

MANCHESTER-BOSTON REGIONAL AIRPORT

REQUEST FOR PROPOSALS

FOR

CLASS VI HIGH SPEED ROTARY PLOWS

NOVEMBER, 2018

FY19-805-5

LEGAL NOTICE

CITY OF MANCHESTER MANCHESTER•BOSTON REGIONAL AIRPORT

REQUEST FOR PROPOSALS CLASS VI HIGH SPEED ROTARY PLOW

November, 2018

FY19-805-5

Manchester•Boston Regional Airport will receive proposals for **Two (2) and Three (3)** "Class VI High Speed Rotary Plows" at Manchester•Boston Regional Airport.

Sealed proposals will be received until <u>3:00 pm on Thursday, December 20, 2018</u> at the office of the Airport Director.

Proposals must be in a sealed envelope plainly marked "CLASS VI HIGH SPEED ROTARY PLOWS", Attention: Operations and Facilities.

Specifications are available and proposals receivable at the Airport Administration Office, One Airport Road, Suite 300, Manchester, New Hampshire 03103, Telephone: (603) 624-6539.

Manchester•Boston Regional Airport reserves the right to waive any irregularities and to reject any and all bids on any basis and without disclosure of the reason.

Theodore S. Kitchens, A.A.E. Airport Director

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RECITALS

WHEREAS, the Airport has identified a significant need for new Class VI High Speed Rotary Plows and is funding this purchase using Airport Improvement Program funding;

WHEREAS, the Airport has determined to implement the purchase using a Request for Proposal (RFP);

WHEREAS, pursuant to the Enabling Law, the Airport issued a Request for Proposals ("RFP") on November 28, 2018 in order to obtain from firms who would be invited to submit their proposals for the delivery of **Two or Three** Class VI High Speed Rotary Plows (depending on funding);

WHEREAS, proposals are due on December 20, 2018;

WHEREAS, following the review and selection process established in the RFP the Airport will select a firm that submitted the specifications, that met the requirements at the lowest cost for either **2 Units or 3 Units**;

WHEREAS, the Airport desires to receive, **Two or Three** Class VI High Speed Rotary Plows in accordance with the terms and conditions of this Proposal;

NOW THEREFORE, for and in consideration of the covenants, agreements, and benefits to those providing proposals, all will agree as follows:

I. PROPOSALS REQUESTED

The Manchester•Boston Regional Airport (hereinafter called the Airport) hereby solicits proposals from qualified firms (hereinafter called either the Company or Manufacturer) interested in providing CLASS VI HIGH SPEED ROTARY PLOWS (hereinafter called Equipment or Units) for Manchester•Boston Regional Airport. The City of Manchester which owns and operates the Airport through its Department of Aviation, will accept and review Proposals from Companies and select one (1) Company to provide **Two or Three** CLASS VI HIGH SPEED ROTARY PLOWS delivered to 400 Kelly Avenue, Manchester, NH 03103.

SCOPE

The airport is requesting sealed proposals for at least **Two** and **Three** Class VI High Speed Rotary Plows. The airport is requesting cost proposals for the delivery of 2 Units and a cost proposal for the delivery of 3 Units. The airport intends to issue a contract based upon available funding. **The airport reserves the right to negotiate with one or more parties who have submitted proposals. Such negotiations are designed to achieve terms and conditions most favorable to the airport.**

The Class VI High Speed Rotary Plows must meet SAE standard ARP 5539 Rotary Plow with carrier vehicle. The Class VI High Speed Rotary Plow must meet specifications of the FAA Advisory Circular AC 150/5220-20A Airport Snow and Ice Control Equipment. The equipment must be capable of casting a windrow of snow a minimum of 150'. The equipment must be capable of removing a windrow created by displacement plows and snow brooms that have cleared ½ inch of snow, weighing 25 lbs per cubic foot from a runway that is 150 feet wide with an additional 50 feet of paved shoulders and is 9250 long all in 10 minutes. The equipment must be capable of a minimum of 7500 tons per hour.

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REFERENCES

1.0 Applicable Documents:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publication shall be the issue in effect on the date of the purchase order. In the event of a conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

1.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Internet address: http://www.sae.org

SAE J931	Hydraulic Power Circuit Filtration
SAE J1503	Performance Test for Air-conditioned, Heated and
	Ventilated Off- Road Self-Propelled Work Machines

1.2 FAR and FAA Publications from FAA: Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Internet address: http://www.faa.gov.

AC 150/5200-30A	Airport Winter Safety and Operations
AC 150/5200-18	Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials

- AC 150/5210-5B Painting, Marking, and Lighting of Vehicles on an Airport
- 1.3 FMCSR Publications from FMCSA: Available from Federal Motor Carrier Safety Administration, 400 Seventh Street SW., Washington, DC, 20590; Internet address: <u>http://www.fmcsa.dot.gov</u>

Title 49, Chapter III, Subchapter B-Federal Motor Carrier Safety Regulations (Title 49)

- 1.4 Federal Spec 297 D, Rust proofing of Commercial (Non-tactical) Vehicles
- 1.5 RTCA Publications: Available from Radio Technical Commission for Aeronautics Inc,1828 L Street NW, Suite 805, Washington, DC 20036, Internet http://www.rtca.org

RTCA document DO-186, "Minimum Performance Standards for Airborne Radio Communications Equipment Operating Within the Radio Frequency Range 117.975 - 137.000

1.6 FMVSS Standards-latest edition

DEFINITIONS

- 1.7 Axle Capacity: The allowable load on an axle based on supportive engineering data and the best judgment of Manufacturer of the axle. Usually based on all the components in an axle system, tire-wheel-bearings-spindle, etc.
- 1.8 Axle Ratio: The numerical ratio of the drive shaft speed to the speed of the axle. The numerical ratio equals the torque multiplication factor of the axle.
- 1.9 Axle, Dead: A means of support for the wheels at each end that is non-driven.
- 1.10 Axle, Live: A means of support for the wheels at each end that is driven.
- 1.11 Auger, Drum-cutter Type:

A structure used to disaggregate snow and transport it across the face of a snow blower. When used in a single stage blower, the drum cutter also casts the snow. The helical flights of a drum cutter are affixed to a relatively large diameter cylinder, or drum, that serves as or is attached to the center axis of the auger. Drum-cutters on Single Stage Snow-thrower Rotary Snowplows are also referred to as "Turbines". Drum cutter augers typically rotate on an axis perpendicular to the direction of travel.

1.12 Auger, Helical:

A structure designed to disaggregate and transport snow across the face of a snow blower, based on an open helix concept, the helix being mounted to the center axis of the auger, usually by some type of spoke arrangement. The center axis structure of a helical auger is relatively small in diameter when compared to the diameter of the helical ribbon. Helical augers typically rotate on an axis perpendicular to the direction of travel.

1.13 Auger, Screw Type:

A screw type structure designed to disaggregate and transport snow across the face of a snow blower, the flights of which are closed and connected directly to the center axis of the auger. Several parallel screw type augers are often used together.

1.14 Auger Drive:

The Auger Drive is the final mechanism(s) employed to rotate the Auger(s). An Auger Drive can by hydrostatic, hydraulic or mechanical, or a combination of hydrostatic and mechanical. Mechanical Auger Drives must be protected by the inclusion of slip clutches or shear pins. Hydrostatic drives must be protected by the inclusion of pressure protection devices.

1.15 Cab:

An enclosed area on a vehicle designed and intended to hold and carry an operator.

1.16 Capacity Rating:

Also see Performance Rating. The Capacity Rating of a Rotary Snowplow is the maximum number of tons of snow a Rotary Snowplow can blow (see Snow-blowers) or throw (see Snow-throwers) a defined Casting Distance.

1.17 Carrier Vehicle: The prime mover for a Rotary Snowplow.

1.18 Casting Distance:

The distance from the left to right center of a Rotary Snowplow to the center of the area of most concentrated snow cast observed during casting.

1.19 Center Drive Augers:

Augers driven by a gear box located more or less in the center position of the auger axis.

- 1.20 Certification:
 - a. Application approval a confirmation and testimony in writing by a qualified expertise.
 - b. Performance manufacturer must provide certified, credible testing results.
- 1.21 Curb Weight:

The weight of the carrier vehicle with all factory installed equipment and in the travel position, full fuel tank(s) and a nominal 180 lbs. operator.

1.22 Deluge System:

A means of providing fluid to windshield(s), window(s), mirror(s), and other surfaces to improve operational visibility from the cab. Deluge systems shall be controlled from the operator station in the cab.

1.23 Differential:

The gear assembly on the drive axle that permits one wheel to turn slower or faster than the other when negotiating a turn. The gear assembly in the transfer case that allows the front drive-shaft to turn slower or faster than the other when negotiating a turn.

1.24 Differential, Automatic Locking:

The gear assembly in the transfer case that allows the front drive-shaft to turn slower or faster than the rear prop-shaft when negotiating a turn while providing maximum driving torque to both the front and rear axles. The gear assembly on the drive axle that permits one wheel to turn slower or faster than the other when negotiating a turn while providing maximum driving torque to both wheels. Automatic locking differentials provide positive drive to both driven members while not requiring operator input or control.

1.25 Differential, Manual Locking (bevel gear):

The gear assembly on the drive axle that permits one wheel to turn slower or faster than the other when negotiating a turn but with provisions for the operator to fully lock and unlock the differential action from the cab. Bevel gears provide positive drive to both driven members.

- 1.26 Dimensions:
 - AE Centerline of rear axle/tandem to the end of frame.
 - BA Bumper to centerline of Front axle
 - BBC Bumper to back of Cab
 - CA Back of Cab to centerline of rear axle
 - CE Back of cab to end of the frame (AE + CA = CE)
 - FH Frame height from the ground to the top of frame
 - OAL Overall Length
 - WB Wheelbase
- 1.27 Drop Box:

A gear box (or chain box) that transmits power output to a driven implement.

1.28 Dual Engine Rotary Snowplow:

A Dual Engine Rotary Snowplow has two engines. One engine provides power to the Rotary Snowplow Head, and the other engine provides motive power.

1.29 Equipment, Auxiliary:

Any equipment, in addition to the basic chassis that is required for a piece of equipment/vehicle to perform its functions. For example, a winch would be auxiliary equipment for a tow truck.

- 1.30 Fan, Fan Blades: See Impeller, Impeller Blades.
- 1.31 FMVSS: An abbreviation for the Federal Motor Vehicle Safety Standard.
- 1.32 Front Discharge Rotary Snowplow:

A front discharge rotary snowplow locates the operator cabin to the rear of the rotary snowplow head. This provides for the snow to discharge in front of the operator.

1.33 Front/Rear Axle Disconnect:

A mechanism designed to engage and disengage torque to the axle.

1.34 Fuel Capacity, Maximum:

The maximum actual volume of fluid able to fit into on-board tanks.

1.35 Fuel Capacity, Useable:

The maximum amount of fluid able to be drawn from an on-board tank with the vehicle and tank stationary and in the fixed, operating position.

1.36 GAWR:

Abbreviation for Gross Axle Weight Rating. The rating of the lowest rated member as defined by the component manufacturer(s) from the following components: tires, suspension, hubs/wheels, rims, bearings, beam and brakes.

1.37 Gear Ratio:

The ratio of the speed of the input to a gear to the speed of the output from the gear. For a pair of gears, the ratio is found by dividing the number of teeth on the driven gear by the number of teeth on the driving gear.

1.38 Geared Speed:

The theoretical vehicle speed based on maximum governed engine RPM, transmission gear ratio(s), driving axle ratio, and tire size.

1.39 Gears, Single and Multiple Reductions:

Single reduction gearing refers to one speed reduction through the gearing component. Multiple reductions refer to more than one step of speed reduction through the gearing component.

- 1.40 Gradeability: The percent grade that a vehicle will negotiate.
- 1.41 GVWR:

Abbreviation for Gross Vehicle Weight Rating. The sum of the Gross Axle Weight Ratings (GAWR).

1.42 HID Light:

Acronym for High Intensity Discharge light. Light created by electric arc, not a filament in a light bulb.

1.43 High Speed:

A High Speed Rotary Snowplow must be designed to perform at its maximum Capacity Rating while operating at a forward speed of at least 25 mph.

1.44 Hitch:

A device to couple/uncouple a working head or appliance to its carrier vehicle. A hitch may be provided with dedicated units to improve maneuverability, entry and exit through narrow doors, and/or improved maintainability.

1.45 Horsepower, Gross Brake (or actual delivered horsepower):

A measure of the rate at which engine power is produced. The time rate of doing work, as measured by a Pony brake or dynamometer. In other words, the amount of work done by a certain torque being exerted over a definite space of time. Brake horsepower is expressed as the torque in pound feet times the number of revolutions per minute divided by the constant 5252.

Brake HP = $\frac{\text{torque} \times \text{engine rpm}}{5252}$ (Eq. 1)

1.46 Horsepower, Gross:

The brake HP determined under conditions defined by dynamometer test of the stripped engine, that is, the brake horsepower of the engine with only those accessories and attachments necessary to the functioning of the engine during test.

1.47 Horsepower, Net:

The brake horsepower delivered to the clutch, or its equivalent, with all accessories and attachments function (including exhaust pipe, muffler and tail pipe) which are standard or regular equipment on the engine as installed in the particular chassis. Gross horsepower less the parasitic loads.

1.48 Impeller:

A Rotary Snowblower Impeller (sometimes called a fan) is a rotating device with blades or fan blades. Normally, the device is disc shaped, with the disc rotating on an axis that is parallel to the direction of travel.

1.49 Impeller Blades:

The impeller blades (or fan blades) are located proud on the forward face of the impeller disc, shaped to produce a centrifugal pumping action of drawing snow into a low pressure area, and discharging snow from a high pressure area, these areas produced as a result of blade shapes and impeller rotation.

1.50 Impeller Drive:

The Impeller Drive is the final mechanism(s) employed to rotate the Impeller. An impeller can be hydrostatic, hydraulic or mechanical, or a combination. Mechanical impeller drives must be protected by the inclusion of slip clutches or shear pins. Hydrostatic drives must be protected by the inclusion of pressure protection devices and/or shear pins.

1.51 Impeller Housing:

The Impeller Housing, also sometimes called a volute or fan housing assembly, is the shallow cylindrically shaped assembly that houses an impeller.

- 1.52 Loading Chute: See Spot Casting Chute.
- 1.53 Maximum Tire Load Rating:

The load rating at the maximum permissible inflation pressure for that tire.

1.54 Maximum Loaded Vehicle Weight:

The sum of curb weight, passengers, and cargo; equal to the Gross Vehicle Weight (GVW).

1.55 Maximum Permissible Inflation Pressure:

The maximum cold inflation pressure to which a tire may be inflated.

1.56 Maximum Speed:

The speed attainable by accelerating at maximum rate from a standing start for 1 mile.

1.57 Maximum Starting Grade:

The percent grade on which a vehicle is able to start from a complete stop.

1.58 Maximum Sustained Vehicle Speed:

Highest speed a vehicle can maintain under full load conditions on level ground.

1.59 Monocoque Construction:

A light weight type of construction where the sides of the vehicle bear a substantial part of the load in shear.

1.60 NHTSA:

An abbreviation for the National Highway Traffic Safety Administration.

1.61 New and Current Production Components:

New, unused and free of all defects and imperfections that could affect the serviceability of the finished product. Component with a manufacture date no older than 1 year prior to bid proposal.

1.62 New and of Current Production Unit, as in total unit (Chassis and attachments):

Unit whose manufacture (assembly of) started no earlier than the award date of the Proposal.

1.63 Payload: The actual weight of the useful cargo carried by a vehicle.

1.64 Percent of Grade:

The figure used in computing the power requirements of a truck. Usually taken at the steepest grade a truck will be required to climb on its route. Percent of grade is determined by dividing the height of a hill by its length.

1.65 Performance Rating:

Also see Capacity Rating. The Performance Rating of a Rotary Snowplow is the minimum number of tons of snow a Rotary Snowplow can blow (see Snowblowers) or throw (see Snow-throwers) a defined Casting distance. Manufacturers must provide certified credible testing results.

1.66 Ply Rating:

A unit of measurement used in tire construction to denote strength of tires.

1.67 Power Divider:

Usually a small auxiliary gear box or chain driven device to allow distribution of drive shaft power to several different mechanical devices mounted on the same truck.

1.68 Power Take-off (PTO):

A mechanical device used to transmit engine power to auxiliary equipment. Power take- offs can be mounted on either a main or auxiliary transmission. Front-mounted and flywheel-mounted power take-offs are also used in various applications.

1.69 Power Train:

All the components that handle the engine power from the truck engine to the driving wheels. This includes transmissions, drive shafts, as well as differentials and driving axles.

1.70 Pusher Axle:

A non-driven (dead) axle installed forward of the driven axle(s) to increase the permissible gross weight, and consequently, the payload.

1.71 Rear Discharge Rotary Snowplow:

A rear Discharge Rotary Snowplow locates the operator cabin over the Rotary Snowplow Head, and forward of the snow casting mechanism. This provides for the snow to be cast from behind, or to the rear, of the operator.

1.72 Reflectors: Glass or plastic prism lenses which reflect light.

1.73 Resisting Bending Moment (RBM):

A calculation used to compare frames of different section modulus and of different material. It is the product of the section modulus times the yield strength of the frame material. The formula expression is:

RBM = Section Modulus x Yield Strength (Eq. 2). It is readily apparent from the above formula that the yield strength of a frame is as important as the section modulus. The RBM should, therefore, be taken into account whenever frames of unlike material and section modulus are being compared.

1.74 Ribbon:

The relatively narrow flights that are formed into the helix portion of any helical auger.

1.75 Road Rolling Resistance:

Sum of the forces at the area of contact between a vehicle's tires and road surface acting against the direction of movement.

1.76 Roadside:

The left side of the vehicle when viewed from the rear. Opposite side from curbside.

- 1.77 Rolling Radius: Height measured from the center of the axle to the ground.
- 1.78 Rotary Snowplow Head:

The Rotary Snowplow Head is the main Rotary Snowplow housing incorporating the auger, the impeller and impeller housing (if any), and the balance of the fabricated assembly.

1.79 Serial Number:

A number issued to a vehicle or to a component of a vehicle for identification purposes. See Vehicle Identification Number (VIN).

1.80 Set-back Front Axle:

The front steering axle is normally as close to the front of the vehicle as the design and wheel and tire size permit. When the front axle is purposely located farther toward the rear it is referred to as being "set back." Center line of front axle to front of front bumper is normally from 28 to 37 inches on regular models and 48 inches or more on set-back front axle models.

1.81 Self-Propelled Rotary Snowplow:

A rotary snow plow that is permanently mounted to a full time dedicated mobile

chassis or prime mover that is used for no purposes other than snow blowing.

1.82 Shipping Weight:

The dry weight of a complete truck with all standard equipment including grease and oil but without any fuel or coolant.

1.83 Side Drive Augers:

Augers driven by a gear box, chain, hydraulic or hydrostatic motor from the left, right, or both sides are Side Drive Augers.

1.84 Snow Casting Chute:

The Snow Casting Chute is part of, or attached to, the Impeller assembly and/or the Rotary Snowplow Head assembly where the snow is discharged or cast. The Snow Casting Chute may, or may not be attached to a Spot Casting Chute (see def.). The Snow Casting Chute may be adjustable to allow for operator control of where snow will be thrown through a vertical arc, or it may be fixed to direct snow only in one direction. Also see Spot Casting Chute.

- 1.85 Spring Capacity: The allowable load that can be supported by the spring(s).
- 1.86 Steering, All Wheel:

Any system that augments the steering action of a chassis, providing for power or power assisted steering controlled by the operator in the cab, on all wheels of the vehicle.

1.87 Steering, Power:

Also commonly referred to as "hydraulic steering". A Steering system that uses hydraulic pressure to control a steering axle without a direct mechanical (controlling) link between the operator's controls and the steering axle. A backup system must be provided to maintain steering at all times.

1.88 Steering, Power Assisted:

Steering gear or mechanism with a direct mechanical (controlling) connection to a steering axle that has provisions for part of the force required for operation to be provided by air, hydraulic, or other means, not including mechanical leverage (longer handles).

1.89 Stopping Distance:

The distance traveled by a vehicle from the point of application of force to the brake control to the point at which the vehicle reaches a full stop.

1.90 Structural Member:

A part of a vehicle designed primarily to support the load of a vehicle in operation.

- 1.91 Suction Line: A tubular connection between a reservoir or tank and the inlet of a pump.
- 1.92 Synchronized Transmission:

A type of manual truck transmission with built in devices to automatically match the rotating speeds of the transmission gears.

1.93 Tag Axle:

A non-driven (dead) axle installed behind the drive axle(s) to increase the permissible gross weight, and consequently, the payload. Also termed "trailing axle."

1.94 Tandem Axle:

Two axles mounted as a group. In a dual-drive tandem, both axles have drive mechanisms and are connected to the engine power unit.

1.95 Tare Weight:

The total weight of an empty vehicle in a condition ready to receive payload.

1.96 Third Party:

A disinterested party professionally qualified to observe, understand, and/or record test data other than Manufacturer that is acceptable to the purchaser.

1.97 Tilt Cab:

A cab that pivots forward to gain access to the engine or other major component.

1.98 Tire Clearance:

Space between tires and the nearest part of the body or under-construction.

1.99 Tire Loaded Radius:

The distance from the center of the wheel to the road with tire loaded to rated capacity. Static radius applies when vehicle is at rest. Rolling radius applies for a vehicle in motion. Rolling radius is usually slightly greater than the static radius.

1.100 Torque Converter:

A hydraulic drive which transmits power with the ability to change torque.

1.101 Tractive Effort:

The maximum force developed by a vehicle power train at contact between the driven wheels and road surface with 100% traction.

1.102 Transfer Case:

Split power gear box transmitting drive to the front and rear axles.

- 1.103 Transmission: Selective gearbox providing various combinations of gear ratios.
- 1.104 Transmission, Automatic:

A type of transmission designed to self-select and change gear ratios based on vehicle and engine speed.

1.105 Transmission, Hydrostatic:

A type of transmission that provides gear reduction between the engine and drive wheels that uses fluid under pressure to transmit power and torque rather than mechanical components.

1.106 Transmission, Manual:

A type of transmission that can function only with periodic mechanical input from an operator to select the gear reduction or drive ratio used in the transmission, and a mechanism (clutch) to disengage the power from the engine to the transmission during the mechanical shift input from the operator.

1.107 Transmission, Powershift:

A type of transmission that can function only with periodic input from an operator to select the gear reduction or drive ratio in use in the transmission. Powershift transmissions include a device that allows the change of drive ratios or gears by means of an internal device that does not require operator action to interrupt power from the engine while changing the gear or drive ratio.

1.108 Tread; Wheel Track:

(a) The distance between the centers of tires on the same axle at the points where they contact the road surface. Duals are measured from the center of dual wheels.(b) That portion of a tire that comes into contact with the road. (c) The pattern of the surface of the tire that comes in contact with the road.

1.109 Truck Loading Chute: See Spot Casting Chute.

1.110 Trunnion:

(a) The axis, pivot point, or center point between axles. (b) The axis or pivot point of power transmission in a steerable drive axle where the turning member joins the non-turning member of the axle.

- 1.111 Turbine: See auger, drum cutter type.
- 1.112 Turning Radius:

One half the diameter of a circle described by the center line of the outside front tire while a vehicle maneuvers through a 360° turn.

- a. wall to wall
- b. curb to curb
- 1.113 Two-Speed Axle:

A driving axle arrangement whereby the driver can select one of two ratios.

1.114 Two Stage Snowblower Rotary Snowplows:

A two stage snowblower rotary snowplow uses one or more auger(s) or drum(s) in its first stage to disaggregate snow and transport snow to the ingress area of the second stage, (impeller or fan), from which the snow is cast. Two Stage Snowblower Rotary Snowplows have at least two distinct assemblies to disaggregate and to cast the snow. The two stages must vary from each other in terms of speed, and/or axis of rotation.

1.115 Vehicle Identification Number (VIN):

A number issued to a vehicle for identification purposes. Format and code of a VIN is prescribed by law to identify manufacturer, configuration, and date of production.

1.116 Volute: See Impeller.

II. GENERAL INFORMATION

MANCHESTER•BOSTON REGIONAL AIRPORT

Owner:	Airport of Manchester, New Hampshire
Location:	Airport of Manchester (County of Hillsborough) and Town of Londonderry (County of Rockingham) State of New Hampshire, located approximately four and one-half (4.5) miles southeast of the downtown Manchester business district.
Identifier:	MHT
Operator:	City of Manchester, Department of Aviation. Airport staff is responsible for the operation of MHT.
Classification:	Small Hub - Air Carrier.

III. PROPOSAL DOCUMENTS AND INTERPRETATION

3.1 **Proposal Documents**. The "**Proposal Documents**" comprise:

- 3.1.1 this Proposal and all Exhibits;
- 3.1.2 any Change Order or other Modification or Amendment;
- 3.1.3 any Notice to Proceed; and,
- 3.1.4 any Construction Drawings and Specifications.

3.2 **Interpretation**. The Proposal Documents are intended to be complementary, and what is set forth in any one document is as binding as if set forth in each document. The Parties recognize that Amendments and Modifications may provide for specific modification to the terms and conditions of other Proposal Documents, in which case, the modified terms and conditions shall govern, as expressly set forth in the Amendment or Modification. However, all terms and conditions of such other Proposal Documents that are not expressly modified or deleted by an Amendment or Modification shall remain in effect. **Section 2.3** shall govern matters of interpretation related to the applicability, stringency, and consistency of the Proposal Documents, which are included among the Proposal Standards. Unless stated otherwise in this Proposal, if a conflict between the sections of this Proposal and the exhibits arises, the sections control over the exhibits.

3.3 **Applicability of Proposal Standards**. Manufacturer shall be obligated to comply only with those Proposal Standards which are applicable in any particular case. Where more than one Proposal Standard applies to any particular performance obligation of Manufacturer hereunder, each such applicable Proposal Standard shall be complied with. In the event there are different levels of stringency among such applicable Proposal Standards, the most stringent of the applicable proposal Standards shall govern. In the event of any inconsistency among the Proposal Standards, Manufacturer shall notify the Airport. The Airport's determination as to the applicable standard shall be binding.

3.4 **Defined Terms**. Capitalized terms used in the Proposal Documents have the meanings set forth in **Exhibit "A"**. Further interpretation provisions are set forth in **Exhibit "A"**.

IV. GENERAL PERFORMANCE REQUIREMENTS

4.1 **Reliance**. Manufacturer acknowledges and agrees that the Airport is entering into this Proposal in reliance on Manufacturer's expertise with respect to the performance of the Equipment. The equipment will serve an essential service and will be critically important to enable the Airport to continue to meet its needs and obligations. Manufacturer shall deliver the Equipment in accordance with the Proposal Standards.

4.2 **Scope of the Work**. The Manufacture and delivery of equipment is more thoroughly described in **Exhibit "B"**. Manufacturer recognizes in accordance with the proposal specifications. **Doing so, by initialing each proposal page.**

4.3 **Information Provided by or on Behalf of the Airport**. Manufacturer shall assess all risks related to the Project and independently verify and confirm all information supplied to it by or on behalf of the Airport and upon which Manufacturer elects to rely in connection herewith. Except as may reasonably be requested by Manufacturer, or as is expressly permitted by this Proposal and General Conditions, Manufacturer shall have no right to relief hereunder, or to make any claim against the Airport, or to seek any adjustment to compensation as the result of any error, omission, or insufficiency relating to any information provided to Manufacturer by or on behalf of the Airport in connection with this Proposal.

4.4 **Responsibility for Personnel Manufacturer-Related Entities**. All obligations of Manufacturer hereunder shall be performed Manufacturer-Related Entities. Manufacturer shall be fully responsible, in accordance with the terms and conditions of the Proposal Documents, for all Work performed by Manufacturer-Related Entities. Manufacturer shall, as between itself and the Airport, be responsible and liable to the Airport for, and not relieved of, its obligations under the Proposal Documents by, the acts, omissions, breaches, defaults, non-compliance, negligence, willful misconduct, or other legal fault of each Manufacturer-Related Entity and all references in this Proposal to any act, omission, breach, default, non-compliance, negligence, willful misconduct, or other legal fault of Manufacturer will be construed accordingly to include any such act, omission, breach, default, non-compliance, negligence, willful misconduct or other legal fault committed by any other Manufacturer-Related Entity.

4.5 **Designated Representative**. The individual identified in **Exhibit "C"** as the "Designated Representative" shall, until further designation under this Section, act as the designated representative of Manufacturer with respect to this Proposal and shall coordinate with the Assistant Airport Director, Operations and Facilities, as to administrative matters under this Proposal. Manufacturer may replace the individual designated as its representative under this Proposal from time to time by written notice to the Airport, subject to the reasonable approval of the Airport. Manufacturer shall replace the individual designated as its representative under this Proposal at any time upon written notice by the Airport in the Airport's reasonable discretion. Any individual designated as the representative of Manufacturer's representative hereunder and shall have sufficient qualifications and experience to serve as Manufacturer's representative hereunder and shall be vested with the authority to act on behalf of Manufacturer, to receive notices on behalf

of Manufacturer, to make binding decisions with respect to the performance of the Equipment. The designated representative shall be the Airport's primary contact for the performance and delivery and shall be available, as required, for the benefit of the Airport.

V. PROPOSAL COMPENSATION

5.1 **General Payment Requirements.**

- 5.1. The payment terms set forth in this Article.
 - 5.4.1. Airport will pay Manufacturer for each unit delivery that has proven to meet the performance specifications set forth in this RFP.

5.1.1.1.1. Proof of Performance Test must be completed as specified in Appendix "A".

5.1.1.1.2. The Airport will not accept or compensate for equipment that performs below 90% of the specified requirements.

5.1.1.1.3. The Airport will reduce the payment for equipment that exceeds 90% of the performance specified but less than 100% of the performance specified as follows:

Payments for Units that perform between 95% and 99% will be reduced by .05% for each 1% below 100%. Payments for units that perform between 90% and 94% will be reduced by 2.5% and 1% per percentage of performance below 95%.

Example: The 3^{rd} party test analysis of the Unit certifies the unit performance is 93% of the specified requirement. The payment would be reduced by 2.5% + 1% for each percentage below 95% or 2 additional percentages. The Airport would pay 95.5% of the example unit cost.

- 5.4.1. The Manufacturer can test units after delivery at the Airport. The Airport will make personnel and facilities available for the third party to test a Unit. The Airport will retain 20% of each Unit delivered until the performance test is completed.
- 5.2. With each application for payment, Manufacturer shall submit a certified release of all claims, known or that should reasonably be known, and liens against the Airport, stating "In consideration for the payment requested herein and upon receipt of such payment, Manufacturer waives and releases all claims and liens of every sort against Airport relating to or arising out of the delivery equipment. The final request for payment shall not be made until Manufacturer delivers to Airport a complete release Manufacturer of all claims and liens of any sort.
- 5.3 The aggregate total of payments to Manufacturer shall not exceed the total of the Proposal Price.

- 5.4 In addition to the Airport's other rights and any provision hereof to the contrary notwithstanding and to the extent reasonably necessary to protect itself, Airport shall not be obligated to make any payment (whether a progress payment or final payment) to MANUFACTURER hereunder if any one or more of the following conditions exist:
 - 5.4.1. Manufacturer is in breach or default under this Proposal;
 - 5.4.2. Any part of such payment is attributable to services, which are not performed in accordance with this Proposal; provided, however, such payment shall be made as to the part thereof attributable to services which were performed in accordance with this Proposal;
 - 5.4.3. Manufacturer has failed to make payments promptly to Subcontractors or other third parties used in connection with the services for which Airport has made payment to Manufacturer; or,
 - 5.4.4. Nothing contained herein shall require the Airport to pay Manufacturer an aggregate amount exceeding the Proposal Price.
 - 5.4.5. MANUFACTURER shall promptly pay all bills validly due and owing for labor in connection with the manufacture and delivery of equipment.
 - 5.4.6. Manufacturer shall ensure the Airport has these rights with Manufacturer's employees, agents, assigns, successors, and subcontractors, and the obligations of these rights shall be explicitly included in any subcontractors or agreements formed between Manufacturer and any subcontractors to the extent that those subcontractors or agreements relate to fulfillment of Manufacturer's obligations to the Airport. Costs of any audits conducted under the authority of this right to audit and not addressed elsewhere will be borne by the Airport.
 - 5.4.7. The acceptance Manufacturer or Manufacturer's successors of final payment under this Proposal, shall constitute a full and complete release of Airport from any and all claims, demands, and causes of action whatsoever which Manufacturer successors have or may have against Airport under the provisions of this Proposal except those previously made in writing and identified Manufacturer as unsettled at the time of the final request for payment in a document captioned "Unsettled Claims" included with Manufacturer's final request for payment.

VI. REPRESENTATIONS AND WARRANTIES

- 6.1 **Representations and Warranties of the Airport**. The Airport represents and warrants that:
 - 6.1.1 The Airport is the Department of Aviation in the City of Manchester, with full legal right, power and authority to enter into and to perform its obligations under this Proposal.
 - 6.1.2 This Proposal has been duly authorized, executed and delivered by all necessary action of the Airport and constitutes a legal, valid, and binding obligation of the Airport, enforceable against the Airport in accordance with its terms.
- 6.2 **Representations and Warranties of Manufacturer.** In addition to any other representations and warranties made by Manufacturer hereunder, Manufacturer represents and warrants that:
 - 6.2.1 Manufacturer is duly organized, validly existing and in good standing. Manufacturer has the authority to do business in the State of New Hampshire and in any state in which it conducts its activities, with the full legal right, power and authority to enter into and perform its obligations under this Proposal.
 - 6.2.2 This Proposal has been duly authorized, executed and delivered by all necessary corporate action of Manufacturer and constitutes a legal, valid and binding obligation of Manufacturer, enforceable against Manufacturer in accordance with its terms, except to the extent that its enforceability may be limited by the Bankruptcy Code or by equitable principles of general application.
 - 6.2.3 To the best of its knowledge after due inquiry, neither the execution nor delivery by Manufacturer of this Proposal nor the performance by Manufacturer of its obligations in connection with the transactions contemplated hereby nor the fulfillment by Manufacturer of the terms or conditions hereof: (a) conflicts with, violates, or results in a breach of any constitution, law, governmental regulation, by-laws, or certificates of incorporation applicable to Manufacturer; or, (b) conflicts with, violates or results in a breach of any order, judgment, or decree, or any Proposal, agreement, or instrument to which Manufacturer is a party or by which Manufacturer or any of its properties or assets are bound, or constitutes a default under any of the foregoing.
 - 6.2.4 No approval, authorization, order or consent of, or declaration, registration, or filing with, any Governmental Authority is required for the valid execution and delivery of this Proposal by Manufacturer except as such have been duly obtained or made.
 - 6.2.5 Except as disclosed in writing to the Airport, there is no legal proceeding, at law or in equity, before or by any court, arbitral tribunal, or other Governmental Authority pending or, to the best of Manufacturer's knowledge after due inquiry, overtly threatened or publicly announced against Manufacturer, in which an unfavorable decision, ruling, or finding could reasonably be expected to have a material and adverse effect on the execution and delivery of this Proposal by

Manufacturer or the validity, legality, or enforceability of this Proposal against Manufacturer, or any other agreement or instrument entered into by Manufacturer in connection with the transactions contemplated hereby, or on the ability of Manufacturer to perform its obligations hereunder or under any such other agreement or instrument.

- 6.2.6 Except as disclosed in writing to the Airport, there are no material and adverse claims or demands based in environmental, Proposal, or tort law pending or threatened against Manufacturer or any of its Affiliates with respect to any facilities designed or constructed by Manufacturer or any of its Affiliates that would have a material and adverse effect upon the ability of Manufacturer to perform the Work.
- 6.2.7 Neither Manufacturer nor any of its Affiliates has any knowledge of any material violation of any law, order, rule, or regulation with respect to any facilities designed or constructed by Manufacturer or any of its Affiliates.
- 6.2.8 The information supplied and representations and warranties made by Manufacturer in all submittals made in response to the RFQ and RFP with respect to Manufacturer (and to its knowledge, all information supplied in such submittals with respect to any Affiliate or Manufacturer's-Related Entity) are true, correct, and complete in all material respects.
- 6.2.9 Manufacturer is under no obligation, commitment or impediment of any kind, whether contractual or otherwise, that will limit or prevent performance of its obligations under this Proposal.
- 6.2.10 Manufacturer is financially secure and no action relating to the Bankruptcy Code or suspension of payments by Manufacturer or any Affiliate has, to the best of its knowledge after due inquiry, been taken or is threatened.
- 6.2.11 Manufacturer:
 - 6.2.11.1. has examined, carefully studied, and thoroughly understands the Proposal Documents;
 - 6.2.11.2. has become familiar with and is satisfied as to the general, local, and delivery conditions that may affect cost, progress, and performance of the delivery;
 - 6.2.11.3. is familiar with and is satisfied as to all Applicable Laws that may affect cost, progress, and performance of the equipment delivery;
 - 6.2.11.4. is prepared to deliver equipment in accordance with Proposal Standards and subject to the terms and conditions of the Proposal Documents; and,
 - 6.2.11.5. warrants that it shall perform all construction of equipment in a good and workmanlike manner, meeting the standards of quality prevailing in work of this kind. contractor shall perform all work using trained and skilled persons having substantial experience performing the work. With respect to any parts and goods it furnishes, contractor warrants:

- 6.2.11.6.1 that all items are free of defects in title, design, material, and workmanship,
- 6.2.11.6.2 that each item meets or exceeds Manufacturer's specifications and requirements for the equipment, structure, or other improvement in which the item is installed,
- 6.2.11.6.3 that each item is new, in accordance with original equipment specifications, and of a quality that meets or exceeds the demands of severe Airport Winter Operations, and
- 6.2.11.6.4 that no item or its use infringes any patent, copyright, or proprietary right.

VII. PROPOSAL SPECIFICATIONS

The Company shall deliver **Two (2) or Three (3)** CLASS VI HIGH SPEED ROTARY PLOWS.

7.1 Insurance Requirements

Highlights of the insurance requirements include the following:

- During the installation period, the Company and all subcontractors must maintain \$1,000,000 of insurance coverage for injury or death in any one occurrence and for damage to property in any one accident.
- \$1,000,000 of comprehensive commercial general liability insurance is required throughout the term of the service Proposal.
- \$1,000,000 of excess liability insurance is required throughout the term of the service Proposal.
- Worker's compensation or employer's liability insurance is required throughout the term of the Proposal, as applicable.
- \$1,000,000 of comprehensive automobile liability insurance for all owned, nonowned and hired vehicles used by Company is required throughout the term of the Proposal.
- An indemnification of the Airport and Manchester•Boston Regional Airport is required.
- The Airport of Manchester and the Manchester•Boston Regional Airport must be named as additional insured on all insurance certificates with cancellation notification.

7.2 <u>Airport Contact</u>

Inquiries on all matters pertaining to this Proposal or the process should be directed to:

Carlton E. Braley Jr., A.A.E. Assistant Director, Operations and Facilities Manchester•Boston Regional Airport 1 Airport Road, Suite 300 Manchester, NH 03103 Telephone: 603/624-6539 email: cbraley@flymanchester.com

Inquiries shall be limited to this proposal package, or questions related to clarification of the contents of this proposal package. All clarifications will be supplied to all proposers.

7.3 <u>Responsibility For Proposal</u>

Manufacturer is responsible for carefully examining the terms and conditions set forth in this Proposal, and for otherwise judging for itself all the circumstances and conditions affecting the Company's Proposal.

Failure on the part of the Company to make such examination and to investigate fully and thoroughly shall not be grounds for any declaration that the Company did not understand the conditions of the Proposal.

7.4 <u>Proprietary Data</u>

The Airport does not anticipate the receipt of proprietary data/material related to this Proposal. However, if the Company provides same, the Airport will handle in strictest confidence all material received in response to this Request for Proposals designated "proprietary". The Airport will, upon request of the Company, enter a confidentiality agreement with the Company that will pertain to the content of the Company's Proposal defined as proprietary and will apply throughout the period during which the Airport is reviewing and evaluating Company's Proposal.

The Airport requires that Manufacturer handle in confidence, any information or data received from the Airport which may be construed as proprietary to the Airport's ownership and management of Manchester•Boston Regional Airport.

7.5 <u>Signature on Proposal</u>

7.5.1. An individual duly authorized to represent and lawfully act on behalf of the Company must date and sign, in ink, at the end of the Proposal. The legal name of the Company must be typed above the signature of the representative.

7.5.2. If the Company is a corporation, the Proposal must be signed by an authorized officer(s), the title of the officer(s) signing the Proposal must be shown, and the corporate seal must be affixed to the Proposal. <u>All signatures must be notarized.</u>

7.5.3. If the Company is a partnership, the Proposal must be signed by an authorized general partner(s), using the term "Member of Firm" or "Partner". <u>Signature must be notarized.</u>

7.5.4. If the Company is an individual, the Proposal must be signed by and in the full name of the Company, using the term "doing business as (insert appropriate business name)", or "sole owner". <u>Signature must be notarized.</u>

VIII. FEDERAL REQUIRED PROVISIONS

8.1 Access to Records and Reports. Manufacturer must maintain an acceptable cost accounting system. Manufacturer agrees to provide the Airport, the Federal Aviation Administration and the Comptroller General of the United States or any of their duly authorized representatives access to any books, documents, papers and records of the contractor which are directly pertinent to the specific Proposal for the purpose of making audit, examination, excerpts and transcriptions. Manufacturer agrees to maintain all books, records and reports required under this Proposal for a period of not less than three years after final payment is made and all pending matters are closed

8.2 Buy American Preferences. Manufacturer agrees to comply with 49 USC § 50101, which provides that Federal funds may not be obligated unless all steel and manufactured goods used in AIP funded projects are produced in the United States, unless the Federal Aviation Administration has issued a waiver for the product; the product is listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list.

8.3 General Civil Rights Provision. Manufacturer agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance. This provision binds Manufacturer and subcontractors from the bid solicitation period through the completion of the Proposal. This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

8.4 Title VI List of Pertinent Nondiscrimination Acts and Authorities. During the performance of this Proposal, Manufacturer, for itself, its assignees, and successors in interest (hereinafter also referred to as the "Manufacturer") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

• Title VI of the Civil Rights Act of 1964 (42 USC § 2000d et seq., 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);

• 49 CFR part 21 (Non-discrimination in Federally-assisted programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964);

• The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 USC § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);

• Section 504 of the Rehabilitation Act of 1973 (29 USC § 794 et seq.), as amended (prohibits discrimination on the basis of disability); and 49 CFR part 27;

• The Age Discrimination Act of 1975, as amended (42 USC § 6101 et seq.) (prohibits discrimination on the basis of age);

• Airport and Airway Improvement Act of 1982 (49 USC § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);

• The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by

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expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and Contractors, whether such programs or activities are Federally funded or not);

• Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 USC §§ 12131 – 12189) as implemented by U.S. Department of Transportation regulations at 49 CFR parts 37 and 38;

• The Federal Aviation Administration's Nondiscrimination statute (49 USC § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);

• Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

• Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

• Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 USC 1681 et seq).

8.5 CERTIFICATION OF MANUFACTURER REGARDING DEBARMENT

By submitting a bid/proposal under this solicitation, Manufacturer certified that neither it nor its principals are presently debarred or suspended by any Federal department or agency from participation in this transaction.

8.6 DISADVANTAGED BUSINESS ENTERPRISES

8.6.1 Proposal Assurance (§ 26.13). The Manufacturer or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Proposal. Failure by the contractor to carry out these requirements is a material breach of this Proposal, which may result in the termination of this Proposal or such other remedy as the Airport deems appropriate, which may include, but is not limited to:

- **8.6.1.1** Withholding monthly progress payments;
- **8.6.1.2** Assessing sanctions;
- **8.6.1.3** Liquidated damages; and/or
- **8.6.1.4** Disqualifying the Contractor from future bidding as non-responsible.

8.7 CERTIFICATION REGARDING LOBBYING. Manufacturer certifies to the best of his or her knowledge and belief, that:

- 8.7.1 No Federal appropriated funds have been paid or will be paid, by or on behalf of Manufacturer, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal Proposal, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal Proposal, grant, loan, or cooperative agreement.
- 8.7.2 If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal Proposal, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- 8.7.3 The language of this certification was included in the award documents for all subawards at all tiers (including subcontractors, sub-grants, and Proposals under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

8.8 TRADE RESTRICTION CERTIFICATION

- 8.8.1 By submission of an offer, the Offeror certifies that with respect to this solicitation and any resultant Proposal, the Offeror is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (USTR);
- 8.8.2 has not knowingly entered into any Proposal or subcontractor for this project with a person that is a citizen or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the USTR; and
- 8.8.3 has not entered into any subcontractor for any product to be used on the Federal project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR.
- 8.8.4 This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18 USC Section 1001.
- 8.8.5 The Offeror/Contractor must provide immediate written notice to the Owner if the Offeror/Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed

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circumstances. The Contractor must require subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

- 8.8.6 Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no Proposal shall be awarded to an Offeror or subcontractor:
- 8.8.7 who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR or
- 8.8.8 whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such USTR list or
- 8.8.9 who incorporates in the public works project any product of a foreign country on such USTR list.
- 8.8.10 Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a Contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- 8.8.11 The Offeror agrees that, if awarded a Proposal resulting from this solicitation, it will incorporate this provision for certification without modification in all lower tier subcontractors. The Contractor may rely on the certification of a prospective subcontractor that it is not a firm from a foreign country included on the list of countries that discriminate against U.S. firms as published by USTR, unless the Offeror has knowledge that the certification is erroneous.
- 8.8.12 This certification is a material representation of fact upon which reliance was placed when making an award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration (FAA) may direct through the Owner cancellation of the Proposal or subcontractor for default at no cost to the Owner or the FAA.

8.9 VETERAN'S PREFERENCE. In the employment of labor (excluding executive, administrative, and supervisory positions), the Contractor and all sub-tier Contractors must give preference to covered veterans as defined within Title 49 United States Code Section 47112. Covered veterans include Vietnam-era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns (as defined by 15 USC 632) owned and controlled by disabled veterans. This preference only applies when there are covered veterans readily available and qualified to perform the work to which the employment relates.

IX. MISCELLANEOUS PROVISIONS

9.1 Exhibits. All exhibits hereto are hereby incorporated herein by reference.

9.2 Assignments. This Proposal is a purchase and delivery Proposal for Manufacturer, Manufacturer's interest in this Proposal, duties hereunder and/or fees due hereunder may not be assigned or delegated to a third party.

9.3 Entire Proposal; Modifications; Conflicts. This Proposal supersedes all prior agreements, written or oral, between MANUFACTURER and Airport and shall constitute the entire Proposal and understanding between the parties with respect to the subject matter hereof. This Proposal and each of its provisions shall be binding upon the Parties and may not be waived, modified, amended or altered except by a writing signed by Airport Manufacturer If there is a conflict between this Proposal and the General Conditions, then the provision which provides the greatest benefit to Airport shall govern.

9.4 Captions. The captions of paragraphs in this Proposal are for convenience only and shall not be considered or referred to in resolving questions of interpretation or construction. MANUFACTURER and Airport shall both be deemed equally to be the drafters of the Proposal Documents, and the Proposal Documents shall not be construed against Airport or MANUFACTURER as the drafter.

10.4.1 Governing Law.

9.4.1 This Proposal and all of the rights and obligations of the Parties hereto and all of the terms and conditions hereof shall be construed, interpreted and applied in accordance with and governed by and enforced under the laws of the State of New Hampshire. Exclusive venue for litigation shall be located in Hillsborough County, NH.

9.4.2 Any new laws, codes, or regulations or modifications of existing laws, codes, or regulations which take effect after the signing date of this Proposal which impose additional cost or time may be a basis for adjustment of the Proposal Price and Proposal Time, as appropriate.

9.5 Non-Waiver. If either Party fails to require the other to perform a term of this Proposal, that failure does not prevent the Party from later enforcing that term and all other terms. If either Party waives the others' breach of a term, that waiver does not waive a later breach of this Proposal. An approval or direction by the Airport, or by any other employee or agent of the Airport, of any part of MANUFACTURER's performance does not waive compliance with this Proposal or establish a standard of performance other than that required by this Proposal and by law.

9.6 Binding Effect. This Proposal shall be binding upon and inure to the benefit of the parties hereto and their respective permitted assigns and successors.

9.7 Appointment. Airport hereby expressly reserves the right from time to time to designate by notice to MANUFACTURER one or more representatives to act partially or wholly for Airport in connection with the performance of Airport's obligations hereunder. MANUFACTURER shall act only upon instructions from such representatives unless otherwise specifically notified to the contrary.

9.8 Notices. All notices, consents, approvals, demands, requests or other communications provided for or permitted to be given under any of the provisions of this Proposal shall be in writing

and shall be deemed to have been duly given or served when delivered by hand delivery or when deposited in the U.S. mail by registered or certified mail, return receipt requested, postage prepaid, and addressed as set forth in the preamble or to such other person or address as may be given in writing by either party to the other in accordance with the aforesaid.

9.9 Dispute Resolution. The dispute resolution procedures, which shall be applicable to all Phases of this Proposal, are set forth in the General Conditions.

9.10 Severability. In case any provision hereof shall, for any reason, be held invalid or unenforceable in any respect, such invalidity or unenforceability shall not affect any other provision hereof, and this Proposal shall be construed as if such invalid or unenforceable provision had not been included herein.

9.11 Independent Contractor. MANUFACTURER recognizes that it is engaged as an independent Contractor and acknowledges that Airport will have no responsibility to provide transportation, insurance or other fringe benefits normally associated with employee status. MANUFACTURER, in accordance with its status as an independent Contractor, covenants and agrees that it shall conduct itself consistent with such status, that it will neither hold itself out as nor claim to be an officer, partner, employee or agent of Airport by reason hereof, and that it will not by reason hereof make any claim, demand or application to or for any right or privilege applicable to an officer, partner, employee or agent of Airport, including, but not limited to, unemployment insurance benefits, social security coverage or retirement benefits. MANUFACTURER hereby agrees to make its own arrangements for any of such benefits as it may desire and agrees that it is responsible for all income taxes required by Applicable Law.

9.12 Use of Work Products

9.12.1 The Airport may use all notes, plans, computations, databases, tabulations, exhibits, photographs, reports, underlying data and other work products (collectively, the "Documents") that MANUFACTURER prepares or obtains under this Agreement.

9.13 Environmental Laws

- 9.13.1 MANUFACTURER shall comply with all federal, state, and local statutes, ordinances, regulations, rules, policies, codes, or guidelines now or hereafter in effect, as they may be amended from time to time, that govern Hazardous Materials or relate to the protection of human health, safety, or the environment, including but not be limited to:
 - 9.13.1.1 the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. Section 136 et seq.;
 - 9.13.1.2 the Safe Drinking Water Act, 44 U.S.C. Section 300(f) et seq.;
 - 9.13.1.3 the Oil Pollution Control Act of 1990, 33 U.S.C. Section 270 et seq.;
 - 9.13.1.4 the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C., Section 9601 et seq., and as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. Law No. 99-499, 100 Stat. 1613;

- 9.13.1.5 the Toxic Substances Control Act, 15 U.S.C., Section 2601 et seq.;
- 9.13.1.6 the Clean Air Act as amended, 42 U.S.C. 7401 et seq.;
- 9.13.1.7 the Clean Water Act, 33 U.S.C., Section 1251, et seq.;
- 9.13.1.8 Hazardous Materials Transportation Act, 49 U.S.C., Section 1801 et seq.;
- 9.13.1.9 the Resources Conservation and Recovery Act, 42 U.S.C., Section 6901 et seq.;
- 9.13.1.10 and those substances defined as hazardous waste or as hazardous substances under the laws of Texas and/or the United States or in regulations promulgated under these laws (collectively, "Environmental Laws").

Within 10 days of receipt Manufacturer of any invoice relating to a failure or alleged failure of Manufacturer (or its agent or any DESIGN-BUILD CONTACTOR employee to comply with the Environmental Laws, Manufacturer shall pay such invoice or reimburse the Airport for any such Airport-paid invoice corresponding to any fines or penalties that may be levied against the Airport by the Environmental Protection Agency, the New Hampshire Commission on Environmental Quality, or any other governmental agency. In paying any such invoice, the Airport shall not, without Manufacturer's prior, written consent, prejudice, waive or forfeit, and, the Airport shall reserve in writing with the agency the right of Manufacturer to contest, dispute or appeal any such fine or penalty.

- 9.13.2 Manufacturer shall not possess, use, generate, release, discharge, store, dispose of, or transport any Hazardous Materials on, under, in, above, to or from the Airport, or any other areas or facilities subject to this Agreement, except in strict compliance with the Environmental Laws. "Hazardous Materials" include, but are not limited to:
 - 9.13.2.1 all substances, materials, wastes, pollutants, oils, or governmentally regulated substances or contaminants defined or designated as hazardous, toxic, radioactive, dangerous, or any other similar term in or under any of the Environmental Laws,
 - 9.13.2.2 asbestos and asbestos-containing materials, petroleum products including crude oil or any fraction thereof, gasoline, aviation fuel, jet fuel, diesel fuel, lubricating oils and solvents, urea formaldehyde, flammable explosives, PCBs, radioactive materials or waste, or
 - 9.13.2.3 any other substance that, because of its quantity, concentration, physical, chemical, or infectious characteristics may cause or threaten a present or potential hazard to human health or the environment when improperly generated, used, stored, handled, treated, discharged, distributed, disposed of, or released.

- 9.13.3 The Airport is subject to the National Pollution Discharge Elimination System Program (NPDES), and the regulations, 40 CFR Part 122, relating to stormwater discharges, for operations at the Airport. MANUFACTURER is familiar with these NPDES stormwater regulations, and shall conduct operations in accordance with 40 CFR Part 122, as amended from time to time. MANUFACTURER understands that there are significant penalties for submitting false information, including fines and imprisonment for knowing violations.
- 9.13.4 Close cooperation is necessary to ensure compliance with any NPDES stormwater discharge permit terms and conditions, as well as to ensure safety and to minimize costs. MANUFACTURER shall implement "Best Management Practices" as defined in 40 CFR, Part 122.2, as amended from time to time, if necessary to minimize the exposure of stormwater to significant materials generated, stored, handled, or otherwise used Manufacturer as defined in the federal stormwater regulations.
- 9.13.5 The Airport's NPDES stormwater discharge permit and any subsequent amendments, extensions, or renewals are incorporated into this Agreement. MANUFACTURER shall be bound by all applicable portions of the permit.
- 9.13.6 MANUFACTURER shall implement the NPDES requirements at its sole expense, unless otherwise agreed to in writing between the Airport and MANUFACTURER and shall meet all deadlines that may be imposed or agreed to by the Airport. Time is of the essence.
- 9.13.7 If either Party asks, the other Party shall provide any non-privileged information submitted to a government entity(ies) under applicable NPDES stormwater regulations.
- 9.13.8 MANUFACTURER appoints the Airport as its agent to negotiate with the appropriate governmental entity(ies) any modifications to the Airport's permit.

9.14 The Airport's remedies with regard to Environmental Requirements are cumulative and survive termination of this Agreement.

9.15 With no intent to limit Manufacturer's indemnification to the Airport set forth in the General Conditions, Manufacturer shall protest, defend and indemnify the Airport and its officers, agents and employees against any loss, cost, claim, demand, penalty, fine, settlement, liability or expense (including but not limited to attorneys' and consultants' fees, court costs and litigation expenses) related to:

9.16 Any investigation, monitoring, cleanup, containment, removal, storage or restoration work performed by the Airport or a third party due to Manufacturer's, its employees', or agents' use or placement of hazardous materials (of whatever kind or nature, known or unknown) on the Airport premises, or any other areas impacted by this agreement;

9.17 Any actual, threatened or alleged hazardous materials contamination of the Airports' premises Manufacturer, its employees or agents;

9.18 The disposal, release or threatened release of hazardous materials Manufacturer, its employees or agents at the Airport that affects the soil, air, water, vegetation, buildings, personal property or persons;
9.19 Any personal injury, death or property damage (real or personal) arising out of or related to hazardous materials use Manufacturer, its employees or agents at the Airport; OR

9.20 Any violation Manufacturer, its employees or agents of any environmental laws.

9.21 This indemnity is not applicable to losses, claims, penalties, fines, settlements, liabilities and expenses that result from conditions existing on the effective date of this agreement or are created by or caused by any entity other than Manufacturer or its agent or any employee of either.

9.22 Airport Security. The Federal Aviation Administration may assess fines and/or penalties for MANUFACTURER's non-compliance with the provisions of 14 CFR Part 107 entitled "Airport Security," as amended from time to time, or by agencies for noncompliance with laws or regulations applicable to MANUFACTURER 's operations. Within 10 days after receiving written notice from the Director stating the amount of any fine or penalty, MANUFACTURER shall reimburse the Airport for any fine or penalty assessed against the Airport because of MANUFACTURER 's non-compliance with 14 CFR Part 107 or other applicable laws or regulations.

X. TECHNICAL REQUIREMENTS:

10.1 <u>General Description</u>:

The Airport is requesting **Two (2) or Three (3)** Class VI High Speed Rotary Plows. The Class VI High Speed Rotary Plows must meet SAE standard ARP 5539 Rotary Plows with carrier vehicle. The Class VI High Speed Rotary Plows must meet specifications of the FAA Advisory Circular AC 150/5220-20A Airport Snow and Ice Control equipment. The equipment must be capable of casting a windrow of snow a minimum of 150'. The equipment must be capable of removing a windrow created by displacement plows and snow brooms that have cleared $\frac{1}{2}$ inch of snow, weighing 25 lbs per cubic foot from a runway that is 150 feet wide with an additional 50 feet of paved shoulders and is 9250 long all in 10 minutes. The equipment must be capable of a minimum of 7500 tons per hour.

The components that make up a complete rotary plow unit are based on the number of stages necessary to perform the functions of disaggregating (snow gathering) and casting snow.

10.2 <u>Warranty</u>:

Manufacturer, must guarantee in writing that for a period of five (5) years from the time of first use, they will at their own expense and without expense to the purchaser, replace all failed parts and make all repairs that may be required by reason of defective design, workmanship, or material in any part of the assembly of the Class VI High Speed Rotary Plow, it's appurtenances, or associated components. The bidder is to provide assistance to the purchaser with any warranty problems that may arise with manufacturing, suppliers, or Contractors.

Upon notice in writing, the Contractor shall promptly repair or replace all defective or damaged items delivered under the Proposal. The Contractor may elect to have any replaced item returned to their plant.

If they should fail as a result of improper application by the Contractor, batteries, rubber and material normally consumed in operation are excluded from this guarantee but shall, in any event, be guaranteed by the Contractor to the extent of any guarantee received by the Contractor from his supplier.

Warranty shall include all parts and labor.

10.3 <u>Two-Stage Rotary</u>:

- 10.3.1 Rotary-Head Box: Fabrication shall be of heavy gauge welded alloy steel designed for the type of expected service using best engineering practices. The rotary-head box shall have provisions for vehicle mounts, shoe or caster brackets, scraper blades, drive lines, controls, augers, and impeller bearing mounts and other mechanical hardware. A scraper blade shall be fitted to the lower leading edge of the box which shall be removable and made of polyurethane. The blade shall run the entire width of the box.
- 10.3.2 Input Auger: The auger(s) shall have a minimum of two bearing supports. The ribbon blades shall be easily replaceable and made of high tensile steel. They shall be bolted or otherwise attached to the auger shaft and balanced to reduce vibration using best engineering practices.

The solid auger which or shall have multiple cutter blades mounted on the auger drive shaft. Input auger shall be designed to feed snow to the discharge impeller to be cast away from the vehicle. The solid auger drive shaft(s) shall be balanced and supported by bearings, one at each end of the auger shaft (some designs may be configured differently).

- 10.3.3 Discharge Impeller System: The impeller capacity shall be at least equal to the capacity of the input auger(s). The impeller blades shall be made of high tensile steel using best engineering practices and be balanced to reduce vibration and shock damage.
- 10.3.4 Operation of the Rotary System: The operation of turbines shall be by hydraulic, hydrostatic, or mechanical means with the speed controlled by a single operator in the vehicle cab. Power shall be transmitted to these systems via mechanisms located on either side of or in the middle of the rotary head box. To ensure efficient snow flow where an auger and impeller share the same drive shaft there shall be a reduction gear system between the two to provide a proper meshing of impeller speed and auger speed.
- 10.3.5 The blower drive may include a full torque Multi-plate clutch, controlled from the cab, for blower drive engagement. Clutch engagement may be electric over hydraulic actuation and offer protection against engaging clutch. Once selected, clutch shall automatically engage ribbon drive in forward direction. For safety, the clutch/ribbon engage button shall be illuminated GREEN when activated and the ribbon status icon on the LCD screen will clearly indicate ribbon status as visual reminders to operator of the status. Clutch shall automatically disengage if engine is shut off to avoid attempts at start up with impeller engaged.

A system shall be provided between the blower engine and the impeller to provide proper torque and speed at the impeller while allowing the engine to operate at the RPM providing maximum efficiency.

The gear box shall include helical gears with pressurized lubrication system. CHAIN TYPE DROP BOXES ARE NOT ACCEPTABLE

- 10.3.6 Snow Casting Assembly: The snow casting assembly shall consist of a casting chute(s) that can be directionally controlled, an impeller(s), and a control system. The casting chute(s) shall be able to rotate in either a vertical or horizontal plane, or both, as required by the purchaser. Casting distances shall range from zero to the maximum cast distance as specified by the purchaser. The snow casting chute(s) shall be designed and positioned on the carrier vehicle so as to provide maximum operator visibility. Chutes shall be controllable by a single operator from within the vehicle cab.
- 10.3.7 Rotary Head Assembly: The rotary head assembly shall be equipped with a device that is capable of raising it a minimum of 8 inches (20 cm) from the pavement. The locking device shall be activated through the use of conveniently located controls in the vehicle cab. The drive system shall not bind, rub, or vibrate excessively when the assembly is being moved.

When the vehicle is traveling, the assembly shall have a means to be locked in the raised position. Customer may specify greater heights for local conditions.

- 10.3.8 Drive Protection System: All auger and impeller assemblies shall be protected against sudden stops or damage that may be caused from foreign objects. Protection may be in the form of automatic clutches, release overrides, and/or shear fasteners. Consideration shall be given to the location of protection devices to minimize the requirement to remove snow in order to gain access to and reset or replace the protection device.
- 10.3.9 Blower Head Drive Train: Drive shafts, universal joints and other mechanical components of the drive train shall continue to provide power to the head assembly under normal operating conditions through the operating range of the blower head without physical damage.
- 10.4 <u>Minimum Performance Requirements</u>:
 - a. Anticipated Uses and/or Features of Rotary Plow (Be Specific) Priority 1 – Runway 200 x 9250
 - b. Capacity (tons/hour): See Appendix A 7500 tons per hour
 - c. Casting Distance (150 ft or m @ Snow weight of 25 lbs/ft^3 or kg/m³)
 - d. Required Speed of Operation (mph or km/h) 9250 cu 10 min or less
 - e. Turning Radius
 - i. wall to wall 75 ft.
 - ii. curb to curb 75 ft
- 10.5 Additional Equipment: See Appendix B.

10.6 Carrier Vehicle Description:

The term carrier vehicle represents the various self-propelled prime movers that provide the power necessary to move this snow and ice control equipment during winter operations. The design of the vehicle chassis shall be based on an all-wheel drive all wheel steering concept for optimized performance and safety. Vehicle must perform at the capacity defined. Although these units are not designed as over-the-road highway vehicles, the following Federal Motor Vehicle Safety Standards shall apply as though they were an on-highway vehicle:

FMVSS 101	Controls & Displays
FMVSS 102	Transmission Shift Lever Sequence, Starter Interlock &
	Transmission Braking Effect
FMVSS 103	Windshield Defrosting & Defogging Systems FMVSS 104
	Windshield Wiping & Washing Systems
FMVSS 105	Hydraulic & Electric Brake Systems
FMVSS 106	Brake Hoses
FMVSS 108	Lamps, Reflective Devices, & Associated Equipment
FMVSS 111	Rearview Mirrors FMVSS 113 Hood Latch Systems
FMVSS 116	Motor Vehicle Brake Fluids FMVSS 119 New Pneumatic
	Tires
FMVSS 120	Tire Selection & Rims for Vehicles Other Than Passenger
	cars
FMVSS 121	Air Brake Systems
FMVSS 124	Accelerator Control Systems
FMVSS 201	Occupant Protection in Interior Impacts
FMVSS 205	Glazing Materials
FMVSS 206	Door Locks & Door Retention Components
FMVSS 207	Seating Systems
FMVSS 208	Occupant Crash Protection
FMVSS 209	Seat Belt Assemblies
FMVSS 210	Seat Belt Assembly Anchorages
FMVSS 302	Flammability of Interior Materials

a. This is a special purpose vehicle customized specifically to meet special airport operator needs.

- 10.6.1 Materials: Materials used on a carrier vehicle shall conform to the specifications listed in the appropriate sections of Title 49, Chapter III, Federal Motor Carrier Safety Regulations. The materials shall be of the best quality available for their intended industrial use. Component parts shall be new, unused, of current production. They shall be free of all defects and imperfections that could affect the serviceability of the finished product.
- 10.6.2 Design: Equipment shall be developed in accordance with the best engineering practices available. This includes the incorporation of ergonomic designs specifically directed at the vehicle's cab environment. Vehicle design shall include current state-of- the-art procedures that consider improved cab visibility, communications systems, interior lighting and the mitigation of noise and vibration.

Design and installation of equipment shall permit easy accessibility for maintenance and service. All vehicle stress points shall be designed to distribute and dissipate shock forces.

10.6.3 Construction: Vehicle construction shall 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 winter 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. Location of all oil, hydraulic, and air lines and electrical wiring shall be in protected positions properly attached to the frame or body structure. Wherever these lines pass through apertures they shall be protected with looms or grommets except where a through-frame connector is necessary.

10.7 Chassis:

The design of the vehicle chassis shall be based on an all-wheel drive, all-wheel steering concept for optimized performance and safety.

It shall have power assisted steering and a transmission with suitable load and speed ranges to accommodate severe operating conditions. Vehicle shall have heavy duty tow hooks, tow eyes, or other suitable tow connections attached to the front & rear of the vehicle. The tow hooks, eyes, or other suitable tow connections shall be attached to the frame or structure of the vehicle, and provide adequate strength to allow lifting and/or pulling the vehicle for emergency recovery situations. A pintle hook, rated at not less than the GVWR shall be permanently attached to the rear frame structure capable of towing a vehicle. All installed parts and accessories necessary for the safe operation of the vehicle shall conform to applicable provisions of Title 49.

- 10.8 <u>Structural Members</u>: The frame shall be made of either pressed or structural steel shape and reinforced as required to prevent distortion under maximum load conditions. All frames and stiffeners shall be treated with a corrosion inhibitor and shall be primed and painted before assembly.
- 10.8.1 Dimensions and Clearances: Carrier vehicles with snow removal attachments shall have the following overall dimensions:

a. Minimum Ground Clearance: The minimum ground clearance of a vehicle chassis shall be 8 inches (20 cm).

b. Maximum Overall Height: Change Maximum Overall Height to read: The maximum overall height of a vehicle including discharge chutes, lights, and exhaust stacks (with rain cap up if so equipped) shall not exceed 13 feet (4.0 m) unless otherwise specified by the customer. A placard shall be installed in the vehicle cab stating the maximum overall height. If practical, the placard should be located at the top of the windshield as nearly over the steering wheel as possible to be immediately visible to the operator when looking upwards.

c. Maximum Overall Width: The overall width of a vehicle including rotary plow head shall be specified by Manufacturer who shall take into consideration gates and doors to equipment shops at the airport.

d. Maximum Overall Length: Maximum vehicular length may be specified by Manufacturer who shall take into consideration shop areas and maneuverability expected of the vehicle during operation.

10.8.2 Weight Distribution: The gross vehicle weight of the vehicle shall be distributed over its axles in accordance with best engineering practices. The center of gravity shall be kept as low as possible under maximum load conditions. While it is loaded the vehicle shall be capable of resting on a 20% transverse grade without danger of overturning.

A copy of the calculated weight distribution shall be provided to the customer prior to construction, and 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.

10.9 Engines:

Engine and vehicle manufacturers shall provide an application approval, at the time of vehicle delivery that states the engine is suitable for use in the vehicle as configured and that the installation is approved by the engine manufacturer. The vehicle engine shall be of internal combustion type. Unless specified, the diesel engine shall be designed and tuned for operation using ASTM D 2 diesel fuel. Anti-freeze, crankcase and gear oils, greases, automatic transmission fluid, and hydraulic oils shall be as per current SAE, API, or ASTM specifications and not proprietary products. It shall be able to meet the performance characteristics specified herein on commercial grade fuel. Dual engine vehicles shall use a common fuel. The engine shall develop sufficient torque and horsepower to meet its normal operational requirements without exceeding the no-load speed at the peak of its certified gross brake horsepower curve. Engine noise and vibration shall be reduced in the vehicle cab by use of best engineering practices and machine layout. Idle time limiters or other automatic shutdown devices designed to limit emissions, conserve fuel, or enhance operating costs must be permanently disabled if such devices could leave a unit disabled on a taxiway or runway. Permanently disabled means the disabling must be done in such a manner so as not to be easily or accidentally re-activated.

10.9.1 Cooling System: The engine cooling system shall be based on either a liquid or forced air design. Internal temperatures of liquid cooled engines shall be controlled by a by- pass thermostat that regulates the flow of engine coolant. Drain cocks shall be installed at the lowest point of the cooling system and at other points necessary to completely drain the system. A sight glass or other device is required in all liquid cooling systems to allow the operator to determine that there is sufficient fluid for normal and safe operation without the need to open the system.

- 10.9.2 Coolant Temperatures: The design and installation of the system shall assure that coolant temperatures shall remain within the engine manufacturer's operational specification (both high and low) when properly maintained and operated in ambient temperatures during snow removal operations. In areas which frequently experience temperatures below 20°, cooling system heaters, oil pan heaters, lubricating oil heaters, battery and block heaters, and cold start aides required unless otherwise specified.
- 10.9.3 Fuel System: The fuel system shall comply with Title 49 and include all components necessary for a complete operational system. Fuel system capacity shall allow for 12 hrs. continuous operation.
- 10.9.4 Fuel Tank(s) and Lines: Useable fuel capacity should be not less than a calculated value of: (total maximum brake horsepower for all engines) x (055 gals/hr./bhp) x (12 hours) x (0.8 for an 60% load factor). Normal operating hours should be eight unless a higher number is desired by the customer. If dual tanks are used, the supply system shall be designed to ensure an uninterrupted flow of fuel to the engine(s) without input by the operator, and to allow shutoff of each tank should the crossover lines of either tank be damaged.

Dual tanks shall also have adequately sized crossover lines to allow refilling both tanks from one location. Fuel lines shall be securely fastened in place, installed to prevent chafing or strain and protected by grommets where lines project through metal apertures. Each fuel tank is to be equipped with an accessible bronze or brass drain plug or a quick drain. A properly rated fuel water separator with integral heater shall be installed in an accessible location near the tank. If the engine requires a boost pump to assure adequate fuel flow to the engine, a pressure operated switch with in-cab warning light shall be furnished to warn the operator of low boost pump pressure. The boost pump should be installed to shut off when the engine is turned off, or to have an emergency shutoff switch or circuit breaker located near the light to allow the operator to shut off the boost pump in the event of fuel leakage downstream of the boost pump.

- 10.9.5 Fuel Filler Pipe: The fuel filler pipe(s) shall be located outside of the vehicle cab in an area accessible for refueling from the ground. A light chain shall be attached near its opening and to the filler cap to prevent loss of the cap. The filler neck shall include a screen to prevent the entry of foreign objects into the tank. Filler neck shall be capable of high flow refueling nozzle. The fuel filler cap shall be painted a color appropriate for the type of fuel, and a permanent label shall be affixed as close as practical to the fill neck(s), in an area visible to the person refueling the vehicle, stating the appropriate fuel and capacity of the tank(s). A label shall also be installed in the cab near the fuel gauge indicating which side of the vehicle must be positioned towards the fuel pumps (e.g., Fuel Fill \rightarrow).
- 10.9.6 Air Cleaner: The air cleaner shall be of a two-stage design. The first stage incorporates a pre-cleaner while the second consists of a dry type replaceable paper filter. A restriction indicator is required in the cab for each engine air intake system.

The connection between the air cleaner outlet(s) and the engine intake(s) shall be waterproof and dust tight. The air cleaner intake shall be positioned in a manner to

eliminate the ingestion of snow and other contaminants, e.g. within the hood cavity.

10.9.7 Exhaust System and Muffler: The engine shall be equipped with an efficient and safe exhaust system including mufflers. Its location shall minimize noise and exhaust gases entering the vehicle cab under all operating conditions. Further noise reduction by noise suppression materials, such as muffler insulation, is encouraged. Horizontal portions of exhaust systems shall be protected, whenever possible, from corrosive agents and fuel spills. Mufflers and exhaust components positioned in or near normal operator work areas shall include appropriate guards to minimize the burn risk to airport personnel.

Exhaust systems shall be positioned on the vehicle in a manner to minimize contact with slush and snow. Muffler(s) are to be made of aluminum, aluminized steel, stainless steel, or materials coated with ceramics. Devices shall be installed to prevent snow and slush from entering vertical exhaust stacks. Customers may specify the location and direction of exhaust system discharge when appropriate for storage building ventilation systems or other operational needs.

- 10.9.8 Governor: Engine speed shall be regulated by a governor set to provide the maximum operating speed recommended by the engine, driveline, and power train manufacturers.
- 10.9.9 Lubrication: An engine's lubricating system shall be equipped with standard production fittings and accessories. Engine oil filter(s) shall be engine manufacturers approved design and able to accept commercial replacement elements. All engine(s) shall receive lubrication prior to delivery with lubricants designated for use under ambient temperature conditions at the point of delivery. The unit(s) shall be tagged to identify the proper lubricants and their temperature ranges.
- 10.9.9a Automatic Lubrication System: The unit shall be equipped with a microprocessor controlled multi-point automatic lubrication system. The system shall be designed for construction equipment applications and shall be capable of distributing pressure fed, calibrated quantities of grease to all critical pivots and joints on a programmable time based delivery system. The system shall utilize independent metering for each lubrication point. The system shall have a grease storage capacity of a minimum of 2 (two) liters. The system shall include a main pump and reservoir with control unit, software, monitoring system, grease filter, and low level indicator. The unit shall operate on 12 volts DC, negative ground. The complete system shall include all high pressure distribution hoses and plumbing, distribution blocks, metering injectors, and pressure switches. The main unit and monitoring panel shall be located in the main engine compartment. A monitor panel in the vehicle cab shall not be required.

The system shall include a parameter setting and diagnostic software package and system interface cables to perform diagnostics and calibration.

10.9.10 An automatic engine protection system to prevent engine damage due to low engine pressure, high coolant temperature, or low coolant level is required. A provision for the emergency movement of the unit from a runway or taxiway must be provided.

10.9.11 Accessibility:

- a. Component Location: Engine and chassis components shall be positioned to allow easy access for inspection and maintenance purposes. Components that historically present maintenance problems or those that have the potential to cause operational problems should particularly be located in unobstructed areas. Locks, controls and fasteners shall be designed to prevent over-torquing. Fluid capacities that must be checked during a pre-trip inspection, such as hydraulic oil level(s), windshield washer fluid level, and diesel fuel level shall be visually observable or otherwise capable of being checked without the need for tools, and without requiring work stands, portable ladders, or other equipment to check the service levels. To the extent practical lighting in these areas shall be adequate to perform the checks without the need for flashlights or other portable lighting.
- b. Cover Plates: Cover plates shall be equipped with either quick-disconnect fastenings or hinges.

10.10 Drive Train:

10.10.1 Transmission: Transmission and vehicle manufacturers shall provide an application approval, at the time of vehicle delivery that states the transmission is suitable for use in the vehicle as configured and that the installation is approved by the transmission manufacturer. The transmission shall operate smoothly and efficiently and be capable of transmitting the maximum gross torque generated by the engine to the drive wheels through all gear reductions.

Manual Transmission not acceptable.

a. <u>Automatic</u>: Automatic or non-manual transmissions are either hydrostatic (with or without transfer case), automatic power shift, standard power shift, or fully automatic. Designs utilizing torque converters shall have a suitable torque ratio for the expected load ranges. The torque converter shall not operate at less than 70% efficiency. The gear or range selector shall have forward, neutral and reverse positions clearly identified.

10.10.2 <u>Transfer Case</u>: The vehicle and transfer case manufacturers shall provide an application approval at the time of vehicle delivery that states the transfer case is suitable for use in the vehicle, as configured. Transfer case assemblies shall provide positive drive to the front and rear axle(s) and may be of optional single or multi-speed design. Three proven alternatives are the manual front axle disconnect type, the center differential with manual or automatic lockout type, or an overriding clutch type.

The purchaser to accept Manufacturers standard transfer case(s). The transfer case may be a separate unit mounted independently or integrated with the transmission.

10.10.3 <u>Axles</u>: The axle and vehicle manufacturers shall provide an application approval at the time of vehicle delivery that states the front and rear axles are suitable for use in the vehicle, as configured. The axle manufacturer's published rating shall at the least be equal to the load imposed at ground level when the

vehicle and/or each component is in its maximum load configuration (i.e., rotary plow up and rotary plow down; and/or a material body, if any, loaded to its cubic rated volume). Each axle shall be equipped with a retarding type device to ensure a torque transfer to each wheel having traction. When appropriate, manual lockout controls shall be located in the vehicle cab. The torque capacity of each axle and differential shall be at least 10% in excess of the maximum torque that the axle may experience under any GVW operating condition. The power transmitting shaft on each steering axle shall incorporate steering joints that do not produce objectionable steering characteristics while the vehicle is operating on uneven surfaces.

10.11 Brake System:

Vehicle service and emergency braking systems shall meet Title 49 requirements for vehicles of similar design. These systems, whether air, hydraulic, or of another design, shall be complete with all necessary equipment to safely control, stop and hold a fully equipped vehicle under all normal operating conditions. Both systems shall be readily accessible for external adjustment. Anti-lock brakes may be specified for improved safety on the airport operational areas.

10.12 Steering Mechanism:

The vehicle shall have a steering mechanism that is operated from the driver's seat. During normal operations, the mechanism shall be capable of controlling the vehicle with all equipment operating. Steering equipped with power assistance shall revert to manual operation in the event of power assist system failure, or be equipped with a dual power steering system that operates in a fail-safe manner so that the failure of one system will not lead to a loss of steering. The design of the steering mechanism should, in the event of a power assist failure, be capable of safely maneuvering the vehicle off the primary operational areas of the airport and to a park position from the maximum design speed allowed on the airport. All wheel steering may substantially increase the handling ability of the vehicle and, therefore, its productivity. All wheel steer is required allowing the operator to individually select all wheel steering, front wheel steer, rear steer, crab steer, coordinated steer.

10.13 <u>Suspension System</u>:

Vehicles shall be equipped with a current production model suspension system having a minimum rated capacity equal to the GVW of the carrier vehicle. When required, front and rear axles shall have auxiliary suspension springs. Manufacturer's capacity ratings may not be arbitrarily raised to conform to the requirements of this specification. The suspension system shall exhibit no permanent set after the load is removed.

10.14 Wheels, Rims, Tires, and Tubes:

a. Wheels, rim and tire ratings shall conform to The Tire and Rim Association's published recommendations.

b. Tires. Each tire shall have a rated carrying capacity at least equal to the loads

imposed on them in the maximum load configuration (i.e., rotary plow up and rotary plow down). Tires on each individual axle shall be of the same size. Tires between axles may vary due to loads, configurations, and engineered gearing sets. In such cases, care must be taken and all components must be viewed as a system that provides an acceptable speed match between driven axles. Tires shall have an aggressive tire tread. Tires (and tubes when applicable) shall meet the first line commercial grade requirements for the speed and type of service required. The front and rear tread widths shall not vary by more than 4%.

c. Spare Rim/Tire. A 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, one spare rim and tire for each distinct configuration is required.

10.15 Hydraulic System:

The hydraulic system shall consist of appropriate rams, pumps, piping, fittings, valves, controls, fluid reservoirs, filters, coolers, and other parts essential to its full operation. The system shall be capable of hydraulically positioning equipment through the entire range of its design limits. It shall be capable of operating all controls simultaneously without a noticeable reduction in power response. All hydraulic controls shall be located in the vehicle cab. The equipment manufacturer shall avoid high pressure hydraulic lines within the cab by means of remote cable or electric over hydraulic controls whenever possible. If a high pressure line must be located within the cab, it shall be properly shielded to protect the operator to the satisfaction of the purchaser. The system shall be ruggedly constructed and able to withstand all loads imposed on it without relying on the use of mechanical locks. Adequate cooling must be included to maintain acceptable hydraulic oil temperatures throughout expected vehicle operational ranges. Filters within the hydraulic system shall conform to SAE J931.

- 10.15.1 <u>Pump(s) and Power Takeoff</u>: The pump(s) shall be ruggedly constructed and powered by the engine through a power takeoff. It shall have sufficient capacity to operate the hydraulic equipment specified herein under all operating conditions and speeds. Belt driven pumps are not acceptable.
- 10.15.2 Lines and Fittings: Only commercial quality hydraulic lines, hoses, and fittings that are capable of withstanding system working pressures under load are acceptable. Hydraulic hoses shall have a bursting pressure of three times their rated working pressure. The use of fittings, joints, and connections shall be kept to a minimum. Where local climatic conditions require, the purchaser should consider requiring arctic type hoses with temperature ratings appropriate for the location. Test gauge connection fittings shall be provided at all suitable points throughout system for maintenance and trouble-shooting. All hydraulic system components are to be shielded from engine exhaust heat, and heat shields shall be installed on the engine exhaust system to divert any possible leakage from the hydraulic system. Hoses shall be installed inside steel tubing wherever necessary to deflect the flow of fluid from exhaust and electrical system components in the event of hose rupture or leakage.

10.15.3 <u>Fluid Tank</u>: The hydraulic fluid tank shall have a filler neck consisting of a strainer, drain plug, shutoff valve, air vent and baffles. Its capacity shall exceed the volume of oil required for the operation of any combination of attachments by 50%. A sight glass or other device shall be provided to allow the operator to verify that fluid level is sufficient for safe operation without the necessity of opening the system. An oil level warning device shall be provided in the cab for all hydraulic systems.

A label shall be installed as close as practical to the filler neck indicating the proper fluid type, viscosity and volume for servicing the hydraulic system, and the capacity of the tank.

10.15.4 <u>System Winterization</u>: Hydraulic systems shall be designed and operated in accordance with the requirements specified in ARP1247. The hydraulic system shall meet the same low temperature requirements as the engine coolant system. Where appropriate properly sized shutoff valves shall be installed on each side of all filters to facilitate filter changing with minimal fluid loss. If filters are installed in compartments or other areas where fluid collection is possible, drain holes will be installed to allow fluid drainage during servicing.

10.16 Electrical System:

The electrical system shall be negatively grounded and installed in accordance with current state-of-the-art practices and appropriate Federal requirements. All vehicle wiring shall be in accordance with SAE J1292. All vehicle body electrical equipment, components, and wiring shall meet the requirements set forth in ARP1247. All parts of the electrical system shall be waterproof, easily accessible, securely mounted, and protected against extreme temperatures, physical damage, snow, oil, and corrosion. All electrical circuit wiring shall be made of stranded conductors with a capacity exceeding the anticipated maximum circuit loading. Insulation of electrical wiring shall be equal to the recommended standards established for insulation materials by the Society of Automotive Engineers (SAE). All electrical circuit wires shall be identified by color or number along their entire length. The wiring codes shall match information to be provided in the supporting service manuals.

- 10.16.1 All vehicle components and systems shall operate without being affected by interference damage or disruption including detrimental effects or interference to on-board computer modules from either vehicle generated noise, or stray EMF or RMF fields encountered from any airport operations. EMF and RMF noise sources that may be generated by the vehicle, especially if such noise is detrimental to aircraft, Air Traffic Control, or air navigation equipment, shall be shielded.
- 10.16.2 <u>Power Supply</u>: The carrier vehicle shall be equipped with self-regulating electric alternators having an output capacity that exceeds the anticipated electrical load. The minimum idle output of the alternator shall be 20% greater than that required by the vehicle with the engine operating at idle, heater and defroster set at low fan setting, parking and/or marker lights on, communication radio(s) on, windshield wipers operating, and either hazard flashers or Vehicle Safety Identification Lights on.

The minimum output of the alternator when operating at governed engine speed shall be 20% greater than that required by the vehicle in its operating mode with the heater and defroster set to maximum settings, headlights and marker/tail lights on, communication radio(s) on, windshield wipers at maximum setting, and the Vehicle Safety Identification Lights operating. An electrical load analysis worksheet shall be provided to the customer prior to construction showing the electrical loads during the above described conditions.

10.16.3 Batteries shall be securely mounted and adequately protected against physical injury, water, chemicals and exhaust heat. They shall be properly sized based on vehicle manufacturer recommendations and be readily accessible for change out and for other purposes.

Enclosed battery compartments shall have adequate ventilation. Battery capacity (cranking amps, voltage, reserve power, continuous/deep cycle demand) shall be compatible with the size of the engine and the anticipated electrical load expected under normal operating conditions. An on-board self-regulating battery charger may be specified by the purchaser.

- 10.16.4 <u>Starting Device</u>: The vehicle shall have an electrical starter that shall not introduce a voltage drop sufficient to adversely affect the ignition system. It shall be equipped with an overload protection device if such device is available from Manufacturer of the starter.
- 10.16.5 <u>Ignition System</u>: Under extreme weather conditions a block heater or other heating device should be considered for improved ignition. A high idle control for efficient engine warmup and stand by operations shall be provided. High idle switches or throttle controls shall be designed to operate only when the transmission is in neutral.
- 10.16.6 <u>Backup Alarm</u>: All blowers shall be equipped with a backup alarm installed at the rear of the vehicle. The backup alarm shall be activated whenever the transmission is placed in reverse. The backup alarm shall be a SAE J994, Type B vehicle backup alarm. Backup alarms may be specified by the customer for other vehicles.
- 10.16.6a <u>Rear View Camera and Monitor</u>: The rotary plow unit shall be fitted with a rear view camera and monitor. The camera shall be mounted at the rear of the engine compartment and fitted with a snow shield-ice bridge so as to provide an unobstructed view of the pavement trailing the vehicle. A color LCD monitor, approximately 4" x 6" shall be mounted on the right cab pillar utilizing an adjustable base.

The monitor shall have an adjustable brightness to compensate for night time operation.

10.16.7 <u>Horn</u>: The vehicle shall be equipped with an electric or air horn to allow the operator to provide an audible warning in an emergency.

10.17 <u>Lighting System</u>: The lighting system, including reflectors, markers identification and clearance lights, shall conform to FMVSS 108 as though the vehicle were an on-highway vehicle. Customers may specify an all LED sealed wiring lighting system for reduced maintenance costs and improved lighting system reliability.

In addition, task-oriented lights, and other lighting shall be furnished to help the operator identify the overall width, and when practical to project a beam or, light pattern on the ground in front of the blower to assist the operator in determining those areas to be cleared and to provide adequate illumination for the operator and service personal when the unit is on darkened aeronautical areas.

a. <u>Headlights</u>: The carrier vehicle shall be equipped with two or more sealedbeam quartz-halogen or high energy discharge type headlights with upper and lower driving beams and a foot or hand controlled switch for beam selection. If snow removal attachments obstruct forward illumination of these lights an auxiliary set of comparable lights shall be provided to overcome the obstruction. A control to select the secondary lights shall be provided in the operator cab.

b. <u>Backup Lights</u>: There shall be at least two backup lights installed at the rear of and at either side of the vehicle that will automatically be activated when the vehicle is shifted into reverse gear.

c. <u>Vehicle Safety Identification Lights</u>: The vehicle shall have a minimum of one flashing strobe mounted on its uppermost part (see FAA AC 150/5210-5B, Painting, Marking and Lighting of Vehicles on an Airport). The light emitted from the beacon should not reflect off rearview mirrors and into the operator's eyes.

10.18 <u>Operator's Cab</u>:

- 10.18.1 <u>General</u>: Carrier vehicle cabs shall be made of either metal or fiberglass construction. They shall be fully enclosed accommodating a single operator plus assistant/trainee (full cab). A definite separation shall exist between the engine and operator's compartment. All non-glass surfaces, such as the floor, sides, and roof of the cab, shall have insulation to reduce exterior noise. The maximum interior cab noise measured at the operator's seat shall not exceed 85 dBa under the following conditions: windows closed, heater and defrost systems at maximum operation, and carrier vehicle and equipment engines operating at maximum rated capacity. Manufacturers of the equipment are encouraged to improve upon the specified noise level. To the extent possible, the interior of the cab shall be ergonomically designed providing the operator with a pleasant working atmosphere that is devoid of the stark conditions normally associated with older equipment. All cabs shall provide at least two different routes of egress to allow the operator to exit the cab in the event of rollover or overturn.
- 10.18.2 <u>Communications Equipment Space</u>: 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.

Radio equipment shall be supplied. Radio programming and installation by owner. Mobile radios shall be supplied with roof-type mounted antennas:

Two (2) Laird B132S 1/4 Wave Broadband Antenna, 132-525 MHz, Tunable Center Frequency, Chrome Color, 23" Overall Length, 21" Straight Whip Style with spring. Two (2) Laird MB8U ³/₄" hole, NMO style all brass mobile mount with 17' RG58U solid center antenna cable.

One (1) Icom IC-A120 VHF-AM Air Band Mobile Transceiver 118.000-136.975 MHz 8W (typical), 760 channels total. Complete with mobile mount bracket, related cables and mounting hardware and the following accessories:

HM-216 HAND MICROPHONE SP-30 20 WATT EXTERNAL SPEAKER

One (1) Motorola M22KSS9PW1 N APX4500 PROJECT 25 CAI Digital Mobile Radio, VHF (136-174) MHz. 1-50 Watts, with the following options:

Q811	ADD: SOFTWARE P25 CONVENTIONAL
GA00804	ADD: APX O2 CONTROL HEAD (Grey)
G444	ADD: APX CONTROL HEAD SOFTWARE
G66	ADD: DASH MOUNT
G89	ADD: NO RF ANTENNA NEEDED
G24	ADD: 3 YEAR SERVICE FROM THE START LITE
W12	ADD: RF PREAMP
G831	ADD: AUXILARY SPEAKER 15W
W22BA	ADD: PALM MICROPHONE

Communication Equipment/Airport Intercom:

One (1) Airport intercom/headset shall be furnished.

Setcom System 1300 Specifications

Radio mixer Setcom Systems 1300 or equivalent complete with noise attenuating overthe-head headband style headset certified for 24dB noise reduction, noise canceling lip microphone featuring an amplified electric microphone mounted on a flexible boom. The system must include Split-Audio in which the AM radio is heard in the right ear only and the FM radio is heard in the left ear only. The system must be capable of simultaneous transmission on the radios. The operator's station must be able to adjust the volume level of the AM and FM audio inputs independent of each other with separate on-off switches and include a momentary three position toggle switch to select and key either radio.

The system components are as follows:

MS-1310 Master Station APX Radio Cable A120 Radio Cable ES-1310-10 Extension Station, 10' 7B-1310R Headset, 6' (dual ear Over-the-Head right cable dress)

NH State Proposal/NAPSO Value Point Radio equipment contact: Ossipee Mountain Electronics 832 Whittier Highway Moultonborough, NH 03254 Tel. (603) 476-5581 Attn: Brian Vastine

- 10.18.3 <u>Fire Extinguisher(s)</u>: The vehicle cab shall have at least one 2A-10BC interior mounted fire extinguisher that is readily accessible to the operator. Vehicles equipped with fuel tank(s), hydraulic oil tank(s), or any flammable liquid tank(s) that have a total combined volume of 200 gallons or more of flammable liquid shall be equipped with one 20 B:C: Purple K type fire extinguisher installed on the vehicle or equipment at a place readily accessible from the ground.
- 10.18.4 <u>Operator Seat</u>: The vehicle cab shall provide an air ride operator seat that can easily be adjusted up and down, fore and aft, a minimum of 3 inches (7.6 cm) in each direction. The seat should also be capable of reducing the effect of vehicle vibration by featuring air-cushion shock absorbing seat systems, or systems of comparable design. All vehicle seats shall have three-point (minimum) seat belts, certified by the vehicle manufacturer to have been tested and in conformance with FMVSS requirements. Seats shall be fully upholstered with a good quality fabric.
- Windows and Windshield: An electrically heated windshield shall be 10.18.5 provided. The vehicle cab shall maximize the use of glass, including the placement of panels if possible in the lower sections of door panels, to increase the operator's view of operational areas and ground surfaces. All installed glass shall be laminated, safety rated, and conform to all FMVSS requirements. Glass to be tinted. The location and size of the windshield shall minimize visual obstructions to the operator. The windshield shall be designed to avoid snow build up and be equipped with one or more variable speed intermittent operating wipers (standard or wet arm). The windshield wiper system shall be capable of sweeping a clear view for all occupants up and be equipped with at least one variable speed automatically operating wiper (standard or wet) that is capable of sweeping a clear view for all occupants. The windshield washer reservoir shall have a capacity of at least 1¹/₂ gallons (5.6 liters). Fluid applicators shall be located to provide at least 75% coverage of the windshield. The cab shall be equipped with sun visors. Windshields and other glass surfaces in the vehicle cab used in the operation of the vehicle and/or to view pavement surfaces, including rear windows if installed, shall be cleared by means of a defroster system that is part of the cab's heating system. The standard circulating air type defroster may be complimented by electrical type heating systems for glass areas as required.
- 10.18.6 <u>Exterior Rearview Mirrors</u>: Two electrically heated exterior rear view mirrors of the extension arm type shall be mounted one on each side of the vehicle cab. Rear view mirrors are to be powered and remotely controlled. Each mirror shall have an area of not less than 100 in² (650 cm²).

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- 10.18.7 <u>Heater</u>: The carrier vehicle cab shall have a heating system that is capable of maintaining a minimum interior temperature of 65 °F (18 °C) at an ambient outside temperature of -20 °F (-29 °C). Heat output shall be controllable from within the cab by a selector switch that is conveniently located to the operator. Under all conditions of heating and ventilation, the temperatures measured in the operator's immediate environment should be uniform within 9 °F (5 °C) (see SAE J1503).
- 10.18.8 <u>Ventilation</u>: Ventilator/heater fan shall have blower capacity equal to one cab volume per minute. Cab ventilator intakes should be screened and positioned in such a manner to minimize the entry of snow.
- 10.18.9 <u>Hour Meters</u>: Every engine permanently attached to a carrier vehicle shall be equipped with an hour meter that registers engine operation time from 0 to 9999 hours. Hour meters shall be prominently displayed so that they can be easily read by an operator or service personnel. The hour meters shall be of direct read design and shall only register when the engine is running.
- 10.18.10 Instrumentation: The cab shall display an instrument panel equipped with rocker and/or toggle switches and controls (instruments) that are friendly to operators wearing bulky winter clothing. Toggle switches, where used, shall have a minimum length of 1½ inches (4 cm). Frequently used instruments shall be located in direct line-of-sight and within forearm reach of a medium sized person sitting in the operator's position. All instruments shall be clearly identified with labels that indicate their function. Instruments should display urgency-of-action lights, i.e., green for normal operation, amber for warning, and red for emergency. Instruments shall be illuminated by background lighting regulated by dimmer switches capable of providing infinitely variable lighting intensities. Circuit breakers shall be grouped for easy access and convenience. Typical instruments that report and track major functions of a carrier vehicle and mounted equipment are as follows:
 - A. Engine:
 - 1) Voltmeter
 - 2) Lubricating Oil Pressure Gauge(s)
 - 3) Coolant Temperature Gauge(s)
 - 4) Tachometer(s) including hour meter(s)
 - 5) Starting Controls (including auxiliary cold start controls)
 - 6) Hydraulic Oil Pressure and Temperature Gauge if applicable
 - 7) Transmission
 - B. Vehicle Chassis:
 - 1) Brake-air Pressure Gauges if applicable
 - 2) Low-air Pressure Warning, visual and audible type if applicable
 - 3) Light Switches and Headlight Beam Indicator
 - 4) Speedometer with Recording Odometer
 - 5) Fuel Quantity Gauge(s)
 - 6) Equipment Controls

10.19 Sheet Metal Components:

10.19.1 <u>General</u>: The carrier vehicle engine, as well as its mechanical components, shall be protected wherever possible from snow, rain and other winter elements. Body and engine enclosures may be fabricated from aluminum, fiberglass, and/or steel. Self-tapping bolts are unacceptable in the construction of these enclosures.

a. Steps: Four-way safety tread, open design steps are required to ascend and descend high profile carrier vehicles. These steps, together with assist handles, shall provide for constant three-point contact, and shall be of ample size to ensure safe and easy access for persons wearing bulky winter clothing.

b. Walkway: A four-way safety tread, open design walkway shall be provided, as necessary, for access.

c. Handrails. Handrails shall be provided as required at all steps, walkways, and work stations. They shall be made of corrosion-resistant materials or otherwise treated to prevent corrosion.

d. Fenders: All carrier vehicles shall be equipped with fenders and when determined by the operator, non-sail mud flaps to prevent wheels from throwing snow and other debris.

e. Drains: Plugged or free flowing drains shall be provided at all body and compartment locations where standing water can collect. Free flowing drains shall not drain onto sensitive mechanical or electrical components or on areas anticipated to be occupied by personnel during normal operations.

f. Doors: Doors shall be equipped with a positive closing mechanism and, where appropriate, a locking mechanism. Top hinged compartment doors shall be held in the open position by a support arm(s).

g. Gutters: The vehicle cab shall be equipped with gutters, located above the entrance doors, of sufficient length to span the door width and provide runoff protection to occupants either entering or exiting the cab.

10.20 <u>Painting, Marking, and Lighting of Vehicles</u>:

- 10.20.1 <u>Painting and Marking</u>: 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 150/5210-5B). To minimize glare to the operator, the top of blower head and blower chute shall be painted flat black.
- 10.20.2 <u>Preparation and Finish</u>: The carrier 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 as required by the purchaser, applied to produce full hiding.

10.20.3 <u>Quality</u>: 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.

10.21 Miscellaneous:

10.21.1 Plastic Plates: Plastic plates are acceptable only in locations that are not exposed to the elements and subject to weathering or excessive heat.

10.21.2 <u>Information</u>: Plates shall identify make, model, serial number, and any other relevant data.

10.21.3 <u>Technical Publications</u>: Manufacturer shall furnish two complete sets of manuals. One set of manuals shall consist of an Operator's manual, Parts Manual, and Maintenance and Service Manual.

10.21.4 <u>Operator's Manual</u>: The operator's manual includes lubrication charts and instructions.

10.21.5 <u>Parts Manual</u>: The parts manual identifies and lists all parts, components, and sub-assemblies used in the fabrication of the carrier vehicle and mounted equipment.

10.21.6 Maintenance and Service Manual: A maintenance and service manual provides guidance to non-specialists performing routine services. The manual should also describe in detail with appropriate schematics the overhaul and major maintenance procedures required to maintain and repair the vehicle. The maintenance manuals shall include complete schematics of the electrical, air, and hydraulic systems as applicable. Number codes on wires and hoses as found on the vehicle shall match those provided in the maintenance manual schematics.

10.21.7 Accessories and Tools: The carrier vehicle shall be equipped with tire tools, a jack, shear pins, and specialized tools as specified by the purchaser. They shall be kept either in a secure and readily accessible enclosure that is permanently affixed to the vehicle or in the maintenance facilities of the airport as required by the purchaser.

10.21.8 Lug wrench and any other special tire tool required to change a flat tire.

10.21.9 <u>Shear Pins</u>: A minimum of six pins shall be provided in support of each shear pin located on the carrier vehicle and its auxiliary equipment.

10.20.10 <u>Specialized Tools</u>: Specialized tools required for routine servicing of the carrier vehicle and its auxiliary equipment.

10.22 <u>Delivery</u>:

10.22.1 <u>Shipment</u>: The vendor (seller) is responsible for the safe and timely delivery of the vehicle and its accessories, spare parts, and tools to 400 Kelly Avenue, Manchester, NH, 03103.

10.22.2 <u>Marking</u>: Carrier vehicles shall be marked for shipment in accordance with instructions agreed to by the purchaser.

10.22.3 <u>Instruction and Training</u>: Manufacturer shall, 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 shall provide instructions to airport personnel sufficient to familiarize themselves with the operational and maintenance characteristics of the vehicle and its auxiliary equipment. The period of instruction shall be 8 hours for 3 shifts or over 5 days total of 24 hours of training upon crew size.

APPENDIX "A" PERFORMANCE TESTING

1. Objective:

The objective of this procedure is for the Manufacturer to determine the tonnage capacity and snow casting ability of this rotary snow blower. Potential suppliers of rotary plow equipment in response to requirements based on this specification and SAE Documents shall conduct capacity tests based on this procedure. Testing is not required on the production unit prior to delivery, but shall be conducted on a prototype or vehicle of similar configuration with similar components and design to that being offered. In the absence of a prototype test, the Manufacturer will be permitted

to test a delivered unit after delivery at the Airport by a 3rd party.¹

2. Criteria:

The snow removal unit with blower attached shall make at least three snow removal passes in a windrow or snow field not less than 18 inches deep. In each pass, the snow removal unit shall clear a path not less than 500 feet long by the full width of blower head, or along the length of a constructed wind row.

Snow depth and density shall be determined in at least five intermediate locations evenly spaced along the path and an average value calculated. Whenever possible, density shall be determined from a vertical section of the snow depth.

The time required to complete each pass shall be measured by a stop watch. The volume of the snow removed shall be determined by the procedure contained in this appendix.

Measurement of snow shall be the appropriate measurement method described herein. The snow removal rate shall be calculated by means of the formula below. The cast distance shall be measured to determine the casting ability of the vehicle by methods described below. A wind speed greater than 5 mph shall be considered unacceptable for testing cast distance and cast distance testing shall be rescheduled.

There shall be no adjustment to calculated capacity based on shear strength of the snow.

In capacity testing for a unit deemed to be a "high speed" unit, the size of the wind row or depth of the snow field must be limited to allow the vehicle to reach its intended capacity at the required speed (greater than or equal to 25 mph). The maximum size must be calculated backwards from the required speed of the vehicle and density of the snow. For accuracy and applicability, high speed testing should be conducted with a constructed windrow only, designed to simulate actual conditions expected.

¹ Examples of components and designs whose change can materially affect blower capacity include, but are not limited to, such items as impeller and ribbon dimensions, impeller and ribbon gear ratios, design, and drive systems, engine horse power, engine torque, and variations in parasitic loads required of the blower engine.

3. Procedure:

Equipment required:

200 ft measuring tape Stopwatch Soil conservation coring tools, 12 inch for horizontal samples and sufficient length for vertical samples as test conditions may require. NOTE: Density sample accuracy increases as the inside diameter of the sampling tubes increases. Large aluminum or plastic spatula Accurate scale Wind speed indicator Marker cones or bright and dark colored spray paint

A. Snow Field Test

Prior to each test run the wind speed shall be measured. A wind speed greater than 5 mph shall be considered unacceptable and testing shall be rescheduled.

A snow field can be an undisturbed field of snow, or snow can be moved, wind rowed and shaped to the desired configuration depth. For a snow field test, snow depth must be a minimum of 18 inches but less than the intake height of the blower. For its entire length, the snow field must be wider than the blower head and of a consistent depth to help assure accuracy of the testing

The snow field shall be a minimum of 700 feet long and clearly marked every 100 feet. The test shall be conducted through at least 500 feet of the course. Approximately 100 feet is required at the beginning of the test field to allow the operator to adjust the speed and operation of the vehicle to the conditions. Sufficient additional snow is required at the end of the test field to assure accurate timing through the entire 500' foot test length.

The vehicle shall make a snow removing pass through the entire length of the prepared site. The time required to make the complete 500' foot pass shall be measured and recorded. A minimum of three such tests shall be conducted.

During the test, the cast distance from the centerline of the snow removal unit's path to the center of mass within the perimeter of the cast pattern shall be measured and recorded. At a minimum, this measurement shall be marked at each 100' foot interval. Because the momentum of cast snow tends to slide it further away from the blower's path, care shall be taken to mark the landing point of the center of the mass and not its final position.



FIGURE A1 - Measuring the Rotary Plow's Width and Depth Pass When Employing the Field Testing Method

After the blower's test pass, measurement of the blown path is made.

The overall width of the blower's path shall be measured. This should be consistent for the entire test track.

Depth of snow is determined on both sides of the blown path. Depth measurements shall be taken at each 100' foot interval on both sides of the blower's path. Depth shall be determined by tape measure from the pavement surface to the surface of the snow on both sides of the blower's path. The measured depths shall be recorded.

The residue left after the blower passes shall be measured at each measurement site, recorded, and subtracted from the measured depth.

NOTE: It is recommended that the depth measurement be taken from the snow surface to the pavement and a separate measurement of the residue be gathered and recorded. The ability to adjust a blower to an acceptable and/or desirable level of residue is a critical factor in snow blower evaluation and should receive attention and visibility.

Snow density measurements shall be taken at a minimum of five evenly spaced intermediate locations along the test site on both sides of the blower's path, including the beginning and end of the marked course. Density measurements must be taken at each individual snowfield run immediately after the snow blowing run is complete.

Density samples shall be obtained by taking a vertical sample from the snow surface to the pavement. Snow density samples shall be taken with a soil conservation service coring tool or similar device. The volumetric capacity of the coring tool must be known and the empty coring tool(s) must be accurately weighed.



FIGURE A2 - Using the Coring Tool When Field Testing

The 24" inch coring tool shall be forcefully inserted through the snow to the pavement surface directly alongside the blown path.

If snow depth is less than the length of the coring tool, make sure the tool's bottom end rests on the pavement surface and remains there throughout this activity. Snow from around the tube is shoveled away from two sides. The third side must remain undisturbed to allow an accurate tape measurement to assess the actual volume of snow contained within the coring tool.

A flat aluminum spatula or similar tool shall be slipped between the pavement surface and the bottom of the coring tool. The coring tool and its contents of snow are moved on the spatula away from the original location and placed on a scale. Extraneous snow shall be removed from the outside of the tool and the scale's surface, and an accurate weight of the tool and its contents is taken and recorded.

If the snow field is greater than the length of the coring tool, three density core samples should be taken horizontally from each side of the test pass at each sample location. Using the 12" inch coring tool, take one sample approximately 8 inches from the pavement surface, one at mid depth, and one approximately 8 inches below the snow surface.

For accuracy of data, care shall be taken to assure all snow within the sample be included in the calculation. Conversely, care shall also be taken to assure no additional snow is packed into the coring tool. These samples are then averaged to provide a relatively accurate density for the snow field.



FIGURE A3 - Weighing the Snow

The average density shall also be calculated. The average density shall fall in the within the range of 15 to 40 pounds per cubic foot for the test to be considered valid.

The capacity of the machine is determined mathematically from the data gathered using the formulas provided in the appendix.

B. Constructed Windrow Test

Snow shall be moved and wind rowed by machinery to construct a sample windrow. The depth of the wind row along its entire length at its peak shall be no less than 18 inches but no greater than the height of the blower's intake. The width at the pavement surface shall be more than half the width, but less than the full width of the blower's intake. For ease and accuracy of the test, care shall be taken to make the wind row's size and shape as consistent as possible throughout the test length. The ideal wind row for the test is triangular in cross section as it is easier to measure.

The length of the windrow shall be 700 feet minimum, clearly marked every 100 feet. The test shall be conducted through 500 feet of the course. Approximately 100 feet is required on the front end of the test field to allow the operator to adjust the speed and operation of the vehicle to the conditions. Sufficient additional snow is required at the end of the test field to assure accurate timing through an entire 500' foot test length.

The size and profile of the windrow is measured and recorded before the capacity runs.

A tape measure and portable gantry are required to gather this dimensional data. The gantry is moved along and positioned astride the wind row at each marked 100' foot interval. Measurements are taken from the known height of the gantry to the surface of the wind row. At a minimum, the apex of the wind row as well as the outer edges of the wind row shall be measured to determine the width at the base. The profile of the windrow is recorded.



FIGURE A4 - Measuring the Windrow Using a Gantry When Employing the Constructed Windrow

The density of the snow shall be measured and recorded. Density measurements shall be made at a minimum of five points evenly spaced along the length of the wind row, including the beginning and end of the marked course. Density measurements must be taken for each windrow constructed immediately prior to the snow blowing run.

Snow density samples shall be taken with a soil conservation service coring tool. The volumetric capacity of the coring tool must be known and the empty coring tool(s) must be accurately weighed.



FIGURE A5 - Using the Coring Tool on Constructed Windrow A coring tool shall be forcefully inserted through the snow to the pavement surface at a point in the windrow that is over 12 inches deep. With snow depth less than the length of the coring tool, make sure the tool's bottom end rests on the pavement surface and remains there throughout this activity. Snow from around the tube is shoveled away from two sides. The third side must remain undisturbed to allow an accurate tape measurement to assess the actual volume of snow contained within the coring tool.

A flat aluminum spatula or similar tool shall be slipped between the pavement surface and the bottom of the coring tool. The coring tool and its contents of snow are moved on the spatula away from the original location and placed on a scale. Extraneous snow shall be removed from the outside of the tool and the scale's surface, and an accurate weight of the tool and its contents is taken and recorded.

The average density shall also be calculated. The average density shall fall in the within the range of 15 to 40 pounds per cubic foot for the test to be considered valid.

During the test, the cast distance from the centerline of the snow removal unit's path to the center of mass within the perimeter of the cast pattern shall be measured and recorded. At a minimum, this measurement shall be marked at each 100' foot interval. Because the momentum of cast snow tends to slide it further away from the blower's path, care shall be taken to mark

the landing point of the center of the mass and not its final position.



FIGURE A6 - Measuring Residue Width of Constructed Windrow

When the run is complete, the residue and spillage remaining after the blower passes shall be measured at each measurement site, recorded, and subtracted from the measured amount.

NOTE: It is recommended that the depth measurement be taken from the snow surface to the pavement and a separate measurement of the residue be gathered and recorded. The ability to adjust a blower to an acceptable and/or desirable level of residue is a critical factor in snow blower evaluation and should receive attention and visibility.

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The capacity of the machine is determined mathematically from the data gathered using the formulas provided in this appendix.



FIGURE A7 - Measuring Residue Depth of Constructed Windrow Calculations

The capacity of the snow blower shall be calculated using the following formula: $Q = A \times L \times D \times 1.8/t$

Where Q = capacity in tons per hour

A = average cross-sectional area of the windrow in square feet

- L = length of test run in ft D = average density of the snow in lbs/cu ft
- t = time of test run measured in seconds
- And 1.8 = a constant (3600 seconds per hr./2000 lbs per ton).

The capacity of the snow blower is determined by calculating each of the capacity runs (no less than three) and finding the average capacity per run.

APPENDIX B ADDITIONAL REQUIREMENTS

Engine-Jacket Water Heater: Re-circulating type with thermostatic control and weatherproof receptacle plug (minimum - 1500 watts).

Engine Oil Pan Heater: 300 watts.

Battery Warmer Pad: Approximately 50 to 100 watts per battery.

Transmission Oil Pan Heater: Wattage as recommended by the transmission manufacturer. Additional Door Handles: Handles shall be installed on lower part of vehicle cab door. Auxiliary Cab Heater and Circulating Fans Cab air conditioning system

Windows:

- a) Extra Window in Lower Part of Cab Doors
- b) Tinted Windshield and Windows
- c) Liquid deluge system for side windows, windshield and rear view mirror with 20 gallon minimum capacity and easy accessible fill
- d) Side Window Wipers

Seats:

- a) Bostrom "T" Seat (or equivalent for driver and passenger sides)
- b) Heated Driver Seat
- c) Arm Rests for Operator Seat

Cab Insulation Upgrade (to reduce exterior noise below 85 dBa) Air Horn Clock

Additional Lighting:

- a) Auxiliary Cab Dome Light
- b) Roof Mounted Lights
- c) Door Lights
- d) High Intensity Strobe Beacon
- e) HID Lights

Additional Corrosion Prevention that conforms to Federal Specification 297 D, Rustproofing of Commercial (Non-tactical) Vehicles.

Tow Chain: Tow chains shall have a minimum link size of 1/2 inch (1.3cra).

Radio Transceivers:

Radio equipment shall be supplied. Radio programming and installation by owner. Mobile radios shall be supplied with roof-type mounted antennas:

Two (2) Laird B132S 1/4 Wave Broadband Antenna, 132-525 MHz, Tunable Center Frequency, Chrome Color, 23" Overall Length, 21" Straight Whip Style with spring.

Two (2) Laird MB8U ³/₄" hole, NMO style all brass mobile mount with 17' RG58U solid center antenna cable.

One (1) Icom IC-A120 VHF-AM Air Band Mobile Transceiver 118.000-136.975 MHz 8W (typical), 760 channels total. Complete with mobile mount bracket, related cables and mounting hardware and the following accessories:

HM-216 HAND MICROPHONE SP-30 20 WATT EXTERNAL SPEAKER

One (1) Motorola M22KSS9PW1 N APX4500 PROJECT 25 CAI Digital Mobile Radio, VHF (136-174) MHz. 1-50 Watts, with the following options:

Q811	ADD: SOFTWARE P25 CONVENTIONAL
GA00804	ADD: APX O2 CONTROL HEAD (Grey)
G444	ADD: APX CONTROL HEAD SOFTWARE
G66	ADD: DASH MOUNT
G89	ADD: NO RF ANTENNA NEEDED
G24	ADD: 3 YEAR SERVICE FROM THE START LITE
W12	ADD: RF PREAMP
G831	ADD: AUXILARY SPEAKER 15W
W22BA	ADD: PALM MICROPHONE

APPENDIX C OPERATIONAL NEEDS DETAIL SHEET

The following site and operational information is critical to assure that the Class VI High Speed Rotary Snow Plow Manufacturer understands the exact nature of the machine that the Airport is requesting to meet its operational needs.

Part I Operating Conditions

The unit must be capable of <u>operating</u> at temperatures as low as $\underline{-50}^{\circ}$ F to as high as $\underline{+55}^{\circ}$ F. The unit must be capable of <u>cold soaked starting</u> at temperatures as low as $\underline{-40}^{\circ}$ F to as high as <u>60</u>°F.

The unit will be stored:

Outside at temperatures as low as -50°F Outside, at temperatures as low as 50°F while connected to electric power for installed heaters, battery chargers, etc. Power Available is <u>120</u> Volts AC/DC

The unit will be used to remove snow and ice from Runways, Taxiways, Ramp & Gate Areas and Service Roadways.

The unit will transit as a self-powered movement with the rotary plow.

Part II Operational Requirements

Rotary Plow Certified Performance Requirements Minimum snow blowing capacity of 7500 tons'/hour Minimum cast distance $\underline{150}$ ft Minimum transport speed $\underline{25}$ mph Snow Density $\underline{20 - 40}$ lbs/cu ft (std) (other) $\underline{25}$ lbs/cu ft Snow shear strength 0 250 0 250 - 500 $\underline{500 - 600}$ Maximum turning radius $\underline{75}$ ft (wall to wall)

XII. POST SUBMITTAL EVENTS

12.01 Evaluation of Proposals

The Airport will use evaluation criteria it judges most appropriate to the review process and the relative importance of this criteria will be determined at the sole discretion of the Airport. No Company shall have any cause of action against the City or its Department of Aviation arising out of a failure to secure a CLASS VI HIGH SPEED ROTARY PLOW contract with the Airport, failure by Airport to consider a Company's Proposal, or the methods by which the Airport evaluated proposals received. The selection of the prospective Company and the decision to engage in negotiations with that Company shall be at the sole discretion of the Airport.

12.02 Exceptions

The Airport may accept proposals that have exceptions. Exceptions must be clearly identified with a justification statement. The exception must meet AIP obligations including Buy American Provisions.

12.03 Proposal Selection

The Airport intends to select at least one (1) Proposal for CLASS VI HIGH SPEED ROTARY PLOWS, but reserves the right to accept none of the Proposals, to negotiate for modification of any Proposal with the mutual consent of the Company, to accept the Proposal which, in the judgment of the Airport, shall be deemed the most advantageous to the Airport, to waive any of the requirements of the proposal procedures explained in this document, and/or to proceed in any other manner deemed to be in the Airport's best interest. Airport reserves the right to retain all copies of Proposals submitted by prospective Companies.

12.04 <u>Disqualification</u>

Although not intended to be an inclusive list of causes for disqualification, any one or more of the following, among others, may be considered sufficient for disqualification of a Company and the rejection of the Proposal:

- a. Evidence of collusion among Companies.
- b. Submitting a Proposal that is incomplete, obscure or which contains irregularities, inaccuracies, or misstatements.
- c. Lack of business skills or financial resources necessary to successfully provide sufficient CLASS VI HIGH SPEED ROTARY PLOW as revealed by either financial statements or experience.
- d. Lack of responsibility as shown by past history, references, or other factors.
- e. Default or termination of other contracts or agreements.
- f. Other causes as the Airport deems appropriate at the Airport's sole and absolute discretion.

12.05 Notice of Acceptance of Proposal

Upon the Airport's selection of a Proposal, the selected Companies will be notified no later than Friday, November 30, 2018 by telephone.

EXHIBIT "A" DEFINED TERMS

ARTICLE 1. INTERPRETATION

1.1 This Proposal, including all Proposal Documents, will be interpreted in accordance with the following:

1.1.1 **General**. The interpretation and miscellaneous provisions of the General Conditions apply to all Proposal Documents and Work. References to sections, paragraphs, articles or other provisions shall be deemed to mean those contained in this main body of the Proposal unless specified otherwise.

1.1.2 **Entire Proposal**. This Proposal, including all Proposal Documents, contains the entire agreement between the parties hereto with respect to the transactions contemplated by this Proposal. Without limiting the generality of the foregoing, this Proposal shall completely and fully supersede all other understandings and agreements among the parties with respect to such transactions, including those contained in the RFQ (if any), the submittal made by the DB in response thereto, the RFP, the proposal made by the DB in response thereto, and any amendments or supplements to any such documents.

1.1.3 **Gender and Plurality**. Words of the masculine gender mean and include correlative words of the feminine and neuter genders and words importing the singular number mean and include the plural number and vice versa.

1.1.4 **Headings**. The table of contents and any headings preceding the text of the articles, sections and subsections of this Proposal shall be solely for convenience of reference and shall not affect its meaning, construction or effect.

1.1.5 **References to Hereto**. The terms "hereto," "hereby," "hereof," "herein," "hereunder" and any similar terms refer to this Proposal.

1.1.6 **References to Including**. The words "include," "includes" and "including" are to be construed as meaning "include without limitation," "includes without limitation" and "including without limitation," respectively.

1.1.7 **References to Statutes**. Each reference to a statute or statutory provision includes any statute or statutory provision which amends, extends, consolidates or replaces the statute or statutory provision or which has been amended, extended, consolidated or replaced by the statute or statutory provision and includes any orders, regulations, by-laws, ordinances, codes of practice or instruments made under the relevant statute.

1.1.8 **References to Governmental Authorities**. Each reference to the Airport or a Governmental Authority is deemed to include a reference to any successor to the Airport or such Governmental Authority or any organization or entity which has taken over the functions or responsibilities of the Airport or such Governmental Authority. Each reference to a private Person that is not an individual is deemed to include a reference to its successors and permitted assigns.

1.1.9 **References to Documents and Standards**. Each reference to an agreement, document, standard, principle or other instrument includes a reference to that agreement, document, standard, principle or instrument as amended, supplemented, substituted, novated or assigned.

Initials _____

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1.1.10 **Delivery of Documents in Digital Format**. In this Proposal, the DB is obligated to deliver reports, records, designs, plans, drawings, specifications, proposals and other documentary submittals in connection with the performance of its duties hereunder. The DB agrees that all such documents shall be submitted to the Airport both in printed form (in the number of copies indicated) and, at the Airport's request, in digital form. Digital copies shall consist of computer readable data submitted in any standard interchange format which the Airport may reasonably request to facilitate the administration and enforcement of this Proposal. In the event that a conflict exists between the signed or the signed and stamped hard copy of any document and the digital copy thereof, the signed or the signed and stamped hard copy shall govern.

1.1.11 **Severability**. If any provision of this Proposal is held to be invalid, unenforceable or illegal to any extent, such provision may be severed and such invalidity, unenforceability or illegality will not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Proposal. If any such provision of this Proposal is held to be invalid, unenforceable or illegal, the Parties will promptly endeavor in good faith to negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Proposal as nearly as possible to its original intent and effect.

1.1.12 **Drafting Responsibility**. The Parties waive the application of any rule of law which otherwise would be applicable in connection with the construction of this Proposal to the effect that ambiguous or conflicting terms or provisions should be construed against the Party who (or whose counsel) prepared the executed agreement or any earlier draft of the same.

1.1.13 **Counterparts**. This Proposal may be executed in any number of original counterparts. All such counterparts shall constitute but one and the same Proposal.

1.1.14 **Governing Law**. This Proposal and all of the rights and obligations of the Parties hereto and all of the terms and conditions hereof shall be construed, interpreted and applied in accordance with and governed by and enforced under the laws of the State of Texas. Exclusive venue for litigation shall be located in Harris County, Texas.

EXHIBIT "B" GENERAL CONDITIONS

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ARTICLE 1 - GENERAL PROVISIONS

1.1 *DEFINITIONS*

1.1.1 Capitalized terms have the meanings set forth in **Article 1**.

1.2 EXECUTION, CORRELATION, AND INTENT

1.2.1 Execution of the Proposal Manufacturer is conclusive that MANUFACTURER has visited the delivery site, become familiar with local conditions under which the Work of the Equipment will be performed.

1.2.2 The Proposal Documents have been read and carefully considered by the Manufacturer.

1.2.3 Reference to standard specifications, manuals, or codes of a technical society, organization, or association, or to laws or regulations of a governmental authority, whether specific or implied, mean the latest edition in effect as of date of Proposal bid date, except as may be otherwise specifically stated in the Proposal Documents.

1.2.4 No provision of any referenced standard, specification, or manual changes the duties and responsibilities of the Airport, MANUFACTURER, or Designer from those set forth in the Proposal.

1.2.5 Unless otherwise defined in the Proposal, words which have well-known approved snow removal equipment industry technical meanings are used in the Proposal in accordance with these recognized meanings.

1.2.6 Where the words "directed," "required," "permitted," "ordered," "designated," "prescribed," or words of like import are used, it shall mean the direction, requirement, permission, order, designation, or prescription of Director unless explicitly stated otherwise. The words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to Director, unless explicitly stated otherwise.

1.2.7 Reference to a specific requirement of a cited standard shall include all general requirements of the entire cited standard pertinent to the specific reference.

1.3 *OWNERSHIP AND USE OF DOCUMENTS*

1.3.1 Neither MANUFACTURER, Subcontractor, nor Supplier will own or claim a copyright to documents contained in the Proposal or any part of the Proposal.

1.3.2 Documents contained in the Proposal Documents, prepared by the Airport or Manufacturer, and copies furnished to MANUFACTURER, are for use solely with respect to the Work.

INITIALS _____
1.3.3 Any documents created Manufacturer or its subcontractors for the manufacture and delivery shall become the property of the Airport upon their creation. In the event this transfer of ownership is ineffective for any reason, the Airport is hereby granted an irrevocable, non-exclusive, perpetual, royalty-free license to use said documents in conjunction with the Project. This provision shall be in all Proposals awarded Manufacturer shall require the provision in all Proposals of lower tiers.

1.4 INTERPRETATION

1.4.1 Specifications are written in an imperative streamlined form and are directed to MANUFACTURER, unless noted otherwise. When written in this form, words "shall be" are included by inference where a colon (:) is used within sentences or phrases.

1.4.2 In the interest of brevity, the Proposal frequently omits modifying words such as "all" and "any" and articles such as "the" and "an", but an absent modifier or article is not intended to affect interpretation of a statement.

ARTICLE 2 - THE AIRPORT

2.1 *LIMITATIONS OF THE AIRPORT'S OFFICERS AND EMPLOYEES*

2.1.1 No officer or employee of the Airport may authorize MANUFACTURER to perform an act or work contrary to the Proposal Documents, except as otherwise provided in the Proposal.

2.2 DUTIES OF THE AIRPORT

2.2.1 Information or services that the Airport is required to provide under the Proposal will be provided by the Airport with reasonable promptness to avoid delay in orderly progress of the delivery.

2.2.2 Except as expressly stated in this Proposal and the Document 00700-General Conditions, the Airport owes no duty to Manufacturer or any Subcontractor or Supplier.

2.3 THE AIRPORT'S RIGHT TO REJECT WORK

2.3.1 The Director shall have the right to reject equipment that does not conform to the Proposal Documents. Airport shall also have the right to require special inspection or testing of the equipment, whether or not such equipment is then fabricated, installed, or completed. Neither Airport's right to act under this Section nor any decision by Airport either to exercise or not to exercise such right shall give rise to any duty or responsibility of Airport to MANUFACTURER or to any other person or entity, or result in a waiver of any of Airport's rights or relieve MANUFACTURER of its obligations.

RELEASE AND INDEMNIFICATION

Manufacturer agrees to and shall release the Airport, its agents, employees, officers and legal representatives (Collectively the "Airport") from all liability for injury, death, damage or loss to persons or property sustained in connection with or incidental to performance under this proposal, even if the injury, death, damage or loss is caused by the Airport's sole or concurrent negligence and/or the Airport's strict product's liability or strict statutory liability.

Manufacturer agrees to and shall defend indemnify, and hold the Airport, its agents, employees, officers and legal representatives (Collectively the "Airport") harmless for all claims, causes of action, liabilities, fines and expenses (including, without limitation, attorneys' fees, court costs and all other defense costs and interest) for injury, death, damage or loss to persons or property sustained in connection with or incidental to performance under the proposal including, without limitation, those caused by:

Manufacturers and/or its agents, employees, officers, directors, manufacturers or subcontractors (Collectively in numbered subparagraphs 3.25.1.1 through 3.25.1.3, "Manufacturer") actual or alleged negligence or intentional acts or omissions;

The Airport's Manufacturer's actual or alleged concurrent negligence, whether Manufacturer is immune from liability or not;

The Airport's Manufacturer's actual or alleged strict products liability or strict statutory Design-Build liability, whether contractor is immune from liability or not.

Manufacturer's duty to defend, indemnify and hold harmless the Airport shall survive any termination of this proposal.

The indemnification obligations hereunder shall not be limited in any way by the limits of any insurance coverage or any limitation on the amount or type of damages, compensation or benefits payable by, for, or to Manufacturer or any subcontractor, supplier, or any other individual manufacturer or any subcontractor, supplier or any other individual or entity under any insurance policy, workers; compensation acts, disability benefit acts or other employee benefits acts.

Release and Indemnification – Patent, copyright, trademark and trade secret infringement unless otherwise specifically required by the proposal, Manufacturer agrees to and shall release and defend, indemnify and hold harmless the Airport, its agents, employees, officers and legal representatives (collectively the "Airport") from all claims or causes of action brought against the Airport by any party, including Manufacturer, alleging that the Airport's use of any equipment, software, process or documents Manufacturer furnishes during the term of the proposal infringes on a patent, copyright or trademark, or misappropriates a trade secret. Manufacturer shall pay subject to reimbursement if allowed under the proposal, all costs (including, without limitation, attorney's fees, court costs and all other defense costs and interest) and damages awarded.

Manufacturer shall not settle any claim on terms which prevent the Airport from using the equipment, software, process or product with the Director's prior written consent.

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Unless otherwise specifically required by the proposal, within sixty (60) days after being notified of the claim, manufacturer shall, at its own expense, either:

Obtain for the airport the right to continue using the equipment, software, process or product, or

If both parties agree, replace or modify them with compatible and functionally equivalent products.

If none of these alternative is reasonably available, the Airport may return the equipment, software or product, or discontinue the process, Manufacturer shall refund the purchase price.

3. <u>ARTICLE 3 – INDEMNIFICATION PROCEDURES</u>

3.1 INDEMNIFICATION PROCEDURES

3.1.1 Notice *of Indemnification Claims:* If the Airport or MANUFACTURER receives notice of any claim or circumstances which could give rise to an indemnified loss, the receiving party shall give written notice to the other Party within ten (10) days.

The notice must include the following:

- 3.1.1. description of the indemnification event in reasonable detail,
- 3.1.2. the basis on which indemnification may be due, and
- 3.1.3. the anticipated amount of the indemnified loss.
- This notice does not stop or prevent the Airport from later asserting a different basis for indemnification or a different amount of indemnified loss than that indicated in the initial notice. If the Airport does not provide this notice within the 10-day period, it does not waive any right to indemnification except to the extent that MANUFACTURER is prejudiced, suffers loss, or incurs expense because of the delay.
- 3.1.4. Defense of Indemnification Claims:
- 3.1.4.1.*Assumption of Defense:* MANUFACTURER may assume the defense of the claim at its own expense with counsel chosen by it that is reasonably satisfactory to the Airport. MANUFACTURER shall then control the defense and any negotiations to settle the claim. Within ten (10) days after receiving written notice of the indemnification request, MANUFACTURER must advise the Airport as to whether or not it will defend the claim. If MANUFACTURER does not assume the defense, the Airport shall assume and control the defense, and all defense expenses constitute an indemnified loss.
- 3.1.4.2. *Continued Participation:* If MANUFACTURER elects to defend the claim, the Airport may retain separate counsel to participate in, but not control, the defense and to participate in, but not control, any settlement negotiations. MANUFACTURER may settle the claim without the consent or agreement of the Airport, unless it:

3.1.4.2.1. would result in injunctive relief or other equitable remedies or otherwise require the Airport to comply with restrictions or limitations that adversely affect the Airport;

3.1.4.2.2. would require the Airport to pay amounts that MANUFACTURER does not fund in full; or

3.1.4.2.3. would not result in the Airport's full and complete release from all liability to the plaintiffs or claimants who are parties to or otherwise bound by the settlement.

ARTICLE 4 - ADMINISTRATION OF THE PROPOSAL

4.1 COMMUNICATIONS IN ADMINISTRATION OF THE PROPOSAL

4.1.1 Except as otherwise provided in the Proposal or when authorized by Director in writing, MANUFACTURER shall communicate with and through the Director. The Director will communicate with Subcontractors and Suppliers through MANUFACTURER, but Director is entitled to communicate directly with Subcontractors and Suppliers at any time to obtain information.

4.1.2 Inspectors employed by the Airport shall be authorized to inspect all work done and materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication or manufacture of the materials to be used. Inspectors are not authorized to revoke, alter or waive any provision of the Proposal. Inspectors are not authorized to issue instructions contrary to the plans and specifications or to act as foreman for Manufacturer or its subcontractors.

4.2 FINAL COMPLETION AND FINAL PAYMENT

4.2.1 MANUFACTURER shall submit the following items to the Airport before the Airport will issue a final payment:

4.2.2 Written statement that MANUFACTURER knows of no substantial reason that insurance will not be renewable to cover Correction Period required by the Proposal Documents;

4.2.3 Consent of Surety to final payment;

4.2.4 The Airport will make final payment to MANUFACTURER within thirty (30) days after acceptance of the equipment and certificate of acceptable performance, subject to limitations, if any, as stated in the Proposal Documents. Airport is entitled to deduct from any payment any amounts owed Manufacturer to Airport, including accrued liquidated damages.

4.2.5 Acceptance of final payment Manufacturer shall constitute a waiver of all Claims, whether known or unknown, Manufacturer, except those previously made in writing and identified Manufacturer as unsettled at time of final Application for Payment.

4.2.6 Warranties required by the Proposal shall commence on the Date of Final Completion. Warranties shall not commence on items not yet completed as of the date of Substantial Completion, until such items are actually completed and accepted.

ARTICLE 5 - MISCELLANEOUS PROVISIONS

5.1 GOVERNING LAWS

5.1.1 The Proposal is subject to the laws of the State of New Hampshire, the Airport and Ordinances, the laws of the federal government of the United States, and all rules and regulations of any regulatory body or officer having jurisdiction.

5.1.2 Venue for any litigation relating to the Proposal is Hillsborough County, NH.

5.2 SUCCESSORS

5.2.1 The Proposal binds and benefits the Parties and their legal successors and permitted assigns; however, this Paragraph does not alter the restrictions on assignment and disposal of assets set out in Paragraph 6.3.1. The Proposal does not create any personal liability on the part of any officer or agent of the Airport.

5.3 WRITTEN NOTICE

5.3.1 All notices required or permitted by the Proposal must be in writing and must be effected by hand delivery; registered or certified mail, return receipt requested; or facsimile with confirmation copy mailed to receiving Party. Notice is sufficient if made or addressed with proper postage to the address stated in the Proposal for each Party ("Notice Address") or faxed to the facsimile number stated in the Proposal for each Party. The notice is deemed delivered on the earlier of:

5.3.1.1 the date the Notice is actually received;

5.3.1.2 the third day following deposit in a United States Postal Service post office or receptacle; or

5.3.1.3 the date the facsimile is sent unless the facsimile is sent after 5:00 p.m. local time of the recipient and then it is deemed received on the following day.

Any Party may change its Notice Address or facsimile number at any time by giving written notice of the change to the other Party in the manner provided for in this Paragraph at least fifteen (15) days prior to the date the change becomes effective.

5.4 *RIGHTS AND REMEDIES*

5.4.1 Duties and obligations imposed by the Proposal and rights and remedies available thereunder are in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

5.4.2 No act or failure to act by the Airport or MANUFACTURER is a waiver of rights or duties afforded them under the Proposal, nor is the act or failure to act constitute approval of or acquiescence in a breach of the Proposal. No waiver, approval or acquiescence is binding unless in writing and, in the case of the Airport, signed by Director.

5.5 TESTS AND INSPECTIONS

5.5.1 MANUFACTURER shall give Airport timely notice of the time and place where tests and inspections are to be made. MANUFACTURER shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

5.5.2 The Manufacturer will employ and pay for services of an independent testing laboratory to perform inspections or acceptance tests required by the Proposal Documents.

5.5.3 MANUFACTURER is responsible for and shall pay all costs in connection with inspection or testing required in connection with Director's acceptance of the Equipment.

5.5.4 Neither observations by the Airport, nor inspections, tests, or approvals by others, relieves MANUFACTURER from obligations to deliver equipment in accordance with the Proposal Documents.

5.5.5 If testing, inspection, or approval reveal failure of the portions of the equipment performance to comply with requirements established by the Proposal Documents, MANUFACTURER shall bear all costs made necessary by such failure.

5.6 INTEREST

5.6.1 No interest will accrue on late payments by the Airport except as provided under Chapter 2251 of the Government Code.

5.7 *PARTIES IN INTEREST*

5.7.1 The Proposal does not bestow any rights upon any third party, but binds and benefits the Parties only.

5.7.2 MANUFACTURER shall comply with all applicable federal, state, and Airport laws, rules, ordinances and regulations. Nothing herein shall be construed to require that MANUFACTURER ensures that the Proposal documents are prepared in accordance with applicable laws.

6.8 ENFORCEMENT

6.8.1 Airport Attorney or designee has the right to enforce all legal rights and obligations under the Proposal without further authorization.

6.9 SEVERABILITY

6.9.1 If any part of the Proposal is for any reason found to be unenforceable, all other parts remain enforceable to the extent permitted by law.

EXHIBIT "C" KEY PERSONNEL STAFF

EXHIBIT "D" PRICE PAYMENT AND DELIVERY SCHEDULE

Price per Unit Two (2) units	\$	
<u>Total Proposal</u>	\$	
Price per Unit Three (3) Units\$		
<u>Total Proposal</u>	\$	

EXHIBIT "E"

TITLE VI: NON-DISCRIMINATION

During the performance of this Proposal, MANUFACTURER, for itself, its assignees and successors in interest agrees as follows:

- 1. <u>Compliance with Regulations</u> Manufacturer shall comply with the regulations relative to nondiscrimination in federally-assisted programs of the Department of Transportation ("DOT") 49 CFR Part 21, as may be amended from time to time ("Regulations"), which are incorporated by reference and made a part of this Proposal.
- 2. <u>Non-discrimination</u> Manufacturer, with regard to the work performed by it during the Proposal, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurement of materials and leases of equipment. Manufacturer shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the Proposal covers a program set forth in Appendix E of the Regulations.
- 3. <u>Solicitations for Subcontractors, Including Procurement of Materials and Equipment</u> In all solicitation, either by competitive bidding or negotiation, made by Manufacturer for work to be performed under a subcontractor, including procurement of materials or leases of equipment, each potential subcontractor or supplier shall be notified by Manufacturer of Manufacturer's obligations under this Proposal and the Regulations relative to non-discrimination on the grounds of race, color, or national origin.
- 4. <u>Information and Reports</u> Manufacturer shall provide all information and reports required by the regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the sponsor or the FAA to be pertinent to ascertain compliance with such regulations, orders and instructions. Where any information required of Manufacturer is in the exclusive possession of another who fails or refuses to furnish this information, Manufacturer shall so certify to the sponsor or the FAA, as appropriate, and shall set forth what efforts it has made to obtain the information.
- 5. <u>Sanctions for Noncompliance</u> In the event of Manufacturer's noncompliance with the nondiscrimination provisions of this Proposal, the sponsor shall impose such Proposal sanctions as it or the FAA may determine to be appropriate, including but not limited to:
 - 5.1. withholding of payments to Manufacturer under the Proposal until Manufacturer complies, and/or
 - 5.2. cancellation, termination, or suspension of the Proposal, in whole or in part.

6. <u>Incorporation of Provisions</u> - Manufacturer shall include the provisions of paragraphs 1-5 above in every subcontractor, including procurement of materials and leases of equipment, unless exempt by the regulations or directives issued pursuant thereto. Manufacturer shall take such action with respect to any subcontractor or procurement as the sponsor or the FAA may direct as a means of enforcing such provisions including sanctions for noncompliance. If Manufacturer becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, Manufacturer may request the sponsor to enter into such litigation to protect the interests of the sponsor and, in addition, Manufacturer may request the United States of America to enter into such litigation to protect the interests of the United States.