ALASKA RAILROAD CORPORATION
ENGINEERING SERVICES
P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500

ALL SEASONS CLOTHING COMPANY
RETAIL VENTILATION

KENAI SUPPLY BUILDING
WASILLA SHOPS CIRCLE
WASILLA, ALASKA

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BARROW
WASILLA
ANCHORAGE
VICINITY MAP
This is a standard legend, some symbols shown on the legend are not necessarily on the drawing.
HEATING AND GAS LINES SHOWN DIAGRAMMATICALLY FOR CLARITY. ROUTE LINES ON WALL.

1. ROUTE NEW DUCTWORK IN RETAIL EXPOSED, UNDER CEILING GRID.

2. FIELD VERIFY SPRINKLER HEAD AND SECURITY CAMERA LOCATIONS. ADJUST DUCT ROUTING TO AVOID OBSTRUCTIONS.

3. FOR ENLARGED BOILER ROOM PLAN, SEE (E) ELECTRIC UNIT HEATER UH-5A, 43.6 MBH, 2.6 GPM.

4. FOR PIPING CONTINUATION SEE 1/M-3.

MICHAEL S. MACEDO
ME-11897
1/11/19

ALASKA RAILROAD CORPORATION
KENAI SUPPLY BUILDING RENOVATION

ALASKA RAILROAD CORPORATION
12/22/2014
1. OFFSET DUCTWORK OVER LIGHTS RUNNING DOWN HALLWAY 217.
2. RELOCATE SPRINKLER HEADS AND BRANCHES IN STORAGE 216 AS REQUIRED TO RUN DUCT MAINS.
3. OFFSET UNDER BEAM, THIS LOCATION.
4. DUCTWORK SHALL BE ROUTED TIGHT TO BEAMS. BOTTOM OF DUCT SHALL REMAIN HIGHER THAN 14" PER SC.
5. RECONFIGURE SPRINKLER BRANCH LINES AND HEADS AS REQUIRED TO ACCOMMODATE HVAC SYSTEM.
BOILER ROOM PLAN

- Demolish existing gas line to mechanical room, provide new gas line to meter.
- Install piping at heat exchanger to allow maintenance access.
- Balance valve, GPM per heat exchanger schedule.
- Temperature sensor (TYP.)
- Pressure sensor
- Pressure / temperature test fitting (TYP.)
- Heater with isolation valve (TYP.) at high point.

HEAT EXCHANGER SCHEMATIC

- 2-way modulating control valve
- Pressure / temperature sensor (TYP.)
- Pressure gauge (TYP.)
- Balance valve (TYP.)

AHU-1 ELEVATION

- Minimum 18" raised platform
- 1/2" from air vent
- Full size line from PRV
- 12" from air vent
- 1/2" hose end, cap and chain (TYP.)
- Install piping at heat exchanger to allow maintenance access.
- Balance valve, GPM per heat exchanger schedule.
- Temperature sensor (TYP.)
- Pressure sensor
- Pressure / temperature test fitting (TYP.)
- Heater with isolation valve (TYP.) at high point.

SHEET NOTES

- Demolish existing gas line to mechanical room, provide new gas line to meter.
KENAI SUPPLY BUILDING RENOVATION
ALASKA RAILROAD CORPORATION

GAS FIRED UNIT HEATER DETAIL

RELIEF FAN DETAIL

ROOF HOOD DETAIL

2-WAY HEATING COIL DETAIL

3-WAY HEATING COIL DETAIL
1.1 PROJECT SITE CONDITIONS
A. Install work in locations shown on drawings, unless prevented by project conditions.
B. Provide information showing preexisting conditions and site project conditions, including changes to work specified herein. Work shall be performed in accordance with site conditions not in the contract. Obtain written permission of Owner before proceeding.

2.1 SUBMITTALS
A. Submit for general design and engineering only and does not relieve the Contractor of the responsibility to resolve deficiencies and differences with the Owner.
B. Submit with the Owner a specification for satisfactory installation in the site conditions.
C. Submit shall be made in accordance with Division 1 requirements.

2.2 ELECTRICAL WORK
A. All work shall be in accordance with all applicable national codes and local codes.

2.3 TESTS AND INSPECTIONS
A. Schedule, obtain, and pay all fees and/or costs related to such inspections and by these specifications, to the extent required by the applicable codes or standards.
B. Deficiencies: Immediately correct all deficiencies, which are evidenced during the test and report tests unit system is approved. Do not cover or conceal piping, equipment, or other portions of the mechanical installations until satisfactory tests are made and approved.

3.1 MACHINERIES’ WARRANTIES
A. In the event of equipment or component, it is the Contractor’s responsibility to repair or replace such equipment or component and bear all associated costs. The Contractor is responsible for any and all warranty claims, written or oral, made by Supplier.
B. Shall be made in accordance with Division 1 requirements.

5.1 SEISMIC CONSTRAINT
A. Contractor shall submit structural calculations and structural drawings to shop drawings for seismic evaluation of all mechanical components and equipment, including ductwork and piping. Calculations to be performed in accordance with the requirements of Chapter 22 of the 2012 International Building Code and the in-force ASCE 7.1-12 Minimum Design Loads for Structures on Land. Calculated reinforcement shall be based on ASCE 37-05.
B. Preventive Reinforcement is to be done to structural components in accordance with ASCE 37-05 to prevent structural failures due to seismic forces.
C. Preventive Reinforcement shall be based on ASCE 37-05 to prevent structural failures due to seismic forces.

5.2 SPECIFICATION REQUIREMENTS
A. Insulation installation detail to be shown on drawings. Painting work to be performed in accordance with specifications. Paint specifications to be shown on drawings. Painting work to be performed in accordance with specifications.
B. Preventive Reinforcement shall be done to structural components in accordance with ASCE 37-05 to prevent structural failures due to seismic forces.
C. Preventive Reinforcement shall be based on ASCE 37-05 to prevent structural failures due to seismic forces.
D. Duct insulation shall be constructed in accordance with requirements of ASME B16.26 cast copper.
E. Duct insulation shall be constructed in accordance with requirements of ASME B16.26 cast copper.
F. Duct insulation shall be constructed in accordance with requirements of ASME B16.26 cast copper.
G. Duct insulation shall be constructed in accordance with requirements of ASME B16.26 cast copper.
H. Duct insulation shall be constructed in accordance with requirements of ASME B16.26 cast copper.
2.7 PIPING EXECUTION

2.7.1 INSTALLATION

A. Ream pipe and tube ends. Remove burrs, scale, and/or any sharp edges from pipe ends.

B. Remove scale and dirt on outside of pipe, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

D. Install in accordance with manufacturer’s instructions.

E. Provide non-conducting diaketic connections whenever piping disassembles metal to metal-NEC §250-54.B.

F. Route piping in orderly manner and maintain gradients.

G. Sleeve pipe passing through partitions, walls, and floors.

H. Install piping to conserve building space and not interfere with use of space.

I. Group piping, wherever practical at common elevations.

J. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

K. Install valves with stems upright or otherwise, unless directed otherwise.

L. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and protecting ends of piping sections, or parts of complex system.

M. Provide clearance for installation of insulation and access to valves and fittings. Provide access doors where valves and fittings are not exposed.

N. Where piping support members are needed to structurally build framing, secure, tension, and apply one of these friction pipe to wood.

O. Prepare unfinished pipe, fittings, supports, and accessories for future painting.

P. Use gate valves for shut-off and to isolate equipment, part of systems, or vertical sections of system.

2.7.2 TESTING

A. Heating Water and Glycol Piping Systems

1. Test all water piping hydrostatically, with an internal pressure, of 1.25 times the working pressure, whichever is greater, for a period of four hours. Observe piping during this time period and repair all leaks.

2. Air Test

a. In general, air testing is not desirable due to the presence of conditions that would subject the piping to freezing, however, an equivalent air pressure test may be used as long as it was preceded and obtaining approval from the Contracting Authority.

b. Make the air test by attaching an air compressor testing apparatus to any suitable air source. If the line has any other holes and outlets to the system and units, until there are uniform gauge pressure for 500 minutes, per square inch, or 150% of working pressure, whichever is not more than 150 pounds. The air pressure shall be held without introduction of additional air for a period at least eight hours. Locate all leaks by applying soap solution to all joints. Repair all leaks.

3. Provide certification that testing has been accomplished. Testing certification to be included in project closeout and maintenance manuals.

B. Natural Gas

1. Test all gas piping before connection to gas source. Do not enduce or connect any unintended portion of the system to the gas piping system.

2. Test all piping in accordance with Chapter 4 of the International Fuel Gas Code.

3. Obtain a certificate of final inspection from the Administrative Authority and include in project closeout and operation, maintenance manuals.

2.8 DUCTWORK

2.8.1 DEFINITIONS

A. Duct size - Inside clear dimensions.

2.8.2 MATERIALS

A. General - Non-combustible or conforming to the requirements of Class 1 air duct materials or Class 4.

B. Sheet, ASTM A53, 26 gauge steel, sheet forming quality, having corrosion resistance, 10 gauge per square foot that for each side in conformance with ASTM A53, 26 gauge and 0.0025 inches thick, minimum.

C. Insulated flexible ducts. UL 181, Class 1, flexible duct wrapped with flexible glass fiber insulation, covered by an outer metallic foil facing, rated at 6 inches WCF, 1 inch IWP and a minimum velocity of 4000 fpm.

D. Sealant - Non-hardening, water resistant, fire retardant, compatible with mating materials, liquid used alone or with tape, or heavy paper.

E. Hog ring Steel, galvanized, threaded both ends, threaded one end, or continuously welded - balance at ends.

F. Balancing dampers - Fabricated with lugs supplied by damper manufacturers. Provide concealed type regulator set for inaccessible damper locations.

2.9 AIR HANDLING (Unit 4-34.1)

A. Time Schedule

1. Start and stop test to meet occupancy and HVAC system requirements. Work to start fails to start signaling.

2. Safety Devices

a. Fire Protection: Stop fan and close all air dampers and modulate heating coil in full heat position if temperature after supply fan is 45 degrees F; signal alarm.

b. Smoke Detection: Shuts off power to VFD and closes outside air and exhaust dampers when smoke is detected signal alarm.

3. System Shutdown: When the smoke alarm and temperature alarm fail and the outside and exhaust dampers will close, the return air dampers will open and the heating coil will be closed.

4. Minimum Outside Air When supply fan is on, the outside air dampers open to provide minimum outside air volume for ventilation.

5. Occupied Mode Minimum outside air: one drawing air to return air, 20 degrees F.

6. CO2 Sensor located in return air duct to operate outside air damper to maintain less than 500 ppm.

D. Mixed Air Temperature (Occupied Mode)

1. When the fan is off, the outside air and exhaust dampers are closed and the return air damper is open. The mixed air temperature for a 50 degrees F mixed air is calculated as follows:

\[ \text{Mixed Air Temperature} = \text{Supply Air Temperature} - \text{Duct Pressure Drop} \]

E. Supply Air Temperature

1. Hand-Picked: When supply fan is on, RPR-5 minimum maintained at 55 degrees F. Supply air temperature measured at Duct Pressure Drop.

2. When supply fan is off, on discharge air temperature shall be maintained by modulating the economizer or in the cooling system, as required to maintain supply air temperature.

3. Temperature - 45 degrees F. When supply fan is on, discharge air temperature shall be maintained by modulating the economizer or in the cooling system, as required to maintain supply air temperature.

F. Controlling Dampers

1. Acoustics - The same as specified above.

2. Filter Elisine - All filters shall be clean.

3. Duct system fans are clean and in place.

4. Duct fans shall be clean and in place.

5. Duct coil fans have been cleaned and combined.

6. Access doors are closed and duct end caps are in place.

7. Duct systems are clean and balanced.

8. Air systems are clean and balanced.

9. Electrical - Acceptance of electrical systems in accordance with applicable NEC and local codes.

10. Heating - Acceptance of heating systems, including air and water systems in accordance with applicable requirements.

11. Test for Balance: Provide linear velocity air flow measurement of all ducts, fans, and equipment.

12. Correct fan rotation.

13. Proper return balance valves are clean and functional.

14. Service and balance valves are open.

15. Report any defects or deficiencies noted during testing for compliance with Testing standards for Air Systems.

16. Properly report abnormal conditions in mechanical systems or conditions which prevent systems balance.

17. If, for design reasons, system cannot be properly balanced, report as soon seen observed.

18. Beginning of work means acceptance of existing conditions.

2.10.1 DIRECTION

A. Provide instruments required for testing, adjusting, and balancing operations.

B. Provide additional balancing devices as required.

2.10.2 INSTALLATION TOLERANCES

A. Air handling systems to plus or minus 5% in percent of return and plus or minus 10% return and for return and supply air temperature, and as indicated.

2.10.3 EXAMINATION

A. All testing, examination, work, verify that systems are complete and operable. Ensure the following:

1. Equipment is installed and in a safe and normal condition.

2. Temperature control systems are installed and operate as intended.

3. Proper thermal overload protection is in place for electrical devices.

4. Final fans are clean and in place. If required, install media filters in addition to final filters.

5. Duct systems are clean and balanced.

6. Correct fan rotation.

7. Floor coils have been cleaned and combined.

8. Duct systems are clean and balanced.

9. Air systems are clean and balanced.

10. Electrical - Acceptance of electrical systems in accordance with applicable NEC and local codes.

11. Heating - Acceptance of heating systems, including air and water systems in accordance with applicable requirements.

12. Ventilation - Acceptance of ventilation systems, including air and water systems in accordance with applicable requirements.

13. Distribution system to air inlets and outlets.

14. Distribution system to air inlets and outlets.

15. Measure air quantities at air inlets and outlets.

16. Measure air quantities at air inlets and outlets.

17. Measure air quantities at air inlets and outlets.

18. Use volume control devices to regulate air quantities only in extent that adjustments can be made without disturbing system pressure. Air flow fluctuation shall be no greater than 5%.

19. Use volume control devices to regulate air quantities only in extent that adjustments can be made without disturbing system pressure. Air flow fluctuation shall be no greater than 5%.

20. Adjust air systems to plus or minus 10 percent of design.

2.11 ADJUSTING

A. Recorded data shall represent actually measured, or observed, not theoretical values.

B. Permanently mark settings of valves, dampers, and other components and devices allowing settings to be restored. Set and lock memory stops.

C. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been modified.

D. Leave systems in proper working order, replacing bell guards, closing access doors, closing dead to switch electrical accessibility to the systems, and providing thermostatic to specified settings.

2.12.1 AIR SYSTEMS

A. Adjust air handling and distribution systems, including all associated air systems, supply, return, and exhaust air quantities.

B. Make air measurement quantities in ducts for each terminal, return, and discharge systems in accordance with applicable requirements.

2.12.2 SYSTEM SPECIFICATION

A. Adjustable air handling and distribution systems, including all associated air systems, supply, return, and exhaust air quantities.

B. Measure air quantities measurement in ducts for each terminal, return, and discharge systems in accordance with applicable requirements.

C. Measure air quantities at air inlets and outlets.

D. Measure air quantities at air inlets and outlets.

E. Use volume control devices to regulate air quantities only in extent that adjustments can be made without disturbing system pressure. Air flow fluctuation shall be no greater than 5%.

F. Use volume control devices to regulate air quantities only in extent that adjustments can be made without disturbing system pressure. Air flow fluctuation shall be no greater than 5%.

G. Provide system schematic with required air quantities recorded at each outlet or inlet.

2.12.3 SYSTEM SPECIFICATION

A. Provide static air pressure conditions on air supply, return, and exhaust air systems, including all associated air systems, supply, return, and exhaust air systems.

B. Adjust exhaust air automatic dampers, as required.

C. Measure temperature conditions across outside air, return, and exhaust air dampers to check leakage.

D. Where modulating dampers are provided, take modulating dampers to static condition at extreme conditions. Balance variable volume dampers at minimum air flow, full heating and cooling.

2.12.4 SYSTEM SPECIFICATION

A. Provide static air pressure conditions on air supply, return, and exhaust air systems, including all associated air systems, supply, return, and exhaust air systems.

B. Adjust exhaust air automatic dampers, as required.

C. Measure temperature conditions across outside air, return, and exhaust air dampers to check leakage.

D. Where modulating dampers are provided, take modulating dampers to static condition at extreme conditions. Balance variable volume dampers at minimum air flow, full heating and cooling.
LEVEL 1 - ELECTRICAL PLAN

1. TELEPHONE SERVICE ENTRANCE
2. PANEL SHOP NORTH (SN)
3. MDP
4. CT ENCLOSURE
5. SERVICE DISCONNECT
6. PANEL RS1
7. PANEL RS2
8. DEMO 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
- GT-1, GT-2
- PMP-5
- SN-6
- SN-3,8,8
- SN-7,9,11
- GT-1,7,7,5
- GT-1,7,5
- SN-5,3,8
- M8 AWG, FC
- M8 AWG, FC
CONNECT TO VFD FURNISHED WITH EF-1. PROVIDE CONDUIT FOR CONTROL WIRES (INSTALLED BY MECHANICAL) FROM EF-1 TO AHU-1.
PART 2 - PRODUCTS

2.1 RADIATORS

A. GUARDING - STEEL COVERS FOR INHERENTLY HAZARDOUS CONDENSATE/STEAM LINE INSTALLATIONS TO PROTECT PERSONNEL FROM PHYSICAL DAMAGE, FOR SERVICE CONDUCTORS AND PANELBOARD FEEDERS.

B. ELECTRICAL, METALLIC TUBING - USED IN ALL OTHER AREAS UNLESS OTHERWISE INDICATED. PROVIDE RINSE FILTERS ON END CAPS TO REMOVE DEPOSITS FROM MATERIALS CONDUCTED THROUGH TUBING TO PREVENT INTERNAL CORROSION, ENSURE COMPLIANCE WITH N.E.C. ARTICLE 250. PROVIDE FREE DRAIN VENT TO PREVENT ACCUMULATION OF CONDENSATE IN TUBING AND RESTORE UNIFORM INTERNAL DIA. CIRCULARITY FACTOR CONSIDERED FOR Diameters and Lengths Listed for Direct Burial.

C. FLEXIBLE METALLIC CONDUIT. USE FOR FINAL CONNECTIONS TO FIXTURES AND EQUIPMENT TO SOLVE VARIATION OR ALLOTTMENT OF INSTALLATION. PROVIDE ELASTOMERIC FITTINGS UPON REQUEST TO INSTALL MATERIALS IN ACCORDANCE WITH THE FOLLOWING SCHEDULE. PROVIDE MULTIPLE BRAZERS WITH INTERNAL COMMON TRISP.

D. PROVIDE "SUSPENDING BREATHERS" CIRCUIT BREAKERS FOR ALL LOADING CIRCUITS CONSIDERED AS IMPORTANT AS ELECTRICAL AND MECHANICAL EFFICIENCY AND OPERATIONS REQUIRED FOR COMPLETE INSTALLATION IN ACCORDANCE WITH ALL SPECIFICATIONS. PROVIDE "SUSPENDING" CIRCUIT BREAKERS DELIVERED TO 1000' GROUND FAULT CIRCUIT INTERRUPTUL IMPERIAL LISTED (EC). PROVIDE SPECIAL OUTLETS CAPACITY, VOLTAGE AND NEMA CONFIGURATION NOTED AS UNLESS OTHERWISE INDICATED.

E. SWITCHES 20 AMP, 120VOLT, 3-POLE FUSE OR CIRCUIT BREAKER, W/STANDARD AB1. PROVIDE "SWITCHING RATED" CIRCUIT BREAKERS FOR ALL LIGHTING CIRCUITS REQUIREMENTS. MOUNT TOP OF CABINET AT 6'-6" UNLESS NOTED.

F. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW ALL FEATURES OF NEW WORK. CUT BACK EXISTING WORK BEING REMOVED OR ABANDONED BEYOND CONDITIONS NOTED ON THE DRAWINGS WERE PREPARED FROM PREVIOUS FURNISHED WHERE EQUIPMENT IS FURNISHED OR INSTALLED BY OTHERS. NOT SCALE DRAWINGS. REVIEW OTHER DRAWINGS AND ADJUST WORK TO CONFORM TO CONTRACT DOCUMENTS. PROVIDE PERSONNEL TO ASSIST ENGINEER IN REMOVAL AND SET IN PLACE AND WIRING IN ACCORDANCE WITH THE FOLLOWING SCHEDULE (COORDINATE ALL WORK WITH MECHANICAL). INSTALL IN ACCORDANCE WITH N.E.C. "STANDARD PRACTICES" FOR GOOD WORKSHIP IN ELECTRICAL CONTRACTING.

G. NOT RELIEVE THE CONTRACTOR FROM ANY REQUIREMENTS OF CONTRACT DOCUMENTS. PROVIDE PERSONNEL TO ASSIST ENGINEER IN REMOVAL AND SET IN PLACE AND WIRING IN ACCORDANCE WITH THE FOLLOWING SCHEDULE (COORDINATE ALL WORK WITH MECHANICAL). INSTALL IN ACCORDANCE WITH N.E.C. "STANDARD PRACTICES" FOR GOOD WORKSHIP IN ELECTRICAL CONTRACTING.

H. DISCONNECT SWITCHEBOARD AND OR DISCONNECTING MEANS. PROVIDE "SWITCHING RATED" CIRCUIT BREAKERS FOR ALL LIGHTING CIRCUITS REQUIREMENTS. MOUNT TOP OF CABINET AT 6'-6" UNLESS NOTED.

I. PROVIDE UPDATED TYPED PANEL SCHEDULES.

J. PROVIDE "SUSPENDING" CIRCUIT BREAKERS FOR ALL LIGHTING CIRCUITS REQUIREMENTS. MOUNT TOP OF CABINET AT 6'-6" UNLESS NOTED.

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