BID SPECIFICATIONS FOR
4000 GALLON 50’ BOOM DEICING TRUCK

Lansing, MI
7-1-2014

1) GENERAL

These specifications contemplate the furnishing and delivery of ONE (1) NEW, REAR-WHEEL DRIVE, HI-SPEED, RUNWAY DEICING CHASSIS, and indicate in general the type, size, and quality desired.

This Vehicle shall be rear wheel drive and must be designed and manufactured in the United States, for the specific purpose of snow removal, with a minimum 72,000 GVW and a minimum wheel base of 183". It shall be designed and line built by the original manufacturer as a 6 X 4. After market conversions of 4 X 2's are not desired and are not acceptable. This vehicle shall comply with all applicable FMCSR and FMVSS quality/safety standards, and requirements of the FAA Advisory Circular 150/5220-20 dated 6/30/1992.

All parts and components of this unit shall be new and engineered and classified as HEAVY DUTY, and shall be of the size, material, and strength to sustain the maximum load limits and severe operating conditions encountered in snow removal, while resulting in minimum wear and failure.

These specifications require the doing of all things necessary or proper for, or incidental to the furnishing of said unit. All items of design and equipment not listed in these specifications, but involved in carrying out their intent, are required to be furnished by the bidder, the same as if these items were specifically mentioned and described in these specifications.

PROTOTYPES AND EXPERIENCE

The airport sponsor requires this specified piece of equipment in order to maintain the airfield during large and small snow events. It will be a central and critical element in the fleet and in the effort to accomplish the airport’s published snow plan. Experience building machines of this nature is mandatory, as is a track record of recent manufacture and in-service record for machines comparable and similar to that specified. No prototypes will be accepted.

Therefore, location and contact lists are required in the bid package to enable the airport sponsor to contact at least 10 airports that have taken delivery of similar equipment from the bidder within the last two years. Bids received without including such location and contact list will be considered non responsive and will not be considered.

2) CHASSIS

The chassis shall be designed to permit easy and safe mounting and dismounting from the unit for the operators and service personnel. All sheet metal, cowling, steps and fenders

shall be free of sharp edges and protrusions. All steps or walkways shall be raised lug or expanded metal type construction. Grab bars shall be installed as required for safe mounting and dismounting by personnel. All sheet metal for cowling, shrouds and fenders shall include ample supports and bracing to prevent distortion and cracking. The engine shall be enclosed in a housing of weatherproof design, full butterfly or full side opening type for access to each side of engine. Front tires shall be equipped with fenders. Rear tires shall have mudflaps.

FRAME

The frame shall be of Grade 8 bolted construction, with heat treated, 120,000 psi yield, straight single channel carbon manganese steel rails, connected by an adequate number of cross members to resist frame distortion from the lateral stress expected in this application. Minimum bar size shall be 10.125" X 3.580" X 0.312". The frame shall be an industry standard width. There shall be two (2) tow hooks mounted on the frame of the front of the vehicle. A minimum 20" integral front extension is required. Outer “C” channel frame reinforcement shall be heat treated, 120,000 psi yield. Channel size shall be 10.813” X 3.892” X 0.312”.

The outside of the frame rails above the front axle shall be clean and free from equipment that might be damaged by snow, ice, sand, or material build up. This includes but is not limited to oil filters, oil coolers, fuel filters, coolant hoses or other critical components that should be protected.

ENGINE

The engine shall be of the four stroke diesel type, six (6) cylinder, minimum 11 liter displacement, developing a minimum of 370 horsepower at 1700 RPM, and shall be equipped with the latest diesel electronic control and engine management system, Navistar N-13 or similar. The engine shall have an automatic power derate system to protect against low oil pressure and high engine temperature. The engine shall be provided with full flow, replaceable oil filters, dry type two stage air cleaner, fuel filter, and emergency warning system with light and buzzer, in event of high water temperature and/or low oil pressure, and front engine PTO flange for mounting a front mounted hydraulic pump to be driven directly off the crankshaft. The engine shall be equipped with a coolant heater.

COOLING SYSTEM

The cooling system shall consist of a HEAVY DUTY front to back cross flow radiator, with the tanks welded together, and side members attached to form a rigid frame. A water to oil transmission cooler shall be provided. A direct fan drive, Horton Drivemaster or similar shall be installed with a nylon fan. The engine cooling system shall be filled with permanent type antifreeze protecting the system to -40 degrees F. The system shall be sized to allow full operation of the vehicle without overheating.

FUEL SYSTEM

Fuel tank(s) shall have a minimum capacity of 50 gallons and shall be left side mounted. The tank shall be constructed of heavy gauge metal and be properly fastened to the frame. A four inch diameter or similar filler neck with chain connected cap shall be provided.

TRANSMISSION
The transmission shall be an Allison 4000 RDS six-speed electronic control automatic, with close ratio gearing, and shall be supplied with the appropriate torque converter for this application. Shifting shall be accomplished via a shift control within easy reach of the operator. LIGHT OR MEDIUM DUTY TRANSMISSIONS ARE NOT ACCEPTABLE.

AXLES
The rear driving axles shall be of the full floating, torsion flow type with a single reduction spiral bevel gear design, maximum 46,000 pound GAWR hub and brake rating, minimum 6" ground clearance, capable of withstanding the loads of the unit being bid. The front axle shall be a non-driving wide track, I beam type, with a 20,000 pound hub and brake rating, a minimum 6" ground clearance, and shall be capable of withstanding the loads of the unit being bid. The front axle shall be equipped with heavy duty hydraulic shock absorbers. DOUBLE REDUCTION TYPE AXLES AND HUBS WILL NOT BE ACCEPTABLE.

BRAKES
The service brakes shall be fully air actuated, drum and shoe type with a minimum 13 CFM air compressor and documented to conform with FMVSS 121 including a wheel control ABS system. The parking brakes shall be spring actuated, air released at the rear service brake chambers, with the air switch mounted in easy reach of the operator. Brakes both front and rear shall be s-cam type. The air system shall be equipped with a heated Bendix AD-IS or approved equal air drier system. DISC BRAKES WILL NOT BE ACCEPTABLE.

WHEELS AND TIRES
This unit shall be equipped with proper sized wheels and tires for the GVWR rating of the unit being bid, in compliance with National Wheel and Rim Association standards. Single Continental 425/65R22.5 or equal approved tires shall be installed on the front axle. Dual Continental 12R22.5 or equal approved tires shall be installed on rear axles. The wheels shall be of the steel disc type with a 12.25" DC. The wheels shall be finished white.

CAB
The cab shall be a CONVENTIONAL two man type, with air-bag type rear suspension, tinted safety glass throughout. Floor mat, rubber or vinyl covering complete cab floor, fastened for easy removal, but securely held to floor. Tilt column steering wheel, National 2000 driver seat and separate passenger seat both with retractable seat belts shall be installed, dual heated rectangular type mirrors, dual sun visors, fresh air heater/defroster, air conditioning, side window defrosters, dual electric windshield wipers with intermittent swipe feature, left and right outside grab handles, ash tray and cab mounted electric horn shall be installed. The chassis shall have cruise control. A warning triangle kit and a mounted fire extinguisher shall be provided in the cab.

ELECTRICAL SYSTEM
System shall be 12-volt, and include a 160-amp alternator, three batteries, with minimum 1900 cold cranking amps at 0 degrees F (- 18 degrees C). Automatic reset circuit breakers

on all major circuits are required (fuses are not acceptable). Integral wiring for all cab-mounted and other lighting equipment shall be provided. Self-canceling turn signals and emergency flasher control shall be mounted on steering column. Standard lighting will meet FMVSS requirements. One (1) amber LED beacon light mounted on cab roof to assure 360 degree visibility, tail, turn, clearance, back-up, and all other lighting, reflectors, etc. to be furnished and mounted on vehicle as required to comply with FMVSS. A master electrical system disconnect switch shall be installed near the battery box. Provisions for jump starting shall also be provided.

PAINT
The complete vehicle shall be painted with one (1) coat of metal primer and two (2) coats of FAA approved "#33" Chrome Yellow two-part acrylic urethane or comparable.

RADIO EQUIPMENT
An ICOM IC-A110 communication radio with an external speaker and an ICOM 4031S maintenance radio with an external speaker will be installed in the unit prior to delivery.

ALIGNMENT
The vehicle is to be delivered with a wheel alignment report verifying proper alignment and set up of all steering axles, both left and right side. Report shall show camber, caster and toe-in before and after adjustment against acceptable product limits. A sample of such alignment report is to be provided in the bid package. This sample shall verify that such testing is standard practice for the manufacturer. A special procedure to satisfy this requirement for this procurement only does not demonstrate the quality procedures and standards desired by the purchaser.

3) 4000 GALLON 50 FOOT BOOM RUNWAY DEICING SYSTEM
The 4000 gallon Deicing system will be mounted on a suitable chassis. All of the equipment shall be operated from the driver seat inside the vehicle cab, including the application rate, the movement of the booms and the opening and closing of the spray nozzles. The controls will be located for easy access by the truck driver and will be illuminated for nighttime operation.

BOOMS
The spray booms shall consist of three sections right, left and center. The center section shall be stationary and 10 ft. 8 inches. The right and left sections should measure 20 ft. each and capable of folding alongside the chassis and lock in place for transport. The system shall be designed so any one or all of the sections may be operated independently or in conjunction with the others. When fully extended the booms should measure a minimum of 50 feet.

Each boom wing shall have at least 3 LED marker lights with one located near the end of the boom so that the operator can maintain visual contact with the boom tip at night or in hazy conditions. One LED spot light shall be located at each wing boom and positioned in such a manner as to illuminate the spray area of each wing boom. In addition, two adjustable lights should be mounted to the rear head of the tank. An amber LED 360

degree coverage beacon shall be installed on or near the rear of the tank.

TANK CONFIGURATION AND MATERIAL
4000 U.S. gallon one compartment tank with two 12-gauge stainless steel flanged baffles. The tank heads will be 12-gauge stainless steel and have a flanged weld area. The tank thickness will be at least 12-gauge with a minimum of 8-gauge on the sills. The tank shall be constructed entirely of 304 stainless steel.

One low profile 16-inch Tiona manhole with a 10-inch filler cap and quick release shall be installed on the tank. A ladder shall be installed at the front of the tank on the street side, it should be approximately 10-inches wide and extend from the top of the tank to no lower than the center line of the axles.

A sight gauge shall be located on the street side of the tank and calibrated in 500 gallon increments. The sight gauge should be clearly visible to the operator from the driver's seat.

SPRAYING SYSTEM
The spraying system will consist of two stainless steel tubes per boom section. The center section will have two tubes. The large tube will be 1 ¼ inch O.D. with .125" wall thickness and will be 97 inches long and will have 4 swirl jet nozzles located on 30 inch centers. The smaller tube will be ¾ inch O.D. with a wall thickness of .0625 inches and will be 111 inches in length and will have 12 Tri-stream penetrating nozzles located on 10 inch centers.

Each wing boom will have two tubes. The large tube will be 1 ¼ inch O.D. with a .125 inch wall thickness. The large tubes will be 18 feet in length and will have 8 swirl jet nozzles located on 30 inch centers per side, 16 nozzles total. The smaller tube will be ¾ inch O.D. with a .0625 wall thickness. The small tubes will be 19 feet 4 inches long and will have 23 Tri-stream penetrating nozzles per side located on 10 inch centers, 46 nozzles total.

The Tri-stream nozzles should allow lighter application rates at slow speeds and the larger swirl jet nozzles should be designed to accommodate higher application rates and faster speeds.

The rate control system should sense the ground speed, spray width and material flow rate. When a change in ground speed or spray width is detected the control system will be designed to automatically change the material flow rate to maintain a constant, pre-selected application rate. These calculations should be updated at least four times a second to provide precise application rates. The rate of application should be equal at all nozzles over the entire length of the spray boom.

FINISH
Portions of the stainless steel tank may be left unfinished. All other related equipment will be powder coated to match cab of truck.

4) MISCELLANEOUS

START UP AND TRAINING
The unit must be fully assembled and tested prior to delivery. Shipping cost is the responsibility of the bidder. FOB the buyer. A qualified factory representative must fully prepare start-up and test the unit prior to training. Training shall be performed by a factory trained and authorized technician. The training shall be performed at the customer's site and shall be 4 hours for operators training and an additional 4 hours for mechanics training (mechanics shall attend the operating training first). The purpose of this training is to review safe and effective procedures for use and maintenance of the machine, review and test all systems, assure the full function of the machine. Start up and training are to be performed at no additional cost.

WARRANTY
The bidder shall warrant his equipment as to the specified capacities and performance, and to be free from all defects in design, material and workmanship. All labor, transportation costs and defective parts shall be replaced at the bidder's expense. THIS GUARANTEE SHALL CONTINUE FOR A MINIMUM OF ONE (1) YEAR AFTER COMMENCEMENT OF ACTUAL OPERATION OF THE EQUIPMENT. No exceptions to the guarantee requirement will be accepted. All component warranties will apply and be warranted by the bidder.

MANUALS

OPERATION AND MAINTENANCE SAFETY MANUALS
Manual(s) are to be included with the unit covering safe operation, and operator maintenance of the unit.

REPAIR, PARTS AND SERVICE MANUALS
The successful bidder shall provide one (1) complete set of chassis manuals to include: parts, operator's and mechanic's service manuals. The mechanic's service manual shall also include complete electrical, hydraulic and compressed air schematics. One (1) complete set of manuals for all auxiliary equipment shall be provided.

INSURANCE
To protect the purchaser from potential involvement in litigation, the chassis manufacturer for this contract shall be adequately covered with liability insurance. The chassis manufacturer shall carry commercial general liability insurance including coverage for the products-completed operations exposure, with limits of not less than $5,000,000 per occurrence and in the annual aggregate for all damage arising out of bodily injury and property damage. The insurance shall be issued by an insurance company with a current A.M. Best rating of A- or higher. A Certificate of Insurance showing that this minimum amount of coverage is currently in force shall be included in the bid package for the bid to be considered.

MANUFACTURER/SUPPLIER STABILITY
In the interest of continued and reliable service, parts, and technical support, equipment suppliers shall have exhibited a consecutive history of financial stability and manufacture of

similar equipment over a minimum of the past ten years. Documentation shall be provided in the bid package to verify such continuous business activity, such as location and contact lists (minimum 10 users), financial statements, and annual reports. In the interest of process and quality control, the chassis manufacturer shall be ISO 9001 certified. Because of the critical nature of the product and its application, the burden of proof for this requirement lays with the bidder and/or suppliers.

CHASSIS MANUFACTURER CERTIFICATION

Chassis manufacturer shall be ISO 9001 certified for the production of heavy trucks. Claims of self-certification programs are self-serving and are not acceptable for this procurement activity. Third party verification is required given the importance and scope of the equipment and the purchaser's equipment procurement program. Certification documentation of chassis manufacturer compliance with ISO 9001 FROM A THIRD PARTY is required in the bid package. Bids not including this documentation will be deemed not acceptable.

COMPONENT SOURCING

Because of the critical nature of this machinery, it is essential that the complete unit and all components be newly manufactured and unused. To this end, the purchaser reserves the right to compare serial numbers of engines, transmissions, transfer cases and axles with the current production records of the component manufacturers. Any component found to be used, or not of current production will be rejected. The contractor (bidder) will replace the component in question with an appropriate and acceptable new replacement component at his own expense.