



ALASKA RAILROAD CORPORATION
327 W. Ship Creek Ave.
Anchorage, AK 99501.

April 22, 2019

Addendum 1

ITB # 19-11-207154

Wasilla Shops HVAC Upgrades

Addendum number 1 is issued for questions / clarifications.

**The Closing Date for this has not changed. This RFP will close as follows:
Proposals will be received until May 1, 2019 @ 3:00 PM local Alaska time.**

Clarifications / Questions:

- 1) There is a page missing in the drawings sent out. **Please see attached**
- 2) Please clarify the duct on the first floor ? **It is to be painted black.**
- 3) Please provide details for concrete pads for the condenser and HX1. **Heat exchanger slab on grade pinned to existing steel mesh reinforcement. Condenser 6" slab on grade, steel mesh reinforcement.**
- 4) Who manufacture of the roofing materials? **Malarkey is the manufacturer.**

All other terms and conditions remain unchanged.

If there are any questions regarding this addendum please let me know.

Thank you,

Greg Goemer
Sr. Contract Administrator
Alaska Railroad Corporation

SEE M-6 FOR CONTINUATION

2.7 PIPING EXECUTION

2.7.1 INSTALLATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside of pipe, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- C. Install in accordance with manufacturer's instructions.
- E. Provide non-conducting dielectric connections wherever jointing dissimilar metals. Install to NACE RP-01-69.
- F. Route piping in orderly manner and maintain gradient.
- 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 whenever practical at common elevations.
- I. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- K. Install valves with stems upright or horizontal, not inverted.
- L. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed 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 pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- O. Prepare unfinished pipe, fittings, supports, and accessories for finished painting.
- P. Use gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.

2.7.2 TESTING

- A. Heating Water and Glycol Piping Systems
1. Test all water piping hydrostatically at 100 psig or 150% of working pressure, whichever is greater, for a period of four hours. Observe piping during this period and repair all leaks.
- C. Insulated flexible ducts: UL 181, Class 1, flexible duct wrapped with flexible glass fiber insulation, enclosed by seamless metallized film vapor barrier, rated to 6 inches WG positive and 1 inch WG negative pressure and a maximum velocity of 4000 fpm.
- D. Sealant: Non-hardening, water resistant, fire resistive, compatible with mating materials, liquid used alone or with tape, or heavy mastic.
- E. Hanger rod: Steel, galvanized, threaded both ends, threaded one end, or continuously threaded.
- F. Balancing dampers: Fabricated with duro dyne specline series regulators. Provide concealed type regulator set for inaccessible damper locations.

2. Air Test.

- a. In general, air testing is not acceptable. In the event of conditions that would subject the pipe to freezing, however, an equivalent air pressure test may be used after obtaining approval from the Contracting Agency.
- b. Make the air test by attaching an air compressor testing apparatus to any suitable opening, and after closing all other inlets and outlets to the system, force air into the system until there is uniform gauge pressure of 100 pounds per square inch, or 150% of working pressure, but not more than 150 psig. The air pressure shall be held without introduction of additional air for a period of 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 operation and maintenance manuals.
- B. Natural Gas
1. Test all gas piping before connection to gas source. Do not enclose or conceal any untested portion of the gas 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 operation and maintenance manuals.

2.8 DUCTWORK

2.8.1 DEFINITIONS

- A. Duct sizes: Inside clear dimensions.

2.8.2 MATERIALS

- A. General: Non-combustible or conforming to requirements for Class 1 air duct materials or UL 181.
- B. Steel ducts: ASTM A525 galvanized steel sheet, lock forming quality, having zinc coating of 1.25 oz per square foot for each side in conformance with ASTM A90.
- C. Insulated flexible ducts: UL 181, Class 1, flexible duct wrapped with flexible glass fiber insulation, enclosed by seamless metallized film vapor barrier, rated to 6 inches WG positive and 1 inch WG negative pressure and a maximum velocity of 4000 fpm.
- D. Sealant: Non-hardening, water resistant, fire resistive, compatible with mating materials, liquid used alone or with tape, or heavy mastic.
- E. Hanger rod: Steel, galvanized, threaded both ends, threaded one end, or continuously threaded.
- F. Balancing dampers: Fabricated with duro dyne specline series regulators. Provide concealed type regulator set for inaccessible damper locations.

2.8.3 DUCTWORK INSTALLATION

- A. Fabricate and support in accordance with SMACNA duct construction standards and ASHRAE handbooks, except as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressure indicated.
- B. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees, convergence downstream shall not exceed 45 degrees.
- C. Use double nuts and lock washers on threaded rod supports.

2.8.4 DUCTWORK APPLICATION SCHEDULE

Air System	Material
Low Pressure Supply	Steel
Exhaust	Steel

2.9 TEMPERATURE CONTROLS

- A. Provide electric/electronic temperature controls for all equipment and systems specified including but not limited to the following.
- 1: Pump PMP-4: Pump shall run continuously, manual on-off switch, set pump to variable differential pressure control mode.
- 2: Gas Fired Unit Heaters GUH-1, GUH-2: On call for heat from wall mounted thermostat (adjustable) burner and fan shall operate.
- 3: Heat Exchanger HX-1: 2-Way hot side valve shall modulate to maintain cold side setpoint of 180 degrees F (adjustable).
- 4: Reheat Coils HC-3, HC-4, HC-5: Space thermostat shall modulate three-way or two-way valve as indicated on plans to maintain setpoint of 72 degrees F (adjustable).
- 5: Air Handling Unit AHU-1:
- A. Time Schedule: Start and stop fan to meet occupancy schedule. Provide status and start/stop. Failure to start signals alarm.
- B. Safety Devices:
- a. Freeze Protection: Stop fan and close outside air damper 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.
- c. System Shutdown: When the system is shut down, the outside and exhaust dampers will close, the return air dampers will open and the heating coil valve is closed.
- C. Minimum Outside Air: When supply fan is on, the outside air dampers open to provide minimum outside air volume for ventilation.
- a. Occupied Mode Minimum outside air, see drawing schedule.
- b. CO₂ Sensor located in return air duct to override outside air damper minimum position open or closed to maintain less than 1000 ppm.
- D. Mixed Air Temperature (Occupied Mode):
- a. When the fan is off, the outside air and exhaust dampers are closed and the return dampers are open.
- b. When the supply fan is on, outside and return dampers modulate to maintain 55 degrees F. mixed air temperature.
- E. Supply Air Temperature:
- a. Heating Mode HC-1: When supply fan is on, PMP-5 modulates to maintain 55 degrees F. supply air temperature.
- b. Cooling Mode CC-1: When supply fan is on, discharge air setpoint shall be maintained by modulating the economizer or staging the DX cooling system as required to maintain 55 degrees F. supply air temperature.
- 6: Relief Fan RF-1: When relief fan is on the damper is open, relief fan VFD modulates to maintain + .03" (adjustable) building static pressure relative to outdoors. Relief fan shall be enabled when AHU-1 is enabled.
- 7: Condensing Unit CU-1: Unit enabled to run when outside air temperature exceeds 55 degrees F. (Adjustable). The unit shall operate subject to its own internal operating and safety controls to maintain supply air temperature of 55 degrees F.

- B. Provide necessary hardware, software, wiring, conduit and terminal unit controls for a complete and functional control system.
- C. Manufacturer shall be company specializing in manufacturing products required for system control with minimum five years experience.
- D. Installer: Company specializing in applying the work with minimum five years experience.

2.10 TESTING, ADJUSTING AND BALANCING

2.10.1 EXAMINATION

- A. Before commencing work, verify that systems are complete and operable. Ensure the following:
1. Equipment is operable and in a safe and normal condition.
2. Temperature control systems are installed complete and operable.
3. Proper thermal overload protection is in place for electrical equipment.
4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
5. Duct systems are clean of debris.
6. Correct fan rotation.
7. Coil fins have been cleaned and combed.
8. Access doors are closed and duct end caps are in place.
9. Air outlets are installed and connected.
10. Duct system leakage has been minimized.
11. Hydronic systems have been flushed, filled, and vented.
12. Correct pump rotation.
13. Proper strainer baskets are clean and in place.
14. Service and balance valves are open.
- B. Report any defects or deficiencies noted during performance of services to Architect/Engineer.
- C. Promptly report abnormal conditions in mechanical systems or conditions which prevent system balance.
- D. If, for design reasons, system cannot be properly balanced, report as soon as observed.

- E. Beginning of work means acceptance of existing conditions.

2.10.2 PREPARATION

- A. Provide instruments required for testing, adjusting, and balancing operations.
- B. Provide additional balancing devices as required.

2.10.3 INSTALLATION TOLERANCES

- A. Adjust air handling systems to plus or minus 5 percent for supply systems and plus or minus 10 percent for return and exhaust systems from figures indicated.
- B. Adjust hydronic systems to plus or minus 10 percent of design.

2.10.4 ADJUSTING

- A. Recorded data shall represent actually measured, or observed condition.
- B. Permanently mark settings of valves, dampers, and other adjustment 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 rectified.
- D. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

2.10.5 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- E. Use volume control devices to regulate air quantities only to extent that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- K. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.
- L. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches positive static pressure near the building entries.
- M. Check multi-zone units for motorized damper leakage. Adjust air quantities with mixing dampers set first for cooling, then heating, then modulating.

2.10.6 WATER SYSTEM PROCEDURE

- A. Adjust water systems to provide required or design quantities.
- B. Use calibrated Venturi tubes, orifices, or other metered fittings and pressure gauges to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in the system.
- C. Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.
- D. Effect system balance with automatic control valves fully open to heat transfer elements.
- E. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.
- F. Where available pump capacity is less than total flow requirements or individual system parts, full flow in one part may be simulated by temporary restriction of flow to other parts.



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

PROJECT :

ALASKA RAILROAD CORPORATION
KENAI SUPPLY BUILDING RENOVATION

TITLE:

MECHANICAL
SPECIFICATIONS

DESIGNED BY: MSM
DRAWN BY: MSM
CHECKED BY: SCH
APPROVED BY: MSM

SCALE: AS NOTED
DATE: 1/11/2019

M-7

AFE NO.:
ACAD FILE:17034-M7
DWG NO.
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REV.	DATE	BY	REVISION