**Legend & Schedules**

**Mechanical**

- **Static Pressure Sensor**
- **Balancing Damper**
- **Supply Air Reg. Grille, or Diffuser**
- **Return/Exhaust Air Reg. or Grille**
- **Thermally Insulated Duct or Pipe**
- **Return Air Slot**
- **Acoustically Lined Duct**
- **Heating Coil**
- **Motor Operated Damper**
- **Supply Air Slot W/Flex Duct**
- **Flexible Duct**
- **Return Air Thermostat**
- **Automatic Air Vent**
- **Outside Air**
- **Exhaust Air**
- **Supply Air**
- **Thermostat**
- **Heating Water Supply**
- **Heating Water Return**
- **Glycol Supply**
- **Glycol Return**
- **Relief Valve**
- **Check Valve**
- **TWO-WAY MOTOR OPERATED VALVE**
- **TWO-WAY MOTOR OPERATED VALVE**
- **Pressure Relief Valve**
- **Reducing/Comparison Valve**
- **Filter**
- **Fire Department Connection**
- **Cubic Feet/Minute**
- **Hose Bibb**
- **Hot Water Circulation**
- **Tempered Water**
- **Return Air, Relief Air**
- **Cold Water**
- **Waste**
- **Vents**
- **Strainer With Drain Valve**
- **Pressure Gage**
- **Pipe Anchor**
- **Pipe Guide**
- **Union**
- **TWO-WAY MOTOR OPERATED VALVE**
- **3-WAY MOTOR OPERATED VALVE**
- **RELIEF VALVE**
- **BBVEN**
- **BALANCING/ISOLATION VALVE**
- **BALL VALVE**
- **NOT IN CONTRACT**

**Abbr.**

- **EXISTING**
- **POINT OF CONNECTION**
- **BACKDRAFT DAMPER**
- **ABOVE FINISHED FLOOR**
- **SANITARY SOIL**
- **WATER METER**
- **FLOOR DRAIN**
- **FLOOR CLEANOUT**
- **FIRE DEPARTMENT CONNECTION**
- **WATER SOFTENER**
- **HEATING WATER RETURN**
- **HEATING WATER SUPPLY**
- **GALVANIZED STEEL DUCT**
- **ACRISTAL**
- **VAV**
- **AFF**
- **BDD**
- **CFM**
- **CO**
- **CV**
- **CW**
- **(E)**
- **E/A**
- **FCO**
- **FDC**
- **FD**
- **GS**
- **GR**
- **HB**
- **HC**
- **HW**
- **HWC**
- **HWR**
- **HWS**
- **MOD**
- **MOV**
- **MOV**
- **NIC**
- **O/A**
- **POC**
- **PRV**
- **R/A**
- **RV**
- **S/A**
- **SL**
- **TW**
- **T'STAT**
- **T'STAT**
- **V**
- **VTR**
- **WCO**
- **W**
- **( % )**

**Explanation**

This is a standard legend, some symbols shown on legend are not necessarily on the drawing.
KENAI SUPPLY BUILDING RENOVATION
ALASKA RAILROAD CORPORATION

LEVEL 1 - HVAC PLAN

1. HEATING AND GAS LINES SHOWN DIAGRAMMATICALLY FOR CLARITY. ROUTE LINES ON WALL.
2. ROUTE NEW DUCTWORK IN RETAIL EXPOSED, UNDER CEILING GRID.
3. FIELD VERIFY SPRINKLER HEAD AND SECURITY CAMERA LOCATIONS. ADJUST DUCT ROUTING TO AVOID OBSTRUCTIONS.

HEAT EXCHANGER SCHEMATIC, SEE 3/M-4

FOR PIPING CONTINUATION SEE 1/M-3

MAKE CONNECTION TO (E) GAS METER

P.O.C. TO (E) CEILING EXHAUST FAN

HEAT EXCHANGER SCHEMATIC, SEE 3/M-4

CAP & DEMO 3/4" HWS & HWR UP TO UH-6B

HALL 114

TOILET 106

T./SHOWER 105

BOILER/RISER 115

OFFICE 112

OFFICE 111

OFFICE 110

TELECOM 108

GARAGE 107

RETAIL 101

RETAIL STORAGE 119

VEST. 100

STAIRWELL 100A

HC-1, 7.8 MBH, 0.8 GPM

GUH-1, SEE 1/M-5

GUH-2, SEE 1/M-5

5"Ø B-VENT UP

12"Ø UP

1-1/4" G

1-1/2" GS

1-1/2" GS

1-1/2" GR

1-1/2" HWS

1-1/2" HWR

1" HWS UP

1" HWR UP

1" HWS UP

1" HWR UP

26x26 R/A UP

26x26 O/A

UP

24x14

12x12

16x14

24x14

12x12

16x14

24x14

12x12

16x14

34x14 W/1" SOUND LINER

34x14

24x28

24x14

3,450 CFM

345 CFM

26x18

26x18

75 MBH, 3.5 GPM

UH-6A

UH-2, 10 MBH, 1.0 GPM

HC-2

HC-1

2" HWS

2" HWR

1" HWS

1" HWR

2" HWS

2" HWR

HEAT EXCHANGER SCHEMATIC, SEE 3/M-4

FOR PIPING CONTINUATION SEE 1/M-3

CU-1, ON 3 INCH CONCRETE PAD, MINIMUM 36" FROM WALL AND FENCE PER MFG INSTALL GUIDE

CULL 3/4 SILENCER TO 3" WALL CAP

NO 3/4" SILENCER TO GAS LINE

3/4" G

3/4" G

3/4" HWR UP TO UH-6B

1" HWR UP TO UH-6B

26x18

26x18

5-1/2" HWS

5-1/2" HWR

3-1/2" HWS UP

3-1/2" HWR UP

26x26 R/A UP

26x26 O/A

UP

24x14

12x12

16x14

24x14

12x12

16x14

24x14

12x12

16x14

34x14 W/1" SOUND LINER

34x14

24x28

24x14

3,450 CFM

345 CFM

26x18

26x18

75 MBH, 3.5 GPM

UH-6A

UH-2, 10 MBH, 1.0 GPM

HC-2

HC-1

2" HWS

2" HWR

1" HWS

1" HWR

2" HWS

2" HWR

HEAT EXCHANGER SCHEMATIC, SEE 3/M-4

FOR PIPING CONTINUATION SEE 1/M-3

CU-1, ON 3 INCH CONCRETE PAD, MINIMUM 36" FROM WALL AND FENCE PER MFG INSTALL GUIDE

CULL 3/4 SILENCER TO 3" WALL CAP

NO 3/4" SILENCER TO GAS LINE

3/4" G

3/4" G

3/4" HWR UP TO UH-6B

1" HWR UP TO UH-6B

26x18

26x18

5-1/2" HWS

5-1/2" HWR

3-1/2" HWS UP

3-1/2" HWR UP

26x26 R/A UP

26x26 O/A

UP

24x14

12x12

16x14

24x14

12x12

16x14

24x14

12x12

16x14

34x14 W/1" SOUND LINER

34x14

24x28

24x14

3,450 CFM

345 CFM

26x18

26x18

75 MBH, 3.5 GPM

UH-6A

UH-2, 10 MBH, 1.0 GPM

HC-2

HC-1

2" HWS

2" HWR

1" HWS

1" HWR

2" HWS

2" HWR

HEAT EXCHANGER SCHEMATIC, SEE 3/M-4

FOR PIPING CONTINUATION SEE 1/M-3

CU-1, ON 3 INCH CONCRETE PAD, MINIMUM 36" FROM WALL AND FENCE PER MFG INSTALL GUIDE

CULL 3/4 SILENCER TO 3" WALL CAP

NO 3/4" SILENCER TO GAS LINE
OFFSET DUCTWORK OVER LIGHTS RUNNING DOWN HALLWAY 217.
4. DUCTWORK SHALL BE ROUTED TIGHT TO BEAMS. BOTTOM OF DUCT SHALL REMAIN HIGHER THAN 1/4 PER SC.
5. RECONFIGURE SPRINKLER BRANCH LINES AND HEADS AS REQUIRED TO ACCOMMODATE HVAC SYSTEM.
DEMOLISH EXISTING GAS LINE TO MECHANICAL ROOM, PROVIDE NEW GAS LINE TO METER.

1-1/2" HWR
2" HWR

DEMO 3/4" HWR FROM UH-3
(E) 1-1/2" HWR FROM UH-2
(E) 1-1/2" HWR FROM UH-1
(E) 3/4" HWR FROM UH-1

(E) 3/4" HWR TO UH-1
(E) 3/4" HWR TO UH-2
(E) 3/4" HWR TO UH-3
(E) 3/4" HWR TO UH-6A

(E) 3/4" HWS TO UH-1
(E) 3/4" HWS TO UH-2
(E) 3/4" HWS TO UH-3
(E) 3/4" HWS TO UH-6A

(E) 1-1/2" HWS TO UH-1
(E) 1-1/2" HWS TO UH-2
(E) 1-1/2" HWS TO UH-3
(E) 1-1/2" HWS TO UH-6A

DEMO Piping with 1/2" Hose End, Cap and Chain (Typ.)
INSTALL PIPING AT HEAT EXCHANGER TO ALLOW MAINTENANCE ACCESS.
1.1 PROJECTS SITE CONDITIONS

A. Install work in locations shown on drawings, unless prevented by project conditions.
B. Provide information showing transformed requirements of the project conditions, including changes to work scope and site work performance in site conditions not in the contract. Obtain written consent of Owner before proceeding.

1.1.7 SUBMITTALS

A. Submit a revised item for general design and engineering only and does not replace any of the contract documents. Provide a complete list of satisfactory installation is within the scope of the contract.
B. Submittals shall be made in accordance with Division 1 requirements.

1.2 OPERATIONS AND MAINTENANCE MANUALS

A. Provide Operation and Maintenance (O&M) Manuals for training of personnel and reference by Owner’s personnel in operations and maintenance of systems and related equipment. Each manual in a hardbound, thumb-indexed, three-ring binder. Use 1-1/2" = 11 white paper.
B. Submittal of O&M Manuals shall be made in accordance with Division 1 requirements.

1.3 SEISMIC RESTRRAINT

A. Contractor shall submit structural calculations and drawings/engraved work drawings for seismic restraint of all mechanical components and equipment, including ductwork and piping. Calculations to be performed in accordance with the requirements of Chapter 9 of the 2012 International Building Code. This code contains information on mechanical systems and equipment related to the seismic design of buildings. The International Building Code is adopted by the State of Alaska.
B. Seismic design detail to be based on Seismic Occupancy Category II and Seismic Design Category C.

1.4 PART 2 - PROJECTS

2.1 SUPPORTS AND ANCHORS

2.1.1 PIPE HANGERS AND SUPPORTS

A. Hangers for pipe over 1/2 to 1-1/2 inch: Adjustable elbow, long hanger.
B. Hangers for pipe sizes 2 to 4 inches: Adjustable, swivel.
C. Michigan Hanger Co. Model No. 100 for steel and pipe and Model #101 for copper pipe.
D. Pipe hanger spacing per Uniform Plumbing Code.
E. Install hangers to provide minimum 1/4 inch space between hanger and elbows, coating and adjacent work. Place a hanger within 12 inches of each horizontal elbow. Steel hangers with 1-inch minimum vertical adjustment.

2.2 HANGER RODS

A. Steel hanger rods: Threaded both ends, threaded one end, or continuous threaded.

2.2.1 PIPE INSULATION

A. Insulation:ULO-1231.
B. Pipe Insulation:ASTM C832.
C. Insulation Anchors:UL 581.

2.2.2 PIPE FITTINGS

A. Elbows: 90 degrees, variable swivel elbow.
B. Reducing Tee: 1-1/2 inch female x 1-1/2 inch male x 1/2 inch male, inside diameter.
C. Reducing Coupling: 1-1/2 inch female x 1-1/2 inch male, inside diameter.
D. Reducing Union: 1-1/2 inch female x 1-1/2 inch male, inside diameter.
E. Reducing Coupling: 1-1/2 inch male x 1 inch female, inside diameter.
F. Reducing Tee: 1-1/2 inch female x 1 inch female x 1/2 inch male, inside diameter.
H. Insulation Anchors:UL 1231.

2.2.3 PIPE SPACING

A. Horizontal pipe runs shall be spaced 30" minimum apart. Vertical pipe runs shall be spaced 18" minimum apart.

2.2.4 INSULATED PIPE FITTINGS

A. Insulated Tee: 1-1/2 inch female x 1 inch female x 1/2 inch male, inside diameter.
B. Insulated Reducing Union: 1-1/2 inch female x 1 inch female, inside diameter.
C. Insulated Reducing Union: 1-1/2 inch female x 1 inch male, inside diameter.
D. Insulated Reducing Tee: 1-1/2 inch female x 1 inch male x 1/2 inch male, inside diameter.
E. Insulated Reducing Tee: 1-1/2 inch male x 1 inch female x 1/2 inch male, inside diameter.
F. Insulated Reducing Tee: 1-1/2 inch male x 1 inch male x 1/2 inch female, inside diameter.

2.3.4 PIPE FITTINGS

A. Insulation:ULO-1231.
B. Pipe Insulation:ASTM C832.
C. Insulation Anchors:UL 581.
D. Insulation Anchors:UL 406.
E. Insulation Anchors:UL 1231.
F. Insulation Anchors:UL 2850.
G. Insulation Anchors:UL 2500.
H. Insulation Anchors:UL 2250.

2.3.5 PIPE SPACING

A. Horizontal pipe runs shall be spaced 30" minimum apart. Vertical pipe runs shall be spaced 18" minimum apart.

2.4 SPRINKLER SYSTEM

A. Provide system design, materials, tools, equipment, supervision, labor, and temperature control to perform work in accordance with project specifications.
B. Provide a complete wet type sprinkler system.
C. Coordinate and resolve details to achieve compatibility between the sprinkler system and other building elements.
D. Provide system to IBC and NFPA 13A.
E. Provide system to vacuum test 2.2.4 in accordance with project specifications.
F. Convey piping, except in mechanical spaces and unfinished spaces.
G. All materials shall be UL or FM label or marked.
H. Coordinate sprinkler piping and fixed automatic sprinkler systems, such as automatic fire, fire extinguishers, and associated controls.
I. Obtain written testing of major and small work.

2.5.1 PLUMBING AND HYDRONIC PIPING

A. Heating, Cooling, and Refrigeration Piping
B. Plumbing, Heating, and Cooling Piping
C. Refrigeration, Heating, and Cooling Piping
D. Domestic Water Piping
E. Sanitary Piping
F. Fire Protection Piping
G. Gas Piping
H. Vacuum Piping

2.5.2 FLANGES, UNIONS, AND COUPLINGS

A. Pipe sizes 2 inch and under: Bored pipe caps for carbon steel pipes. Welded joints.
B. Electrician’s connections: Union with galvanized or plated steel thread end and flange, to be used for water pressure and other piping purposes.

2.5.3 VALVES

A. Select values of the best quality and type suited for the specific service and piping system used. Minimum working pressure rating 125 psi or 100 psi. For all. Ball valves are to be used in lieu of gate valves for proper shut-off service.
B. Ball valves: Up to and including 3 inches: Three-layer, three-piece, stainless steel body, 250 W.P.S. - 150 W.P.S., standard port, stainless steel ball or plug, unlocked, T-Teflon seals, and stuffing box ring, lever handle, socket or brush finish. Material to be compatible with food handler.

2.6.1 REFRIGERATION PIPING

A. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe.
B. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe. American Copper Product, Inc. ASTM B280, Type 1, and/or threaded copper pipe. Incoloy 800, and/or threaded copper pipe.
C. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe. American Copper Product, Inc. ASTM B280, Type 1, and/or threaded copper pipe. Incoloy 800, and/or threaded copper pipe.
D. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe. American Copper Product, Inc. ASTM B280, Type 1, and/or threaded copper pipe. Incoloy 800, and/or threaded copper pipe.
E. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe. American Copper Product, Inc. ASTM B280, Type 1, and/or threaded copper pipe. Incoloy 800, and/or threaded copper pipe.

2.6.2 MATERIALS

A. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe.
B. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe.
C. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe.
D. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe.
E. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe.
F. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe.
G. Copper Tubing: ASTM B280, Type 1, and/or threaded copper pipe.
LEVEL 1 - ELECTRICAL PLAN

ALASKA RAILROAD CORPORATION
KENAI SUPPLY BUILDING RENOVATION

KENAI SUPPLY BUILDING RENOVATION
ALASKA RAILROAD CORPORATION

1. TELEPHONE SERVICE ENTRANCE
2. PANEL SHOP NORTH (SN)
3. MDP
4. CT ENCLOSURE
5. SERVICE DISCONNECT
6. PANEL RS1
7. PANEL RS2
8. DEMOLISH PMP-3 SEE SHEET M-4
9. PANEL SHOP SOUTH (SS)
10. CONNECT GT-1 TO CIRCUIT INDICATED IN PANEL SN2.
11. PANEL O
12. NEW PANEL SN2
13. VFD FURNISHED WITH AHU-1
14. SINGLE POINT EQUIPMENT CONNECTION. PROVIDE CONDUIT FOR CONTROL WIRES (INSTALLED BY MECHANICAL) FROM CU-1 TO AHU-1.
15. CONNECT PMP-4 TO SPARE 20A/1P CIRCUIT BREAKER IN PANEL O.

SN2-1, 3, 5
SN2-2
SN2-4
SN2-6
SN2-7, 9, 11
SN2-8
SN2-10
SN2-12

PANEL - CIRCUIT NUMBER, TYPICAL

#6 AWG, 1"C.

ALASKA RAILROAD CORPORATION

ELECTRICAL PLAN
A. GROUND ALL ELECTRICAL DEVICES, MOTORS, METALLIC PIPING, DUCTWORK, METAL TRIM, SCONCES, WALL SWITCHES, PLASTIC FORMERS, TIME CLOCKS, MOTOR STARTER AND DISCONNECTS (MC = MECHANICAL CONTRACTOR) WHERE SHOWN, PROVIDE FUSED SWITCH TYPE COMBINATION STARTERS FOR ALL ELECTRICAL EQUIPMENT AND ENCLOSURES AS REQUIRED AT THE PANELBOARD. PROVIDE CIRCUIT BREAKERS DESIGNATED "GFI" WITH INTEGRAL CLASS A GROUND FAULT CIRCUIT INTERRUPTER UL LISTED. USE QUICK-BREAK WITH A MINIMUM OF 10,000 AIC RATING AT 120/208 VOLT. MEET NEMA SPECIFICATION W-C-596F TESTS. COLOR TO MATCH EXISTING. PROVIDE OUTLETS REQUIRING PROTECTION WHERE SHOWN, PROVIDE MULTI-POLE CURRENT LIMITING CIRCUIT BREAKERS WHERE SHOWN. PROVIDE MULTI-POLE BREAKERS WITH INTERNAL COMMON TRIP.

B. SUPPLY ALL MATERIAL AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND SHOP DRAWINGS FOR EQUIPMENT OR MATERIAL INSTALLATION INSURED TO MEET DESIGN REQUIREMENTS. PROVIDE APPROPRIATE PROTECTION FOR MANUFACTURED COMPONENTS AND ELECTRICAL MATERIALS. PROVIDE ENCLOSED SWITCHES, DISTRIBUTION CENTER, AND PANELS TO OPERATE SATISFACTORILY IN ACCORDANCE WITH REQUIREMENTS.

C. INSTALL ALL MATERIAL AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND SHOP DRAWINGS FOR EQUIPMENT OR MATERIAL INSTALLATION INSURED TO MEET DESIGN REQUIREMENTS. PROVIDE ENCLOSED SWITCHES, DISTRIBUTION CENTER, AND PANELS TO OPERATE SATISFACTORILY IN ACCORDANCE WITH REQUIREMENTS.

D. INSTALL ALL MATERIAL AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND SHOP DRAWINGS FOR EQUIPMENT OR MATERIAL INSTALLATION INSURED TO MEET DESIGN REQUIREMENTS. PROVIDE ENCLOSED SWITCHES, DISTRIBUTION CENTER, AND PANELS TO OPERATE SATISFACTORILY IN ACCORDANCE WITH REQUIREMENTS.