IRON BODY, STAINLESS STEEL AND BRASS TRIM, EPDM DIAPHRAGM, RATED FOR 250 DEG F, 2 PSIG THROUGH 150 PSIG, 3/4 INCH SYSTEM CONNECTION, 3/8 INCH NPT CONNECTION TO ATMOSPHERE WITH DRAIN PIPING. PROVIDE WITH ISOLATION VALVE UPSTREAM OF VENT, ARMSTRONG AAE–750 OR APPROVED EQUAL.

BALANCE VALVES – ANGLE OR STRAIGHT PATTERN, INSIDE SCREW GLOBE VALVE FOR 125 PSIG WORKING PRESSURE, WITH BRONZE BODY AND INTEGRAL UNION FOR SCREWED CONNECTIONS, RENEWABLE COMPOSITION DISC, PLASTIC WHEEL HANDLE FOR SHUT–OFF SERVICE, AND LOCKSHIELD KEY CAP FOR BALANCING SERVICE. INSTALL PER MANUFACTURER'S INSTRUCTIONS. B&G CIRCUIT SETTER OR APPROVED EQUAL.

DIAPHRAGM–TYPE COMPRESSION TANKS – WELDED STEEL CONSTRUCTION, RATED FOR WORKING PRESSURE OF 125 PSIG, WITH FLEXIBLE EPDM DIAPHRAGM SEALED INTO TANK. NSF APPROVED LINER, FOR DOMESTIC WATER EXPANSION TANK, AIR–CHARGING FITTING.

GLYCOL SOLUTION – INHIBITED PROPYLENE GLYCOL AND WATER SOLUTION MIXED 50–50 SUITABLE FOR OPERATING TEMPERATURES OF –29 DEG F. PREMIXED BY MANUFACTURER AND SHIPPED TO SITE IN SEALED CONTAINERS. DOWFROST AS MANUFACTURED BY DOW CHEMICALS.

PIPING SUPPORTS AND HANGERS

HANGERS OR WALL SUPPORTS FOR 1/2–1 INCH COPPER PIPE: COPPER HORN TYPE "AMPTROL VAN HANGERS", SIZED FOR PIPE SUPPORTED.

HANGERS FOR PIPE SIZES 1/2" TO 1–1/2 INCHES: MALLEABLE IRON, ADJUSTABLE SWIVEL, SPLIT RING FOR STEEL PIPE, COPPER SWIVEL FOR COPPER PIPE.

FLOOR SUPPORT FOR PIPE SIZES TO 4 INCHES AND ALL COLD PIPE SIZES: CAST IRON ADJUSTABLE PIPE SADDLE, LOCKNUT NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.

SHIELD FOR INSULATED PIPING 1–1/2 INCHES AND SMALLER: 18 GAUGE GALVANIZED STEEL SHIELD, OVER INSULATION IN 180° SEGMENTS, MINIMUM 12 INCHES LONG AT PIPE SUPPORT.

HANGER RODS: THREADED BOTH ENDS, OR CONTINUOUS THREADED.

SEISMIC RESTRAINT

SEISMIC RESTRAINT – ALL PIPING, AND EQUIPMENT INSTALLED UNDER THIS PROJECT SHALL BE SEISMICALLY RATED AND RESTRAINED FOR A SEISMIC EVENT IN ACCORDANCE WITH THE 2009 EDITION OF THE INTERNATIONAL BUILDING CODE AND ASCE 7. SEISMIC CATEGORY D, COMPONENT IMPORTANCE FACTOR 1.0.

VALVES AND UNIONS ETC.

BALANCE VALVES – ANGLE OR STRAIGHT PATTERN, INSIDE SCREW GLOBE VALVE FOR 125 PSIG WORKING PRESSURE, WITH BRONZE BODY AND INTEGRAL UNION FOR SCREWED CONNECTIONS, RENEWABLE COMPOSITION DISC, PLASTIC WHEEL HANDLE FOR SHUT–OFF SERVICE, AND LOCKSHIELD KEY CAP FOR BALANCING SERVICE. INSTALL PER MANUFACTURER'S INSTRUCTIONS. B&G CIRCUIT SETTER OR APPROVED EQUAL.

BALL VALVES – UP TO 2 INCHES: CLASS 150, BRONZE TWO PIECE BODY, FULL PORT, FORGED BRASS, CHROME PLATED BALL, TEFLON SEATS AND STUFFING BOX RING, BLOW–OUT PROOF STEM, LEVER HANDLE, SOLDER OR THREADED ENDS.

SPRING LOADED CHECK VALVES – IRON BODY, BRONZE TRIM, STAINLESS STEEL SPRING, RENEWABLE COMPOSITION DISC, SCREWED, WAFER OR FLANGED ENDS.

STRAINERS – SIZE 2 INCH AND UNDER: SCREWED BRASS OR IRON BODY FOR 175 PSIG WORKING PRESSURE, Y PATTERN WITH 1/32 INCH STAINLESS STEEL PERFORATED SCREEN. SIZE 2–1/2" TO 4 INCH: FLANGED IRON BODY FOR 175 PSIG WORKING PRESSURE, Y PATTERN WITH 3/64 INCH STAINLESS STEEL PERFORATED SCREEN.

RELIEF VALVES – BRONZE BODY, TEFLON SEAT, STAINLESS STEEL STEM AND SPRINGS, AUTOMATIC, DIRECT PRESSURE ACTUATED, CAPACITIES ASME CERTIFIED AND LABELED. RELIEF VALVES TO BE RATED ATLEAST 150 PSI.

DIELECTRIC CONNECTIONS: UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER; CLEAR FLOW PRODUCTS ALLOWED.

FLANGES, UNIONS, AND COUPLINGS – 150 PSIG MALLEABLE IRON UNIONS FOR THREADED FERROUS PIPING; BRONZE UNIONS FOR COPPER PIPE, SOLDERED JOINTS.

INSULATION

PIPING: TYPE A: GLASS FIBER, RIGID, MOLDED, NON–COMBUSTIBLE INSULATION; ANSI/ASTM C547; 'k' VALUE OF 0.24 AT 750 DEG F, RATED TO 850 DEG F, VAPOR RETARDER JACKET OF KRAFT PAPER BONDED TO ALUMINUM FOIL; JOHNS–MANVILLE "MICRO–LOK" OR EQUAL.

PIPING	TYPE	SIZE, IN	INSULATION THICKNESS, IN
DOMESTIC WATER & HYDRONIC	A	ALL SIZES	1"

TESTING AND BALANCING

DISINFECTION OF POTABLE WATER SYSTEM – THE NEW PORTIONS OF THE DOMESTIC WATER PIPING SYSTEM SHALL BE DISINFECTED IN ACCORDANCE WITH SECTION 609.9 OF THE UPC.

TEST AND START–UP – TEST ALL PIPING SYSTEMS WITH 60 PSIG FOR ONE HOUR BEFORE FILLING. FILL ALL HEATING PIPING WITH "CH2O CLEAN–N–FLUSH SOLUTION" OR APPROVED EQUAL, AND OPERATE FOR TWO HOURS AT NORMAL OPERATING TEMPERATURE BEFORE FLUSHING AND FILLING WITH GLYCOL SOLUTION.

BALANCE – THE CONTRACTOR SHALL BALANCE THE NEW HYDRONIC SYSTEM TO THE SATISFACTION OF THE OWNER.

INSTRUMENTATION

SOLAR POWERED DIGITAL THERMOMETERS –HI–IMPACT ABS CASE; –50/ 300°F (–45/150° C) SWITCHABLE RANGE; 1/2" LCD DIGITS, WIDE AMBIENT FORMULA DISPLAY; 1% ACCURACY; 1/10" BETWEEN –19.9/199.9 °F (–28/93°C) RESOLUTION; 10 LUX (ONE FOOT–CANDLE) LUX RATING; 10 SECOND UPDATE RATE; –30/140°F (–35/60°C) AMBIENT OPERATING RANGE; GLASS PASSIVATED THERMISTOR –NTC SENSOR. MODEL DIGITAL VARI–ANGLE AS MANUFACTURED BY WEISS PRODUCTS.

PRESSURE GAUGES –4–1/2 INCH DIAMETER CAST ALUMINUM CASE, PHOSPHOR BRONZE BOURBON TUBE, ROTARY BRONZE MOVEMENT, BRASS SOCKET, WITH SILICONE FLUID DAMPENING BLACK FIGURES ON WHITE BACKGROUND, ONE PERCENT MID–SCALE ACCURACY, SCALE CALIBRATED IN PSI. MODEL 600C AS MANUFACTURED BY TRERICE.

PRESSURE GAUGE TAPS: GAUGE ISOLATION VALVE: LEVER HANDLE BALL VALVE, FORGED BRASS BODY, CHROME PLATED BRASS BALL, VITON O–RINGS FOR MAXIMUM 150 PSIG. MODEL MINI T–82–M AS MANUFACTURED BY JOMAR.
A. NEEDLE VALVE: BRASS FOR MAXIMUM 150 PSIG. MODEL 735 AS MANUFACTURED BY TRERICE.
B. PULSATION DAMPER: PRESSURE SNUBBER, BRASS WITH 1/4 INCH CONNECTIONS. SERIES 870 AS MANUFACTURED BY TRERICE.
COIL SIPHON: BRASS, ¼", MALE PIPE THREAD EACH END. 885 SERIES.

THERMOMETER SUPPORTS
A. SOCKET: BRASS SEPARABLE SOCKETS FOR THERMOMETER STEMS WITH OR WITHOUT EXTENSIONS AS REQUIRED, AND WITH CAP AND CHAIN.
B. FLANGE: 3 INCH OUTSIDE DIAMETER REVERSIBLE FLANGE, DESIGNED TO FASTEN TO SHEET METAL AIR DUCTS, WITH BRASS PERFORATED STEM.

TEST PLUGS
A. TEST PLUG: 1/4 INCH OR 1/2 INCH BRASS FITTING AND CAP FOR RECEIVING 1/8 INCH OUTSIDE DIAMETER PRESSURE OR TEMPERATURE PROBE WITH NORDEL OR VITON CORE FOR TEMPERATURES UP TO 350 DEGREES F.
B. TEST KIT: CARRYING CASE, INTERNALLY PADDED AND FITTED CONTAINING ONE 2–1/2 INCH DIAMETER PRESSURE GAUGE, TWO GAUGE ADAPTERS WITH 1/8 INCH PROBES, TWO 1–1/2 INCH DIAL THERMOMETERS.

STATIC PRESSURE GAUGES – 4 INCH DIAMETER DIAL IN CAST ALUMINUM CASE, MAGNEHELIC DIFFERENTIAL PRESSURE GAUGE, BLACK FIGURES ON WHITE BACKGROUND, FRONT RECALIBRATION ADJUSTMENT WITH TUBING, STATIC PRESSURE TIPS, ADJUSTABLE SIGNAL FLAG. SERIES 2000 AS MANUFACTURED BY DWYER.

IDENTIFICATION

IDENTIFICATION – LABEL ALL EQUIPMENT WITH HEAT RESISTANT LAMINATED PLASTIC LABELS HAVING ENGRAVED LETTERING 1/2" HIGH. IF ITEMS ARE NOT SPECIFICALLY LISTED ON THE SCHEDULES, CONSULT THE ENGINEER CONCERNING DESIGNATION TO USE. SETON ENGRAVED SETON–PLY NAMEPLATES OR EQUAL. IDENTIFY PIPING TO INDICATE CONTENTS AND FLOW DIRECTION OF EACH PIPE EXPOSED TO VIEW BY A LABELED SLEEVE OR PIPE MARKER IN LETTERS READABLE FROM FLOOR AT LEAST ONCE IN EACH ROOM AND AT INTERVALS OF NOT MORE THAN 20' APART AND ON EACH SIDE OF PARTITION PENETRATIONS. COLORING SCHEME IN ACCORDANCE WITH ANSI A13.1–1981, SETON OPTI–CODE OR EQUAL. PROVIDE LABELING FOR ALL POTABLE AND NON–POTABLE WATER PER THE REQUIREMENTS OF UPC 601.2.

SEQUENCE OF OPERATION

HEATING WATER CIRCULATION PUMP (CP–21): UPON CALL FOR HEATING FROM ANY OF THE INTEGRAL AQUASTAT'S (HWG–1, HWG–2, HWG–3 OR HWG–4) CIRCULATION PUMP CP–22 SHALL OPERATE AND SIMULTANEOUSLY OPEN THE CONTROL VALVES ASSOCIATED WITH (HWG–1, HWG–2, HWG–3 AND HWG–4)

DOMESTIC HOT WATER RE–CIRCULATION PUMP (CP–22): PUMP SHALL RUN CONTINUOUSLY.



MECHANICAL AND ELECTRICAL
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AMCC WATER HEATER REPLACEMENT

NOME, ALASKA - 99762

REVISIONS:

DESIGNED BY: SR

CHECKED BY: JAB

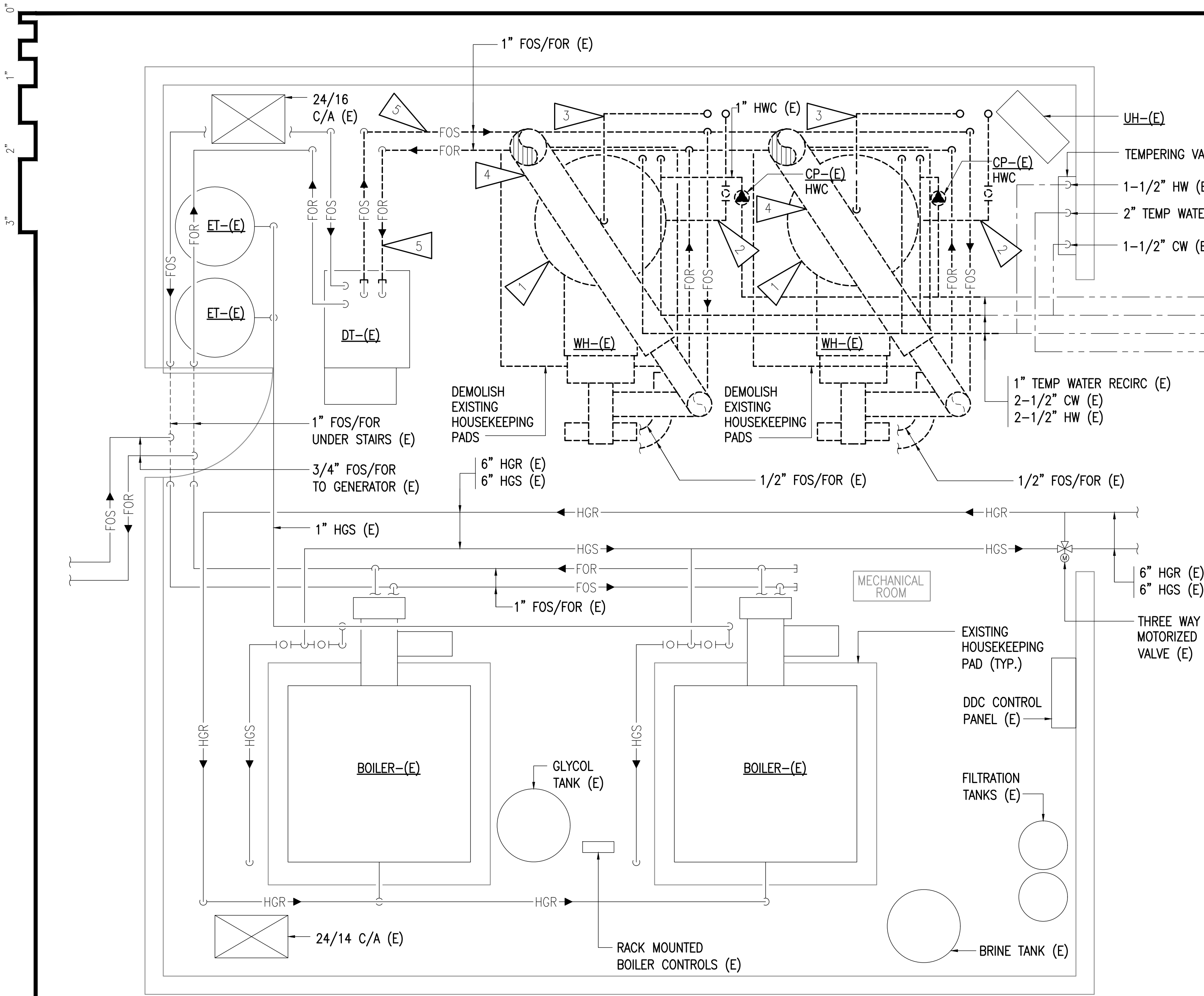
DATE: 10-1-2015

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DRAWING TITLE:
MECHANIAL
SPECIFICATIONS

SHEET:
M0.2



1

MECHANICAL ROOM DEMOLITION PLAN

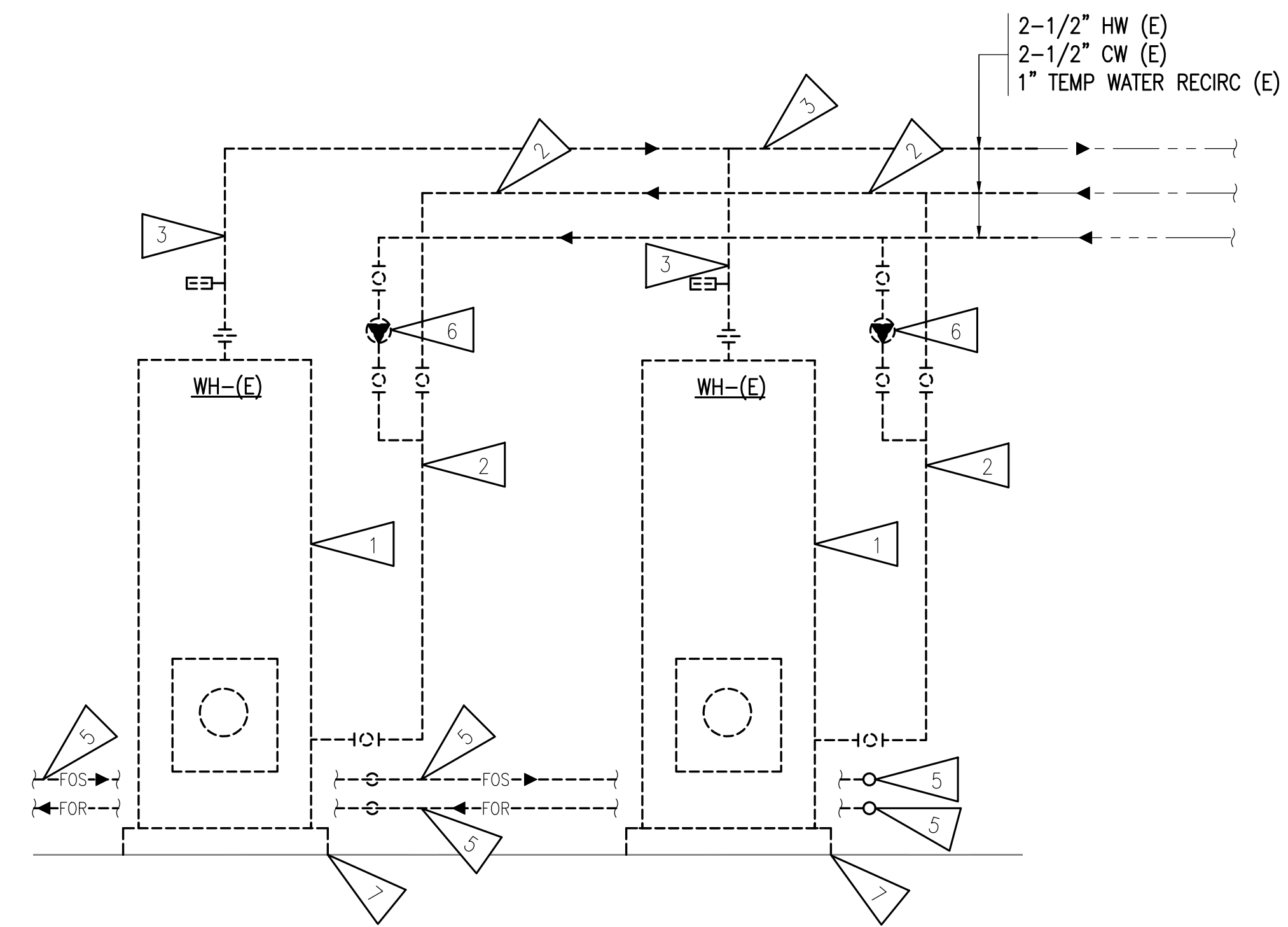
SCALE: 1/2" = 1'-0"

GENERAL NOTE:

A. THE INFORMATION SHOWN ON THIS DRAWING IS TAKEN FROM AS-BUILT DRAWINGS AND A NON-DESTRUCTIVE WALKTHROUGH OF THE FACILITY. THE CONTRACTOR SHALL FIELD VERIFY ALL ITEMS SCHEDULED FOR DEMOLITION PRIOR TO START OF WORK.

SHEET NOTES:

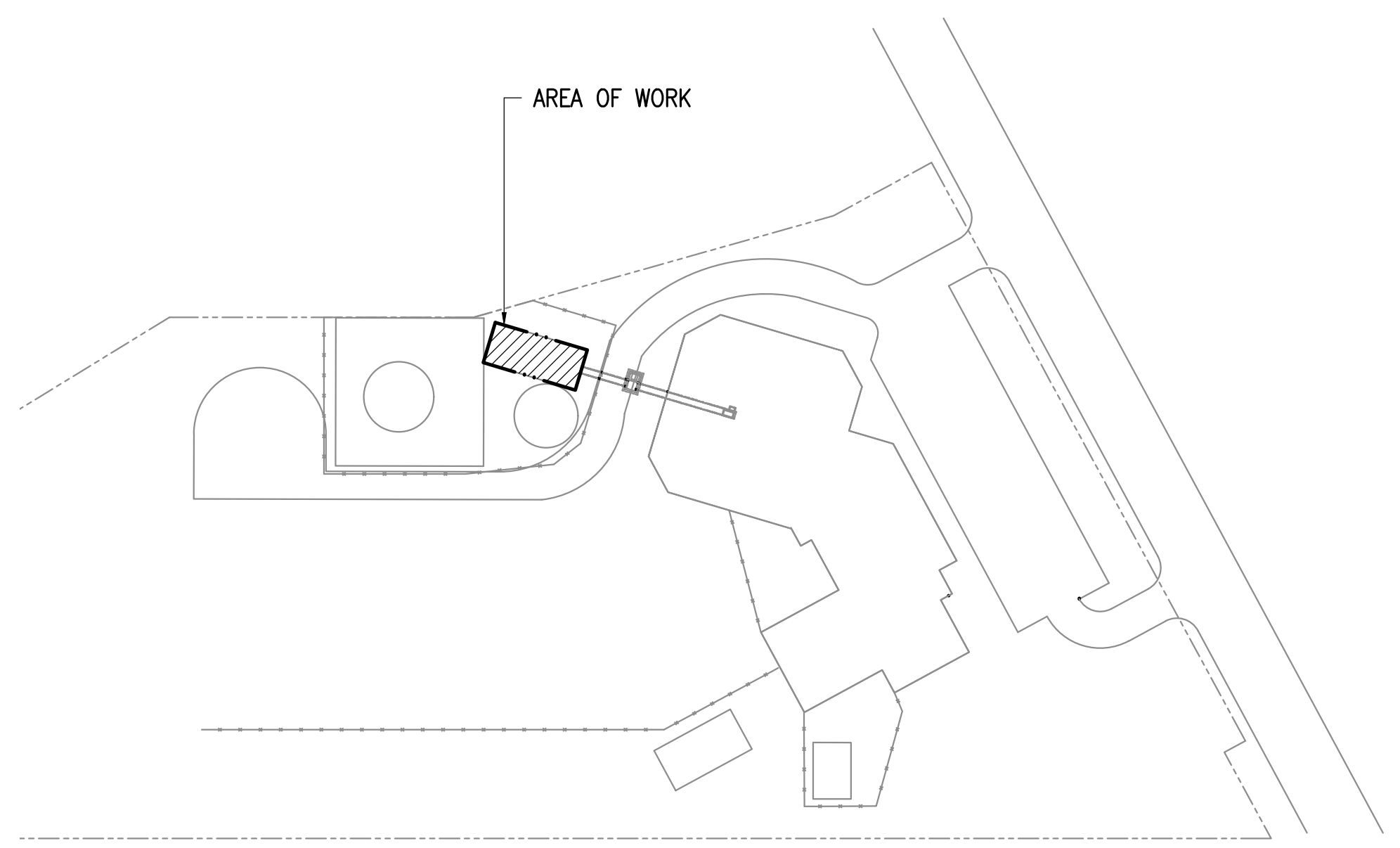
- 1
- DEMOLISH EXISTING WATER HEATER AND ASSOCIATED APPURTENANCES.
- 2
- DEMOLISH CW PIPING UP TO EXTENT NECESSARY FOR THE DEMOLITION OF THE EXISTING WATER HEATER AND THE INSTALLATION OF THE NEW WATER HEATERS.
- 3
- DEMOLISH HW PIPING UP TO EXTENT NECESSARY FOR THE DEMOLITION OF THE EXISTING WATER HEATER AND THE INSTALLATION OF THE NEW WATER HEATERS.
- 4
- DEMOLISH FLUES FROM THE WATER HEATER THROUGH ROOF. PATCH ROOF AND CEILING TO MATCH ADJACENT CONSTRUCTION MATERIALS. REPAIR AND PATCH DUCTWORK AND INSULATION.
- 5
- DEMOLISH AND CAP FUEL OIL PIPING SUPPLY AND RETURN AS INDICATED SERVING WATER HEATERS AT DAY TANK.
- 6
- DEMOLISH EXISTING HOT WATER RE-CIRCULATION PUMPS AND ASSOCIATED APPURTENANCES, DEMOLISH HOT WATER CIRCULATION PIPING TO EXTENT NECESSARY FOR INSTALLING HOT WATER NEW RE-CIRCULATION PUMP.
- 7
- DEMOLISH EXISTING HOUSEKEEPING PADS.



2

WATER HEATER DEMOLITION PIPING SCHEMATIC

NO SCALE



KEY PLAN

NO SCALE



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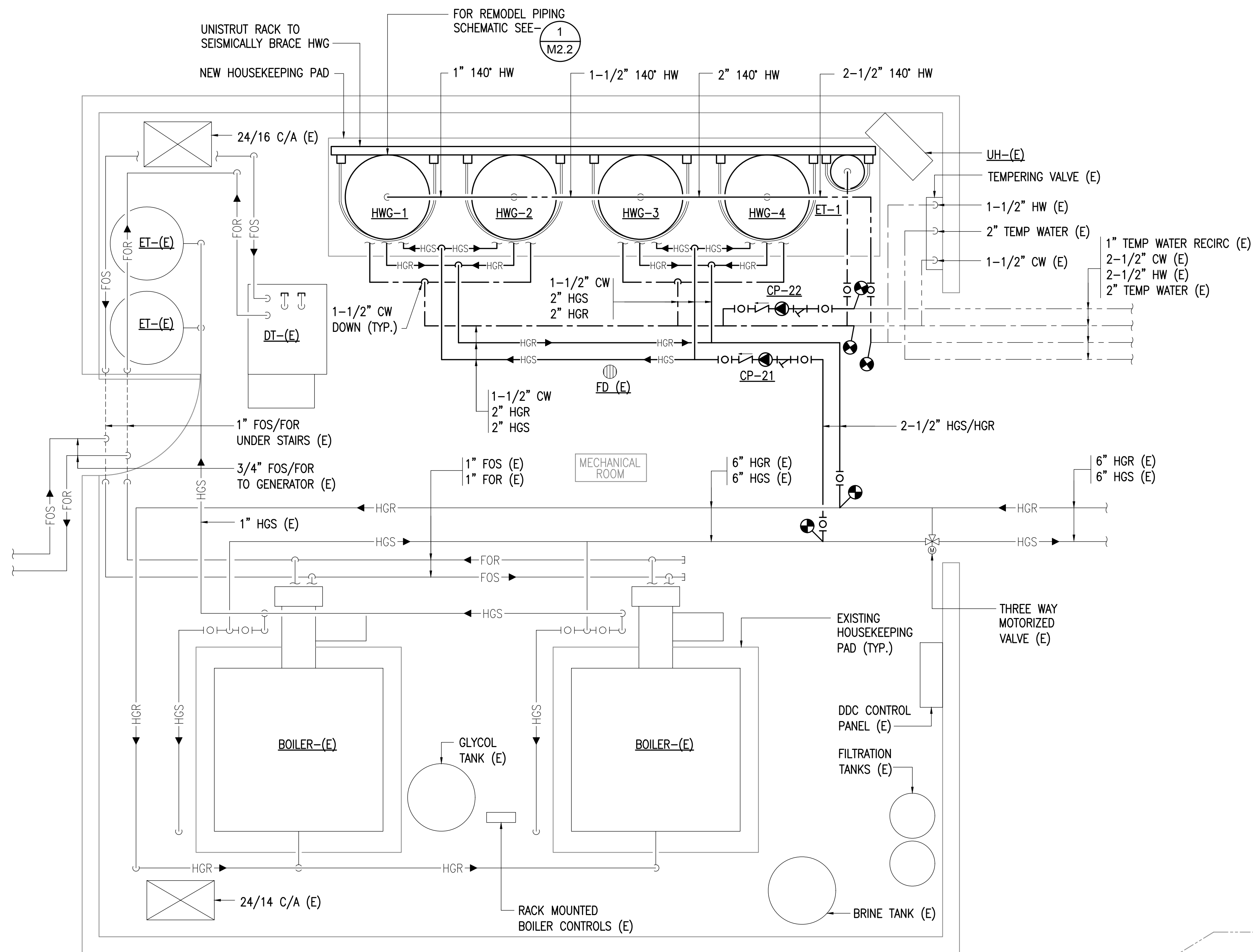
AMCC WATER HEATER REPLACEMENT
NOME, ALASKA - 99762

REVISIONS:

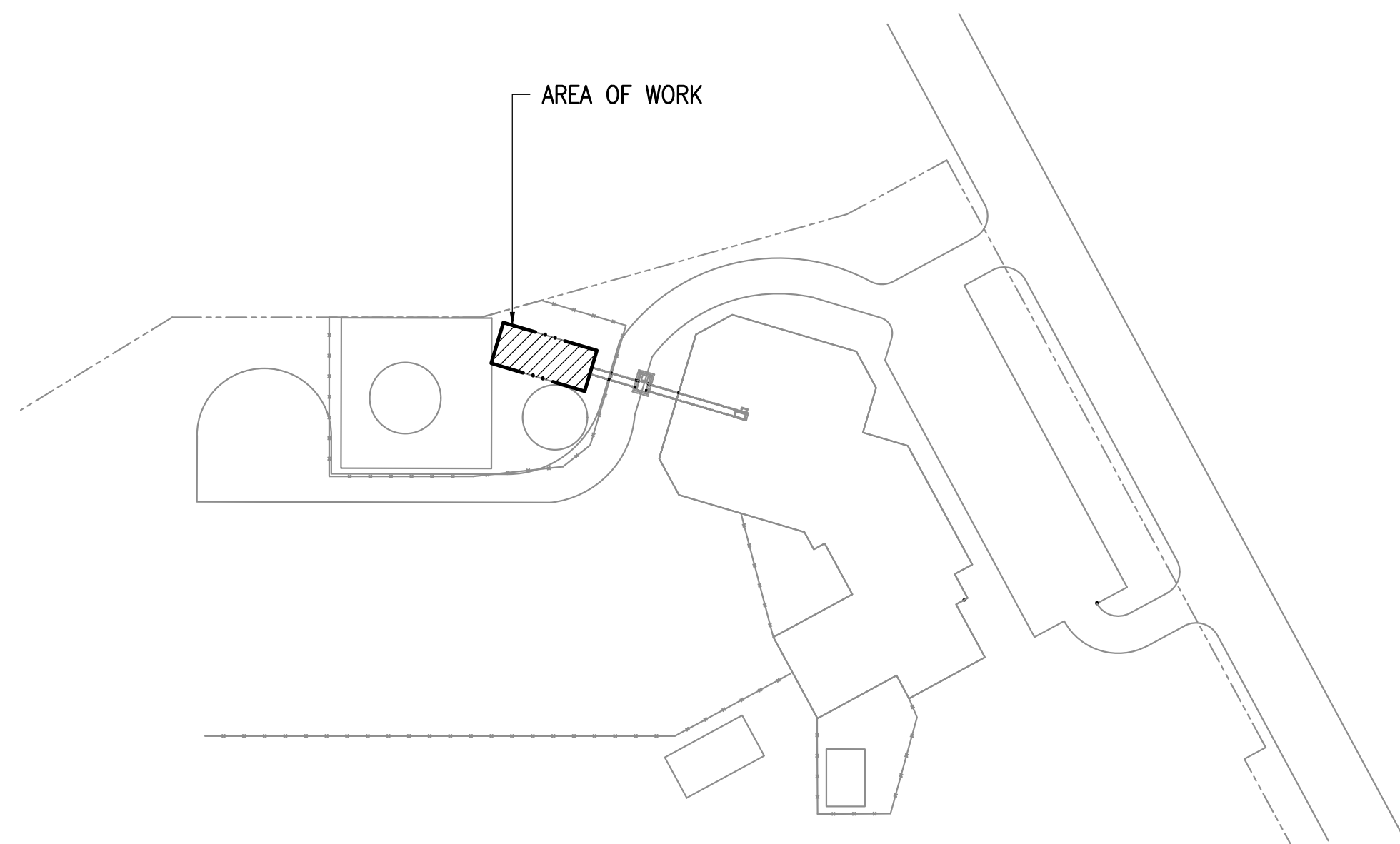
DESIGNED BY:	SR
CHECKED BY:	JAB
DATE:	10-1-2015
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DWG FILE:	L5219_MSERIES

DRAWING TITLE:
MECHANICAL DEMOLITION, PLAN AND SCHEMATIC

SHEET:
M1.1



1 MECHANICAL ROOM REMODEL PLAN
SCALE: 1/2" = 1'-0"



KEY PLAN
NO SCALE



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AMCC WATER HEATER REPLACEMENT

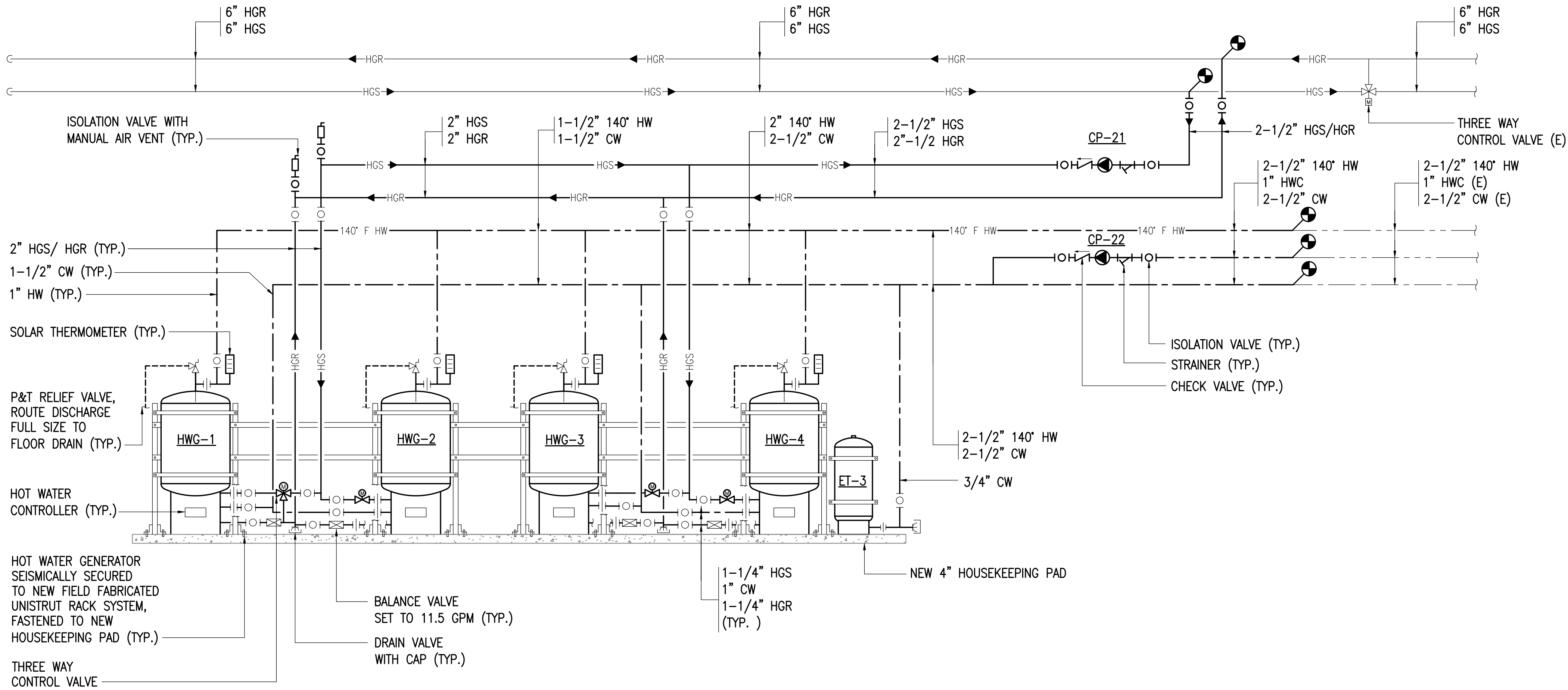
NOME, ALASKA - 99762

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DESIGNED BY: SR
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DATE: 10-1-2015
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DRAWING TITLE:
MECHANIAL REMODEL
PLAN AND SCHEMATIC

SHEET:
M2.1



1 WATER HEATER REMODEL PIPING SCHEMATIC
NO SCALE



MECHANICAL AND ELECTRICAL
ENGINEERING BY:

RSA ENGINEERING, INC.
191 E Swanson Ave, Suite 101
Wasilla, AK 99654
Phone (907) 357-1521 Fax (907) 357-1751



AMCC WATER HEATER REPLACEMENT

NOME, ALASKA - 99762






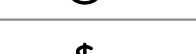

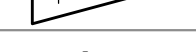
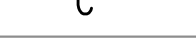
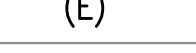

REVISIONS:

DESIGNED BY: SR
CHECKED BY: JAB
DATE: 10-1-2015
JOB NUMBER: L5219.00
DWG FILE: L5219_MSERIES

DRAWING TITLE:
MECHANIAL REMODEL
SCHEMATIC

SHEET:
M2.2

0
1"
2"
3"

LEGEND	
	CONDUIT, EXPOSED
	NUMBER AND SIZE OF WIRES (NO MARKS = 3 #12)
	HOMERUN TO PANEL (PANEL AND CIRCUIT No.)
	PANEL
	MOTOR (SIZED AS NOTED)
	FRACTIONAL HORSEPOWER MOTOR STARTER
	NOTE TAG (No. INDICATES NOTE)
	CONDUIT
	DENOTES EXISTING ITEM
	NATIONAL ELECTRICAL CODE
	TYPICAL

PANELBOARD LOAD CALCULATIONS	
EXISTING PANEL 'SL':	250A, 120/208V, 3P, 4W
MEASURED INSTANTANEOUS DEMAND READING:	UNKNOWN
EXISTING LOADS REMOVED:	
CP-18,19	0.08 kVA
WATER HEATER x2	1.66 kVA
TOTAL LOAD REMOVED:	1.73 kVA
NEW LOADS ADDED:	
HWG-1,2,3,4	0.96 kVA
CP-21,22	0.82 kVA
TOTAL LOAD ADDED:	1.78 kVA
TOTAL NEW CALCULATED DEMAND LOAD:	0.05 kVA
TOTAL NEW CALCULATED DEMAND LOAD (IN AMPS):	0.1 A
THE PANEL SIZE WILL BE ADEQUATE TO ACCEPT THE NEW LOADS ADDED.	

EXISTING PANEL 'SL'											
MFR/MODEL: SQUARE 'D' TYPE NQ				VOLTS: 120/208V,3PH,4W				ENCLOSURE: NEMA 1			
				VOLT-AMPS				250 A			
NOTE	CIRC	POLE	AMPS	SERVICE	TYPE	A		B		C	
										TYPE	SERVICE
	1	1	20	AIR COMP/DOM WATER							
	3	1	20	DAY TANK							
b	5	1	20	HWG-1,2,3,4	MOTR					960	
b	7	1	20	CP-21,22	MOTR	822					
	9	1	15	CP-11							
	11	1	15	CP-12							
	13	1	20	SPARE							
	15	1	15	FIRE BELL							
	17	1	20	UH'S							
	19	3	15	B-1							
	21	3	15	AAA							
	23	3	15	AAA							
	25	3	15	B-2							
	27	3	15	AAA							
	29	3	15	AAA							
	31	1	20	RECP							
	33	1	20	RECP							
	35	1	20	SPARE							
	37	1	20	BATT CHARGER							
	39	1	20	GEN DAMPER							
	41	1	20	BLOCK HEATER							
TOTAL V-A						822		0		960	
TOTAL AMPS						7		0		8	
A.I.C. RATING: 10,000											
PANEL NOTES:										PANEL OPTIONS:	
a ALL CIRCUITS EXISTING UNLESS OTHERWISE NOTED.											
b EXISTING CIRCUIT BREAKER WITH NEW LOAD SHOWN.											

ELECTRICAL SPECIFICATIONS

26 00 50 – COMMON WORK RESULTS FOR ELECTRICAL

- SCOPE OF WORK: FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT FOR AN EXTENSION TO THE EXISTING ELECTRICAL SYSTEM AS INDICATED ON THE DRAWINGS AND IN THESE SPECIFICATIONS.
- STANDARDS, CODES AND REGULATIONS: COMPLY WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE, INTERNATIONAL BUILDING CODE, AND INTERNATIONAL FIRE CODE INCLUDING ALL STATE AND LOCAL AMENDMENTS TO THESE CODES. COMPLY WITH THE LATEST PUBLISHED VERSION OF THE NECA STANDARD OF INSTALLATION.
- DRAWINGS: THE DRAWINGS ARE DIAGRAMMATIC, NOT NECESSARILY SHOWING ALL OFFSETS OR EXACT LOCATIONS OF FIXTURES, EQUIPMENT, ETC. UNLESS SPECIFICALLY DIMENSIONED. REVIEW THE DRAWINGS AND SPECIFICATIONS FOR EQUIPMENT FURNISHED BY OTHER CRAFTS BUT INSTALLED IN ACCORDANCE WITH THIS SECTION. BRING QUESTIONABLE OR OBSCURE ITEMS, APPARENT CONFLICTS BETWEEN PLANS AND SPECIFICATIONS, GOVERNING CODES OR UTILITIES REGULATIONS TO THE ATTENTION OF THE OWNER. CODES, ORDINANCES, REGULATIONS, MANUFACTURER'S INSTRUCTIONS OR STANDARDS TAKE PRECEDENCE WHEN THEY ARE MORE STRINGENT OR CONFLICT WITH THE DRAWINGS AND SPECIFICATIONS.
- RECORD DRAWINGS: MARK UP A CLEAN SET OF DRAWINGS AS THE WORK PROGRESSES TO SHOW THE DIMENSIONED LOCATION AND ROUTING OF ALL ELECTRICAL WORK WHICH WILL BECOME PERMANENTLY CONCEALED. SHOW ROUTING OF WORK IN PERMANENTLY CONCEALED BLIND SPACES WITHIN THE BUILDING. SHOW COMPLETE ROUTING AND SIZING OF ANY SIGNIFICANT REVISIONS TO THE SYSTEMS SHOWN.
- WORKMANSHIP: INSTALLATION OF ALL WORK SHALL BE MADE SO THAT ITS SEVERAL COMPONENT PARTS SHALL FUNCTION AS A WORKABLE SYSTEM COMPLETE WITH ALL ACCESSORIES NECESSARY FOR ITS OPERATION. ALL MATERIAL AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, INSTRUCTIONS AND/OR INSTALLATION DRAWINGS AND IN ACCORDANCE WITH NECA STANDARDS. MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL CONFORM WITH APPLICABLE INDUSTRY STANDARDS, NEMA STANDARDS AND UNDERWRITERS LABORATORIES STANDARDS WHERE APPLICABLE.
- WARRANTY: THE CONTRACTOR SHALL GUARANTEE ALL WORK EXECUTED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM BENEFICIAL OCCUPANCY. ANY FAULTY MATERIALS OR WORKMANSHIP SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER DURING THE GUARANTEE PERIOD.
- PERMITS: SECURE AND PAY FOR ALL FEES, PERMITS, ETC. REQUIRED BY LOCAL AND STATE AGENCIES.
- REFERENCE SYMBOLS: THE ELECTRICAL "LEGEND" ON THE DRAWINGS IS A STANDARDIZED VERSION, AND ALL SYMBOLS SHOWN MAY NOT BE USED. USE THE "LEGEND" AS A REFERENCE FOR THE SYMBOLS USED ON THE DRAWINGS.
- PENETRATION OF FIRE BARRIERS: ALL ELECTRICAL PENETRATIONS THROUGH FIRE RATED BARRIERS SHALL BE SEALED IN ACCORDANCE WITH NEC ARTICLE 300.21 AND THE FOLLOWING:
 - ALL HOLES OR VOIDS CREATED TO EXTEND ELECTRICAL SYSTEMS THROUGH FIRE RATED FLOORS, WALLS OR CEILING SHALL BE SEALED WITH AN ASBESTOS-FREE INTUMESCENT FIRE STOPPING MATERIAL CAPABLE OF EXPANDING 8 TO 10 TIMES WHEN EXPOSED TO TEMPERATURES 250 DEGREES F OR HIGHER.
 - MATERIALS SHALL BE SUITABLE FOR THE FIRE STOPPING OF PENETRATIONS MADE BY STEEL, GLASS, PLASTIC AND SHALL BE CAPABLE OF MAINTAINING AN EFFECTIVE BARRIER AGAINST FLAME, SMOKE AND GASES IN COMPLIANCE WITH THE REQUIREMENTS OF ASTM E814, UL 1479 AND THE UL FIRE RESISTANCE DIRECTORY REQUIREMENTS FOR THROUGH-PENETRATION FIRESTOP DEVICES (XHCOR).
 - THE RATING OF THE FIRE STOPS SHALL BE THE SAME AS THE TIME-RATED FLOOR, WALL OR CEILING ASSEMBLY.

- INSTALL FIRE STOPPING MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- UNLESS PROTECTED FROM POSSIBLE LOADING OR TRAFFIC, INSTALL FIRE STOPPING MATERIALS IN FLOORS HAVING VOID OPENINGS OF FOUR (4) INCHES OR MORE TO SUPPORT THE SAME FLOOR LOAD REQUIREMENTS AS THE SURROUNDING FLOOR."

26 05 05 – SELECTIVE DEMOLITION FOR ELECTRICAL

- DEMOLITION DRAWINGS ARE BASED ON A NON-DESTRUCTIVE FIELD OBSERVATION. PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN ALL EXISTING ELECTRICAL SYSTEMS (TELEPHONE, FIRE ALARM, LIGHTING, ELECTRICAL SERVICE, ETC.) IN SERVICE DURING CONSTRUCTION. DISABLE SYSTEMS ONLY TO MAKE SWITCHOVERS AND CONNECTIONS.
- OBTAIN PERMISSION FROM OWNER AT LEAST 24 HOURS BEFORE PARTIALLY OR COMPLETELY DISABLING SYSTEM. MINIMIZE OUTAGE DURATION AND MAKE TEMPORARY CONNECTIONS TO MAINTAIN SERVICE IN AREAS ADJACENT TO WORK AREA. WHEN WORK MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS.
- REMOVE, RELOCATE AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION. REMOVE ABANDONED WIRING TO SOURCE OF SUPPLY. REMOVE EXPOSED ABANDONED CONDUIT, INCLUDING ABANDONED CONDUIT ABOVE ACCESSIBLE CEILING FINISHES. WHERE ABANDONED CONDUIT ENTERS EXISTING SURFACES TO REMAIN, CUT CONDUIT FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES. DISCONNECT ABANDONED OUTLETS AND REMOVE DEVICES. REMOVE ABANDONED OUTLETS IF CONDUIT SERVING THEM IS ABANDONED AND REMOVED. PROVIDE BLANK COVER FOR ABANDONED OUTLETS WHICH ARE NOT REMOVED.
- REMOVE BRACKETS, STEMS, HANGERS AND OTHER ACCESSORIES. REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS WHICH REMAIN ACTIVE.

26 05 19 – WIRE AND CABLE

- SUBMITTALS: NONE REQUIRED FOR THIS SECTION.
- MATERIALS:
 - ALL CONDUCTORS SHALL BE COPPER WITH TYPE XHHW, THWN, THW OR THHN INSULATION. MINIMUM BRANCH CIRCUIT CONDUCTOR SIZE SHALL BE #12 AWG. MINIMUM CONTROL CIRCUIT CONDUCTOR SIZE SHALL BE #18 AWG. CONTROL CIRCUITS SHALL BE COPPER, STRANDED CONDUCTOR, 600V INSULATION, THHN/THWN.
- INSTALLATION:
 - COLOR CODE WIRES BY LINE OR PHASE. COLOR CODE THE 120/208V CONDUCTORS BLACK, RED, BLUE, AND WHITE.
 - DO NOT SHARE NEUTRAL CONDUCTORS. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT THAT REQUIRES A NEUTRAL.
 - USE PROPERLY SIZED INSULATED SPRING WIRE CONNECTORS WITH PLASTIC CAPS FOR ALL CONDUCTORS #8 AWG AND SMALLER.
 - INSTALLATION SCHEDULE: BUILDING WIRE IN RACEWAYS AT ALL LOCATIONS UNLESS OTHERWISE NOTED. PROVIDE XHHW-2 IN EXTERIOR LOCATIONS.

26 05 33 – RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

- SUBMITTALS: NONE REQUIRED FOR THIS SECTION.
- MATERIALS
 - ELECTRICAL METALLIC TUBING CONDUIT (EMT): ANSI C80.3. GALVANIZED TUBING. FITTINGS AND CONDUIT BODIES: ANSI/NEMA FB 1; STEEL OR MALLEABLE IRON, COMPRESSION TYPE OR SET SCREW FITTINGS WITH INSULATED THROAT BUSHINGS. DIE-CAST FITTINGS ARE NOT

- ACCEPTABLE.
 - FLEXIBLE METAL CONDUIT: FS WW-C-566; STEEL, FULL WALL THICKNESS. REDUCED WALL FLEXIBLE METAL CONDUIT IS NOT ACCEPTABLE. FITTINGS AND CONDUIT BODIES: ANSI/NEMA FB 1; STEEL OR MALLEABLE IRON WITH INSULATED THROAT BUSHINGS. DIE CAST FITTINGS ARE NOT ACCEPTABLE.
- INSTALLATION:
 - INSTALL CONDUIT FOR ALL SYSTEMS UNLESS OTHERWISE NOTED, 1/2 INCH MINIMUM SIZE, EXCEPT CONDUIT FOR SPECIAL SYSTEMS SHALL BE 3/4" MINIMUM.
 - EMT MAY BE USED FOR CONCEALED, DRY, INTERIOR LOCATIONS.
 - MOTOR AND EQUIPMENT CONNECTIONS SHALL BE SHORT EXTENSIONS OF FLEXIBLE METAL CONDUIT TO ALLOW FOR VIBRATION.

26 05 53 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

- SUBMITTALS: NONE REQUIRED FOR THIS SECTION.
- MATERIALS
 - TAPE LABELS: ADHESIVE TAPE LABELS, WITH 3/16 INCH BOLD BLACK LETTERS ON CLEAR BACKGROUND MADE USING DYMO RHINOPRO 5000 OR EQUAL LABEL PRINTER.
 - WIRE AND CABLE MARKERS: CLOTH MARKERS, SPLIT SLEEVE OR TUBING TYPE.
- INSTALLATION:
 - JUNCTION BOXES: MARK ALL CIRCUIT NUMBERS OF WIRING ON ALL JUNCTION BOXES WITH SHEET STEEL COVERS. MARK WITH INDELIBLE BLACK MARKER. ON EXPOSED JUNCTION BOXES IN PUBLIC AREAS, MARK ON INSIDE OF COVER.
 - WIRE IDENTIFICATION: PROVIDE WIRE MARKERS ON EACH CONDUCTOR IN PANELBOARD GUTTERS, PULL BOXES, OUTLET AND JUNCTION BOXES, AND AT LOAD CONNECTION. MARKERS SHALL BE LOCATED WITHIN ONE INCH OF EACH CABLE END, EXCEPT AT PANELBOARDS, WHERE MARKERS FOR BRANCH CIRCUIT CONDUCTORS SHALL BE VISIBLE WITHOUT REMOVING PANEL DEADFRONT.

26 24 16 – EXISTING PANELBOARDS

- SUBMITTALS: NONE REQUIRED FOR THIS SECTION.
- MATERIAL:
 - REVISE CIRCUIT DIRECTORY TO REFLECT ALL CIRCUITING CHANGES.

26 29 13 – MOTOR STARTERS

- SUBMITTALS: NONE REQUIRED FOR THIS SECTION.
- MATERIALS:
 - MANUFACTURERS: SQUARE D, GE, EATON, OR EQUAL
 - MANUAL AND FRACTIONAL MOTOR STARTERS: NEMA ICS 2, AC GENERAL PURPOSE CLASS A, MANUALLY OPERATED UNIT WITH NUMBER OF POLES AS REQUIRED BY THE LOAD SERVED, FULL-VOLTAGE CONTROLLER FOR FRACTIONAL HORSEPOWER INDUCTION MOTORS, WITH THERMAL OVERLOAD UNIT, RED PILOT LIGHT, AND TOGGLE OPERATOR.
- INSTALLATION
 - SELECT AND INSTALL HEATER ELEMENTS IN MOTOR STARTERS TO MATCH INSTALLED MOTOR CHARACTERISTICS.
 - FIELD ADJUST THE TRIP SETTINGS OF ALL MOTOR STARTER MAGNETIC TRIP ONLY CIRCUIT BREAKERS TO APPROXIMATELY 11 TIMES MOTOR FULL LOAD CURRENT. DETERMINE FULL LOAD CURRENT FROM MOTOR NAMEPLATE FOLLOWING INSTALLATION.
 - AFTER FINAL CONNECTIONS ARE MADE, CHECK AND CORRECT THE ROTATION OF ALL MOTORS.
 - MOTOR STARTING EQUIPMENT SHALL BE LISTED FOR USE AND PROPERLY SIZED FOR OPERATION WITH THE MOTORS SPECIFIED BY MECHANICAL.



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AMCC WATER HEATER REPLACEMENT

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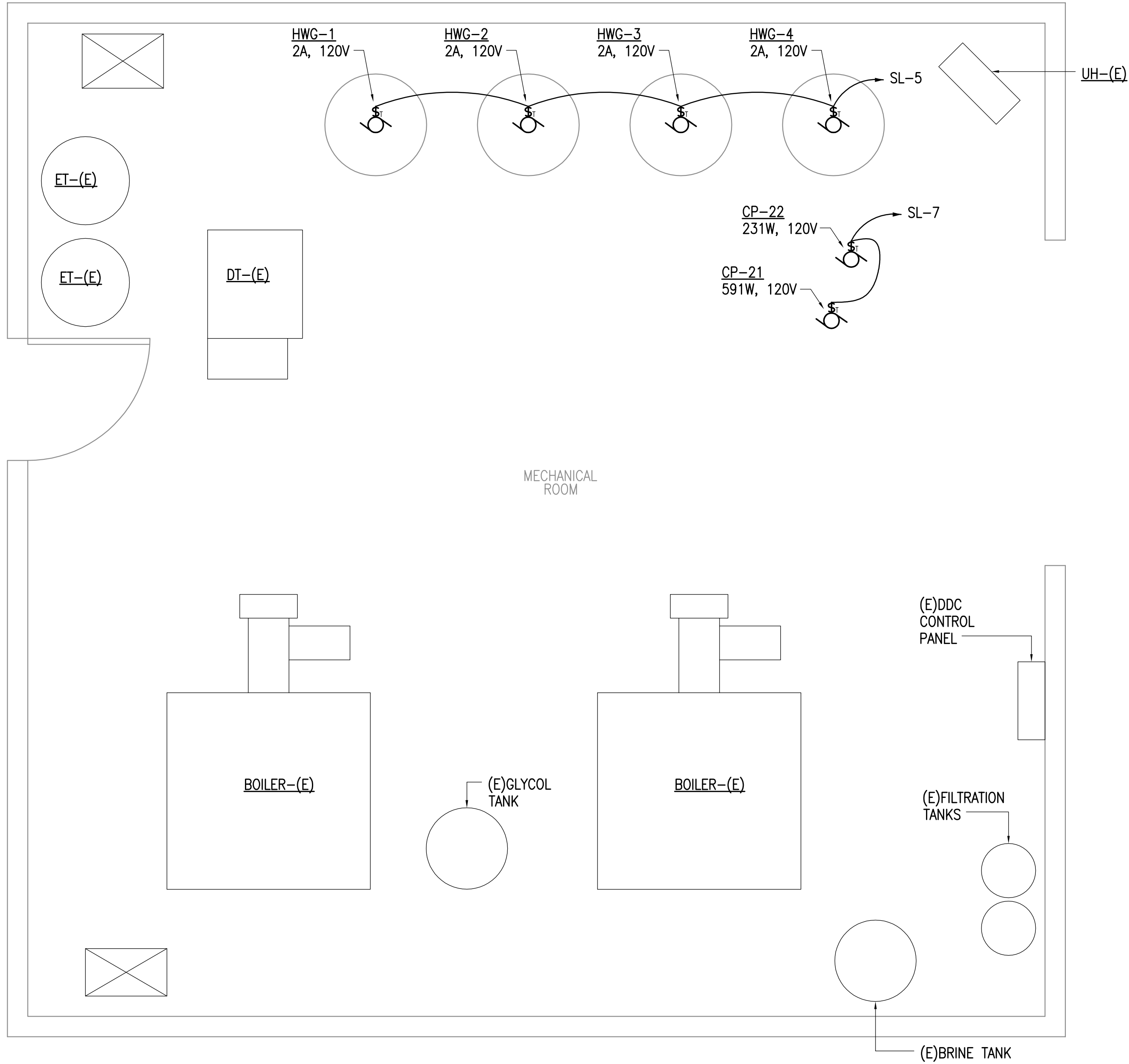
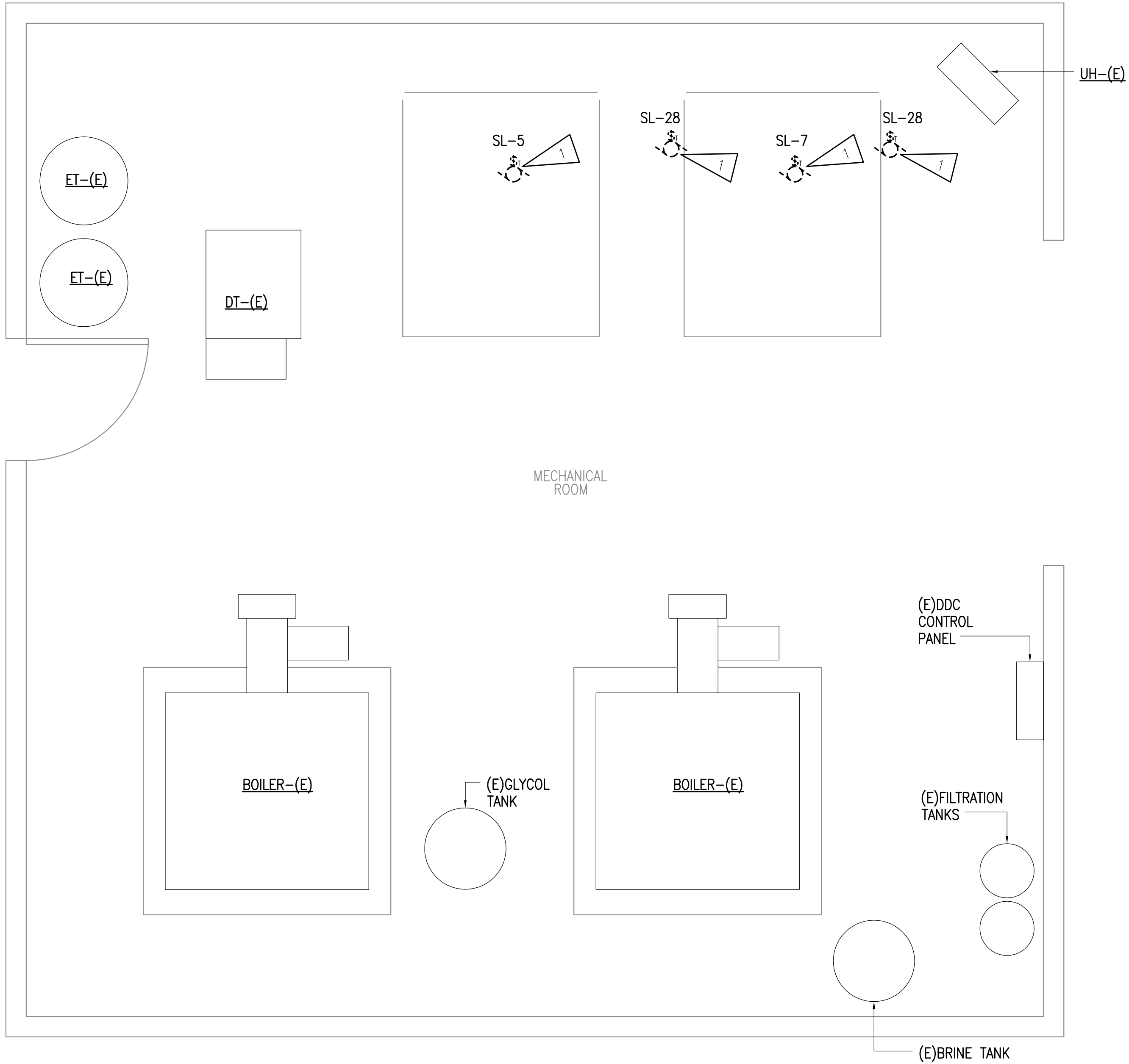
REVISIONS:

DESIGNED BY:	MSS
CHECKED BY:	BJR
DATE:	10-1-2015
JOB NUMBER:	L5219.00
DWG FILE:	L5219_ESERIES

DRAWING TITLE:
ELECTRICAL LEGEND, LOAD CALCULATION, PANEL SCHEDULES AND SPECIFICATIONS

SHEET:
E1

0"
1"
2"
3"



1 ELECTRICAL DEMOLITION PLAN
SCALE: 1/2" = 1'-0"

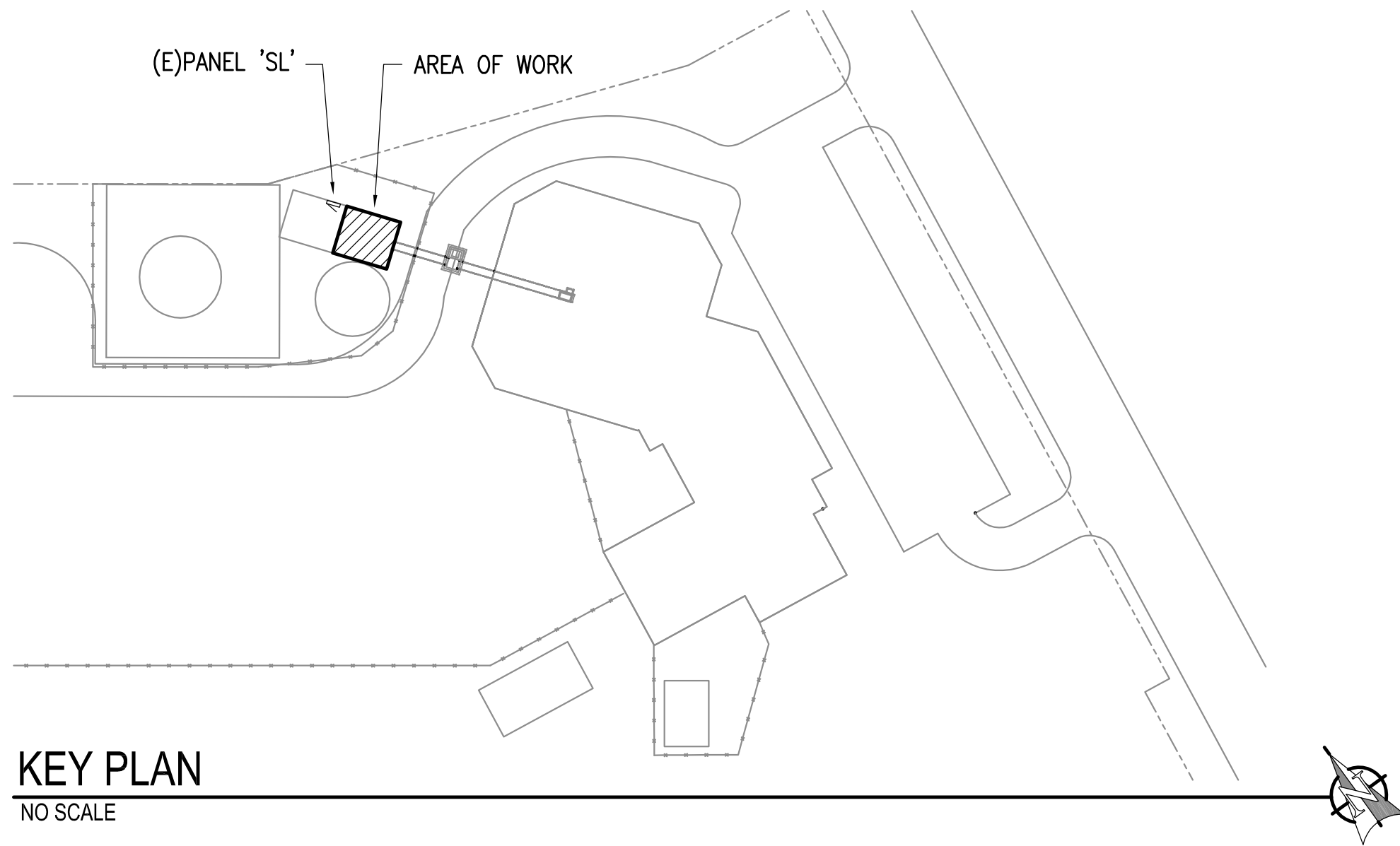
2 ELECTRICAL REMODEL PLAN
SCALE: 1/2" = 1'-0"

DEMO NOTES:

- THE INFORMATION SHOWN ON THIS DRAWING IS TAKEN FROM AS-BUILT DRAWINGS AND A NON-DESTRUCTIVE WALK THROUGH OF THE FACILITY. THERE IS NO WARRANTY OR GUARANTEE AS TO THE ACCURACY OF THE INFORMATION SHOWN HERE-IN. THE CONTRACTOR SHALL FIELD VERIFY ALL ITEMS SCHEDULED FOR DEMOLITION PRIOR TO START OF WORK.
- THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL SALVAGEABLE MATERIALS. THE CONTRACTOR SHALL DELIVER SALVAGED MATERIALS TO A WAREHOUSE AS DIRECTED BY THE OWNER. THE CONTRACTOR SHALL DISPOSE OF, OFF-SITE, ALL UNWANTED MATERIALS.
- DASHED OR DOTTED LINES INDICATE ITEMS TO BE REMOVED. SOLID LINES INDICATE EXISTING ITEMS TO REMAIN.
- SEE KEY PLAN FOR PANEL 'SL' LOCATION.

NOTES:

- DEMOLISH EXISTING MECHANICAL EQUIPMENT, CONDUIT AND CABLING BACK TO EXISTING PANEL 'SL'.



KEY PLAN
NO SCALE



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DRAWING TITLE:
ELECTRICAL DEMOLITION
& REMODEL PLANS

SHEET:
E2