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**ADDENDUM NO. 1  
March 28, 2025**

**2025 SRE Acquisition - Liquid Deicing Vehicle  
City of Duluth No. 25-4404  
Duluth International Airport  
Duluth, Minnesota**

**SEH No. DULAI 183286**

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To: Document Holders

DOCUMENT HOLDERS on the above-named project are hereby notified that this document shall be appended to, take precedence over and become part of the original bidding documents dated March 7, 2025, for this work. Bids submitted for the construction of this work shall conform to this document.

This addendum consists of 1 page and attached Document TS-2A and TS-2B Technical Specification (7 pages).

**Changes to Specifications:**

1. Document TS-2A and TS-2B Technical Specification, DELETE in its entirety and REPLACE with attached new Document TS-2A and TS-2B.

Changes made to TS-2A:

- a. A1-1 – minimum deicer tank size is now 2,000 gallons.
- b. A1-7-2.b. – updated basis of design for emergency two-way transceiver radio.
- c. A2-2c – added a section for an auto greaser, if available.
- d. A2-2d – added inclusion of remote drains for all fluids if available.
- e. A2-2e – added that all wheel or rear wheel drive are acceptable.
- f. A2-2f – added that on spare rim and tire shall be provided for each type, size, and configuration on the vehicle.

Changes made to TS-2B:

- a. A5-2c – minimum deicer tank size is now 2,000 gallons.
- b. A5-4a.6 – added this section to include four (4) spare spray nozzles.

**NOTE:** Receipt of this Addendum No. 1, dated March 28, 2025 shall be acknowledged on [Bid Express](#). Failure to do so will not allow Bidder to submit Bid.

**END OF ADDENDUM**

## TS-2A Technical Specification

### Appendix 1. Specification for Carrier Vehicle

#### Part A - Airport Operator Checklist

##### Technical Specification

The technical specifications provided herein for the pavement deicing carrier vehicle are to tailor the equipment to the requirement of the Duluth International Airport.

**A1-1. Anticipated uses and/or features of vehicle.** The equipment will be used for the application of pavement deicing fluid. The equipment will include a carrier vehicle equipped to hold a **2,000-gallon** tank of liquid pavement deicer.

##### A1-2. Performance requirements.

The carrier vehicle must be a setback axle truck with a single rear axle. It must reach a 40 mph working speed. The turning radius is required to be 25’.

The unit must meet the directives established in the FAA 150-5200-30D (Airport Winter and Safety Operations Circular) and be approved by the FAA.

##### A1-3. Engine/transmission.

- a. Automatic Transmission
- b. Diesel

**A1-4. Transfer case.** Pre-approved by FAA as standard, required item.

**A1-5. Axle capacities.** Front 22,000 lbs / Rear 30,000 lbs

**A1-6. Fuel capacity.** 70 gallons

##### A1-7. Carrier Vehicle Requirements

**1. Painting** - The carrier vehicle equipment shall be painted chrome-yellow in color, as specified in AC 150/5210-5D, Appendix A. Additional markings for the carrier vehicle shall be provided in accordance with Item 4.c of AC 150/5210-5D, “Airfield Service Vehicles and Aircraft Support Vehicles.” Specific requirements for markings are as follows:

- a. The vehicle number shall be black with three-character numbers as determined by the airport, and provided prior to production, and shall be in accordance with 4.c(1) through (3).
- b. The airport logo in an electronic template file version will be furnished by the Owner and installed by the vehicle manufacturer.
- c. A horizontal band of reflective paint or tape shall be provided in accordance with Item 4.c(5) and Figure 1 (Option 1) of AC 150/5210-5D

2. **Radio Transceivers:** Each transceiver shall be equipped with its own microphone, antenna and remote speaker. VHF radios used to communicate with air traffic control facilities shall satisfy the criteria set forth in section 3 of Radio Technical Commission for Aeronautics document DO-186,

"Minimum Performance Standards for Airborne Radio Communications Equipment Operating Within the Radio Frequency Range 117.975 to 137.000 MHz.," dated January 20, 1984. This document may be examined at any Federal Aviation Administration Regional Office or purchased from: RTCA Secretariat, One McPherson Square, 1425 K Street, NW, Suite 500, Washington, DC 20005.

- a. Transceivers using other frequencies shall meet applicable standards of the Federal Communications Commission. 1 transceiver is required and shall be similar to Model IC-A220 Multi Frequency Transceiver. Transceiver frequencies shall be pre-programmed. Frequencies will be given to the Contract after bid. Transceiver shall include MB-53 Mounting package, or similar, for mounting transceiver with mounting bracket, wiring harness, and an SP-5 "external" speaker with EM-AL mic, antenna, coax, and connectors.
- b. **One (1) emergency services two-way transceiver radio, complete with antennae and microphone shall be installed. Radio and headset to be supplied by Owner. Frequency information will be provided after contract award. Basis of design/function of the emergency services two-way radios shall be Motorola P25. Other radios meeting the specifications and characteristics of the Motorola P25 series radios are acceptable, such as the JVC Kenwood Viking, BK RELM KNG2-P800, and BK-RELM BKR9000-TS.5BS**
- c. Transceivers must be programmed, installed and instruction to airport personnel provided at no additional cost to the owner.

## Part B - Specification for Carrier Vehicle

**A1-8. Materials and components.** See referenced SAE ARP equipment specification.

**A1-9. Delivery.**

**a. Preparation for delivery.**

(1) **Shipment.** The vendor is responsible for the safe and timely delivery of the vehicle and its accessories, spare parts, and tools to the agreed place of delivery.

(2) **Marking.** Carrier vehicles must be marked for shipment in accordance with instructions agreed to by the purchaser.

**b. Instruction and training.** The manufacturer must, at no additional cost, furnish the services of trained personnel to the purchaser at a time and place agreed to by all parties. These individuals must provide instruction to airport personnel sufficient for the personnel to familiarize themselves with the operation and maintenance of the carrier vehicle, its auxiliary equipment, and the provided radios. The period of instruction must not be less than 24 hours or as specified in the referenced SAE ARP equipment specification.

**A1-10 Testing**

**a. Testing shall be IAW FAA AC 150/5220-20A**

**b.** The manufacturer is responsible for conducting tests to ensure that its snow removal and ice control equipment meets the operational and performance requirements it advertises. The manufacturer must submit certified records of these compliance tests with each response to an invitation to bid. Equipment tests must be conducted on standard production models and not on specially constructed prototypes.

(1) **Pre-testing.** Examine each test carrier vehicle to ensure that it is a standard production model and not a specially constructed unit made specifically for the test. Prior to testing, all controls, adjusting mechanisms, hydraulic systems and other assemblies must be operated to ensure against leaks, restrictions, and malfunctions. Once assured that the unit is fit, actual testing may begin.

(2) **Additional testing.** The purchaser may consider conducting his or her own operational performance tests on equipment prior to acceptance. In such cases, the manufacturer should have the opportunity to witness the performance of such tests, but the costs for such testing and interpretation of results is the sole responsibility of the purchaser. Test the carrier vehicle in accordance with (1) this paragraph and (2) any referenced SAE ARP(s) for the specified equipment the carrier vehicle is to support.

## Appendix 2. Optional/Alternate Equipment Specification

**A2-1. General.** See below for selected options for Carrier Unit

### **A2-2. Carrier vehicle.**

Require equipment is as follows:

**a. Vehicle cab.**

(1) **Auxiliary cab heater.**

(2) **Clock**

(3) **Additional Lighting:**

(a) Auxiliary cab dome light

(b) Roof mounted lights

(c) Door lights

(d) High intensity LED strobe beacon

(e) HID lights

1. The vehicle shall have an automatic signaling device to sound an alarm when moving in reverse.

**b. Mechanical.**

(1) **Automatic engine shutdown.** An automatic engine shutdown system is equipped with an override switch to prevent engine damage due to low engine oil pressure, high coolant temperature, or low coolant level.

(2) **Block Heater** 1000 watt/115 volt block heater

**c. Auto Greaser.**

(3) If available an auto greaser shall be installed on the unit. The auto greaser shall ensure consistent lubrication without manual interruption. The auto greaser shall be designed to withstand harsh operating conditions.

Components:

a. Pump: electric or pneumatic

b. Reservoir capacity: 6 or 8 liters

c. Control Unit: Timer or brake counter

d. Distribution System: Tubing and fittings at each lubrication point

e. Grease Output: Variable depending on system resistance and tubing length

f. Low-Level Switch: to alert when lubrication levels are low

**d. Remote Drains**

(4) If available, install remote drains for all fluids (coolants, oil, etc.)

**e. Drive**

(5) All wheel or rear wheel drive are both acceptable

**f. Tires**

(6) One spare rim and tire shall be provided for each type, size and configuration on the vehicle.

## TS-2B Technical Specification

### Appendix 5. Pavement Deicing Liquid Material Spreader

#### Part A - Airport Operator Checklist

##### Technical Specification

The technical specifications provided herein for the pavement deicing liquid material spreader are to tailor the equipment to the requirement of the Duluth International Airport.

##### A5-2. Liquid spreader

- a. **Anticipated uses and/or features of spreader.** The equipment will be used to spray icy pavement with a pavement deicing fluid to combat ice buildup on airport pavements. The equipment shall include an application system, a tank, and a planned attachment to the carrier vehicle.
- b. **Size of Priority 1 paved area:** 4,320,875 square feet
- c. **Size of tank:** 2,000 gal
- d. **Critical application rate** 0.5 gallon/square foot
- e. **Time needed to complete major operation:** 30 minutes
- f. **Proximity to loading farm** 5 minute
- g. **Capacity of loading farm** 8700 gallons
- h. **Controls:** The control system shall be able to sense ground speed, spray width, and material flow rate. The control system shall be able to change material flow rate as needed to maintain constant application rate. Application rate shall be modifiable while spraying.

## Part B - Material Spreader Specifications

### A5-4. Liquid material spreader components

SAE G15 is finishing draft SAE ARP 5559, Liquid Deicing/Anti-icing Material Spreader for Airport Application. This AC will reference that aerospace recommended practice upon its issuance by SAE. Until then, the carrier vehicle for liquid spreaders complies with SAE ARP 6059 and the liquid spreader must comply with paragraph 2 below.

**a. Standard equipment.** A liquid material spreader must have the following standard equipment:

(1) **Hydraulic system.** The spreader hydraulic system must meet the basic requirements of the carrier vehicle system under SAE ARP 6059. The system must also be capable of supplying the power to operate the deicing pumps, to fold the booms, and to turn the spreader on and off. Hydraulic tank must be located between cab and the product tank. The tank shall be constructed of stainless steel and have a sight gauge. The hydraulic fittings shall be sized in accordance with pump capability. The hydraulic pump shall be an axial piston, variable displacement pump with pressure compensator and minimum output 100cc and 28.5 GPM. System shall be sized to allow for adequate operation of all functions of the deicing systems.

(2) **Tank.** The tank must be constructed of grade 304 stainless steel or better. Optional construction, using polymer or fiberglass materials, is acceptable providing that the manufacturer certifies that the materials used are capable of meeting the same stress and fatigue requirements as their stainless-steel counterparts. The shell, head, and baffles of steel tanks with a capacity of 2000 gallons (7570 l) or less must be made of at least 12-gauge material. For tanks with a capacity greater than 2000 gallons (7570 l), these components must be made of 10-gauge material. Sills for all tanks must be no less than 8-gauge and they must also be made of grade 304 stainless steel. Baffle spacing for any tank should not be more than 44 inches (112 cm). The tank must have a full-length double slope sump trough with mid tank outlet, allowing for full drainage and easy cleanout of tank. Tank sump shall be constructed so no whirlpooling occurs in max pump conditions. Tanks must be equipped with a manhole opening to allow inspection of the tank interior, a minimum of 16 inches in diameter. A ladder shall be installed. A sight gauge shall be installed and calibrated in 500 gallon increments.

(3) **Pumping system.** The pumping system must have sufficient capacity for full boom width spraying at a maximum discharge rate of 3 gallons/1000 square feet (120 liters/1000 square meters) while operating at a speed of 30 mph (48 km/hr). The pump should be capable of a 600 gpm flow at 50 psi. Pumping manifold shall allow pumping system to be used in loading or unloading tank while in a stationary position. All connections and valves shall be colored-coded. The plumbing system shall be designed with non-corrosive materials.

(4) **Spray boom and nozzles.** The spray boom must be constructed in sections with each section capable of independent use. The boom design must permit it to break away when an object is struck. Spray nozzles must be equipped with check valves and be located to provide uninterrupted surface coverage. Filters must be installed on lines leading to the spray

booms. Spray arms must provide a 50 ft overall uniform spray pattern. Spray tubes carrying deicing fluid shall be constructed of 2 inch by 2 inch stainless steel tubing. Nozzles shall be non-metallic, located every 30" on spray arms, and equipped with check valves. Each spray arm shall be operable independently or simultaneously. All equipment shall be operable from the cab and controls shall be located for easy access by the operator and shall be illuminated for nighttime operations. A microprocessor-based control system shall control spraying applications regardless of vehicle speed or spray arm widths utilized. Controller shall be capable of displaying and applying in gallons per 1000 sf. The control system shall be able to sense ground speed and have a pavement temperature sensor. The application rate shall be modifiable while spraying and shall be automatically maintained regardless of vehicle speed, gear selection, oil viscosity, or other inefficiencies.

(5) **Hoses and Connections.** The vehicle shall come with all necessary hoses, pumps, and connections to load fuel from the storage tank to the vehicle tank.

(6) **Additional Nozzles.** Contractor shall supply four (4) spare spray nozzles

**b. Services.** All spreader drive components must have a minimal number of lubrication points with easy access for maintenance. The spreader must receive lubrication prior to delivery with lubricants designated for use in the winter conditions normally experienced at the delivery location. The spreader must be conspicuously tagged to identify the lubricants and their temperature ranges.

**c. Lights and Cameras.** LED work lights required along each boom and one LED work light required in the front. These are provided to illuminate each section of the spray arm and the pump station. All lights shall be controlled from within the cab by means of electrical switches. Rearview backup camera system shall be installed which activates when the vehicle is shifted to reverse. The display shall allow the operator to see behind the vehicle while backing.

**d. Fenders.** The rear wheels shall be covered with non-corrosive, high impact fenders. The front and rear mud flaps shall be installed on both wheels.