

**MECHANICAL / PLUMBING SYSTEMS OVERVIEW**

MECHANICAL SYSTEMS FOR THE WASHETERIA ARE DESIGNED TO UTILIZE WASTE HEAT FROM THE POWER HOUSE TO PREHEAT DRYER MAKE UP AIR, PROVIDE BUILDING HEAT, HEAT THE WATER STORAGE TANK, PROVIDE LOOP HEATING FOR THE VILLAGE WATER DISTRIBUTION SYSTEM, PROVIDE HEAT ABOVE GROUND EXPOSED PIPING, HEAT UTILWAYS, AND HEAT WATER FOR ON SITE LAUNDRY AND FOR ON SITE BATHROOMS. BOILER B-1 IS USED ONLY FOR PROVIDING HEAT FOR RAISING DRYER AIR TEMPERATURES TO A LEVEL ALLOWING FOR DRYING CLOTHES PROPERLY. B-2, B-3 AND B-4 PROVIDE ADDITIONAL HEAT AS REQUIRED FOR THE FACILITY.

MECHANICAL SYSTEMS ARE DESIGNED FOR MAINTENANCE BY LOCAL ON SITE PERSONNEL. THE OUTSIDE AIR VENTILATION SYSTEM IS DESIGNED FOR OPERATION ONLY WHEN THE FACILITY IS OCCUPIED THE DRYER MAKE UP AIR SYSTEM IS DESIGNED FOR OPERATION ONLY WHEN DRYERS ARE BEING USED

PLUMBING WATER SYSTEMS INCLUDE WATER STORAGE, WATER PUMPING, WATER HEATING, AND WATER DISTRIBUTION PLUMBING WASTE SYSTEMS INCLUDE FIXTURE WASTE TO LIFT STATION AND GRAY WATER ROUTED TO STORAGE TANK PLUMBING VENT SYSTEMS INCLUDE FIXTURE VENT, GRAY WATER VENTING AND TANK VENTING

POTABLE WATER FOR THE WASHETERIA IS TAKEN FROM THE VILLAGE WATER SUPPLY AND IS STORED IN AN ON SITE TANK WATER IS THEN PUMPED FROM THE TANK AND DELIVERED AS HOT AND COLD TO WASHERS AND FACILITY BATHROOMS

WASTE WATER FROM THE BATHROOMS AND SINKS IS ROUTED TO AN ON-SITE LIFT STATION GRAY WATER FROM THE WASHING MACHINES IS ROUTED TO AN ON SITE STORAGE TANK

**GENERAL NOTES:**

PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR COMPLETE SAFE WORKABLE SYSTEMS AS INDICATED ON THE DRAWINGS AND AS SPECIFIED. TEST ALL SYSTEMS TO ASSURE PROPER OPERATION. USE NEW EQUIPMENT OF THE LATEST DESIGN.

CONTRACTOR SHALL COMPLY WITH THE APPLICABLE LOCAL, STATE, AND NATIONAL CODES, ORDINANCES, AND REGULATIONS AFFECTING MATERIALS AND METHODS USED AND RECOMMENDED PRACTICES AS SET FORTH BY NFPA, UMC, UPC, NFC, UBC, UL, NEC EXCEPT IN CASES WHERE STATUTES GOVERN.

DURING FINAL INSPECTION, DEMONSTRATE THAT THE ENTIRE INSTALLATION OPERATES SATISFACTORILY IN ACCORDANCE WITH DRAWINGS.

PROVIDE FLUID AND AIR BALANCE OF MECHANICAL SYSTEMS AND BALANCE REPORT INSTRUCT OWNERS PERSONNEL FOR OPERATION AND MAINTENANCE PROCEDURES.

INSTALL ALL EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS. INSTALL EQUIPMENT TO PROVIDE EASE OF ACCESS FOR MAINTENANCE.

PROVIDE ACCESS DOORS FOR CONCEALED EQUIPMENT, VALVES, DAMPERS, AND OTHER MECHANICAL DEVICES REQUIRING SERVICING OR ADJUSTMENT.

DO NOT SPRING OR BEND PIPE TO FIT CONDITIONS OR MAKE-UP JOINTS. PROVIDE VALVES FOR BRANCH LINES AS REQUIRED OR SHOWN.

MAINTAIN CURRENT "AS-BUILTS" AS THE PROJECT PROGRESSES AND TURN THEM OVER TO THE OWNER AT THE TIME OF FINAL INSPECTION.

**MECHANICAL DRAWING LIST**

- M-1.0 LEGEND DRAWING LIST GENERAL NOTES MECHANICAL/PLUMBING OVERVIEW
- M-1.1 EQUIPMENT LIST
- M-1.2 EQUIPMENT LIST
- M-1.3 MATERIAL LIST-PLUMBING
- M-1.4 MATERIAL LIST-PIPING AND HVAC
- M-1.5 CONTROLS-SEQUENCE OF OPERATION-MATERIALS
- M-1.6 CONTROL DIAGRAMS
- M-1.7 BOILER CONTROL DIAGRAMS
- M-1.8 UNIT HEATER UH-1, UH-2, UH-3 CONTROL DIAGRAM
- M-1.9 CONTROL DIAGRAMS
- M-2.0 UNDERFLOOR PLUMBING PLAN
- M-2.1 PLUMBING PLAN
- M-2.5 PLUMBING DIAGRAMS AND DETAILS
- M-3.0 MECHANICAL PLAN-PIPING
- M-3.1 MECHANICAL PLAN-HVAC
- M-3.2 MECHANICAL SECTIONS
- M-3.5 MECHANICAL DETAILS
- M-3.6 BOILER DETAILS
- M-4.0 HEATING AND WATER SUPPLY DIAGRAM
- M-4.1 HEATING AND WATER SUPPLY DIAGRAM

SYMBOL	ABBREVIATION	DESCRIPTION
--------	--------------	-------------

	GHS	FLOW ARROW
	GHR	GLYCOL HEATING SUPPLY
	CW	GLYCOL HEATING RETURN
	CWC	DOM. COLD WATER SUPPLY
	HW	DOM. COLD WATER CIRC.
	WTHS	DOM. HOT WATER
	WTHR	WATER TANK HEAT SUPPLY
	W	WATER TANK HEAT RETURN
	V	WASTE DR SEWER
	GW	VENT
	GWV	GRAY WATER
	VTR	GRAY WATER VENT
		VENT THROUGH ROOF
		BALL VALVE
		PRESS. RELIEF VALVE
		CHECK VALVE
	C.D.	CLEAN DUT
	FDS	FUEL OIL SUPPLY
	FDR	FUEL OIL RETURN
	PMP-	PUMP
	ET	EXPANSION TANK
		PRESSURE GAGE
	TS	THERMOMETER
	NC	THERMOSTAT
	ND	VALVE NORMALLY CLOSED
	SC	VALVE NORMALLY OPEN
	SW	SPEED CONTROL
	AAV	SWITCH
	MAV	AUTD AIR VENT
		MANUAL AIR VENT
		CIRCUIT SETTER
		/BALANCING VALVE
		DUCT WIDTH X HEIGHT
		GRILL NUMBER
		AIRFLOW AND DIRECTION
		TEMPERATURE ELEMENT

**LEGEND DRAWING LIST NOTES MECH/PLG OVERVIEW**

**CHEFORNAK WASHETERIA**  
**CHEFORNAK, ALASKA**



**CAPSTONE ENGINEERING LLC**  
**MECHANICAL ENGINEERS**

12110 BUSINESS BLVD STE 6 PMB 169  
EAGLE RIVER, ALASKA 99577  
TELEPHONE & TEXT MSG 907-414-1456

DATE: JUNE 17, 2016  
DRAWN: F.H. BELZ  
CHKD: AS NOTED  
SCALE: AS NOTED  
REVISION: C 389  
JOB NO. C 389  
SHEET NO. 1 OF 20  
M-1.0

95% REVIEW-NOT FOR CONSTRUCTION

BOILER SCHEDULE				
NUMBER	TYPE	INPUT	OUTPUT	NOTES
B-1	HOT WATER OIL FIRED CAST IRON	189 MBH 1.35 GPHDOE	162 MBH V8H4W	BASE BOILER, NO CIRCULATOR, ALASKA DOUBLE HIGH LIMITS, LOW WATER CUT OFF, INTERLOCK SWITCH FOR PUMP AND BOILER ROOM FAN, 5 AMPS / 115 V / 1 PH 7 INCH FLUE
B-2	HOT WATER OIL FIRED CAST IRON	364 MBH 2.60 GPHDOE	299 MBH V8H9W	BASE BOILER, NO CIRCULATOR, ALASKA DOUBLE HIGH LIMITS, LOW WATER CUT OFF, INTERLOCK SWITCH FOR PUMP AND BOILER ROOM FAN, 5 AMPS / 115 V / 1 PH 8 INCH FLUE

COIL SCHEDULE									
NUMBER	TYPE	FINNED WIDTH HEIGHT	TYPE BTUH	AIRFLOW AIR PD-MAX	EAT LAT	FLUID MIX	EFT/LFT GPM FLOW	MAX PD FLUID	SELECTION
PHC-1	CU TUBE	24" WIDE	HEATING 50,300 BTUH	800 CFM	70 F EAT	PROP GLYCOL 50/50	180 F EFT 160 F LFT	2.0 FT	3 ROW COIL, 5/8 TUBES, 4 CIRCUIT MFG: SUPER RADIATOR
PHC-2	AL FINS CASED COIL	16" HIGH		0.10 WC	125 F LAT	PROP GLYCOL 50/50	5.2 GPM		24 X 16-3R-0.625/72 LH COIL
HC-1	CU TUBE	24" WIDE	HEATING 44,750	800 CFM	125 F EAT	PROP GLYCOL 50/50	205 F EFT 190 F LFT	2.0 FT	3 ROW COIL, 5/8 TUBES, 4 CIRCUIT MFG: SUPER RADIATOR
HC-2	AL FINS CASED COIL	16" HIGH		0.15 WC	175 F LAT	PROP GLYCOL 50/50	6.3 GPM		24 X 16-3R-0.625/72 LH COIL

PUMP SCHEDULE					
NUMBER	TYPE	FLUID PUMPED	GPM	FLUID-TDH FLUID TEMP	PUMP SELECTION
PMP-1A	INLINE CIRCULATOR WET ROTOR	PROP GLYCOL 50/50	21 GPM	17 FT TDH	GRUNDFOS UPS 32-80/2
PMP-1B	INLINE CIRCULATOR WET ROTOR	PROP GLYCOL 50/50	205 F	205 F	1/2 HP / 208 V / 1 PH
PMP-2A	INLINE CIRCULATOR WET ROTOR	PROP GLYCOL 50/50	88 GPM	42 FT TDH	GRUNDFOS UPS 50-240/2
PMP-2B	INLINE CIRCULATOR WET ROTOR	PROP GLYCOL 50/50	180 F	180 F	2 HP / 208 V / 3 PH
PMP-3	INLINE CIRCULATOR WET ROTOR	ETHYL GLYCOL 50/50	91 GPM	10 FT TDH	GRUNDFOS MAGNA3-50-80F
PMP-4	INLINE CIRCULATOR WET ROTOR	ETHYL GLYCOL 50/50	190 F	18.5-325 W / 208 V / 3 PH	
PMP-5	INLINE CIRCULATOR WET ROTOR	WATER	15 GPM	17 FT TDH	GOULDS J55
PMP-6A	PRESSURE PUMP	WATER	50 GPM	50 PSIG	GOULDS 22SV8R8F60
PMP-6B	PRESSURE PUMP	WATER	50 GPM	50 F	3 HP / 208 V / 13PH
PMP-7	INLINE CIRCULATOR WET ROTOR	COLD WATER	5 GPM	20 FT TDH	GRUNDFOS UPS 26-64F
PMP-8	INLINE CIRCULATOR WET ROTOR	PROP GLYCOL 50/50	16.5 GPM	52 FT TDH	GOULDS SSVR48F60

UNIT HEATER SCHEDULE						
NUMBER	TYPE	OUTPUT	FLUID	EGT/LGT FLOW	MFG MODEL	NOTES
UH-1	HOT WATER PROPELLOR TYPE	100 MBH	50/50 PROP GLYCOL	180 F EGT 155 F LGT 9 GPM	MODINE HC 165	1/3 HP / 115 V / 1 PH TE MOTOR
UH-2	HOT WATER PROPELLOR TYPE	40 MBH	50/50 PROP GLYCOL	180 F EGT 155 F LGT 3.6 GPM	MODINE HC 86	1/8 HP / 115 V / 1 PH TE MOTOR
UH-3	HOT WATER PROPELLOR TYPE	7 MBH	50/50 PROP GLYCOL	180 F EGT 160 F LGT 1.0 GPM	MODINE HC 18	1/60 HP / 115 V / 1 PH TE MOTOR
UH-4	HOT WATER PROPELLOR TYPE	1.5 MBH	50/50 PROP GLYCOL	180 F EGT 150 F LGT 1.0 GPM	AEROTECH RLMF	PROVIDE SURFACE MOUNT FRAME KIT FOR MOUNTING

FAN SCHEDULE						
NUMBER	TYPE	CFM	EXT STATIC	MFG MODEL	NOTES	
EF-1	INLINE FAN	220 CFM	0.4 IN WC	FANTEC FG-8	118 WATTS / 115 V / 1 PH W/ MFR SPEED CONT STEEL HOUSING/ 8 INCH FLANGES	
EF-2	INLINE FAN	300 CFM	0.4 IN WC	FANTEC FG-8	118 WATTS / 115 V / 1 PH W/MFR SPEED CONT STEEL HOUSING/ 8 INCH FLANGES	
EF-3	INLINE FAN	1500 CFM	0.4 IN WC	GREENHECK BSQ-140-3	1/3 HP / 115 V / 1 PH BELT DRIVE/ SINGLE LUBE LINES/ TOGGLE SWITCH, HANGING RUBBER ISOLATORS	
BRF-1	INLINE FAN	840 CFM	0.6 IN WC	GREENHECK BSQ-120-3	1/3 HP / 115 V / 1 PH BELT DRIVE/ SINGLE LUBE LINES/ TOGGLE SWITCH, HANGING RUBBER ISOLATORS	
MUF-1	INLINE FAN	12,500 CFM	0 IN WC	LEADING EDGE 3620-1	.65 AMPS / 115 V / 1 PH WITH MFR 12003 SPEED CONTROL	

EXPANSION AND PRESSURE TANK SCHEDULE						
NUMBER	TYPE	ACCEPT-ANCE	FLUID TEMP	MFG MODEL	NOTES	
ET-1	BLADDER EXPANSION	30 GAL	PROP GLYCOL	AMTROL SX 90	180 F GLYCOL SYSTEM EXPANSION TANK	
ET-2	BLADDER EXPANSION	3.2 GAL	PROP GLYCOL	AMTROL EX 90	205 F GLYCOL SYSTEM EXPANSION TANK	
ET-3	BLADDER EXPANSION	4.4 GAL	HOT WATER	AMTROL ST-12C	120 F POTABLE WATER	
HT-1	BLADDER PRESSURE WELL TYPE	34 GAL	COLD WATER	AMTROL WX-250	60 F POTABLE WATER	
ET-4	PRESSURE WELL TYPE	30/50	PROP GLYCOL	AMTROL WX-256	70 F GLYCOL SYSTEM EXPANSION	

VARIABLE FREQUENCY DRIVE SCHEDULE/PRESSURE TRANSDUCERS

VFD-6A	ABB #ACC0550-PC-017A-2
VFD-6B	ABB #ACC0550-PC-017A-2
PT-6A	SETRA #2091100PG2M11A1
PT-6B	SETRA #2091100PG2M11A1

06-12-2016

06-16-2016

06-12-2016

06-12-2016

95% REVIEW-NOT FOR CONSTRUCTION

**EQUIPMENT LIST**  
CHEFORNAK WASHETERIA  
CHEFORNAK, ALASKA



**CAPSTONE ENGINEERING LLC**  
MECHANICAL ENGINEERS

12110 BUSINESS BLVD STE 6 PMB 169  
EAGLE RIVER, ALASKA 99577  
TELEPHONE & TEXT MSG 907-414-1456

DATE:	JUNE 17, 2016
DRAWN:	F.H. BELZ
CHECKED:	AS NOTED
SCALE:	
REVISED:	C 389
JOB NO.:	
SHEET NO.:	2 OF 20
M-11	

HEAT EXCHANGER SCHEDULE						
NUMBER	TYPE	HOT SIDE	HOT SIDE FLOW	COLD SIDE	COLD SIDE FLOW	CAPACITY
HX-1	PLATE & FRAME DOUBLE WALL	170 EGT 135F LGT 3 PSI PD MAX	10 GPM 50/50 ETHYL GLYCOL MAX	45 F EWT 75 F LGT 3 PSI PD MAX	10 GPM WATER GLYCOL	300 MBH 2"NPT PORTS
HX-2	PLATE & FRAME SINGLE WALL	185F EGT 165F LGT 3 PSI PD MAX	91 GPM 50/50 ETHYL GLYCOL MAX	155F EGT 175F LGT 3 PSI PD MAX	88 GPM 50/50 PROP GLYCOL	800 MBH 4"PORTS-150# FLANGED
HX-3	PLATE & FRAME SINGLE WALL	175F EGT 155F LGT 3 PSI PD MAX	17 GPM 50/50 ETHYL GLYCOL MAX	60 F EGT 80 F LGT 3 PSI PD MAX	17 GPM 50/50 PROP GLYCOL	150 MBH AMERIDEX SL-70-20-TK 1 1/2"NPT PORTS

HOT WATER MAKER SCHEDULE				
NUMBER	TYPE	DEMAND	HEATING	GLYCOL
HWM-1	TANK TYPE DW COIL SS CONST	202 GPH 40 F EWT 115F LWT	HEATING 118 K BTUH	180 F EGT 155 F LGT 10 GPM
HWM-2	TANK TYPE DW COIL SS CONST	70 GPH 40 F EWT 115F LWT	HEATING 30 K BTUH	180 F EGT 150 F LGT 3 GPM

DAMPER SCHEDULE-MOTORIZED - CONTROL - BACKDRAFT				
NUMBER	TYPE	SIZE	CONTROL	MFG MODEL
BD-1	LOW LEAKAGE OBD	14"WIDE X 8"HIGH	LOCKING QUADRANT	RUSKING CD-50 WITH LOCKING QUADRANT
BD-2	LOW LEAKAGE OBD	14"WIDE X 8"HIGH	LOCKING QUADRANT	RUSKING CD-50 WITH LOCKING QUADRANT
BD-3	LOW LEAKAGE OBD	12"WIDE X 10"HIGH	LOCKING QUADRANT	RUSKING CD-50 WITH LOCKING QUADRANT
BDD-1	INLINE BACKDRAFT DAMPER	10"WIDE X 8"HIGH	COUNTER WEIGHT	RUSKIN CBD2 OR EQUAL
MD-1	INLINE MOTORIZED DAMPER	48"WIDE X 10"HIGH	DAMPER MOTOR	RUSKIN CD-50 WITH BELIMO LF24 SPRING RETURN ACTUATOR 24 VAC 7 VA-35 IN LB
MD-2	INLINE MOTORIZED DAMPER	10"WIDE X 8"HIGH	DAMPER MOTOR	RUSKIN CD-50 WITH BELIMO LF24 SPRING RETURN ACTUATOR 24 VAC 5 VA-35 IN LB
MD-3	INLINE MOTORIZED DAMPER	10"WIDE X 10"HIGH	DAMPER MOTOR	RUSKIN CD-50 WITH BELIMO LF24 SPRING RETURN ACTUATOR 24 VAC 5 VA-35 IN LB

REVISED  
06-01-2016

DAY TANK  
 DT-1 DAY TANK: 50 GALLON TANK WITH 150 PERCENT CONTAINMENT BASIN. SINGLE TRANSFER TANK FILL PUMP 1/3 HP / 115 V / 1 PH. INCLUDES LEVEL GAGE, MANUAL FILL CAP, CONTROLS, CONTAINMENT ALARM, LEVEL CONTROL, PANEL, SOLENOID 3/4" SHUTOFF VALVE, 4 DIP TUBES FOR BOILERS, PRIMER PUMP FOR FILL PUMP  
 MFG: TRAMONT TRS SERIES OR APPROVED EQUAL

95% REVIEW-NOT FOR CONSTRUCTION

	<b>EQUIPMENT LIST</b> <b>CHEFORNAK WASHETERIA</b> <b>CHEFORNAK, ALASKA</b>	<b>CAPSTONE ENGINEERING LLC</b> <b>MECHANICAL ENGINEERS</b> <small>12110 BUSINESS BLVD STE 6 PMB 169        EAGLE RIVER, ALASKA 99577        TELEPHONE &amp; TEXT MSG 907-414-1456</small>
DATE: JUNE 17, 2016 DRAWN: F.H. BELZ CHKD: AS NOTED SCALE: REVISION: C 389 JOB NO.:	SHEET NO. 3 OF 20 M-1.2	

PLUMBING WATER DISTRIBUTION MATERIAL

PIPING SHALL BE TYPE I HARD DRAWN COPPER WITH ~~WROUGHT~~ COPPER FITTINGS.

06-01-2016

AQUATHERM PP-R GREEN PIPE MAY BE USED IN LIEU OF COPPER PEX TUBING IS TO BE USED WHERE PIPING IS IN WALL CAVITIES USE "BRIDGIT" OR EQUIVALENT NO-LEAD SOLDER FOR COPPER JOINTS

FIXTURE CONNECTIONS, (TOILETS, LAVATORIES, SINKS), SUPPLY PIPING FROM STOPS TO FIXTURE PROVIDE STAINLESS STEEL BRAIDED FLEX CONNECTOES (AQUAFLOW OR EQUAL).

VALVES SHALL BE FULL PORT BALL-TYPE 2" & SMALLER USE SWEAT OF NPT CONNECTIONS

MFG: HAMMOND OR EQUAL RATED 400 PSI WDG

CHECK VALVES: 2" AND UNDER BRONZE SPRING CHECK

MFG: HAMMOND FIG. 947 C X C, UDN.

WATER STOPS: PROVIDE PLATED BRASS 1/4 TURN TYPE WITH STAINLESS ESCUTCHEON

PLUMBING WATER PIPING ACCESSORIES

WHA-1 WATER HAMMER ARRESTOR: MFG: SMITH 5005 OR EQUAL

TP-1 TRAP PRIMER UNIT: MFG: PPP 500 SS STAINLESS STEEL

FM-1: TANK FILL FLOW METER: INLINE TYPE RECORDING METER: RESETTABLE: 1"NPT MFG: BADGER METER OR EQUAL

TG-1: ULTRASONIC TANK GAGE WITH DIGITAL READOUT

AD-1: SHOWER VALVE ACCESS DOOR: 12 INCH X 12 INCH HINGED DOOR 16 GAUGE STAINLESS STEEL. MFG: ACUDOR UF-5000 OR EQUAL

06-01-2016

PLUMBING WASTE, GRAY WATER AND VENT PIPING

PROVIDE ABS, DWV COPPER, NO HUB CAST IRON, BRASS, OR OTHER APPROVED MATERIAL. HDPE MAY BE USED FOR BUILDING SEWER, PUMPED WASTE OR LIFT STATION VENT WHERE SUBJECT TO DAMAGE SEE VTR DETAIL FOR VENTS

PLUMBING WASTE AND VENT PIPING ACCESSORIES

ROOF VTR FLASHING: PROVIDE DEKITEE FLASHINGS AND SEALS

ROOF VTR: PROVIDE SNOW SPLITTER PER VTR DETAIL

PLUMBING PIPING INSULATION

ALL POTABLE HOT EXPOSED WATER PIPING TO BE INSULATED WITH 1/2 INCH THICK "MICROLOCK" RIGID WITH APT JACKET. PROVIDE ZESTON FITTINGS FOR ELBOWS AND TEES. IN WALL PEX IS NOT INSULATED

INSULATION FOR VTR: 2" FIBERGLASS WITH VAPOR BARRIER

PLUMBING PIPING HANGERS

PROVIDE ROD AND CLEVIS OR TRAPEZE HANGERS FOR HANGING PIPING PROVIDE PLATED HANGERS OR UNISTRUT CUSHA CLAMPS FOR COLD WATER AND RIGID INSULATION WITH SHIELDS FOR HOT WATER.

PROVIDE WALL HANGERS AS REQUIRED

HANGER SPACING AND SWAY BRACING PER NFPA 13

PROVIDE UNISTRUT CUSH A CLAMPS FOR PUMP PIPING AREAS TO ALLOW FOR PIPE EXPANSION AND TO REDUCE PIPE STRAIN.

PLUMBING GENERAL NOTES

PROVIDE CODE REQUIRED CLEANOUTS AT SINKS AND OTHER AREAS AND WHERE SHOWN DISINFECT POTABLE WATER SYSTEMS PER CODE MATERIALS AND FIXTURES SHALL BE AS SHOWN OR EQUAL, ALL FIXTURE COLORS SHALL BE PER ARCHITECT APPROVAL PROVIDE FLANGED CONNECTIONS OR UNIONS TO ALLOW FOR EQUIPMENT SERVICE

SEISMIC RESTRAINTS

PROVIDE CODE APPROVED WALL STRAPS FOR HOT WATER MAKERS AND HYDRO-PNEUMATIC TANKS SWAY BRACE HANGING PIPING PER NFPA 13 PROVIDE GALVANIZED STEEL BASES LAGGED TO FLOOR AND BOLTED TO PUMPS FOR BASE MOUNTED PUMPS. BASES MAY BE FORMED OR WELDED CONSTRUCTION

PLUMBING FIXTURES

L-1 LAVATORY: WALL MOUNT VITROUS CHINA HANDICAP TYPE WITH SINGLE LEVER HANDICAP MIXING FAUCET: MFG: KOHLER WITH 4 INCH CENTERS AND DELTA FAUCET W/ POP UP DRAIN. PROVIDE WASTE PIPE COVER FOR HANDICAP PROTECTION UNDER LAV.

L-2 LAVATORY: WALL MOUNT VITROUS CHINA HANDICAP TYPE WITH SINGLE LEVER HANDICAP MIXING FAUCET: MFG: KOHLER WITH 4 INCH CENTERS AND DELTA FAUCET W/ POP UP DRAIN.

WC-1 WATER CLOSET: TANK TYPE ELONGATED BOWL FLUSH TANK TYPE TOILET HANDICAP HEIGHT, WITH OPEN FRONT SOLID PLASTIC SEAT. (WHITE COLOR) MFG: KOHLER OR EQUAL, SEAT: BEMIS OR EQUAL

WC-2 WATER CLOSET: TANK TYPE ELONGATED BOWL FLUSH TANK TYPE TOILET COMFORT HEIGHT, WITH OPEN FRONT SOLID PLASTIC SEAT. (WHITE COLOR) MFG: KOHLER OR EQUAL, SEAT: BEMIS OR EQUAL

SH-1 SHOWER: 36 X 36 HANDICAP SHOWER MODULE: ACRYLIC FIBERGLASS REENFORCED. ONE PIECE BARRIER FREE. TWO STAINLESS STEEL GRAB BARS, FOLD DOWN RH SEAT SINGLE LEVER ANTI SCALD VALVE WITH WAND, VERTICAL ADJUSTIBLE WAND HOLDER. MFG: KOHLER K12100-C WITH K-9132 DRAIN, DELTA FAUCET OR APPROVED EQUAL

SH-2 SHOWER: 36 X 36 SHOWER MODULE: ACRYLIC FIBERGLASS REENFORCED. WITH INTEGRAL SOAP LEDGES. SINGLE LEVER HANDLE FAUCET WITH TOP SPRAY NOZZLE MFG: KOHLER SONATA WITH K-9132 DRAIN, K9459 ACCESSORY KIT, DELTA FAUCET/ SPRAY OR APP EQUAL

LS-1 LAUNDRY SINK: FREE STANDING STAINLESS STEEL SINK. 18" X 18" WITH BACKSPLASH. MIXING FAUCET WITH SWING SPOUT. MFG: ADVANCE TABCO 4-18-18 SINK W/ REGENCY FAUCET OR EQUAL

FD-1 FLOOR DRAIN. GENERAL DUTY TYPE SUITABLE FOR FLOOR IN AREA. ADJ HGT. MFG: SMITH OR EQUAL FD-2 FLOOR DRAIN. GENERAL DUTY TYPE SUITABLE FOR FLOOR IN AREA. ADJ HGT. MFG: SMITH OR EQUAL

US-1 UTILTY SINK: FLOOR SINK-MOLDED TYPE 24" X 24" X 10" D WITH WALL MIXING FAUCET. PROVIDE WALL BACK SPLASH, MOP HOLDER. MFG: ZURN OR EQUAL

**PLUMBING FIXTURES-MATERIALS-NOTES**  
**CHEFORNAK WASHETERIA**  
**CHEFORNAK, ALASKA**



**CAPSTONE ENGINEERING LLC**  
**MECHANICAL ENGINEERS**

12110 BUSINESS BLVD STE 6 PMB 169  
EAGLE RIVER, ALASKA 99577  
TELEPHONE & TEXT MSG 907-414-1456

DATE: JUNE 17, 2016  
DRAWN: F.H. BELZ

CHKD: AS NOTED  
SCALE: AS NOTED  
REVISED: C389

JOB NO. C389

SHEET NO. 4 OF 20  
M-1.3

95% REVIEW-NOT FOR CONSTRUCTION

GLYCOL PIPING MATERIAL

GLYCOL PIPING SHALL BE TYPE L HARD DRAWN COPPER WITH WROUGHT COPPER FITTINGS, PEX TUBING, HDPE, BLACK STEEL, GALVANIZED STEEL, BRASS, OR CAST IRON USE SILVER BEARING SOLDER FOR COPPER PIPING JOINTS VALVES SHALL BE BRASS FULL PORT BALL-TYPE USE SWEAT OR NPT CONNECTIONS

MFG: HAMMOND OR EQUAL RATED 400 PSI WDG CHECK VALVES: BRONZE SWING CHECK MFG: HAMMOND OR EQUAL

NOTE: GLYCOL PIPING CONNECTIONS TO RADIATOR SYSTEM IN POWER HOUSE SHALL FOLLOW EXISTING SYSTEM CONSTRUCTION

GLYCOL PIPING ACCESSORIES

AUTO AIR VENTS: 1/2" MPT, TACD #426 OR EQUAL, MOUNTED ON 1/2" BALL ISOLATION VALVE UDN.

FLOW CONTROL VALVES/CIRCUIT SETTERS: TACD ACUF SERIES PRESSURE GAGES: BOURDON TUBE TYPE 2" DIAL THERMOMETERS: STRAP ON TYPE- DIAL INDICATOR THERMOMETERS: STRAP ON TYPE- DIAL INDICATOR

GT-1: GLYCOL MIX BARREL: NOMINAL 30 GALLON TANK: MFG: ACE AC00032N1V2 WITH BLACKMER MODEL 414 B OR EQ AS-1 AIR SCODP 3 INCH SIZE MFG: TACD 436 OR EQUAL AS-2, AS-3 AIR SCODP 1 1/2 INCH SIZE MFG: TACD 433 OR EQUAL MAY MANUAL AIR VENT: SCREWDRIVER VENT MFG: TACD 417 OR EQUAL AAV AUTO AIR VENT: VENT WITH 1/2" ISOLATION VALVE MFG: TACD 418 OR EQUAL

GLYCOL PIPING INSULATION

ALL GLYCOL PIPING SHALL BE INSULATED, VALVES ARE NOT INSULATED: INSULATION: GHS-GHR(180 F PIPING), HW PIPING: 1 INCH FIBERGLASS WITH SEALING JACKET AND FITTING COVERS INSULATION: GHS-GHR(205 F PIPING): 1 1/2 INCH FIBERGLASS WITH SEALING JACKET AND FITTING COVERS

GLYCOL

GLYCOL 50-50 MIX PROPYLENE GLYCOL

GLYCOL OR FUEL OIL PIPING HANGERS

PROVIDE ROD AND CLEVIS OR TRAPEZE HANGERS FOR HANGING PIPING PROVIDE RIGID INSULATION AND INSULATION SHIELDS AT HANGERS PROVIDE WALL HANGERS AS REQUIRED HANGER SPACING AND SWAY BRACING PER NFPA 13 PROVIDE UNISTRUT CUSH A CLAMPS FOR PUMP PIPING AREAS TO ALLOW FOR PIPE EXPANSION AND TO REDUCE PIPE STRAIN

FUEL OIL SUPPLY PIPING MATERIAL

FUEL OIL PIPING SHALL BE LOW TEMP SCH 80 BLACK STEEL A333 BLACK STEEL WITH SOCKET WELD FITTINGS VALVES SHALL BE BRASS FULL PORT BALL-TYPE WITH NPT CONNECTIONS MFG: HAMMOND OR EQUAL RATED 400 PSI WDG DE-1 OIL FILTER: INLINE TYPE WITH SPIN-ON CARTRIDGE. MFG CIM-TEK 50181 ADAPTER 3/4"NPT SPIN ON FILTER ELEMENT: CIM-TEK 200 SERIES SPIN ON OR EQUAL

FUEL OIL PIPING ACCESSORIES

TL TIGER LOOP AIR ELIMINATOR ( 1 PER BOILER) MFG: WESTWOOD PRODUCTS INC TIGERLOOP ULTRA OR EQUAL FUSIBLE VALVES: FIRMATIC OR EQUAL CHECK VALVES: FIRMATIC OR EQUAL FF-1 FUEL FILTER: GAR-BER 11BV-MK (CARTRIDGE GF 2615) OR EQUAL (1 PER BOILER)

GLYCOL/FUEL OIL PIPING GENERAL NOTES

PROVIDE UNIONS OR FLANGES FOR SERVICE AND REPLACEMENT OF EQUIPMENT CLEAN AND DRY ALL PIPING BEFORE PUTTING INTO SERVICE MATERIALS AND ACCESSORIES SHALL BE AS SHOWN OR EQUAL,

BOILER INSTALLATION ACCESSORIES

PROVIDE 16 GA GALVANIZED SHEET METAL DRIP PANS UNDER OIL BURNERS, OIL FILTERS, VALVES AND TIGER LOOPS BOILER STACKS: SELKIRK METALBESTOS TYPE "PS" STACK WITH TYPE 304 STAINLESS STEEL INNER AND OUTER PIPES. VERIFY SIZES

SEISMIC RESTRAINTS

PROVIDE CODE APPROVED WALL STRAPS FOR HOT WATER MAKERS AND HYDRO-PNEUMATIC TANKS SWAY BRACE HANGING PIPING PER NFPA 13 PROVIDE GALVANIZED STEEL BASES LAGGED TO FLOOR AND BOLTED TO PUMPS FOR BASE MOUNTED PUMPS. BASES MAY BE FORMED OR WELDED CONSTRUCTION

HVAC DUCT WORK

ALL MATERIAL, SEALING, AND HANGERS TO BE PER IMC AND SMACNA STANDARDS USE ROD AND CLEVIS OR TRAPEZE HANGERS IN OPEN CEILING AREAS FLEX JOINTS AT INLINE FANS FOR VIBRATION REDUCTION SQUARE DUCTS: DURD DYNA JR DURDLON CONNECTOR ROUND DUCTS AT FANS AND DRYER VENTS: VENDOR: HOSECRAFT TD-1 WITH SS WORM DR CLAMPS SEE EQUIPMENT LIST FOR BALANCING DAMPERS

DRYER VENT CAPS

DV-1 DRYER VENT CAP: WALL CAP, 8"ROUND INLET, STAINLESS STEEL. MFG: ALDES 22-408-SS DV-2 DRYER VENT CAP: WALL CAP, 10"ROUND INLET, STAINLESS STEEL. MFG: ALDES 22-410-SS NOTE: DRYER VENT CAPS HAVE MAGNETIC CATCH AND ARE COMMERCIAL TYPE

GRILLES AND REGISTERS

SG-1 SUPPLY GRILLE: BAR GRILL WITH HORIZONTAL BARS 14 X 10 MFG: SHOEMAKER 901-NO OBD RG-1 RETURN GRILLE: BAR GRILL WITH HORIZONTAL BARS 10 X 10 MFG: SHOEMAKER 905 NO OBD RG-2 RETURN GRILLE: BAR GRILL WITH HORIZONTAL BARS 10 X 6 MFG: SHOEMAKER 905 NO OBD RG-3 RETURN GRILLE: 14 W X 20 H FILTER GRILLE MFG: SHOEMAKER 915 NO OBD TG-1 RETURN GRILLE: BAR GRILL WITH HORIZONTAL BARS 10 X 4 MFG: SHOEMAKER 905 NO OBD

AIR FILTERS

SF-1 SUMMER FILTERS: 2 EA 20 X 25 X 1 ALUMINUM PERMANENT WASHABLE FILTER: MFG: AAF 316-001-800 OR EQUAL SF-2, SF-3 SUMMER AIR FILTER: 1 EA 10 X 20 X 1 ALUMINUM PERMANENT WASHABLE FILTER: MFG: AAF 316-001-200 OR EQUAL AF-1 AIR FILTER: 1 EA 14 X 20 X 1 FIBERGLASS DISPOSABLE FILTER: MFG: AAF OR EQUAL HVAC DUCT INSULATION AIR INTAKE DUCTS WHERE SHOWN AND AS NEEDED: 2 INCH RIGID GLASS WITH FSK COVER

95% REVIEW—NOT FOR CONSTRUCTION

PIPING AND GENERAL MATERIALS  
CHEFORNAK WASHETERIA  
CHEFORNAK, ALASKA



CAPSTONE ENGINEERING LLC  
MECHANICAL ENGINEERS

12110 BUSINESS BLVD STE 6 PMB 169  
EAGLE RIVER, ALASKA 99577  
TELEPHONE & TEXT MSG 907-414-1456

DATE: JUNE 17, 2016  
DRAWN: F.H. BELZ

CHKD: AS NOTED  
SCALE:  
REVISED:  
JOB NO.: C389

SHEET NO. 5 OF 20  
M-1.4

CONTROL VALVES

CV-1, CV-2: CONTROL VALVE: 1/4 TURN MOTOR OPERATED VALVE 2 INCH NPT BRASS BODY  
SS BALL, SPRING RETURN 24 VAC ACTUATOR (FAIL OPEN) MFG: HONEYWELL VB2F 1350 DR EQUAL  
CV-3 THRU CV-10 CONTROL VALVE: 1/4 TURN MOTOR OPERATED VALVE 1 INCH NPT BRASS BODY  
SS BALL, SPRING RETURN 24 VAC ACTUATOR (FAIL OPEN) MFG: HONEYWELL VB2F 1350 DR EQUAL  
CV-11 CONTROL VALVE: 1/4 TURN MOTOR OPERATED VALVE 3/4 INCH NPT BRASS BODY  
SS BALL, SPRING RETURN 24 VAC ACTUATOR (FAIL OPEN) MFG: HONEYWELL VB2F 1350 DR EQUAL  
CV-12, CV-13, CV-14 CONTROL VALVE: 1/4 TURN ZONE VALVE 3/4 INCH NPT BRASS BODY  
SS BALL, SPRING RETURN 24 VAC ACTUATOR MFG: TACD 570 DR EQUAL  
CV-15 CONTROL VALVE: 3 WAY VALVE-MIXING SERVICE: CV=15, FNPT BRASS BODY, 24 VAC 0-10 VDC SIGNAL  
MFG: HONEYWELL V5013N1063/U VALVE WITH HONEYWELL ML7425 OPERATOR. STEM UP ON POWER FAILURE

MOTORIZED DAMPERS-SEE DAMPER SCHEDULE M-1.2 FOR DETAILS  
THERMOSTATS

TH-1, TH-2, TH-3, TH-4, TH-7 WALL THERMOSTATS-LINE VOLTAGE STAT MFG: HONEYWELL T4051A W/LOCKING COVER,  
TH-5, TH-6 THERMOSTAT: LOW VOLTAGE WALL STAT MFG: HONEYWELL T87 WITH LOCKING COVER  
TH-8, TH-9, TH-10, TH-11: THERMOSTAT- LINE VOLTAGE ADJ DIFF MFG: HONEYWELL T631B1005 DR EQUAL  
TEMPERATURE CONTROLLERS  
TC-1, TC-2: TEMPERATURE CONTROL . IMMERSION TYPE STAT WITH

ADJUSTIBLE SET POINT 100 TO 240 F RANGE MFG: HONEYWELL L4006A2007 DR EQUAL  
TC-3: TEMPERATURE CONTROL . IMMERSION TYPE STAT WITH  
ADJUSTIBLE SET POINT 40 TO 180 F RANGE MFG: HONEYWELL L4006A1959 WITH THERMOWELL DR EQUAL  
TC-4, TC-5, TC-7: TEMPERATURE CONTROL . BULB TYPE REMOTE BULB, 20 FT CAPILLARY 0-100F, 2 SPDT  
3-10 F ADJUSTIBLE DIFF MFG: HONEYWELL T678A1015 DR EQUAL

TC-6: TEMPERATURE CONTROL . BULB TYPE REMOTE BULB, 10 FT CAPILLARY 80 F TO 220 F, 1 SPDT  
3-10 DIFFERENTIAL ADJUSTIBLE SET POINT MFG: HONEYWELL T675F1032 DR EQUAL

MULTIPLE BOILER CONTROLLER

BCP-1 BOILER CONTROL PANEL: SEQUENCES B-1,B-2, AND B-3 BASED ON RETURN AND SUPPLY TEMPERATURE.  
MFG: HONEYWELL T775P2003 DR APPROVED EQUAL

MULTIPLE UNIT HEATER CONTROLLER

UHTC-1 UNIT HEATER CONTROL PANEL: SEQUENCES UH-1, UH-2, UH-3 BASED ON ROOM AND DSA TEMPERATURE.  
MFG: HONEYWELL T775P2003 DR APPROVED EQUAL

HEAT TRACE CONTROLLER

HITC-1 HEAT TRACE CONTROL PANEL: STARTS AND STOPS PMP-8 AND RESET CONTROLS CV-17 WHILE SENSING  
OUTSIDE AIR TEMP AND HEAT TRACE LOOP TEMP MFG: HONEYWELL T775R2027/U DR APPROVED EQUAL

SEQUENCE OF OPERATION-- BOILER SYSTEMS

BOILER SYSTEM #1

BOILER SYSTEM #1 BOILER B-1, PUMPS PMP-1A & PMP-1B, HC-1, HC-2, HC-3, CV-3, CV-4, CV-5  
BOILER OPERATES CONTINUOUSLY ON TC-6 CONTROL: SET 200 DN/ 210 OFF PMP-1A DR PMP-1B OPERATES CONTINUOUSLY  
CV-3, CV-4 , CV-5 CYCLE WHEN ASSOCIATED DRYERS OPERATE DURING LAUNDRY OCCUPIED MODE  
CV-3, CV-4 , CV-5 ARE DISABLED DURING LAUNDRY UNOCCUPIED MODE

BOILER SYSTEM #2

BOILER SYSTEM #2 BOILER B-2, B-3,B-4, PUMPS PMP-2A & PMP-2B, PHC-1, PHC-2, PHC-3, BUILDING HEAT, TANK HEAT  
BOILERS OPERATES CONTINUOUSLY CONTROLLED BY BCP-1, SET 180 F. PMP-2A DR PMP-2B OPERATES CONTINUOUSLY  
CV-6, CV-7 , CV-8 CYCLE WHEN ASSOCIATED DRYERS OPERATE DURING LAUNDRY OCCUPIED MODE  
CV-6, CV-7 , CV-8 ARE DISABLED DURING LAUNDRY UNOCCUPIED MODE

CV-1 IS OPEN AND CV-2 IS CLOSED DURING LAUNDRY OCCUPIED MODE

CV-1 IS CLOSED AND CV-2 IS OPEN DURING LAUNDRY UNOCCUPIED MODE

UNIT HEATERS UH-1, UH-2, UH-3 OPERATE FROM UHTC DURING LAUNDRY OCCUPIED MODE

UNIT HEATERS UH-1, UH-2, UH-3 ARE DISABLED DURING LAUNDRY UNOCCUPIED MODE

UNIT HEATERS UH-4, UH-5, UH-6, UH-7, UH-8, UH-9 (COIL FLOW CONTINUOUS) LINE VOLTAGE ROOM THERMOSTATS CYCLE THE FANS.

BATHROOM HEATERS: BH-1, BH-2, CV-13, CV-14, TS-3. LOW VOLTAGE TSTATS CYCLE ZONE VALVES

TANK UTILADDER HEAT TRACE: CV-12, TC-2 REMOTE BULB TSTAT: TSTAT CYCLES CV-12 AS NEEDED

HOT WATER MAKER HWM-1, HWM-1, TC-1, CV-10: TC-1 CYCLES CV-10 TO MAINTAIN TANK TEMPERATURE @ 115 F

UTILADDER-LIFT STATION HEAT TRACING: HTPC CONTROLS CV-15 AND PMP-8 TO TAKE HEAT FROM BOILER LOOP

WATER TANK HEATING: HWM-2, TC-2, TC-3, CV-11, PMP-4, TC-3 ENABLES TC-2, CV-11 AND PMP-4 BELOW TANK TEMP OF 45 F ( ADJ)

POWER HOUSE ADD HEAT TO BOILER SYSTEM: HX-2, PMP-3: TMP CONTROLS PMP-3 TO EFFECT HEAT ADD TO HEATING LOOP

BOILER ROOM FAN OPERATION: BRF-1, B-1,B-2, B-3, B-4: BOILER ROOM FAN OPERATES WHEN ANY BOILER FIRES

BOILER ROOM FAN ALSO OPERATES WHEN BOILER ROOM COOLING TSTAT (TH-11) CLOSES (SET 80 F CLOSE, 75 F OPEN)

CONTROL(S)(CONTINUED)

T-1 TRANSFORMER 120 VAC TO 24 VAC 150 VA FOOT MOUNTED TRANSFORMER  
MFG: ALLIED 6K149 OR EQUAL. REQUIRES FUSED OR CIRCUIT BREAKER ON SECONDARY  
T-2 THROUGH T-7, T-11, T-12 TRANSFORMER 115 VAC TO 24 VAC 40 VA PLATE MOUNTED  
MFG: HONEYWELL A172D-1188/U OR EQUAL.

T-8, T-9, T-10 TRANSFORMER 115 VAC TO 24 VAC 75 VA FOOT MOUNTED  
MFG: HONEYWELL A188 OR EQUAL.

CR-1 CONTROL RELAY: DPDT RELAY, 12 AMP@ 120 VAC POWER DUTY RATED CONTACTS  
WITH MAX 25 VA PILOT DUTY @ 24 VAC MFG: HONEYWELL R8222D1029 OR EQUAL  
CR-2 CONTROL RELAY: SPDT RELAY, 16.0 AMPS@ 120 VAC POWER DUTY  
24 VAC COIL, BOX OR WALL MOUNTED, TOTALLY ENCLOSED. MFG: WHITE RODGERS 8A0-1 OR EQUAL

CSR-1 CURRENT SENSING RELAY: SPST RELAY FOR SWITCHING 24 VAC RELAY OR VALVE  
BOX MOUNTED, TOTALLY ENCLOSED. MFG: HONEYWELL 32001754 OR EQUAL

LVCB-1 CIRCUIT BREAKER 10 AMP: 10 AMP RATED @ 24 VAC MFG: CARLING 4VA76 OR EQUAL

TS-1 TOGGLE SWITCH: 10 AMP RATED @ 120 VAC LIGHTED ROCKER MFG: GRAINGER 2V1N1 OR EQ  
CB-1 CIRCUIT BREAKER 10 AMP RATED @ 24 VAC MFG: GRAINGER 4VA76 OR EQ

TMP TMP IS A THERMAL MANAGEMENT PANEL DEVELOPED BY AVEC TO DEVELOP A 0-10 VDC  
TO CONTROL A VARIABLE SPEED PUMP USING MULTIPLE INPUTS FROM TEMPERATURE ELEMENTS

SEQUENCE OF OPERATION-- EF-2, EF-3, MD-3

EF-3 RUNS AND MD-3 OPENS ON MAKE OF TH-8 COOLING STAT SET 80 F ADJ  
EF-2 RUNS ON MAKE OF TH-9 COOLING STAT SET 80 F ADJ

SEQUENCE OF OPERATION--AREA VENTILATION MUF-1, EF-1, MD-2

ON-OFF SWITCH IN OFFICE CONTROLS VENTILATION CONTROL PANEL  
SWITCH ON: MUF-1 OPERATES, MD-2 OPENS AND EF-1 OPERATES  
SWITCH OFF: MUF-1 STOPS, MD-2 CLOSES AND EF-1 STOPS

SEQUENCE OF OPERATION-- LAUNDRY OCCUPIED/UNOCCUPIED MODES

SEE M-1.6 FOR CONTROL DIAGRAMS

OCCUPIED MODE

PHC-1, PHC-2, PHC-3 OPERATION IS ENABLED  
HC-1, HC-2, HC-3 OPERATION IS ENABLED  
MD-1 IS OPEN  
UH-1, UH-2, UH-3 OPERATION OF UHTC IS ENABLED  
CV-1 IS OPEN AND CV-2 IS CLOSED DURING LAUNDRY OCCUPIED MODE  
ALL OTHER EQUIPMENT OPERATES NORMALLY

UNOCCUPIED MODE

PHC-1, PHC-2, PHC-3 OPERATION IS DISABLED  
HC-1, HC-2, HC-3 OPERATION IS DISABLED  
MD-1 IS CLOSED  
UH-1, UH-2, UH-3 OPERATION IS DISABLED  
CV-1 IS CLOSED AND CV-2 IS OPEN DURING LAUNDRY UNOCCUPIED MODE  
ALL OTHER EQUIPMENT OPERATES NORMALLY

SEQUENCE OF OPERATION PMP-7 COLD WATER SUPPLY CIRCULATOR PUMP

TC-4 AS AN OUTSIDE AIR SENSOR STARTS PUMP AT TEMPERATURES BELOW +20 F(ADJUSTIBLE)

95% REVIEW--NOT FOR CONSTRUCTION

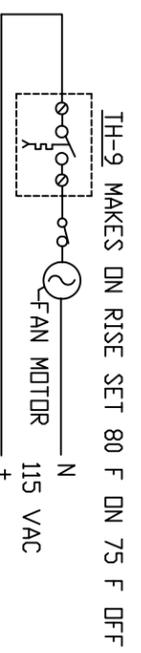
CONTROLS AND SEQUENCE OF OPERATION  
CHEFORNAK WASHETERIA  
CHEFORNAK, ALASKA



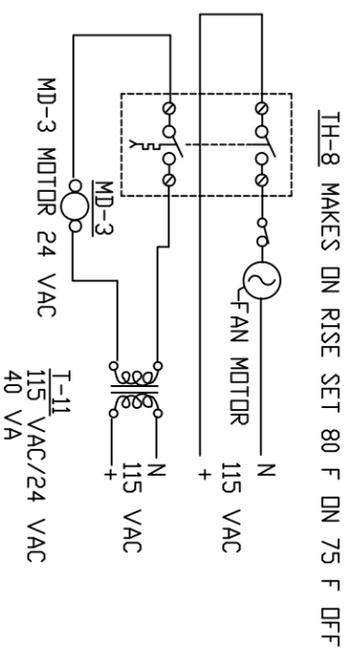
CAPSTONE ENGINEERING LLC  
MECHANICAL ENGINEERS

12110 BUSINESS BLVD STE 6 PMB 169  
EAGLE RIVER, ALASKA 99577  
TELEPHONE & TEXT MSG 907-414-1456

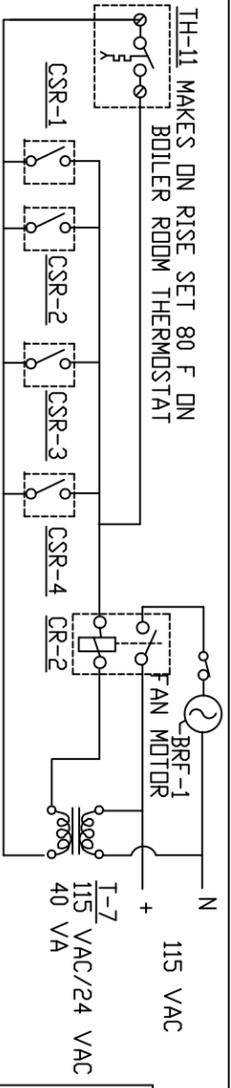
DATE: JUNE 17, 2016  
DRAWN: F.H. BELZ  
CHKD:  
SCALE: AS NOTED  
REVISED:  
JOB NO.: C389  
SHEET NO.: 6 OF 20  
M-1.5



**EF-2, CONTROLS**

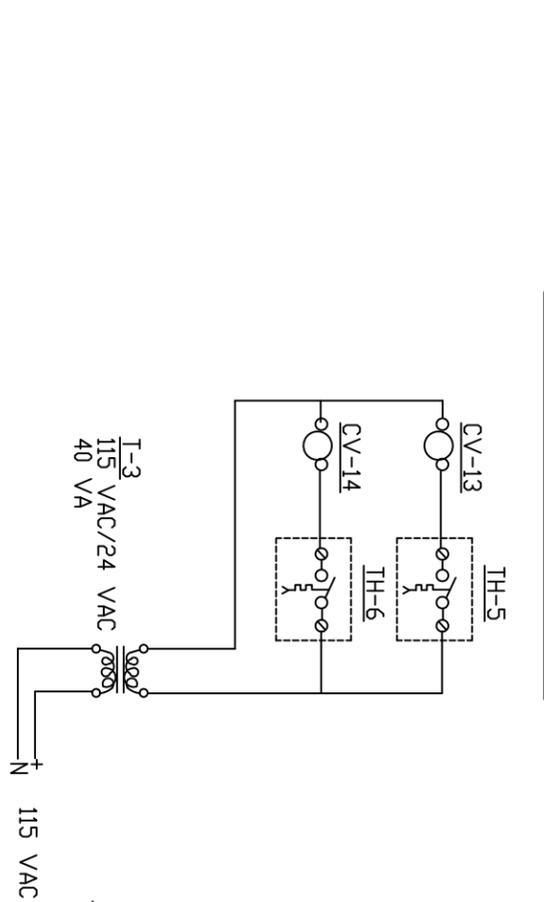


**EF-3, MD-3 CONTROLS**

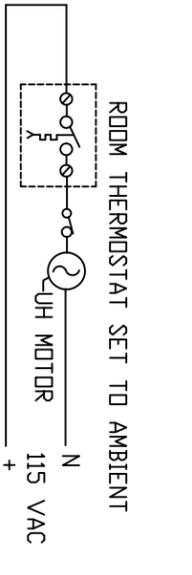


**BRF-1 CONTROLS**

NOTE: CSR-1, CSR-2, CSR-3, CSR-4 SENSE CURRENT ON NEUTRAL OF 115 V POWER TO B-1, B-2, B-3, B-4 IN BOILER ROOM

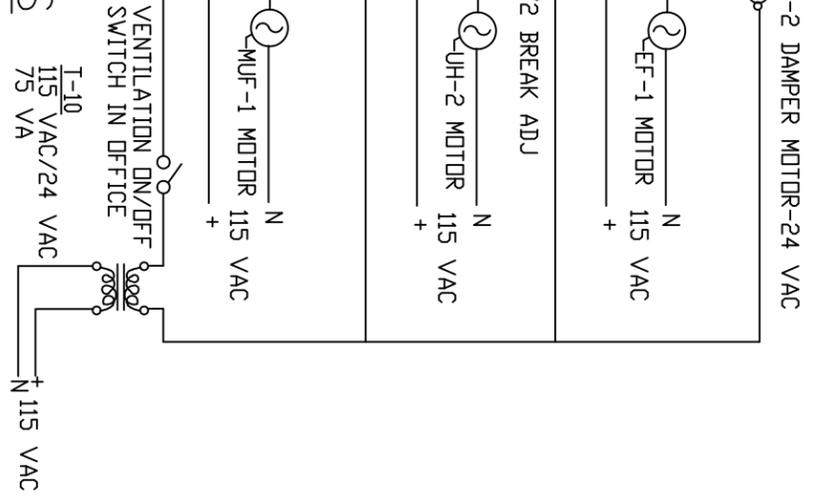


**BH-1, BH-2 CONTROLS**

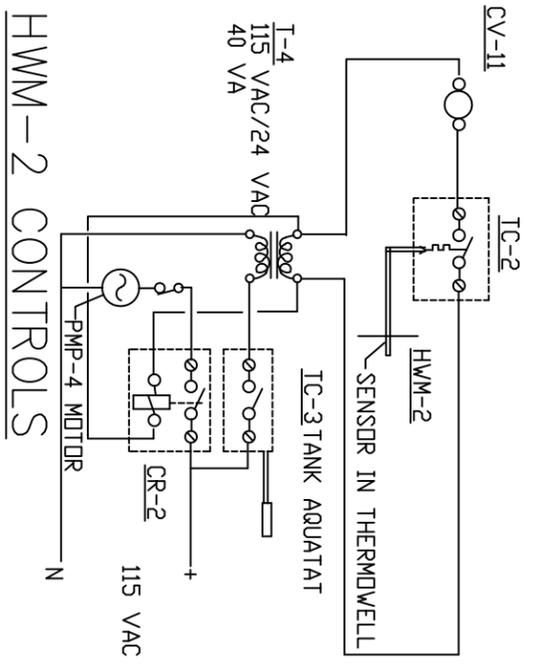
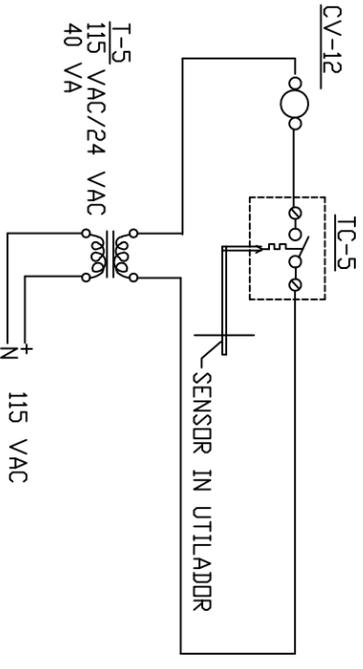


**UH-4, UH-5, UH-6, UH-7, UH-8 CONTROLS**

**VENTILATION CONTROLS**

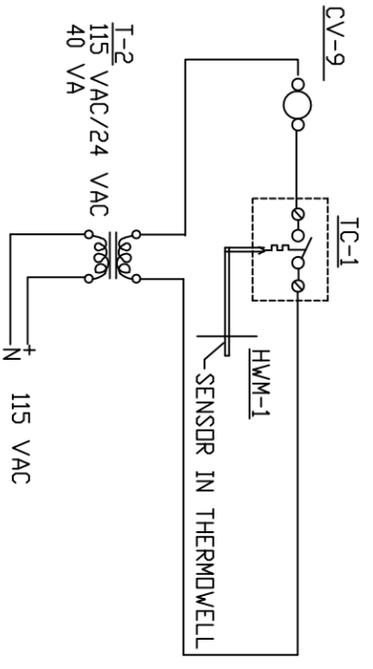


**TANK UTILADOR HEAT TRACE CONTROLS**



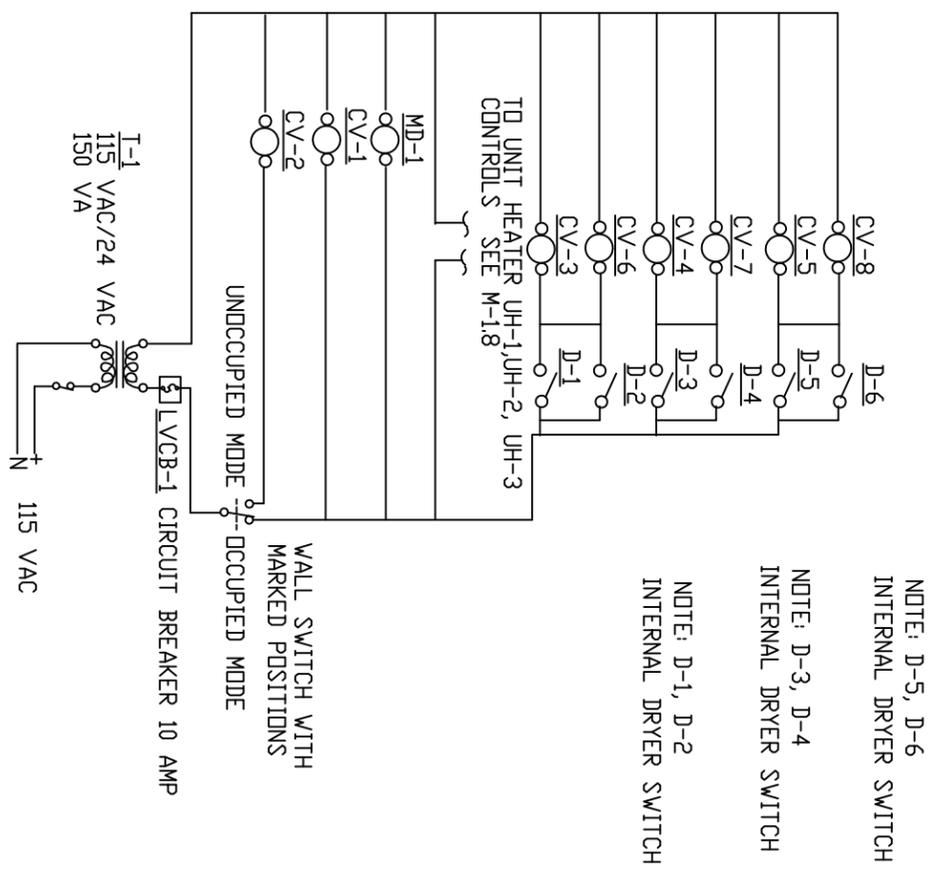
**HWM-2 CONTROLS**

**HWM-1 CONTROLS**

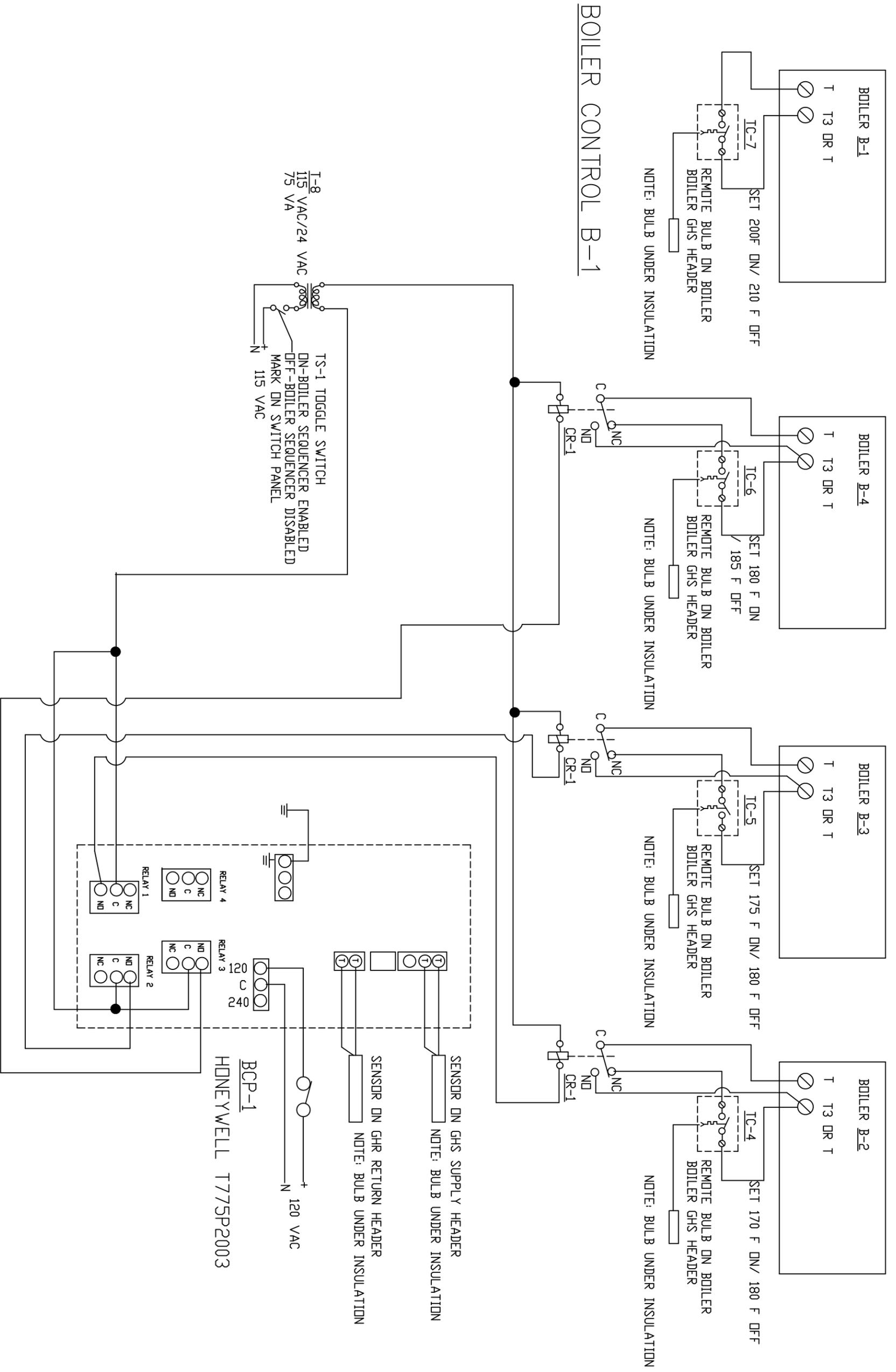


**HWM-1 CONTROLS**

**LAUNDRY OCCUPIED / UNOCCUPIED MODE**



95% REVIEW-NOT FOR CONSTRUCTION



**BOILER CONTROL B-1**

**BOILER CONTROL B-3, B-4, B-5**

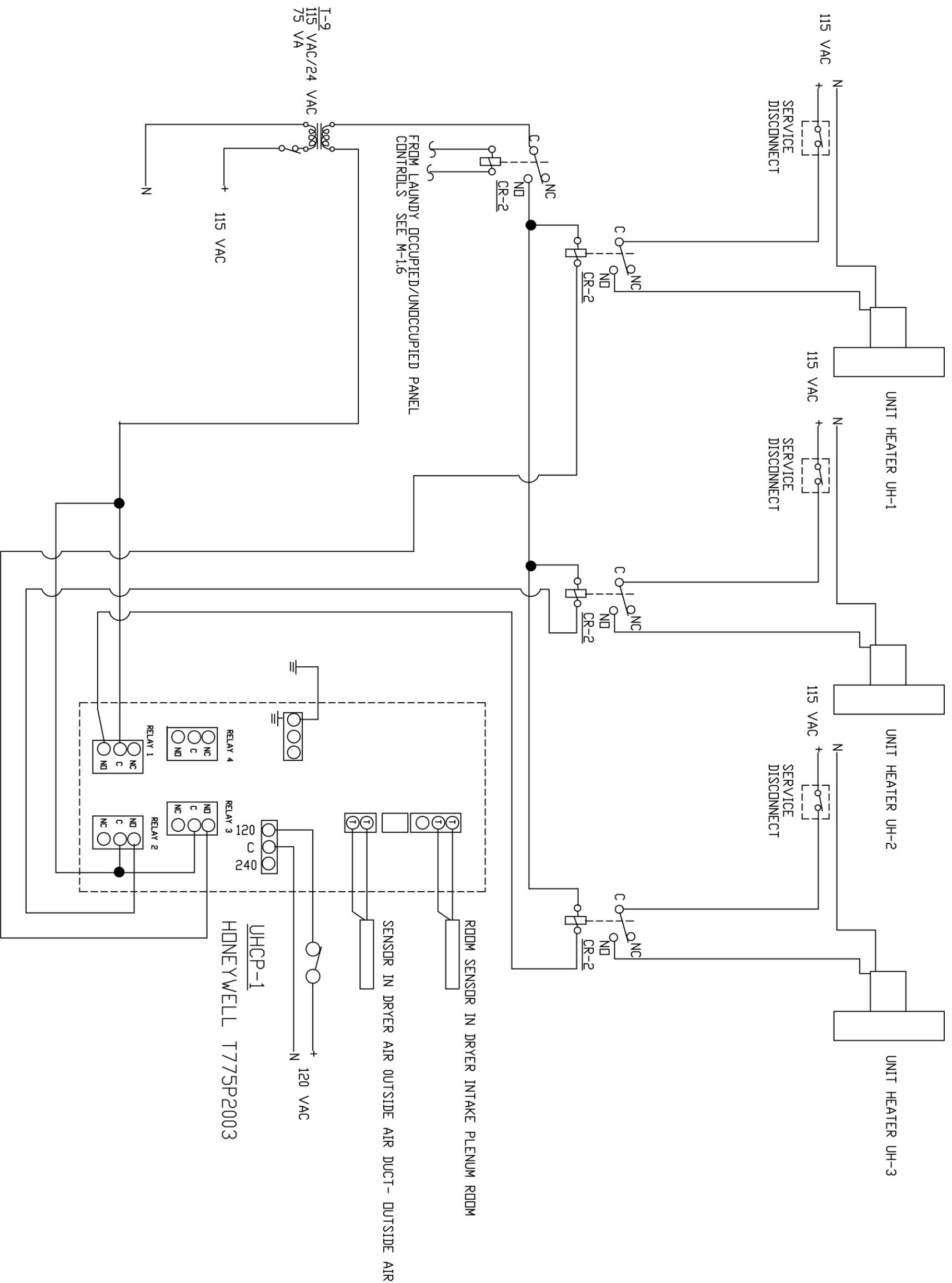
95% REVIEW-NOT FOR CONSTRUCTION

**BOILER B-1, B-2, B-3, B-4 CONTROL DIAGRAM**  
CHEFORNAK WASHETERIA  
CHEFORNAK, ALASKA



**CAPSTONE ENGINEERING LLC**  
**MECHANICAL ENGINEERS**  
12110 BUSINESS BLVD STE 6 PMB 169  
EAGLE RIVER, ALASKA 99577  
TELEPHONE & TEXT MSG 907-414-1456

DATE: JUNE 17, 2016  
DRAWN: F.H. BELZ  
CHKD: AS NOTED  
SCALE: AS NOTED  
REVISED: C389  
JOB NO. C389  
SHEET NO. 8 DF  
M-1.7 20



UNIT HEATER UH-1, UH-2, UH-3 CONTROL

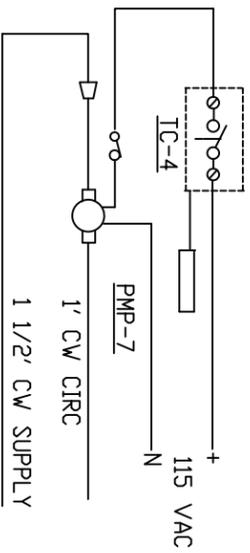
95% REVIEW-NOT FOR CONSTRUCTION

UNIT HEATER UH-1, UH-2, UH-3 CONTROLS  
 CHEFORNAK WASHETERIA  
 CHEFORNAK, ALASKA

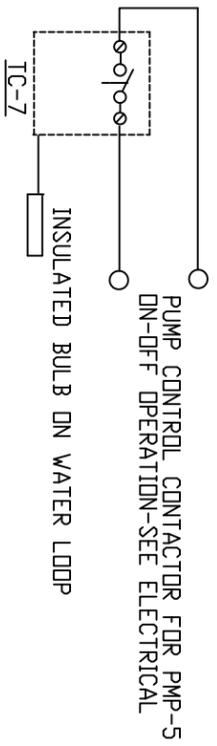
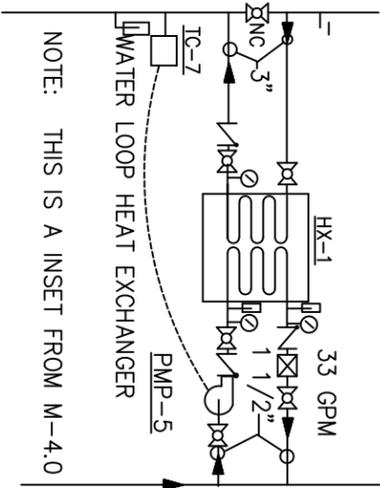


CAPSTONE ENGINEERING LLC  
 MECHANICAL ENGINEERS  
 12110 BUSINESS BLVD STE 6 PMB 169  
 EAGLE RIVER, ALASKA 99577  
 TELEPHONE & TEXT MSG 907-414-1456

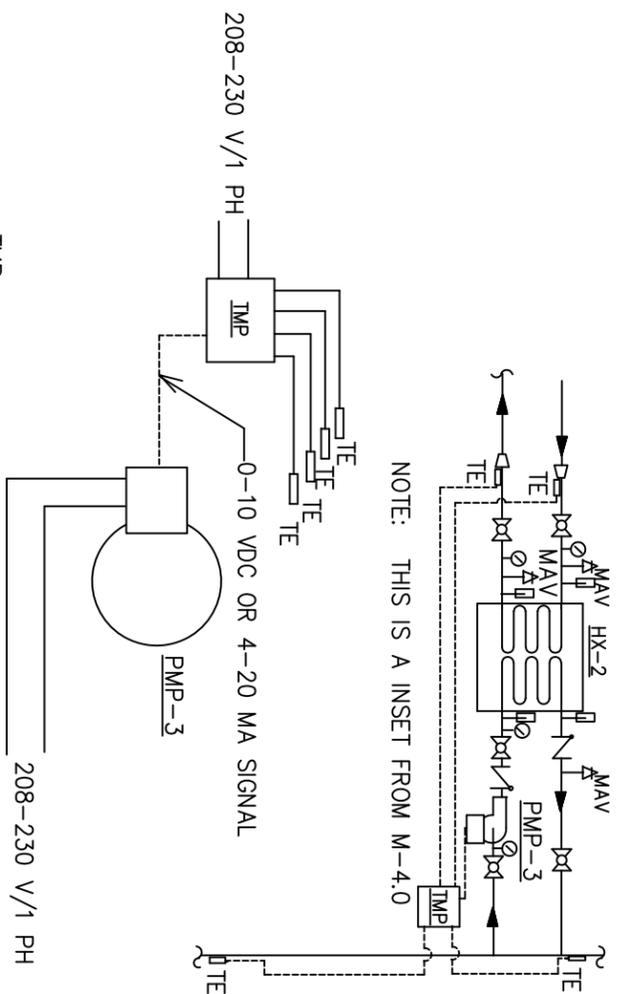
DATE: JUNE 17, 2016  
 DRAWN: F.H. BELZ  
 CHECKED: AS NOTED  
 REVISION: C389  
 JOB NO.: C389  
 SHEET NO.: 9 DF  
 M-18 20



**PMP-7 CONTROLS**

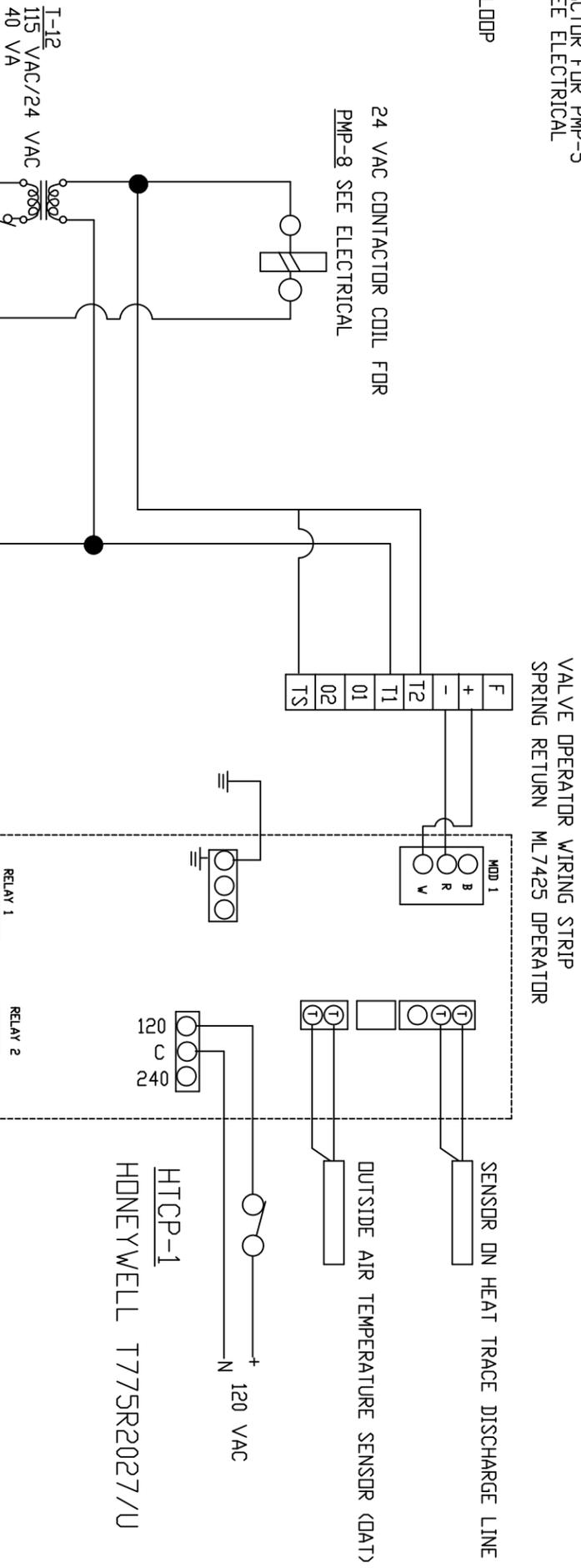


**PMP-5 CONTROLS**



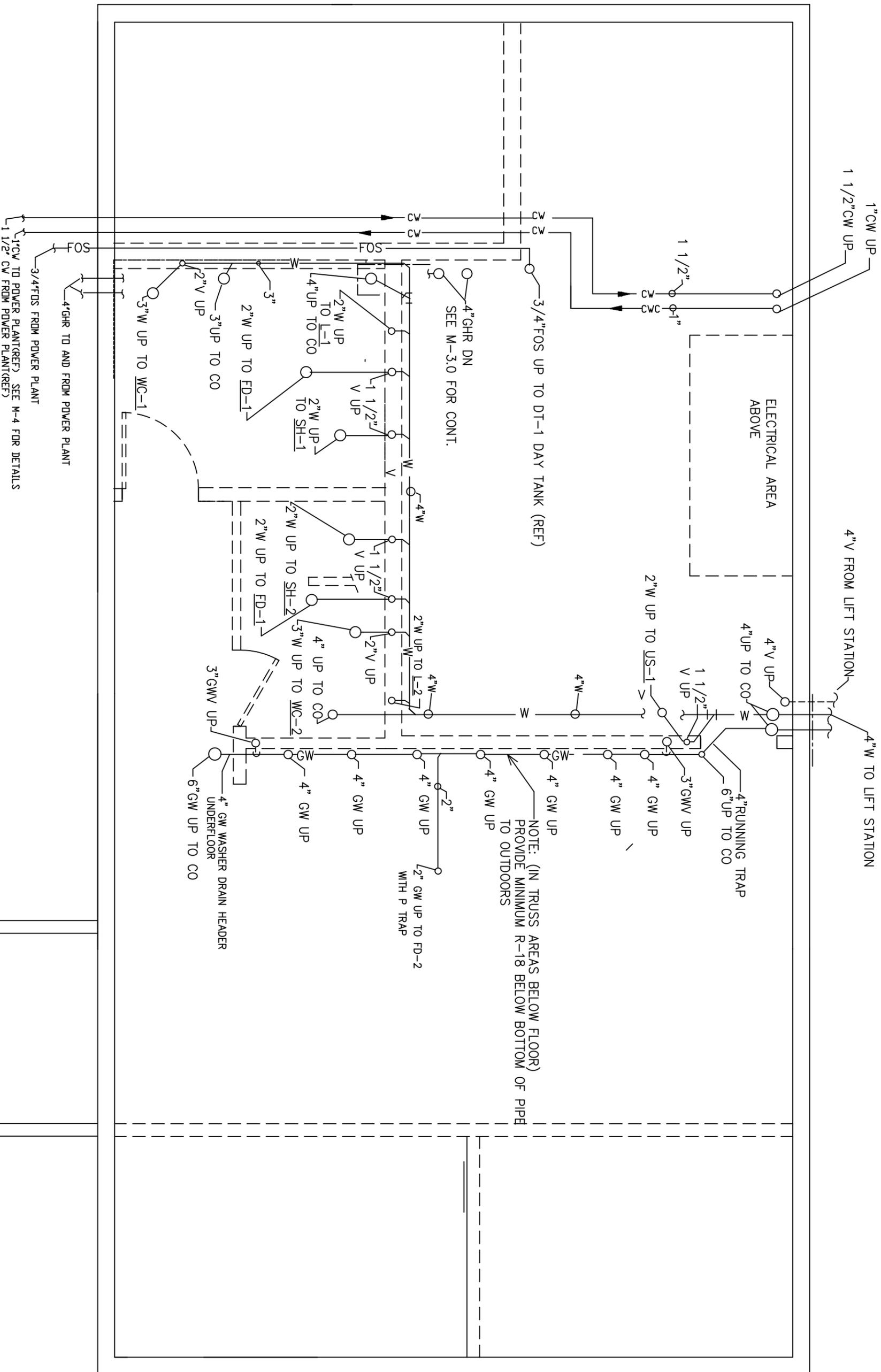
**PMP-3 CONTROLS**

TMP IS A THERMAL MANAGEMENT PANEL DEVELOPED BY AVEC CONTROLLING A VARIABLE SPEED PUMP AND USING MULTIPLE TEMPERATURE INPUTS FROM TEMPERATURE ELEMENTS.



**PMP-8, UTILADOR HEAT TRACE CONTROLS**

95% REVIEW-NOT FOR CONSTRUCTION



CHEFORNAK WASHETERIA UNDER FLOOR PLUMBING PLAN

SCALE 1/4"=1'-0"

95% REVIEW-NOT FOR CONSTRUCTION

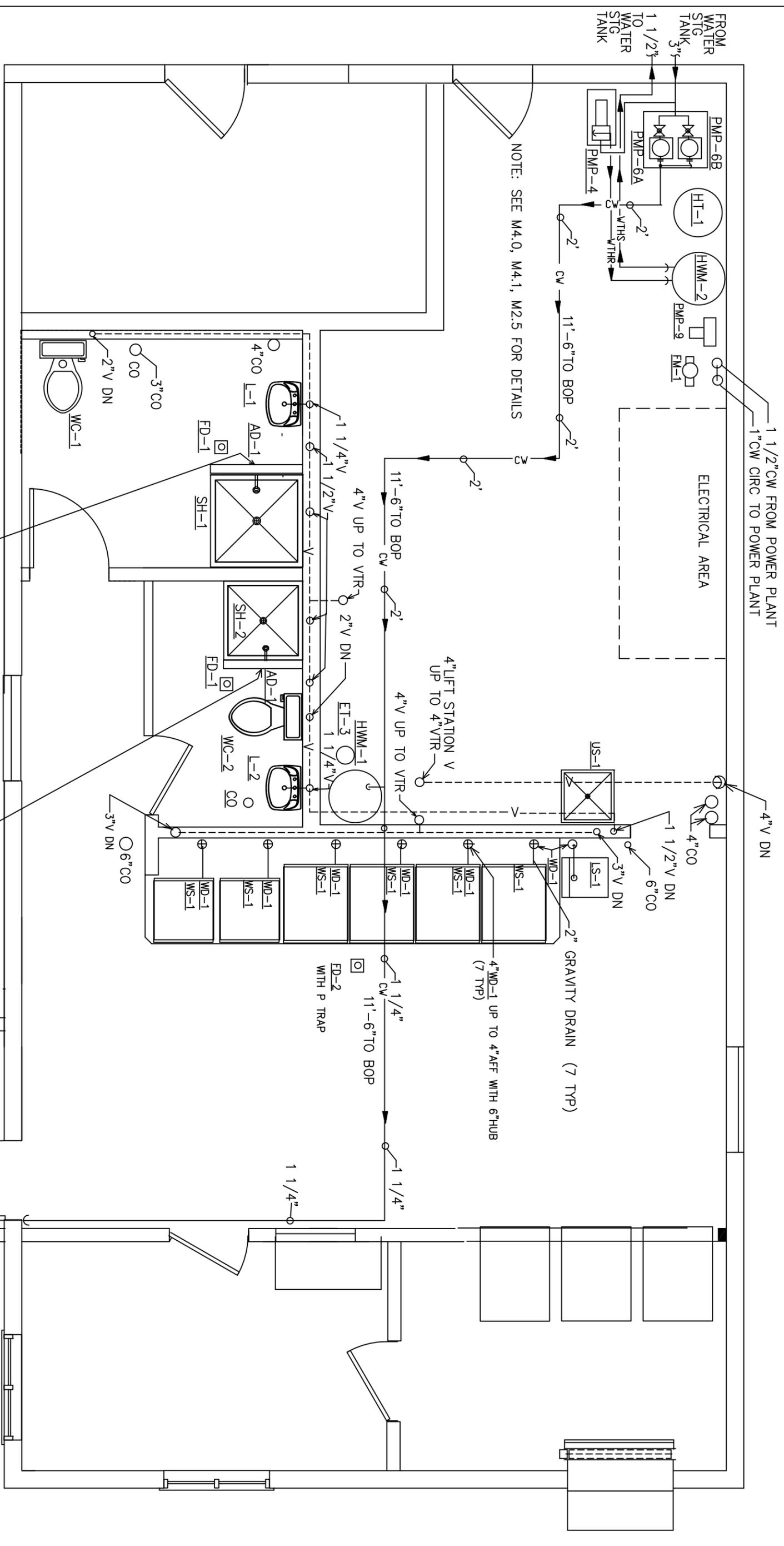
DATE:	JUNE 17, 2016
DRAWN:	F.H. BELZ
CHKD:	AS NOTED
SCALE:	AS NOTED
REVISED:	
JOB NO.:	C389
SHEET NO.:	11
OF	20

UNDERFLOOR PLUMBING PLAN  
 CHEFORNAK WASHETERIA  
 CHEFORNAK, ALASKA



CAPSTONE ENGINEERING LLC  
 MECHANICAL ENGINEERS  
 12110 BUSINESS BLVD STE 6 PMB 169  
 EAGLE RIVER, ALASKA 99577  
 TELEPHONE & TEXT MSG 907-414-1456

NOTE: STRAP HT-1, HMM-1 TO WALL PER CODE FOR SEISMIC



NOTE: SEE M4.0, M4.1, M2.5 FOR DETAILS

PROVIDE ACCESS DOORS (AD-1) FOR SHOWER VALVE MAINTENANCE

# CHEFORNAK WASHETERIA PLUMBING PLAN

SCALE 1/4"=1'-0"

## HB-2 DETAIL

ND SCALE

- 1 1/4" CW THROUGH WALL
- 1 1/4" LOCKABLE BALL VALVE NC
- 1 1/4" BRASS MALE CAMLOCK X 1 1/4" FPT CONNECTOR #107112
- 1 1/4" BRASS DUST CAP CAMLOCK DT COUPLER 12V #107112

95% REVIEW - NOT FOR CONSTRUCTION

ROUTE HIGH INSULATE WITH 1" FIBERGLASS- THIS AREA

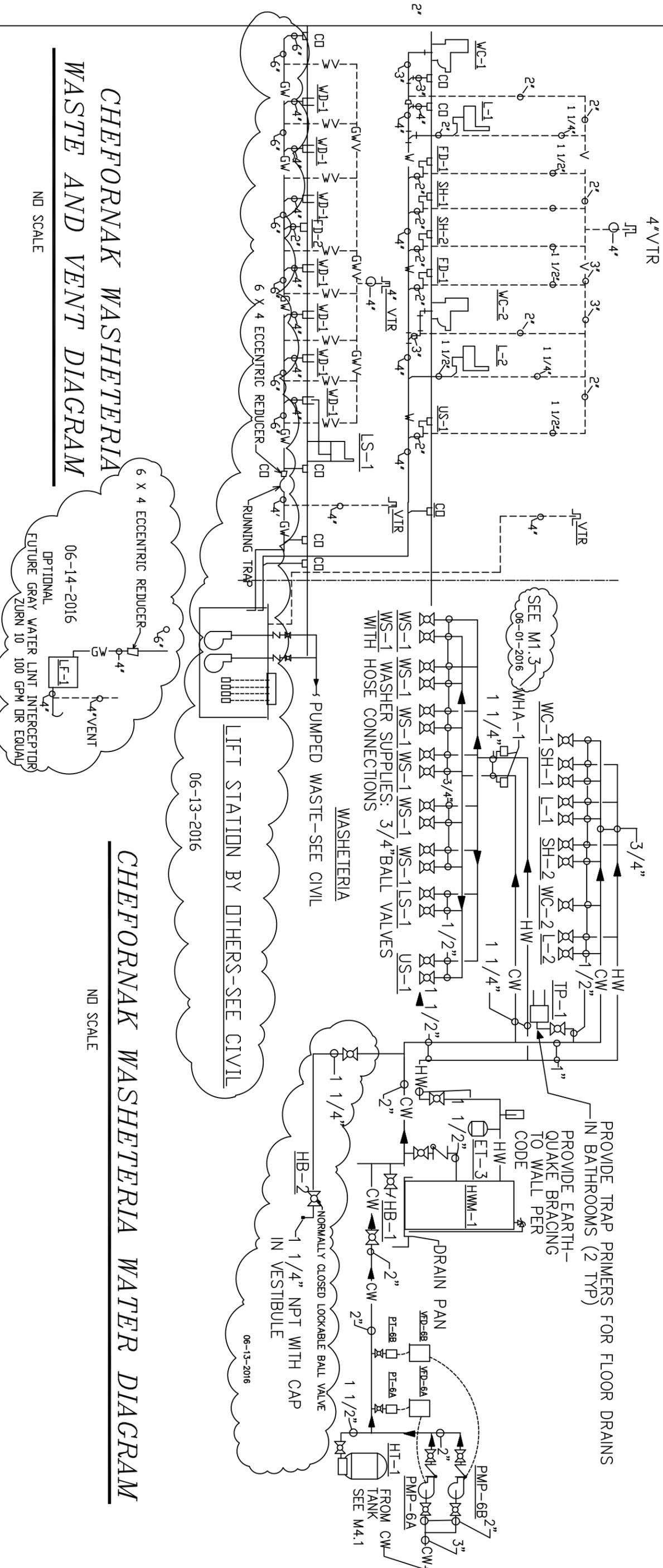
VALVE IN VERTICAL RISER AT 5' 0" AFF PROVIDE 16 GA FLASHING OVER PIPE TO 4'-6" AFF

HB-2 SEE DETAIL- THIS DRAWING CAMLOCK FITTING @3' AFF

<p>PLUMBING PLAN CHEFORNAK WASHETERIA CHEFORNAK, ALASKA</p>		<p><b>CAPSTONE ENGINEERING LLC</b> MECHANICAL ENGINEERS</p> <p>12110 BUSINESS BLVD STE 6 PMB 169 EAGLE RIVER, ALASKA 99577 TELEPHONE &amp; TEXT MSG 907-414-1456</p>
<p>DATE: JUNE 17, 2016 DRAWN: F.H. BELZ CHKD: AS NOTED SCALE: AS NOTED REVISED: _____ JOB NO.: C389</p>	<p>SHEET NO. 12 M-2.1 DF 20</p>	

WASHETERIA

WASHETERIA



**CHEFORNAK WASHETERIA  
WASTE AND VENT DIAGRAM**

ND SCALE

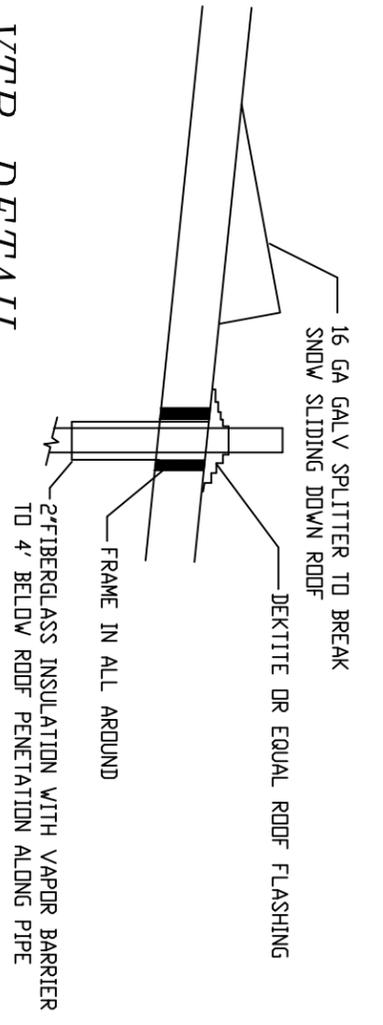
**CHEFORNAK WASHETERIA WATER DIAGRAM**

ND SCALE

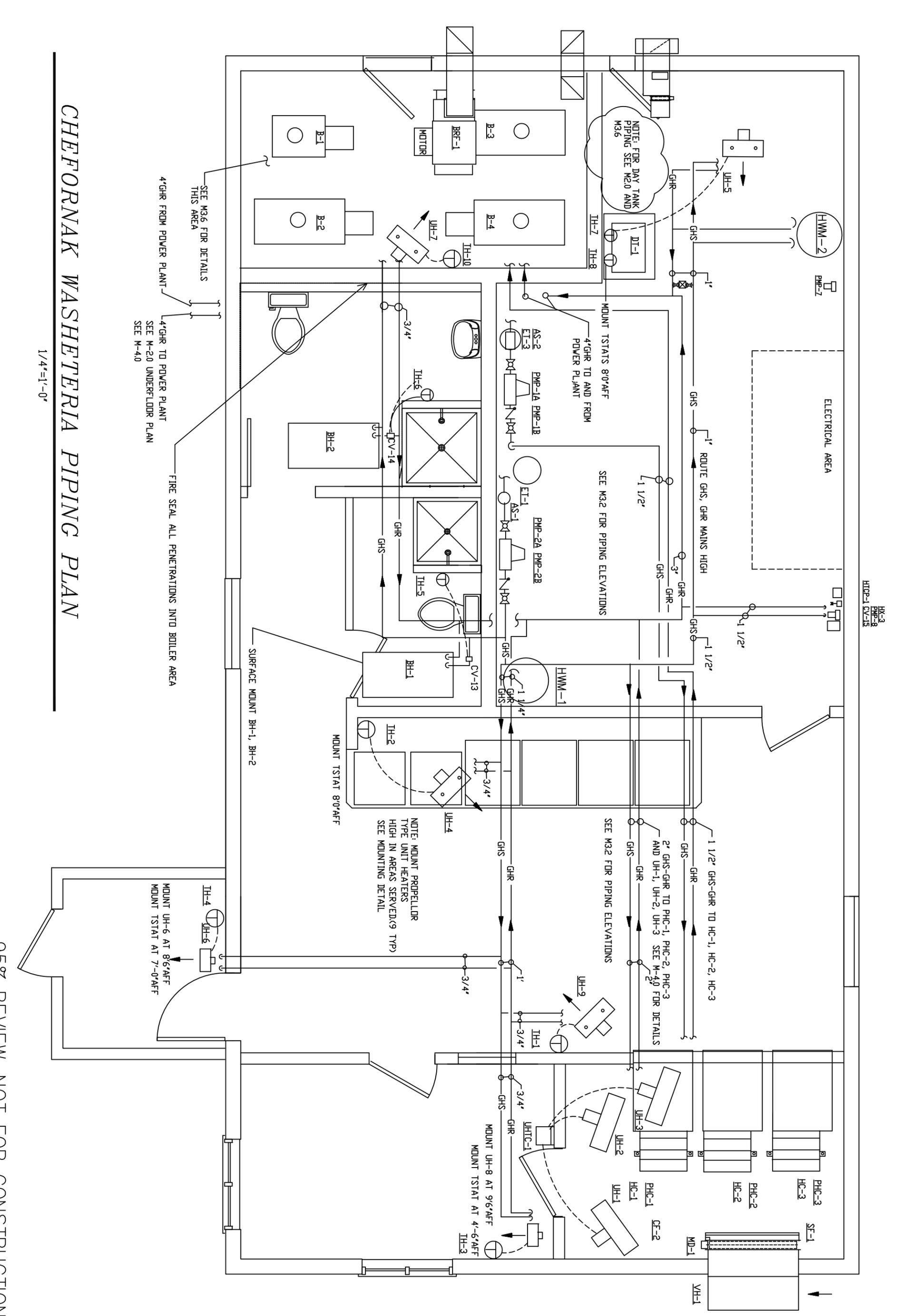
PLUMBING FIXTURE CONNECTION SCHEDULE	WASTE	VENT	CW	HW	DESCRIPTION
LS-1	2"IND	1 1/2"	1/2"	1/2"	FLOOR MOUNT LAUNDRY SINK
L-1	1 1/2"	1 1/4"	1/2"	1/2"	LAVITORY
L-2	1 1/2"	1 1/4"	1/2"	1/2"	LAVITORY
WC-1	3"	2"	1/2"		WATER CLOSET-FLUSH TANK
WC-2	3"	2"	1/2"		WATER CLOSET-FLUSH TANK
FD-1	2"	1 1/2"			FLOOR DRAIN-WOOD FLOOR TYPE
FD-2	2"IND				FLOOR DRAIN-WOOD FLOOR TYPE
HB-1			1/2"		1/4 TURN LOCKABLE BALL VALVE TYPE 06-13-2016
HB-2			1 1/4"		1/4 TURN LOCKABLE BALL VALVE TYPE
WS-1			3/4"	3/4"	WASHER WATER SUPPLY USE BALL VALVES
ET-3			3/4"		EXPANSION TANK
WD-1	4"IND				WASHER DRAIN
SH-1	2"	1 1/2"	1/2"	1/2"	SHOWER-HANDICAP
SH-2	2"	1 1/2"	1/2"	1/2"	SHOWER
US-1	2"	1 1/2"	1/2"	1/2"	UTILITY SINK

**VTR DETAIL**

ND SCALE



95% REVIEW—NOT FOR CONSTRUCTION



# CHEFORNAK WASHETERIA PIPING PLAN

1/4"=1'-0"

95% REVIEW-NOT FOR CONSTRUCTION

DATE:	JUNE 17, 2016
DRAWN:	F.H. BELZ
CHKD:	AS NOTED
SCALE:	AS NOTED
REVISED:	
JOB NO.:	C389
SHEET NO.:	14 OF 20

**MECHANICAL PLAN-PIPING**  
**CHEFORNAK WASHETERIA**  
**CHEFORNAK, ALASKA**



**CAPSTONE ENGINEERING LLC**  
**MECHANICAL ENGINEERS**  
 12110 BUSINESS BLVD STE 6 PMB 169  
 EAGLE RIVER, ALASKA 99577  
 TELEPHONE & TEXT MSG 907-414-1456

# CHEFORNAK WASHETERIA MECH ROOM HVAC PLAN

1/4"=1'-0"

## TRANSFER GRILLE DETAIL

ND SCALE

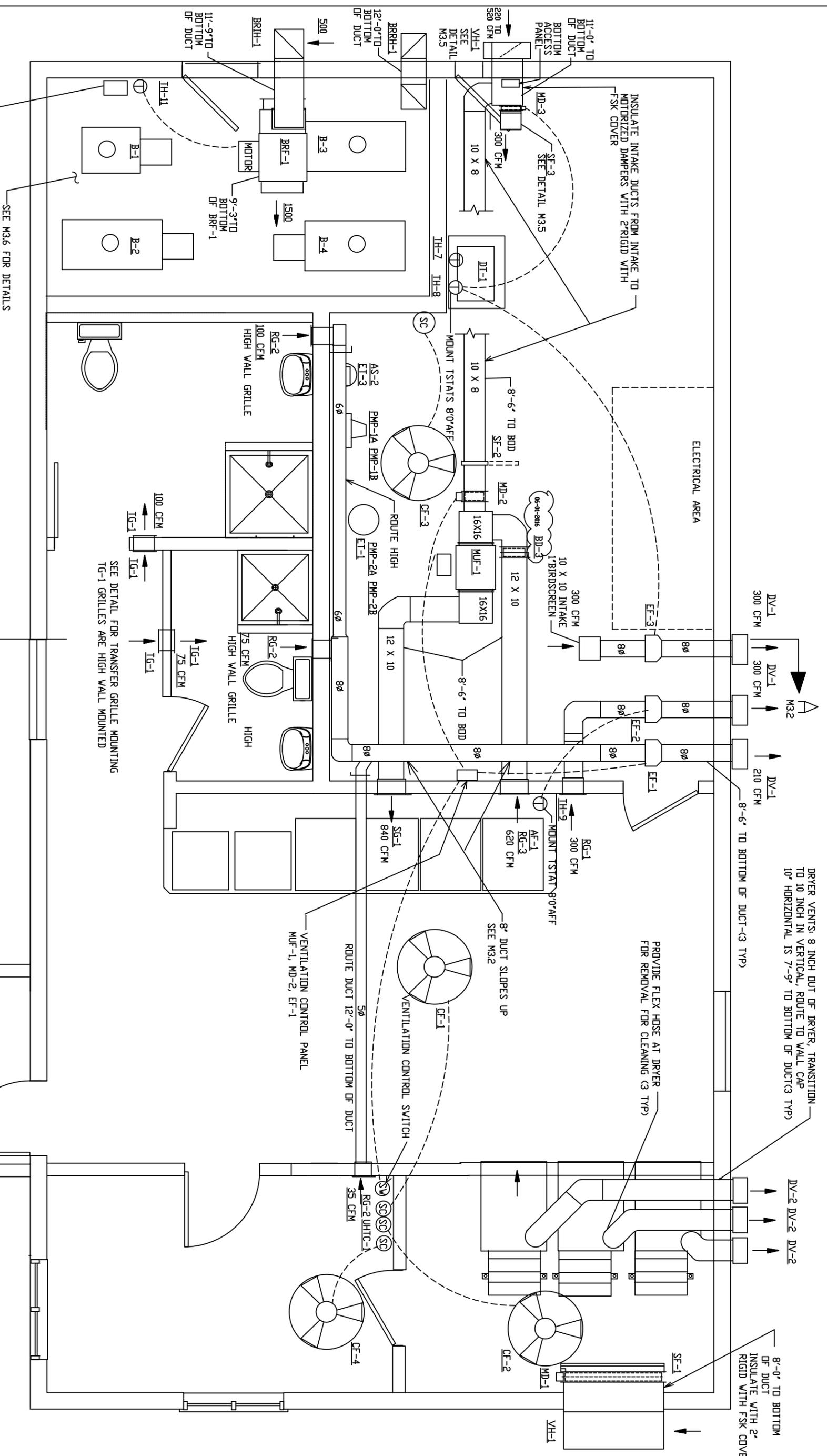
95% REVIEW—NOT FOR CONSTRUCTION

INTERLOCK TO START FAN (BRF-1) ON BOILER FIRING  
SEE DWG M-16 FOR DETAIL

SEE M3.6 FOR DETAILS  
THIS AREA

10" V X 3 1/2" D WALL SLEEVE  
OFFSET GRILLES FOR ND SEE THROUGH M3.2

SEE DETAIL FOR TRANSFER GRILLE MOUNTING  
TG-1 GRILLES ARE HIGH WALL MOUNTED



MECHANICAL PLAN—HVAC  
CHEFORNAK WASHETERIA  
CHEFORNAK, ALASKA



CAPSTONE ENGINEERING LLC  
MECHANICAL ENGINEERS

12110 BUSINESS BLVD STE 6 PMB 169  
EAGLE RIVER, ALASKA 99577  
TELEPHONE & TEXT MSG 907-414-1456

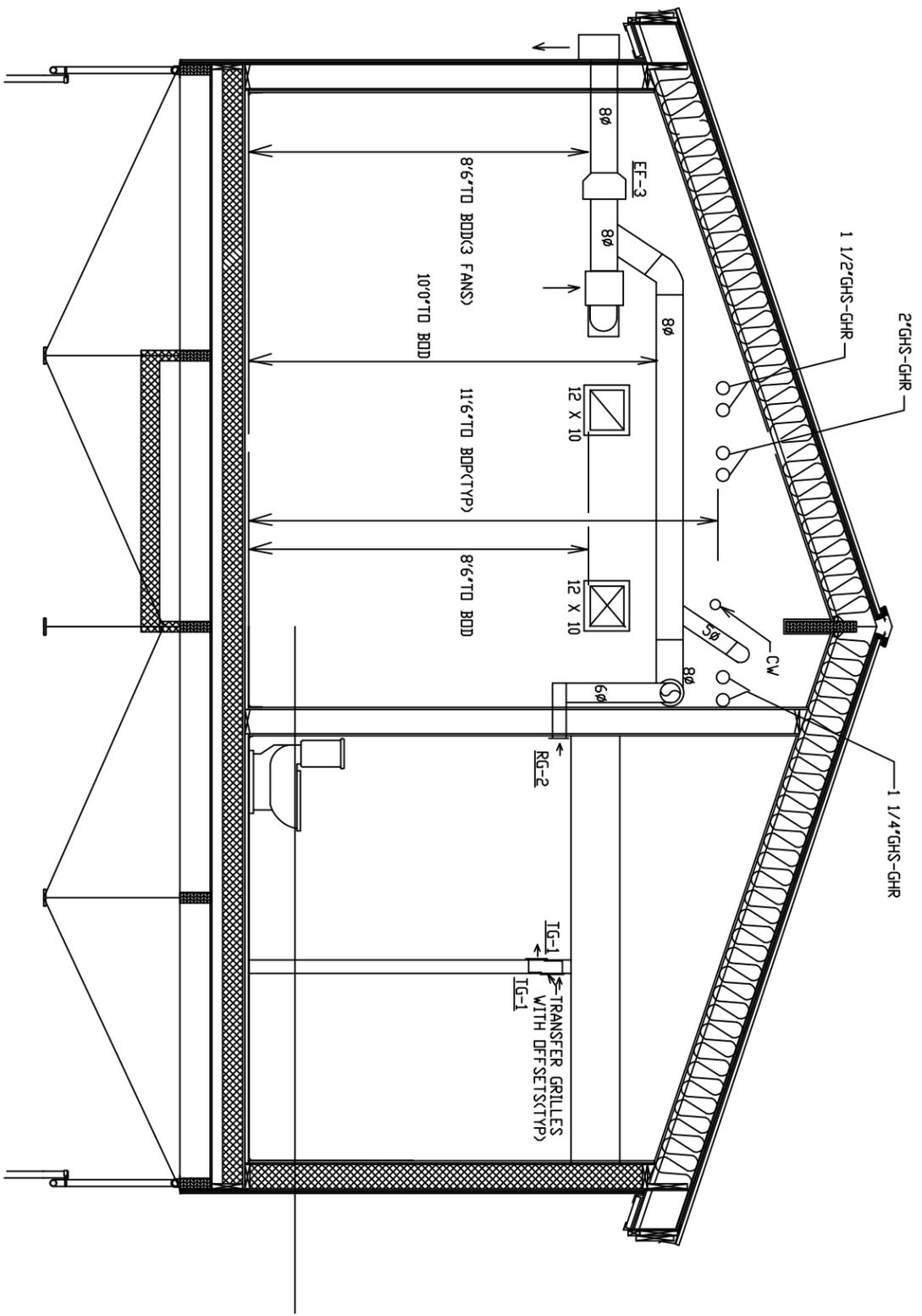
SHEET NO.	15 OF
M-31	20
DATE:	JUNE 17, 2016
DRAWN:	F.H. BELZ
CHKD:	AS NOTED
SCALE:	AS NOTED
REVISED:	
JOB NO.:	C889

12110 BUSINESS BLVD STE 6 PMB 169  
 EAGLE RIVER, ALASKA 99577  
 TELEPHONE & TEXT MSG 907-414-1456

**CAPSTONE ENGINEERING LLC**  
**MECHANICAL ENGINEERS**



**MECHANICAL SECTIONS-DETAILS**  
**CHEFORNAK WASHETERIA**  
**CHEFORNAK, ALASKA**

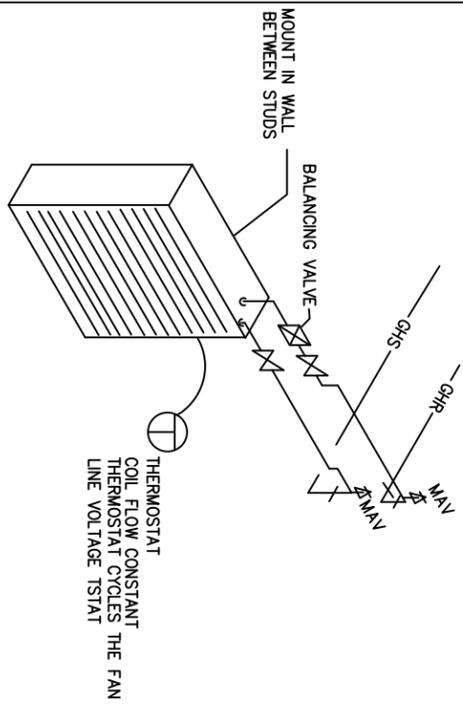


**CHEFORNAK WASHETERIA MECH SECTION A-A**

1/4"=1'-0"

95% REVIEW-NOT FOR CONSTRUCTION

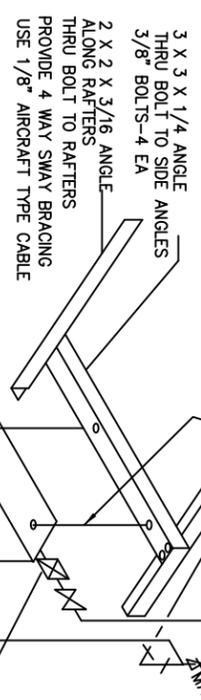
DATE:	JUNE 17, 2016
DRAWN:	F.H. BELZ
CHKD:	AS NOTED
SCALE:	AS NOTED
REVISED:	
JOB NO.:	C389
SHEET NO.:	16 OF 20
M-31	



**UH-6, UH-8 DETAIL**

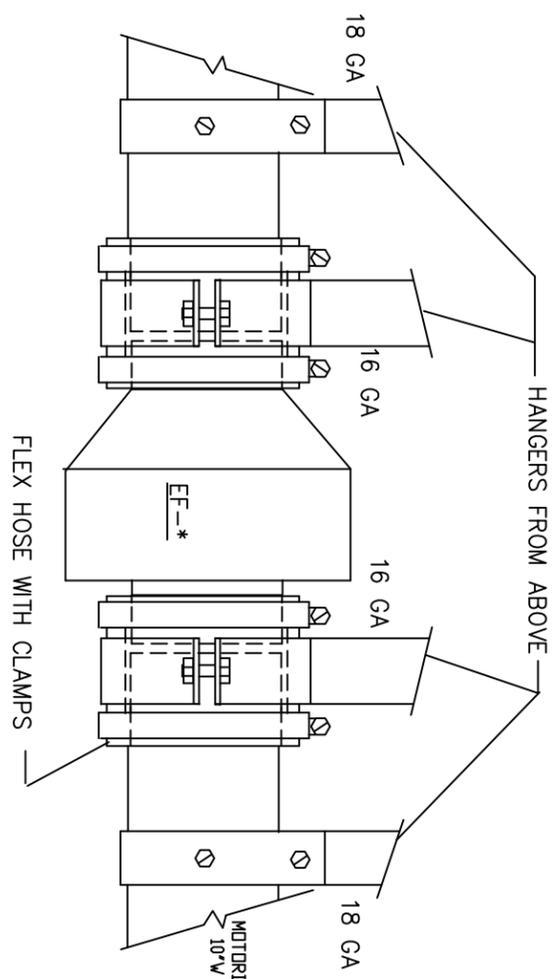
ND SCALE

HANGERS PER MFGS INSTALLATION INSTRUCTIONS



**UH-1, UH-2, UH-3, UH-4, UH-5, UH-7, UH-9  
UNIT HEATER MOUNTING DETAIL**

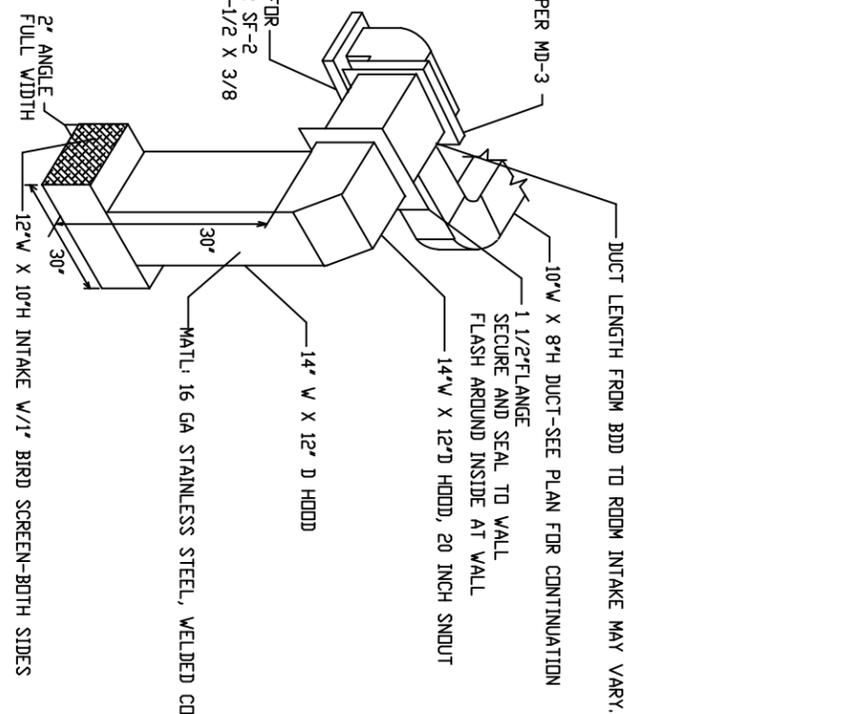
ND SCALE



**EF-1, EF-2, EF-3 DETAIL**

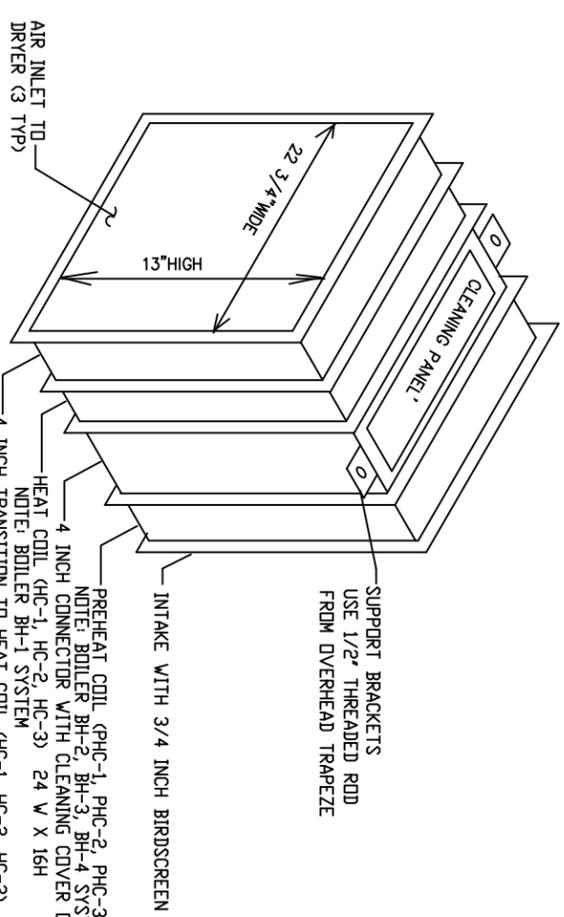
ND SCALE

FILTER RACK FOR SUMMER FILTER SF-2 FILTER 8-3/4 X 10-1/2 X 3/8



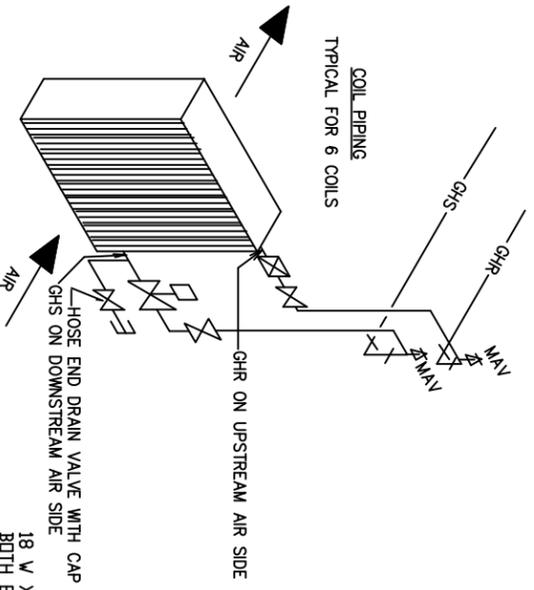
**VH-1 INTAKE HOOD**

ND SCALE

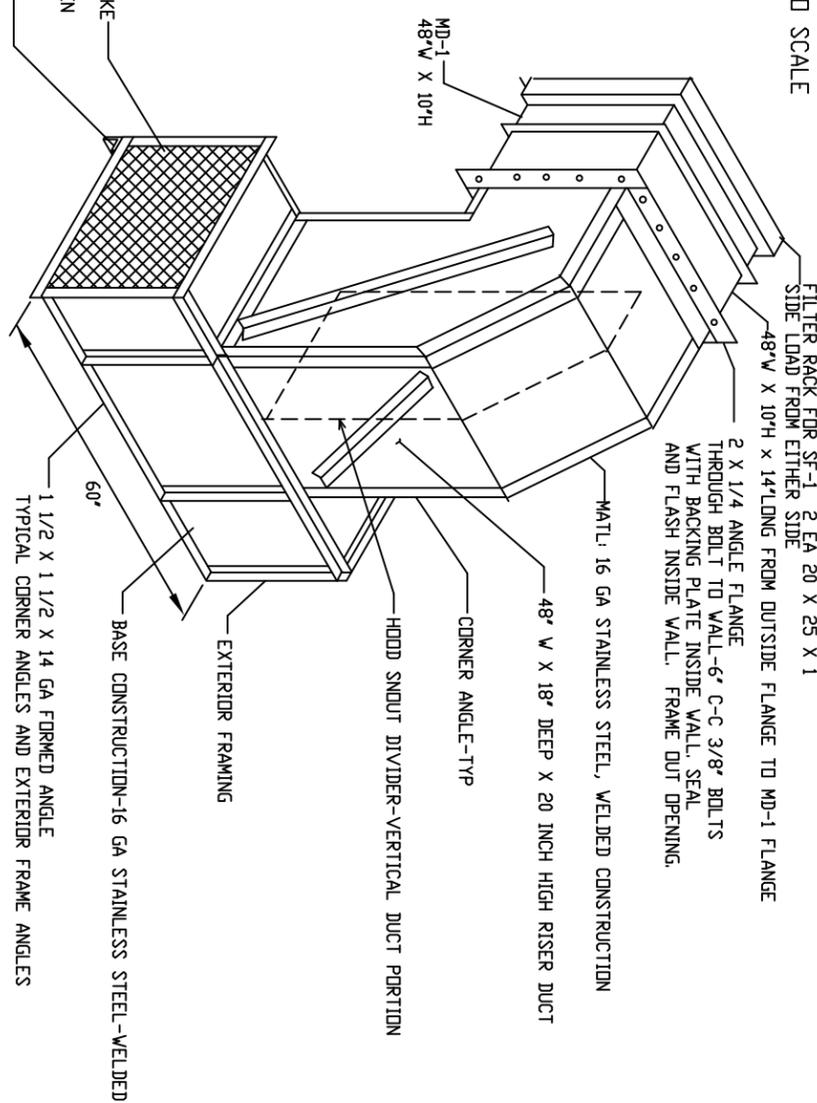


**DRYER HEAT COILS - PHC AND HC**

ND SCALE



2 X 1/4 ANGLE FLANGE FOR CONNECTION TO WALL THROUGH BOLT TO WALL-6\"/>



**DIH-1 INTAKE HOOD DETAIL**

ND SCALE

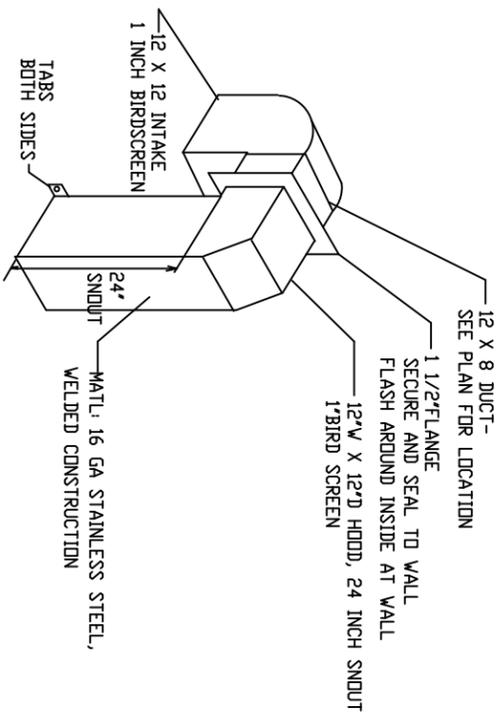
95% REVIEW-NOT FOR CONSTRUCTION

SHEET NO.	17 OF 20
DATE:	JUNE 17, 2016
DRAWN:	F.H. BELZ
CHKD:	AS NOTED
SCALE:	AS NOTED
REVISED:	
JOB NO.:	C889

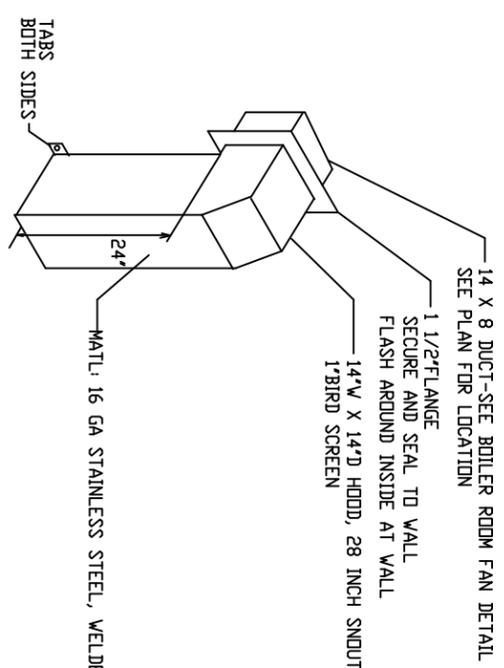
**HVAC AND HEATING DETAILS**  
**CHEFORNAK WASHETERIA**  
**CHEFORNAK, ALASKA**



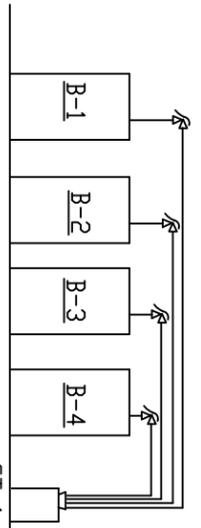
**CAPSTONE ENGINEERING LLC**  
**MECHANICAL ENGINEERS**  
 12110 BUSINESS BLVD STE 6 PMB 169  
 EAGLE RIVER, ALASKA 99577  
 TELEPHONE & TEXT MSG 907-414-1456



BOILER ROOM RELIEF HOOD **BRRH-1**



BOILER ROOM INTAKE HOOD **BRH-1**

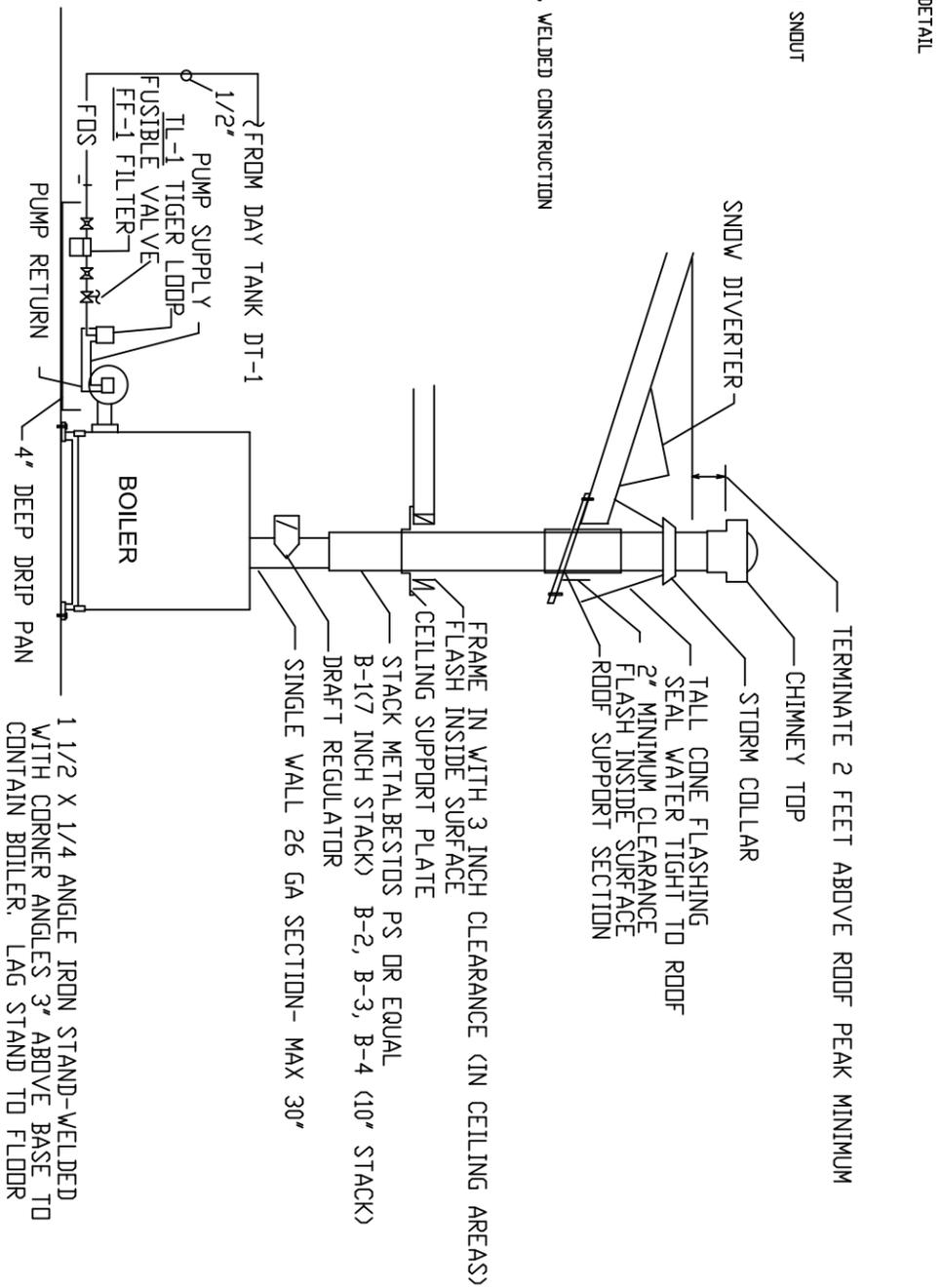


NOTE: ROUTE RELIEF VALVES FULL SIZE TO GLYCOL TANK WITH AIR GAP

GT-1 GLYCOL TANK

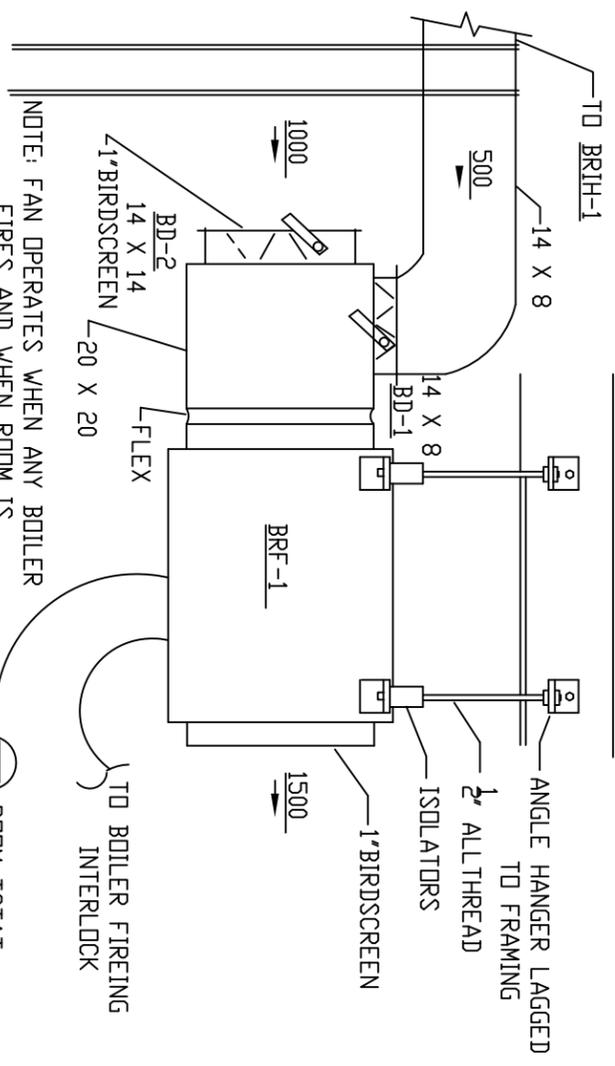
**BOILER RELIEF VALVE PIPING**

NO SCALE



**BOILER FUEL OIL & STACK DETAIL (4 TYP)**

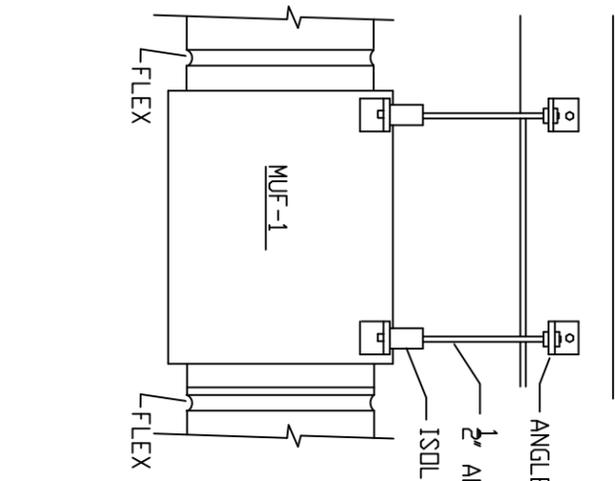
NO SCALE



NOTE: FAN OPERATES WHEN ANY BOILER FIRES AND WHEN ROOM IS ABOVE 85 F

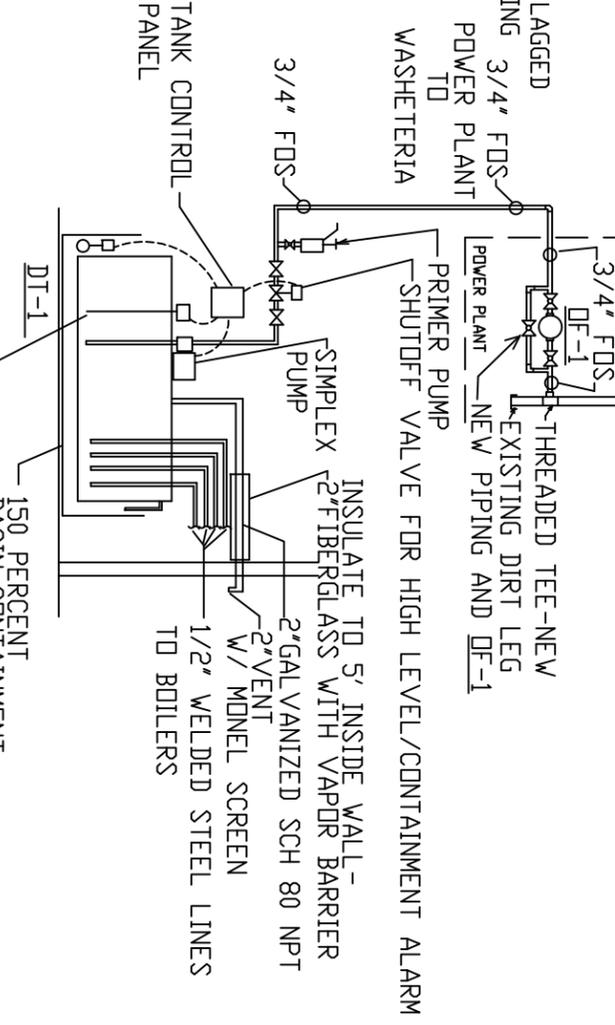
**BOILER ROOM FAN MOUNTING DETAIL**

NO SCALE



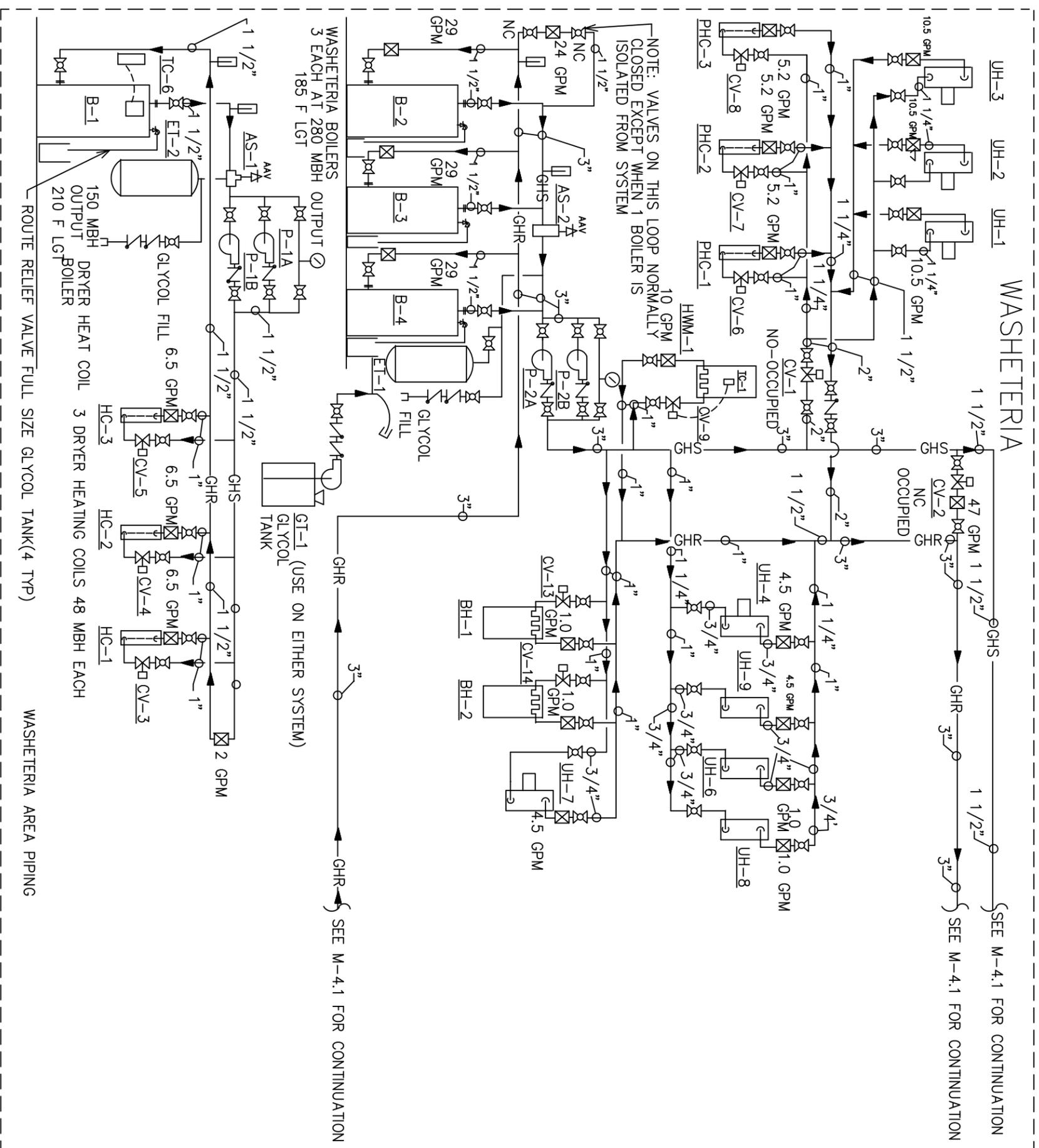
**MUF-1 MOUNTING DETAIL**

NO SCALE



**DAY TANK PIPING DIAGRAM**

NO SCALE 95% REVIEW-NOT FOR CONSTRUCTION



**CHEFORNAK WASHETERIA HEATING AND WATER SUPPLY DIAGRAM #1**

95% REVIEW-NOT FOR CONSTRUCTION

<p><b>HEATING AND WATER SUPPLY DIAGRAM #1</b> <b>CHEFORNAK WASHETERIA</b> <b>CHEFORNAK, ALASKA</b></p>		<p><b>CAPSTONE ENGINEERING LLC</b> <b>MECHANICAL ENGINEERS</b></p> <p>12110 BUSINESS BLVD STE 6 PMB 169 EAGLE RIVER, ALASKA 99577 TELEPHONE &amp; TEXT MSG 907-414-1456</p>
<p>DATE: JUNE 17, 2016 DRAWN: F.H. BELZ CHKD: AS NOTED SCALE: REVISED: JOB NO.: C389</p>	<p>SHEET NO. M-4.0 19 OF 20</p>	

