DOCUMENT 00 00 12

ADDENDUM NO. 2
April 1, 2025

2025 SRE Acquisition - Multi-Unit Vehicle
City of Duluth No. 25-4403
Duluth International Airport
Duluth, Minnesota

SEH No. DULAI 183286

From: Short Elliott Hendrickson Inc.
3535 Vadnais Center Drive
St. Paul, MN 55110-3507
651.490.2000

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-1 Technical Specification (13 pages).

Changes to Specifications:

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

   Changes made:
   a. Section 3.2G Plow – Changed the width of the plow blade to 24 feet.

NOTE: Receipt of this Addendum No. 2, dated **April 1, 2025** shall be acknowledged on **Bid Express**. Failure to do so will not allow Bidder to submit Bid.

END OF ADDENDUM

TS-1 TECHNICAL SPECIFICATION
MULTI-UNIT VEHICLE

PART 1 - GENERAL

This specification is the basis for procurement of Multi-Tasking Equipment (MTE) for airfield snow removal. The unit shall include a combination of carrier vehicle, snowplow, rotary broom and high velocity air blast system intended for plowing and sweeping snow from airport operational areas, including runways, taxiways and apron areas.

1.1 RELATED INFORMATION.

A. FAA Advisory Circular 150/5220-20A Airport Snow and Ice Control Equipment.

B. FAA Advisory Circular 150/5210-5D Painting, Marking, and Lighting of Vehicles Used on an Airport

C. SAE International ARP5548 Multi-Tasking Equipment (MTE) for Airfield Snow Removal High Speed, Multi-Tasking Snow Removal Unit to include Carrier Vehicle, Snowplow, Rotary Broom High Velocity Air Blast

1.2 INTENTION OF TERMS.

Whenever in these specification or on the plans, the words “directed,” required,” “permitted,” “ordered,” “designated,” “prescribed,” or words or the like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Airport is intended; and similarly, the words “approved,” “acceptable,” “satisfactory,” or words of the like import, shall mean approved by, or acceptable to, or satisfactory to the Airport, subject in each case to the final determination of the owner.

Any referent to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.

1.3 PATENTED MATERIAL, EQUIPMENT AND PROCESS

If the successful Bidder utilizes any design, device, equipment, material or process that is covered by a patent, trademark or copyright, the Bidder shall indemnify and hold harmless the Owner and Owner’s representative from any and all claims for infringement by reason of the use of any patented design, device, equipment, material or process or the use of any trademark or copyright.

1.4 DECALS

The Contractor shall not affix advertising decals, stickers or other signs to the specified equipment. Vehicle mud flaps, when specified, shall be installed with the blank side facing outward.

1.5 BRAND NAMES

Whenever in the specification proprietary names, manufacturers, trade names or catalog numbers are specified, such reference is made for the purpose of defining the minimum performance, quality and other salient characteristics of the desired item. Where “brand names” are specified, the term “or equal” is deemed to follow. Such reference is not intended to be restrictive in nature. The Contractor may offer any material, item or process deemed equal with respect to the required minimum characteristics of the specified “brand name”. The Owner reserves the right to make the final determination of equivalency.

1.6 MANUALS AND DOCUMENTS

As a minimum, copies of the following documents must be submitted with final delivery of the equipment/vehicle. Supplier shall provide both paper and electronic copies. Paper copies shall be assembled in a three-ring binder with tabs for each section below, as applicable. Submittal of this information is in addition to any other submittal required specified within the Specifications.

1. Applicable Title documents. Required to transfer ownership and license/tag in the State of Minnesota.
2. An owner’s/Operator’s manual that includes all standard manufacturer/vendor literature.

3. Internet Access. Provide internet access to parts manual if available.
4. Manufacturer's standard warranties and guaranties
5. Maintenance instructions
6. Vendor Certifications
7. Manufacturer's/Vendor's Contact Information
8. Additional documents per Document 01 78 23

1.7 REQUIREMENTS.

This specification is intended to identify the technical requirements for an MTE equipped with snow plow, rotary broom and high velocity air blast system. The MTE shall meet the requirements of AC 150/5220-20A as amended by SAE ARP5548 and as modified by this specification.

1.8 SYSTEM DESCRIPTION.

The MTE shall be a Modular or Integral Non-Articulating configuration. The Bidder shall indicate the type of MTE configuration proposed.

A. Modular. The Modular type MTE shall utilize a four-wheel drive power unit with front mounted plow, and trailer mounted tow-behind broom and airblast with a fifth wheel hitch and self-steering trailing axle. The configuration shall be a two-engine design, one dedicated to the traction unit and one dedicated to the tow behind broom/airblast. The traction unit shall have forward mounted cab with near center steering and chassis drive engine behind the cab.

B. Integral Non-Articulating. The Integral Non-Articulating type MTE shall utilize a four-wheel drive power unit with front mounted plow. Broom and airblast shall be mounted mid-chassis. The configuration shall be a two-engine design, one dedicated to the four-wheel drive power unit and one dedicated to the broom/airblast. The chassis shall have a forward mounted cab.

The MTE with attachments shall have the ability to operate at forward speeds of at least 35 mph.

All parts and components of this equipment shall be designed and manufactured to be of the size, material, and strength necessary to sustain the specified performance operating in all snow removal conditions with minimum wear and failure.

1.9 BID SUBMITTALS.

Refer to Document 00 21 13 – Instructions to Bidders

1.10 BID SUBMITTAL - SPECIFICATION COMPLIANCE CERTIFICATION.

By submitting a bid, the bidder intends to comply with the performance, design and construction requirements of this specification. The Goods are all of the tangible personal property required to be furnished under the Contract Documents and Specifications.

The Bidder shall provide a detailed description of the item(s) in which the proposed Goods fail to comply with the procurement specification. Failure to submit this information shall be grounds to consider the bid non-responsive.

1.11 OPERATIONAL STANDARDS AND TESTING.

Each Bidder shall certify that the equipment offered complies with the performance requirements of FAA Advisory Circular 150/5220-20 Airport Snow and Ice Control Equipment, SAE ARP5548 and this specification. Equipment testing shall be conducted on standard production models.

1.12 SCHEDULE.

The Goods are to be delivered to the point of delivery designated by the Owner, commissioned and ready for Owner's acceptance on or before **500 calendar days** after the effective date of the Contract. The Bidder shall indicate if earlier delivery can be provided.

1.13 SHOP DRAWINGS AND PRODUCTION SCHEDULE.

Within sixty calendar days of the effective date of the Contract, the Contractor shall provide to the Owner complete shop drawings of all system components and operating systems comprising the Goods to be provided.

Within sixty calendar days of the effective date of the Contract, the Contractor shall provide to the Owner a production schedule indicating the dates of substantial completion of each major component and operating system. The schedule shall also indicate the dates of final completion, testing, shipment and delivery of the Goods.

1.14 PRE-DELIVERY INSPECTION.

The Owner will perform a pre-delivery inspection of the equipment at the Contractor's facility. The trip shall be for two (2) Airport representatives made to the facility at the end of equipment acquisition. Travel, meals, and lodging **expenses shall be paid for by the Contractor**. The purpose of the inspection is to verify compliance with critical requirements of the specification. The inspection shall not serve as the final acceptance inspection.

1.15 MATERIAL SAFETY DATA SHEETS

The Contractor shall submit applicable Material Safety Data Sheets (MSDS) for all chemical products supplied with the acquired equipment/vehicle to the Owner under a separate cover and within the calendar day limit of the Contract.

1.16 ACCEPTANCE

Delivery of equipment by the Contractor does not constitute acceptance by the Owner. Acceptance of the furnished equipment will be based on combination of submitted manufacturer certifications and acceptance tests conducted by the Contractor at the time of delivery. The Contractor shall maintain ownership, secure storage responsibilities, and insure the vehicle/equipment for loss and/or damage throughout the entire delivery and acceptance process. The Contractor shall provide manufacturer certification for components and systems identified within the Technical Specification. The Contractor shall prepare and furnish the Owner a signed written certification that the components constituting the whole of the equipment being provided comply with the applicable performance, vehicle requirements of the Technical Specifications.

1.17 DELIVERY.

A. Preparation for Delivery:

1. The completed unit, with accessories, must be fully assembled and tested prior to delivery.
2. The vendor is responsible for the safe and timely delivery of the unit and its accessories, spare parts, and tools to the place of delivery.
3. Shipment. The equipment shall be packed in such a manner as to ensure acceptance and safe delivery to the designated point.
4. Marking for shipment shall be in accordance with the instructions issued by the Purchaser.
5. Shipment shall be Free on Board (FOB) to the address noted herein below. Cash on Delivery (COD) deliveries will not be accepted. All vehicles/equipment shall be off loaded at the designated location at Contractor's expense. A minimum of three (3) business days' notice shall be given prior to delivery. Delivery must be made between the hours of 8:00 am and 4:00 pm weekdays.

   Duluth International Airport
   4875 Malstrom Street
   Duluth, MN 55811
   Attn: Ryan Welch, Airside Operations Manager

6. Marking: Carrier vehicles must be marked for shipment in accordance with instructions agreed to by the purchaser. Duluth Airport Logo and vehicle number will be applied to vehicle and included in the contractor's pricing.

B. Field Testing, Startup, and Operations and Maintenance Training. At no additional expense to the Owner, the Contractor shall, upon delivery of the equipment, have an authorized representative conduct an operational test of the furnished equipment in the presence of the Owner. The Contractor shall demonstrate that all features and components are in proper working order and operate as intended by the Specifications. This demonstration is an addition to any other stated acceptance tests within the Specifications and as required by the Owner.

The Owner shall be instructed as to the proper use of the equipment including, but not limited to, connection/hook-up, plow operation, bucket operation, and other requested features. The demonstration shall be made by a factory trained specialist from the Contractor who shall be responsible for complete instruction as to operation and maintenance of the equipment.

A demonstration specialist shall remain at the Airport for a sufficient amount of time to provide thorough instruction to personnel, or as instructed by the Owner. All meals, motel and travel costs shall be the responsibility of the successful bidder.

C. Completeness. All equipment delivered by the Contractor shall be complete and ready for Owner use; complete and fully operational. All parts necessary for operation or which are normally furnished as standard equipment shall be furnished by the Contractor whether specified or not. Substitutions or cancellations are not permitted without written approval from the Owner.

D. Main Component List. Per SAE ARP5548 the manufacturer shall provide a dedicated (by VIN) component list for each unit delivered. The component list shall be itemized and list each main system component. The list shall include but not be limited to items such as engine(s), transmission, main hydraulic system components, drive gear boxes, axles, brakes, alternators, batteries, belts, and filters, etc. The list shall provide the description, manufacturer, part number, and quantity required. The serial number of the engine, transmission, drive gear boxes and axles installed on the subject machine shall be provided. The list shall be provided prior to shipping the equipment. The complete unit and all components shall be newly manufactured and unused. The Owner shall reject any component found to be used, or not of current production. The Contractor (Bidder) will replace the component in question with an appropriate and acceptable new replacement component at its own expense

1.18 WARRANTY.

The snow removal equipment and attachments shall be warranted against defective materials, workmanship and performance deficiencies for a period of one year. The successful Bidder shall be responsible for warranty work on all equipment and components, including attachments and non-factory parts. Provide point of contact name and telephone number for warranty service and parts that is available 24 hours per day, 7 days per week, 365 days per year. Bidder shall submit complete warranty information with the bid.

Components such as engine, emissions parts, transmission, or other items that are warrantied separately from the vehicle manufacturer's warranty shall be clearly identified in the service manuals.

The warranty period for remedying all defects in the Goods will begin on the date on which testing, start-up and training has been completed to the Owner's satisfaction, all of the Goods are functioning as intended and the Owner has accepted all of the goods to be in accordance with the Procurement Documents.

1.19 QUALITY ASSURANCE.

A. Quality Assurance Provisions. The Contractor shall be responsible for the performance inspection requirements specified. The Contractor shall utilize his own or any other inspection facilities or services. The Contractor shall maintain records of inspections and tests. Copies of these records shall be provided to the Owner.

B. Substitutions. The Contract, if awarded, will be on the basis of material and equipment described or specified in these technical specifications. After the Contract has been awarded, the procedure for submittal of substitute or equal item of material or equipment by Contractor, and consideration by Owner, is set forth in the General Conditions. When the Contractor elects to use a material exceeding the specifications for its convenience or availability, it does so at its own expense.

1.20 MATERIALS.

Materials shall conform to the specifications listed in this document, Advisory Circular 150/5220-20 and SAE ARP5548. Materials shall be of the best quality available for their intended commercial use. Component parts shall be new and free of all defects and imperfections that could affect the serviceability of the finished product. Contractor shall promptly repair any defects and related defects discovered within the standard 12-month warranty period, or selected warranty period. Unless otherwise approved by the Owner, Contractor shall commence to correct the defect and related defect within 15 calendar days from receipt of notification from the Owner. All materials supplied shall be of current serial numbers representing that the materials are current and readily available upon need due to failure and normal replacement. No obsolete, but unused parts shall be utilized in the manufacturing of this equipment.

1.21 DESIGN.

Equipment shall be developed in accordance with the best engineering practices available. Vehicle design shall include current state-of-the-art procedures that consider improved cab visibility, interior lighting and the mitigation of noise and vibration. Design and installation of equipment shall permit easy accessibility for maintenance and service.

1.22 CONSTRUCTION.

Equipment shall be constructed to provide maximum protection against structural member failures. Equipment shall withstand the cold, moisture, strains, jars, vibration, and other conditions that are likely to be encountered during operation. All components and assemblies shall be free of hazardous protrusions, sharp edges, cracks, or other elements that might cause injury to personnel or damage to equipment. All oil, hydraulic, air lines, and electrical wiring shall be located in protected positions properly attached to the frame or body structure. Wherever these lines pass through structural members, they shall be protected with looms or grommets except where a through-frame connector is necessary.

PART 2 - REFERENCES

2.1 APPLICABLE DOCUMENTS.

Documents and publications referenced or described in AC 150/5210-5D, 150/5220-20A and SAE ARP5548 are incorporated by reference.

2.2 DEFINITIONS.

Definitions shall be per AC 150/5210-5D, 150/5220-20A and SAE ARP5548.

PART 3 - PERFORMANCE REQUIREMENTS

3.1 INTENT

The multi-tasking vehicle shall be designed for one-person operation and shall have the ability to operate at forward speeds of at least 35 mph during snow removal operations on ramps, taxiways and runways. The design of these units shall ensure positive tire-to-ground tractive effort while brooming and doing full wall-to-wall turnarounds.

A. OPERATING CONCEPT

The operating concept is that a single operator can operate a plow, runway broom and air-blast system simultaneously to clean the surface to bare pavement.

All MTE components shall be designed to provide continuous service under difficult working conditions in -40 to +100 °F cold or hot weather conditions without degradation of performance. The broom shall be designed to allow

B. SIMULTANEOUS OPERATION

The MTE plow, broom and air blast will be operating simultaneously with the broom and air-blast following the plowed path at all times.

3.2 MINIMUM PERFORMANCE REQUIREMENTS.

The MTE shall be a Modular or Integral Non-Articulating configuration. The MTE shall include a combination of all-wheel drive carrier vehicle, snowplow, rotary broom and high velocity air blast system intended for plowing and sweeping snow from airport operational areas, including runways, taxiways and apron areas.

A. Snow Moving Capacity. The MTE shall be capable of clearing 3 inches of snow having a density of 25 pounds per cubic foot from 4,300,000 square feet of critical pavement in 30 minutes.

B. Operating Speed. The MTE shall have an operating speed of at least 35 mph.

C. Traction Unit (Chassis) Engine Performance. Per SAE ARP5548 paragraph 5.3.3 the engine shall develop sufficient torque and horsepower to meet normal operational requirements. Traction unit drive engine shall have minimum of 400 horsepower, and shall meet the requirements of SAE ARF5548 plus any additional requirements listed in these specifications.

D. Broom/Airblast Engine Performance. Broom/airblast drive auxiliary engine shall be a minimum of 495 horsepower. Refer to SAE ARP5548 paragraph 8.3.8 for performance requirements. The broom head with 46-inch brush diameter shall be capable of producing a minimum of 4,000 Foot-Pounds of torque at maximum hydraulic pressure (approximately 5,000 psi) and minimum brush rotation speed of 500 RPM.

E. Broom Width. Broom shall be 22 feet wide with a minimum swept path of 18 feet in operating position.

F. Airblast Performance. Per SAE ARP5548 paragraph 8.7.3 the airport user shall specify the minimum airblast performance rating required. The airblast system shall produce a minimum of 22,000 CFM at 400 MPH. The velocity and CFM at each nozzle shall be certified by an independent test facility and submitted with the bid.

G. Plow. Front-mounted power reversing plow shall be flared, 24 feet wide, with polyethylene moldboard a minimum height of 50 inches and discharge height a minimum of 64 inches. Moldboard shall meet the requirements of SAE ARP5548 paragraph 7.2.d.

H. **Storage Facility Dimensions.** SRE facility doors are 14 feet high and 25 feet wide. Plow and broom shall pivot to a width of 20 feet or less to allow sufficient clearance through door. Overall height of MTE is limited to 12 feet to provide sufficient overhead clearance through the door opening**. Inside length available is 70 feet.** The fully assembled MTE shall be able to fit within these dimensional requirements.

I. **Performance Certification.** The Bidder shall submit with the bid certified test results, conducted and certified by a PE or an officer of the company, certifying that the MTE meets the requirements of SAE ARP5548 paragraph 4.2.9 for consistent clearing of pavement while operating at a forward speed of at least 35 MPH.

J. **Weight Distribution.** To comply with SAE ARP5548 paragraph 5.2.5 the manufacturer shall submit with the bid the calculated weight distribution on the axles. The actual weight distribution on the produced vehicle shall not deviate from the calculated weight distribution by more than 5% on any axle, or for the gross weight as determined by weighing the unit at a public certified scale. The actual weight shall be provided to the Owner prior to equipment delivery.

K. **Engine Performance.** Per SAE ARP5548 paragraph 13.1 the unit is to be delivered with a performance report for each engine. The performance report shall be used for verification of engine operating parameters and specification compliance.

L. **Alignment.** Per SAE ARP5548 paragraph 13.2 the vehicle shall be delivered with a wheel and frame alignment report verifying proper alignment and set up of the frame rails and main load bearing axles. The report shall show camber, caster and toe-in before and after adjustment against acceptable product limits.

3.3 APPROVALS.

Per SAE ARP5548 the following installation and application approvals are required and shall be submitted with the bid:

- Motive engine installation approval by engine manufacturer (HP rating equal to or greater than that specified).
- Auxiliary engine installation approval by engine manufacturer (HP rating equal to or greater than that specified).
- Motive transmission approval by transmission manufacturer.
- Chassis transfer case if applicable.
- Axles (drive axles and non-drive axles).
- Hydraulic pumps.
- Hydraulic motors.
- Air blast unit.
- Gear drives and gear boxes, all applicable power take-off devices (e.g., pump drives).
- Drive shafts shall have an application approval by the joint/shaft manufacturer.

3.4 TEST PROCEDURES AND AIRPORT/CONTRACTOR OBLIGATIONS.

Per paragraph 4.3.1 of SAE ARP5548 the Owner shall verify that the wall to wall turning circle of the MTE with equipment attached is 100 feet maximum.

The Owner reserves the right to conduct performance testing of the MTE for snow removal capabilities. The Owner will notify the manufacturer of the date scheduled for testing. Weather conditions and/or lack of snow may delay performance testing and will delay Owner's acceptance and final payment.

Performance testing conducted by the Owner shall comply with the requirements of AC 5220-20A and SAE ARP5548.

3.5 ADDITIONAL TESTS.

The Owner may conduct his own operational, performance, and capacity tests on equipment prior to acceptance. The manufacturer shall have the opportunity to witness the performance of these tests, but interpretation of results is the sole responsibility of the Owner. The Owner shall not accept equipment that fails to comply with the performance requirements of the specification or the requirements of FAA Advisory Circular 150/5220- 20.

PART 4 - EQUIPMENT

This specification is intended to identify the technical requirements for a MTE equipped with snowplow, rotary broom and high velocity air blast system. The MTE equipped with snowplow, rotary broom and high velocity air blast system shall meet the requirements of AC 5220-20A as amended by SAE ARP5548 and as modified by this specification.

4.1 FAA ADVISORY CIRCULAR 5220-20A MTE SPECIFICATION SELECTIONS.

The following section summarizes Table 7-1 MTE Specification Selections from AC 5220- 20A. The paragraph numbers correspond to SAE ARP5548. The MTE and attached equipment shall meet the requirements and as modified below.

4.1 Acceptable Design. Per 4.1 of SAE ARP5548 the MTE shall be a Modular or Integral Non-Articulating configuration. The Bidder shall indicate the type of MTE configuration proposed.

A. Modular. The Modular type MTE shall utilize a four-wheel drive power unit with front mounted plow, and trailer mounted tow-behind broom and airblast with a fifth wheel hitch and self-steering trailing axle. The configuration shall be a two engine design, one dedicated to the traction unit and one dedicated to the tow behind broom/airblast. The traction unit shall have forward mounted cab with near center steering and chassis drive engine behind the cab.

B. Integral Non-Articulating. The Integral Non-Articulating type MTE shall utilize a four-wheel drive power unit with front mounted plow. Broom and airblast shall be mounted mid-chassis. The configuration shall be a two engine design, one dedicated to the four-wheel drive power unit and one dedicated to the broom/airblast. The chassis shall have a forward mounted cab.

C. Integral Articulating. Integral articulating type MTE will not be accepted.

4.3.1 Operational and performance testing. Per paragraph 4.3.1 of SAE ARP5548 the Owner shall verify that the wall to wall turning circle of the MTE with equipment attached is 100 feet maximum.

The Owner reserves the right to conduct performance testing of the MTE for snow removal capabilities. The Owner will notify the manufacturer of the date scheduled for testing. Weather conditions and/or lack of snow may delay performance testing and will delay Owner's acceptance and final payment.

5.2.3 Install Pintle Hitch. Per paragraph 5.2.3 of SAE ARP5548 install pintle hitch at the rear of the power unit and the trailer of a Modular type MTE. Install pintle hitch at the rear of an integral Non-Articulating type MTE.

5.3 Engines. Engines shall be standard catalog diesel engines. Alternative fuel engines not accepted. All components shall conform to section 5.3 "Engines" of SAE ARP5548. Components which the Bidder proposes but does not meet section 5.3 shall specifically be listed in the Bidder's proposal.

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

5.3.7 Fuel System - Fuel Tank Heaters. Thermostatically controlled fuel tank heaters not required.

5.3.7 Fuel System - Fuel Line Heaters. Thermostatically controlled fuel line heaters not required.

5.4.4.i Transfer Case. Transfer case shall be manufacturer's standard equipment.

5.6.1 Steering Enhancements. Provide manufacturer's standard design for steering enhancements.

5.6.2 Standard Catalog Steering. Provide manufacturer's standard design for steering enhancements.

5.6.2 Enhanced Steering. Provide manufacturer's standard design for All-Wheel Steering. All wheel steering is required.

5.6.2 All-Wheel Steering Manager's Switch. Provide manufacturer's standard design All-Wheel Steering lockout switch.

5.8.3 Spare Rim/Tire. Spare rim(s) and tire(s) are required. If one size and configuration of tire and wheel cannot be immediately interchanged to all positions on the vehicle, provide one spare rim and tire for each distinct configuration.

5.9.2 Hydraulic System - Arctic Type Hoses. Arctic type required.

5.9.2 Hydraulic System - UV Protected Hoses. UV protected hydraulic hoses required.

5.9.4 Hydraulic System - Cold Weather Operation. Hydraulic system preheater required.

5.10.2 Auto-Lubrication. Provide manufacturer's standard design for auto-lubrication system.

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:

- Pump: electric or pneumatic
- Reservoir capacity: 6 or 8 liters
- Control Unit: Timer or brake counter
- Distribution System: Tubing and fittings at each lubrication point
- Grease Output: Variable depending on system resistance and tubing length
- Low-Level Switch: to alert when lubrication levels are low

5.11.1 Managed Battery System. Provide manufacturer's standard catalog managed battery system to preserve starting power by automatically disconnecting auxiliary and parasitic loads from the vehicle batteries.

5.12.d Clearance and Side Marker Lights. Provide reflective conspicuity markings.

5.12.3 Auxiliary or Specialty Lighting. Auxiliary or specialty lighting not required. Provide four light assemblies mounted and adjusted to illuminate the plowing path per SAE ARP5548 paragraph 5.12.g.

5.12.5 Audible Alarm. Provide manufacturer's standard catalog audible backup alarm per SAE ARP5548.

5.12.6 Horn. Provide manufacturer's standard catalog audible electric or air horn per SAE ARP5548.

5.13.1 Engine Coolant Heater. Provide manufacturer's standard catalog thermostatically

controlled engine coolant heaters per SAE ARP5548. The vehicle shall be able to perform normal operations at an ambient temperature of -40 degrees F.

5.13.2 Engine Oil Heater. Thermostatically controlled engine oil heaters not required.

5.13.6 Hydraulic Tank Heaters. Thermostatically controlled hydraulic tank heaters not required.

5.15 Operator's Cab. Provide manufacturer's standard design cab to meet the requirements of SAE ARP5548.

5.15.3 Cab Glass. Provide manufacturer's standard cab glass to meet the requirements of SAE ARP5548.

5.15.4 Wiper and Washer System. Provide manufacturer's standard catalog heated wipers, and heated side window wipers. Include heated washer fluid systems if available.

5.15.5 Heat, Defrost and Conditioned Air. Provide manufacturer's standard catalog system meeting the requirements of SAE ARP5548.

5.15.7 Rear View Mirrors. Provide manufacturer's standard catalog rear view mirrors to meet the requirements of SAE ARP5548.

5.15.8 Sun Visors. Provide manufacturer's standard catalog sun visors for the front and side windows to meet the requirements of SAE ARP5548.

5.15.11 Two-Way Radio Prewiring. Provide pre-wiring for installation of two-way radios. This will include a master connection point for multiple radios and continuous duty relays.

Transceivers shall be installed in carrier vehicles to establish voice communication with other vehicles, the air traffic control tower, and snow control center and maintenance facilities. The vehicle cab shall be designed to provide convenient space near the operator for the installation of a pair of transceivers.

A tunable airport frequency 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. Contractor shall request a sample model from the airport.

An 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

Bidder shall have the option to program the radios at the factory or use a local vendor to complete programming at the airport. Frequency and programming information will be provided after contract award.

5.15.12 Windshield Deluge System. Provide manufacturer's standard catalog windshield deluge system meeting the requirements of SAE ARP5548.

5.15.13 Fire Extinguisher(s). Provide manufacturer's standard catalog fire extinguisher(s) meeting the requirements of SAE ARP5548.

5.16.1 Seating. Provide manufacturer's standard catalog seat meeting the requirements of section 5.16.1 of SAE ARP5548.

6.2 Backup Camera. Provide manufacturers standard backup camera meeting the requirements of section 6.2 of SAE ARP5548.

7.5 Cutting Edge. The cutting edges shall be rubber type.

7.6 Plow Hitch Lift Cylinder. Provide manufacturer's standard single or double acting lift cylinder to meet the requirements of SAE ARP5548.

7.7 Spray Guard. A spray guard meeting the requirements of SAE ARP5548 shall be affixed to the top moldboard flange for reinforcement.

7.8 Shock/Impact Absorbers. An automatic cushioning device shall be installed between the moldboard and drive frame to minimize damage to the moldboard, cutting edge and carrier vehicle, and to enhance driver safety.

7.10 Caster Wheel Assemblies. Provide manufacturer's standard catalog caster wheel assemblies to meet the requirements of SAE ARP5548.

8.2 Mount Configurations - b. Non-Stowable Broom Head. The Integral Non- Articulating type MTE shall be a non-stowable broom head design.

8.3.3 Brush Diameter. New unworn rotary broom brush shall be 46 inches in diameter.

8.3.4 Bristle Materials. Bristle assemblies shall be a 50/50 combination of polypropylene and wire bristles. Bristle materials shall be as specified in SAE ARP5548. The bristles shall withstand storage temperatures ranging from -60 to +160 degree F and operating temperatures ranging from -40 to +125 degrees F.

8.3.5.1.a Wafers. Provide standard wafer configured bristles.

8.3.5.1.c Wafers – Bristle End Count. Polypropylene bristles shall be 0.075 inch x 0.105 inch, oval shaped, and 8 pounds total wafer weight minimum. Wire bristles shall have a mean diameter of 0.018 inch, galvanized, and 13 pounds total wafer weight minimum.

8.4.8 Broom Hood. The broom hood shall be fabricated from heavy gauge sheet steel or other durable material and securely fastened to the broom frame. It shall shield the top half of the broom completely and shall be non-clog design to prevent snow and ice buildup underneath the hood. It shall provide the necessary quick access to the broom for replacement of bristles and for inspection.

8.4.9 Stripper Device. There shall be an adjustable and replaceable stripper bar or device on the front of the hood to strip the snow from the broom, preventing snow carryover from the front of the broom to the back of the broom. It shall be the full length of the broom. The stripper device adjustment shall be accomplished manually at the broom hood or automatically in accordance with brush wear. Adjustment is required to maintain a specific and predetermined amount of clearance between the stripper bar and the bristle tips.

8.4.10 Snow Deflector. An airport operator may request a hydraulically adjustable snow deflector mounted at the front of the hood. It shall give the machine operator ability to influence the angle or trajectory of the snow as it leaves the broom for snow cast control purposes and to minimize accumulation of swept snow on the carrier vehicle. The deflector shall be adjusted by the operator at the operator control station.

PART 5 – FINISH AND PAINT

5.1 Painting and Marking:

Painting and marking of MTE vehicle shall be in accordance with FAA Advisory Circular 150/5210-5 Painting, Marking, and Lighting of Vehicles Used on an Airport.

A. Painting. The vehicle shall be painted Chrome-Yellow in accordance with color tolerance charts that have been made available for FAA regional airport inspectors and key potential users in the aviation safety equipment industry (see AC 150/5210-5).

B. Preparation and Finish: The vehicle and all mounted and towed equipment shall be cleaned first, then treated with a corrosion inhibitor, primed, puttied, sanded, and finally painted. The paint shall consist of not less than two coats of Chrome- Yellow polyurethane enamel, acrylic enamel, acrylic urethane, or similar high durability, long life paint applied to produce full hiding.

C. Plow. Plow frame and hitch shall be painted with one coat of metal primer and two coats of black two-part acrylic urethane. The rear of the plow shall have a non- glare finish.

D. Broom. The broom shall be painted with one coat of metal primer and two coats of black two-part acrylic urethane. The rear of the broom head shall have a non- glare finish.

E. Quality: The finished paint shall be free of “fisheye,” “orange peel,” chips, runs, or other imperfections that detract from the equipment’s corrosion resistance and appearance.

F. Marking. The carrier vehicle shall display the airport logo and vehicle number as indicated in section 1.17-A.6. Actual details for lettering and logo shall be submitted and approved by the airport management prior to vehicle completion.

PART 6- METHOD OF MEASUREMENT

6.1 GOODS.

Goods shall be measured by the lump sum for Multi-Tasking Equipment (MTE) with snowplow, rotary broom and high velocity air blast system as identified in the Bid Schedule. The Goods are all of the tangible personal property to be furnished under the Contract Documents and Specifications.

6.2 SPECIAL SERVICES.

Special Services to consist of field testing, startup, operations and maintenance training, and delivery of operations and maintenance manuals shall not be measured for payment but shall be considered incidental to the Goods to which they are associated.

PART 7 - BASIS OF PAYMENT

7.1 GOODS.

A. **Application for Payment 1.** The first Application for Payment will be submitted after delivery of the Goods has been accepted by Owner and will be accompanied by a bill of sale and other documentation satisfactory to Owner warranting that Owner has received the Goods free and clear of all liens, charges, security interests and encumbrances and Field Testing and Startup Services have been completed and accepted by Owner and Operations and Maintenance Manuals have been delivered to Owner. Such documentation shall include releases and waivers from all parties who, during CONTRACTOR's performance under the Procurement Documents, might have obtained or filed any such lien, charge, security or encumbrance. In the case of multiple deliveries of Goods, additional Applications for Payment will be submitted as Owner accepts delivery of additional items of the Goods. For Progress Payment Number 1, Owner shall pay to CONTRACTOR an amount equal to 95% of the Contract Price.

B. **Final Payment.** Final Application for Payment may be requested after completion of initial 60-day operational period. If the application and accompanying documentation are appropriate, as to form and substance, Owner shall, within 60 days after receipt thereof, pay CONTRACTOR the amount due less any sum Owner is entitled to offset, including but not limited to liquidated damages to which Owner is entitled.

7.2 ALTERNATE #1 – EXTENDED WARRANTY.

7.2.1 **Alternate #1 –** As an alternate, provide pricing for an extended warranty for the carrier vehicle. The warranty shall be 60 months/5,000 powertrain hours. Contract award will be based on the base bid. The alternate will be considered separately.

END OF SECTION