

Metropolitan Washington Airports Authority
PROCUREMENT AND CONTRACTS DEPT.
AMENDMENT OF SOLICITATION

Metropolitan Washington Airports Authority Procurement and Contracts Dept., MA-440 1 Aviation Circle, Suite 154 Washington, DC 20001-6000 Telephone: (703) 417-8660	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #e0e0e0;">1A. AMENDMENT OF SOLICITATION NO.</td> <td style="background-color: #e0e0e0;">1B. DATED</td> </tr> <tr> <td>1-12-C190</td> <td>July 30, 2012</td> </tr> <tr> <td style="background-color: #e0e0e0;">2A. AMENDMENT NO.</td> <td style="background-color: #e0e0e0;">2B. EFFECTIVE DATE</td> </tr> <tr> <td>One (001)</td> <td>August 24, 2012</td> </tr> </table>	1A. AMENDMENT OF SOLICITATION NO.	1B. DATED	1-12-C190	July 30, 2012	2A. AMENDMENT NO.	2B. EFFECTIVE DATE	One (001)	August 24, 2012	
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1-12-C190	July 30, 2012									
2A. AMENDMENT NO.	2B. EFFECTIVE DATE									
One (001)	August 24, 2012									
The solicitation identified in Block 1A is amended as set forth in Block 3. Hour and date specified for receipt of offers <input checked="" type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offerors must acknowledge receipt of this amendment prior to the hour and dated specified in the solicitation or as amended, by one of the following methods: (a) by completing Block 4 and returning copy of the amendment; (b) by acknowledging receipt of this amendment on the Solicitation Offer and Award Sheet, Block 13. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.										
3. DESCRIPTION OF AMENDMENT										
The Metropolitan Washington Airports Authority Solicitation 1-12-C190, entitled "Dedicated Front-Mounted Runway Broom Vehicle, Ronald Reagan Washington National Airport" is amended as follows:										
<ol style="list-style-type: none"> 1. Deadline for offer submission is hereby extended to 2:00 P.M. September 12, 2012. 2. Section X, Attachment 01, SPECIFICATIONS, is hereby deleted in its entirety and replaced with the attached revised Specifications annotated "Revised – Amendment One". Changes are limited to Sections G.3 and R.3. 										
Except as provided herein, all terms and conditions of the document referenced in Block 1A, as heretofore changed, remain unchanged and in full force and effect.										
4A. NAME AND TITLE OF OFFEROR	4B. SIGNATURE	4C. DATE								

ATTACHMENT 01 – REVISED – AMENDMENT ONE
METROPOLITAN WASHINGTON AIRPORTS AUTHORITY
RONALD REAGAN WASHINGTON NATIONAL AIRPORT
SPECIFICATIONS FOR
DEDICATED FRONT MOUNTED RUNWAY BROOM and CHASSIS

All elements of the specifications identified by bold italic type are considered critical. Exceptions to these specifications are not allowed. Quotations having exceptions to such critical elements shall be deemed non-conforming.

**SPECIFICATION FOR
DEDICATED FRONT MOUNTED RUNWAY BROOM AND CHASSIS**

PURPOSE: It is the intent of this specification to describe a new, current model year, purpose built, 4 Wheel Drive, Dedicated Front Mounted Runway Broom and Chassis. This document shall indicate in general, the type, size, and quality desired. All components utilized in the manufacture of this unit shall be new, current production, and of the size, material, strength, and engineered to be classified as heavy / severe duty. All components shall have the ability to withstand the maximum load limits and extreme operating conditions, and be of a quality which results in minimal wear and fatigue, encountered during continuous high-speed airport runway snow removal operations. Any components / equipment not specifically mentioned in this specification, but are required for this Runway Broom to completely perform the intended function are to be furnished as if it were part of the specification. This vehicle shall comply with all applicable FMCSR, FMVSS, ANSI, and SAE quality/safety standards, and requirements of the FAA Advisory Circular 150/5220-20. **All components, assemblies, and parts shall be new, current production, and unused. Remanufactured components, assemblies, and parts are unacceptable. Prototypes shall not be accepted. Prototypes and units that may be considered as first generation designs without a verifiable performance and service history may be deemed as non-compliant to this specification.**

The configuration shall be Cab Forward design with front mounted Runway Broom, rear mounted Carrier Engine and mid-mounted Auxiliary Engine. As a reference, the unit as described herein shall have the pertinent salient characteristics of an Oshkosh H Series Carrier unit or an Wausau Sno-Saw Carrier Unit. The unit shall be rated at no less than 50,000 lbs GVWR.

INSTRUCTIONS:

1. Complete this form and submit with offer. Circle YES or NO for compliance with each specification. If NO, briefly describe EXCEPTION. If more space is required, use Attachment 3, Exceptions to Specifications.
2. Include with offer: Documentation, Literature, Mechanical Drawings, Photographs, and Warranty information which will completely describe the vehicle being offered.

A. CAB DESIGN: The Vehicle shall be of Cab Forward design and be designed to allow performance and function, control and monitoring by a single driver / operator. The Cab shall be fully enclosed with two (2) entry / exit doors. The Cab shall be designed for maximum visibility with 5,750 sq. in. minimum total combined cab glass area and near center driver position. The Cab and Driver configuration shall provide maximum visibility, maneuverability, and safety while operating on runways and taxiways. The Cab shall be configured as follows:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Fully enclosed Cab Forward design of corrosion resistant all metal construction.	YES	NO	
2	Near center driver position.	YES	NO	
3	60 inch minimum inside width.	YES	NO	
4	Total combined cab glass area shall be 5,750 sq. in. minimum. Indicate total combined cab glass area below: Total combined cab glass area _____ sq. in.	YES	NO	
5	One piece panoramic reverse sloped windshield.	YES	NO	
6	Windshield shall be electrically heated.	YES	NO	
7	Forward cab exposure shall contain either a full height windshield or left and right side fixed auxiliary windows mounted below windshield for maximum visibility.	YES	NO	
8	Left and right side rear quarter windows for maximum visibility.	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
9	Left and right entry/exit side doors shall be designed for maximum visibility.	YES	NO	
10	Power electric left and right side door windows.	YES	NO	
11	Stationary rear glass	YES	NO	
12	All glass to be tinted safety glass	YES	NO	
13	Left and right side, lockable entry / exit doors keyed same as ignition.	YES	NO	
14	Door hinges shall be bolted to door frame and cab frame.	YES	NO	
15	Cab shall be completely thermally and acoustically insulated to include cab ceiling, cab floor, doors, and back wall of cab. Noise level inside cab at driver's position under full operating conditions shall not exceed 85db.	YES	NO	
16	Full length heavy duty thermo-acoustic rubber floor covering	YES	NO	
17	Completed Cab shall be completely rustproofed.	YES	NO	
18	Cab entry steps/ladder shall be constructed of raised lug / grip strut type material. Minimum three (3) steps per side.	YES	NO	
19	Catwalks on left and right sides of cab shall be constructed of raised lug / grip strut type material. Catwalks shall be installed with heavy duty bracing and support system.	YES	NO	
20	Grab bars installed on cab exterior behind left and right doors. Grab bars shall provide an adequate non-slip hand hold for entry/exit of cab as well as mounting / dismounting the vehicle. Grab bars shall have a knurled or approved non slip grab surface. Grab rails, grab bars, and steps shall be configured to allow 3-point contact for personnel accessing the equipment.	YES	NO	
21	Air ride, 8-way fully adjustable, high back, cloth covered drivers seat w/ armrests and 3 point seat belt. Upholstery color shall be black or dark gray. Indicate seat manufacturer / model below: Manufacturer: _____ Model: _____	YES	NO	
22	Passenger seat / jump seat, cloth covered w/ 3 point seat belt. Upholstery color shall be black or dark gray.	YES	NO	
23	High output fresh air type heater / defroster / A/C system w/ multiple speed fan motor. Fan motor shall be three (3) speeds minimum and rated at 380 CFM minimum. System shall be designed to de-humidify cabin and all glass in severe weather conditions.	YES	NO	
24	Fresh air intake filter for HVAC system	YES	NO	
25	Two (2) dash mounted, caged, auxiliary defrosting fans. Fans shall be 12 volt, 2 speed design, 340 CFM minimum, low luster safety black finish controlled by separate dash mounted switches. As a reference: A.R. Lintern Inc. 9000 Series or approved equal.	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
26	Tilt / telescoping steering wheel w/ self cancelling turn signals.	YES	NO	
27	Windshield wipers and high beams shall be controlled by a multi-function turn signal switch.	YES	NO	
28	Dual electric windshield wipers / washers. Wipers to be mounted above windshield to eliminate snow packing at lower windshield. Wipers shall have two (2) speeds minimum plus intermittent function. The wiper system shall have an interlock function to eliminate wiper operation with parking brake applied. Washer reservoir shall be 5 quart minimum.	YES	NO	
29	Wipers for left and right side door glass. These wipers shall work independently from the windshield wipers and be individually switched.	YES	NO	
30	Electric remote controlled heated west coast mirrors with bottom mounted remote controlled heated convex mirror	YES	NO	
31	All cab switches, controls, potentiometers, and instrumentation shall be permanently labeled in English and have variable intensity back-lit illumination	YES	NO	
32	Hazard warning light switch			
33	High idle switch/switches for carrier and auxiliary engine	YES	NO	
34	Interior courtesy dome lights. Minimum two (2). Activated manually and by door opening.	YES	NO	
35	Interior courtesy low mounted entry lights. Minimum two (2). Activated by door opening.	YES	NO	
36	Auxiliary wiring for 2 way radios to include battery power wire w/ 20 amp protection and ignition wire w/ 20 amp protection coiled under dash or overhead for end user radio applications.	YES	NO	
37	Auxiliary 12 volt power outlet	YES	NO	
38	AM / FM / Weather band radio	YES	NO	
39	Digital clock	YES	NO	
040	Electric horn	YES	NO	
41	Dual air horns	YES	NO	
42	Full width sun visor mounted exterior above windshield	YES	NO	
43	Fully adjustable interior tinted sun visors	YES	NO	
44	Lubrication data plate mounted for ease of visibility and protected from weather.	YES	NO	
45	5 lb. Class ABC fire extinguisher mounted for easy access	YES	NO	
46	Removable factory floor mats			
47	Cup holder	YES	NO	
48	Coat hook	YES	NO	

B. CAB INSTRUMENTATION / ELECTRONICS: All instrumentation, gauges, and controls shall be English display. Instrumentation shall be in the form of a full color, non-glare, Liquid Crystal Display or Displays (LCD). ***This display shall provide complete vehicle operational information.*** The LCD shall indicate at a minimum, but not limited to, the following vehicle operational information and parameters for the Carrier engine, Auxiliary engine, and Runway Broom where applicable. Items marked with ** indicates this parameter/function is required for both the carrier engine and auxiliary engine.

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Electronic Speedometer w/ odometer	YES	NO	
2	Electronic Tachometer **	YES	NO	
3	Electronic engine hour meter **	YES	NO	
4	Electronic engine oil pressure gauge **	YES	NO	
5	Electronic water temperature gauge **	YES	NO	
6	Electronic transmission temperature gauge	YES	NO	
7	Hydrostatic pressure and hydraulic fluid temperature	YES	NO	
8	Voltmeter**	YES	NO	
9	Electronic fuel gauge	YES	NO	
10	Illuminated Warning Icons and audible alarms for the following: low air pressure, anti-lock brake system failure, engine failure**, low voltage**, engine overheat**, engine low oil pressure**, transmission failure, transmission overheat and fluid level, hydraulic temperature and fluid level, clogged hydraulic filter, parking brake applied, transmission gear selection indicator, transfer case gear selection indicator, differential lock indicator, high beam indicator, turn signal indicator	YES	NO	
11	Dual Air Brake System pressure gauge	YES	NO	
12	On-board diagnostics Fault / Trouble Code display **	YES	NO	
13	Broom Speed Tachometer	YES	NO	
14	Easily accessible cab mounted data connector ports for scan tools and lap top access for troubleshooting all systems.	YES	NO	

C. ON-BOARD DIAGNOSTICS AND ELECTRONIC CONTROL SYSTEM: Functional control of vehicle shall be centered on an Electronic Control System utilizing J1939 data bus. The Electronic Control System shall include on board diagnostic assistance to simplify the operation, diagnosis/troubleshooting, and repair of the unit and enable complete diagnosis/troubleshooting of chassis and runway broom systems and functions by means of the LCD dash display and laptop computer. Engine and transmission diagnosis/troubleshooting shall also be accomplished through easily accessible cab mounted data connectors/ports for scan tools and lap top access. Electronic Control system shall include but not be limited to the following:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	ECU's, VIMS, Power Modules and Direct Current Controllers shall be of the highest reliability and durability for use in mobile equipment.	YES	NO	
2	Message area on LCD to display error message to operator as any system function fails.	YES	NO	
3	Error message toggle if more than one failure is present.	YES	NO	
4	Memory retention of failures until cleared by maintenance personnel with password access.	YES	NO	
5	Real time operational indicator of system function on diagnostics/maintenance screens.	YES	NO	
6	Offeror shall provide all cable kits required to access data link via laptop computer.	YES	NO	
7	Carrier Engine, Auxiliary Engine, and Transmission diagnosis/troubleshooting shall be accomplished through easily accessible cab mounted data connectors/ports for scan tools and lap top access.	YES	NO	

D. FRAME: The frame rails shall be heat treated, carbon manganese steel, single formed channels. The frame rail width shall be the industry standard 34" and connected by an adequate number of cross-members to resist frame distortion under stress from extreme conditions and loads encountered during continuous hi-speed snow removal operations. **Frame Liners, Fish plating, Bolt-on or Welded Frame extensions are unacceptable. The Frame and all related components shall be assembled with flanged Grade 8 bolts and flanged Grade 8 thread crimped lock-nuts. Nylock style lock-nuts or Rivets are unacceptable.** The frame shall be configured as follows:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Yield strength: 120,000 psi minimum	YES	NO	
2	RBM: 2,700,000 in-lb per rail minimum	YES	NO	
3	Nominal frame rail size shall be 12.375 x 3.500 x .375 inches minimum.	YES	NO	
4	34" Standard frame rail width	YES	NO	
5	Flanged Grade 8 bolts throughout	YES	NO	
6	Flanged Grade 8 thread crimped lock-nuts throughout	YES	NO	
7	24" integral front frame extension.	YES	NO	
8	Two (2) rear frame mounted tow hooks accessible through cut-outs in rear bumper.	YES	NO	

E. CHASSIS, AXLES, and SUSPENSION: The chassis shall be 4 Wheel Drive and of Cab Forward design with rear mounted Carrier Engine and mid-mounted Auxiliary Engine. The unit shall be rated at no less than 50,000 lbs GVWR. The Front and Rear Axles shall be Full-Floating design with single reduction spiral bevel gears. The axle / tire combinations shall provide 10" minimum ground clearance. **State Manufacturer and GVWR of chassis being offered.**

Manufacturer: _____ GVWR: _____

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	50,000 lbs. GVWR minimum	YES	NO	
2	Approximate Wheelbase 164 inches	YES	NO	
3	Angle of departure not less than 20 degrees.	YES	NO	
4	Front drive and steer axle shall be rated at 27,000 pounds GVW rating minimum. Indicate axle manufacturer / GVW rating below: Manufacturer: _____ Rating: _____	YES	NO	
5	Front axle steering ends shall be bolted to and removable from axle center section.	YES	NO	
6	Front axle cardan type drive joints shall be enclosed in a sealed ball / socket assembly	YES	NO	
7	Steering trunion pins shall be supported by and pivot on greaseable tapered roller bearings	YES	NO	
8	Front axle shall be equipped with a driver controlled traction control differential.	YES	NO	
9	Rear drive axle shall be rated at 23,000 pounds GVW rating minimum. Indicate axle manufacturer / GVW rating below: Manufacturer: _____ Rating: _____	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
10	Rear axle shall be equipped with a driver controlled traction control differential.	YES	NO	
11	Final drive gear ratios shall provide good performance and fuel economy and be determined by a nominal maximum forward speed of 45 m.p.h. Indicate final drive gear ratio below: Ratio:	YES	NO	
12	Indicate if Planetary wheel end / hub reduction will be utilized in this application.	YES	NO	
13	Front springs shall be of semi-elliptical leaf design, alloy steel, and rated at 27,000 pounds minimum.	YES	NO	
14	Rear springs shall be of semi-elliptical leaf design, alloy steel, and rated at 23,000 pounds minimum.	YES	NO	
15	Spring hangers shall be of heavy duty design with bronze bushings and greaseable pins.	YES	NO	
16	10 " minimum ground clearance	YES	NO	
17	Front and rear axles shall be aligned and toe set on front axle after chassis has been fully loaded.	YES	NO	

F. BODY / SHEET METAL: The Body shall be designed to allow safe access to cab and all mechanical components with grab rails and grab bars installed for maximum safety wherever practical and to allow 3-point contact for personnel while accessing the vehicle. All sheet metal, steps, ladders, grab rails, hand rails, grab bars, and fenders shall be free of sharp edges and protrusions and installed / welded with heavy duty bracing and support systems to minimize distortion and cracking under maximum load limits and extreme operating conditions. The Body shall be configured as follows:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Catwalks shall be full length and located on left and right sides of carrier and auxiliary engines and located to allow cab access and complete workable access to all mechanical components. Catwalks shall be installed with heavy duty bracing and support system.	YES	NO	
2	Catwalks shall be constructed of raised lug / grip strut type material.	YES	NO	
3	Catwalk access steps/ladder shall be constructed of raised lug / grip strut type material. Minimum three (3) steps per side.	YES	NO	
4	Tubular metal handrail shall extend the full length of the catwalks on left and right sides. Handrail shall be 40" in height and provide a non-slip grab surface. Hand rails, grab bars, and steps shall be configured to allow 3-point contact for personnel accessing the equipment.	YES	NO	
5	Full steel fenders front and rear. Undersides of fenders shall be completely rustproofed.	YES	NO	
6	Full width mud flaps behind front and rear wheels.	YES	NO	
7	Full width rear bumper with a minimum height of 12" which follows the contour of the rear of vehicle.	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
8	Engine enclosures for the Carrier and Auxiliary engines shall be constructed of steel, aluminum, or fiberglass and fully enclose the engine assembly and related components. These enclosures shall provide complete access to the engines and all related components. All moveable components of the enclosures shall be securely latched. The enclosures shall be of sufficient construction to withstand the flexing of this vehicle without cracking, distortion, loss of alignment, or loss of ability to remain securely latched during operation. Complete access to all mechanical components shall be possible by one person without the need for special tools.	YES	NO	

G. CARRIER ENGINE: The Carrier Engine shall be an inline six cylinder, four cycle, turbo charged, inter-cooled, diesel. It shall be equipped with the most recent electronic fuel injection and electronic engine management systems. The engine shall meet all current federal emissions standards and regulations for this application, and as a reference, the engine shall have the pertinent salient characteristics of a Caterpillar C-13 engine. An emergency shutdown/power de-rate manual bypass mode shall be incorporated into the electronic engine controls to enable the operator to move the vehicle away from a runway in emergency situations regardless of the presence of an engine fault or fault codes. ***Certification of engine cooling tests provided by the engine manufacturer for this application shall be provided with offer. Certification shall state engine manufactures approval of installation and suitable cooling capacity for this application in ambient temperatures up to 115 degrees F when operated at maximum horsepower. Carrier and Auxiliary engines shall be of the same manufacturer. State Manufacturer, Model / Displacement, Horsepower, and Torque of engine being offered.***

Manufacturer: _____ Model / Displacement: _____

Horsepower: _____ Torque: _____

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Inline six cylinder, four cycle, turbo charged, inter-cooled, diesel with 12.5L minimum displacement.	YES	NO	
2	Rated @ 425 HP minimum @ 2,100 rpm and 1450 lb ft torque minimum @ 1,200 rpm.	YES	NO	
3	<i>Certification of engine cooling tests for this application, provided by the engine manufacturer, authorized distributors, or authorized representatives, shall be provided with offer.</i>	YES	NO	
4	Electronic fuel injection and electronic engine management system.	YES	NO	
5	Emergency shutdown/power derate system with warning light and audible alarm in event of high coolant temperature and/or low oil pressure.	YES	NO	
6	Emergency shutdown/power de-rate manual bypass mode which enables the operator to move the vehicle away from a runway in emergency situations regardless of the presence of an engine fault or fault codes.	YES	NO	
7	Front crankshaft P.T.O. flange.	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
8	1500 watt / 115 volt ac engine block heater. Shoreline receptacles for battery charger and engine block heaters shall be at the same location.	YES	NO	
9	Automatic measured shot ether starting aid with thermostatic control.	YES	NO	
10	Spin-on full flow oil filters.	YES	NO	
11	Spin-on fuel filters.	YES	NO	
12	Spin-on coolant additive filter if applicable.	YES	NO	
13	Heated fuel filter / water separator described in section O. FUEL SYSTEM item #5.	YES	NO	
14	High idle mode.	YES	NO	
15	Dry type two stage air cleaner w/ restriction indicator located inside of the carrier engine compartment.	YES	NO	
16	Two position air intake offering both fresh and under hood air intake.	YES	NO	
17	Heavy duty radiator with integral transmission cooler. Construction shall be of bolted tank design. Radiator shall be shock mounted.	YES	NO	
18	Radiator mounted Charge Air Cooler.	YES	NO	
19	Thermostatically controlled air disengaging type fan clutch.	YES	NO	
20	Fan belt shall be serpentine type with automatic tensioner.	YES	NO	
21	Coolant protection to -35 degrees.	YES	NO	
22	All coolant hoses shall be heavy duty silicone type.	YES	NO	
23	Exhaust system shall be manufacturer's standard system with stainless steel heat shields where required to protect personnel.	YES	NO	
24	Covered centralized metal enclosures shall be incorporated within the chassis where all oils and coolants from both the Carrier and Auxiliary engines and transmission can be drained from easily accessible locations during maintenance routines. Each enclosure shall be of a shallow design where drain valves must be in the closed position for enclosure cover to close. Each drain line shall be controlled by a ball type valve located at the panel and capped for drip free operation. Caps shall be attached to each valve by means of a stainless steel lanyard. All drain valves shall be permanently labeled.	YES	NO	

H. TRANSMISSION: The transmission shall be an electronic, heavy duty, automatic shift with the pertinent salient characteristics of an Allison, RDS4000 Series, 4 Speed, Electronic Transmission. A power de-rate manual bypass mode shall be incorporated into the electronic transmission controls to enable the operator to shift the transmission and move the vehicle away from a runway in emergency situations regardless of the presence of a transmission fault or fault codes. ***A computer generated performance summary for drivetrain component matching and performance shall be provided with offer. State Manufacturer and Model of transmission being offered.***

Manufacturer: _____ Model: _____

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Allison, RDS4000 Series, 4 Speed, Electronic Controlled Transmission.	YES	NO	
2	<i>A computer generated performance summary for drivetrain component matching and performance shall be provided with offer.</i>	YES	NO	
3	Power de-rate / manual bypass mode which enables the operator to shift the transmission and move the vehicle away from a runway in emergency situations regardless of the presence of a transmission fault or fault codes.	YES	NO	
4	Four forward speeds.	YES	NO	
5	Low gear ratio of 3.51:1	YES	NO	
6	High gear ratio of 1.00:1	YES	NO	
7	Fault code, transmission temperature, and fluid level indicators located on driver's LCD display.	YES	NO	
8	Transmission cooler integral to radiator.	YES	NO	

I. TRANSFER CASE: The transfer case shall be of full-time 4 wheel drive, two speed (range) design, with automatic locking / unlocking center differential to control torque between front and rear axles during axle to axle wheel slippage. ***Certification of Transfer Case testing and manufacturer's approval for this application shall be provided with offer. State Manufacturer and Model of transfer case being offered.***

Manufacturer: _____ Model: _____

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Two speed (range) design.	YES	NO	
2	Full time 4 wheel drive with automatic locking / unlocking center differential.	YES	NO	
3	The Transfer Case shall have a torque transmission capacity rating which exceeds the maximum torque developed by the engine and transmission.	YES	NO	
4	Range selection shall be accomplished by an electric over air system operated from the cab easily accessible from the driver's position.	YES	NO	
5	High / low range selection indicator located on driver's LCD display.	YES	NO	
6	<i>Certification of Transfer Case testing and manufacturer's approval for this application shall be provided with offer.</i>	YES	NO	

J. DRIVESHAFTS:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Dana 1710 Series drive shafts minimum	YES	NO	
2	All driveshafts shall have a splined slip joint	YES	NO	
3	Permanent coating on all splines	YES	NO	
4	Drive shafts shall be balanced	YES	NO	

K. WHEELS and TIRES: All wheels and tires shall support the GVW rating of the vehicle.

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Hub piloted steel disc type wheels, front and rear. Wheels shall be painted to match body color.	YES	NO	
2	Tires shall be matched to support the GVW rating of the vehicle and be 395/85R20 20 ply rating minimum. Tires shall have an off-road / snow style tread. As a reference: Michelin 395/85R20 20 ply rating, XZL tread design. Indicate Tire Manufacturer / Size below: Manufacturer: _____ Model: _____ Size: _____ Load Range: _____	YES	NO	

L. ELECTRICAL SYSTEM: The Electrical System and all related components shall be a 12 volt DC system. All wiring is to be concealed and secured in industry standard wire loom/conduit with all connectors being of the **weatherproof** style. No Butt Connectors or Scotch Lock Style Connectors shall be used. The Electrical System shall include but not be limited to:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Heavy Duty Starters with over crank thermal circuit protection for Carrier and Auxiliary engines. Starters shall be 12 volt and rated not less than Delco 42MT.	YES	NO	
2	Keyed ignition switches for carrier and auxiliary engines	YES	NO	
3	High output internally regulated alternator. Alternator shall be 12 volt and rated a minimum 20% larger than full electrical load. (200 amp minimum). Alternator shall be carrier engine driven by a serpentine style belt with automatic tensioner.	YES	NO	
4	Four 12 volt maintenance free batteries rated at 950 CCA each. Total 3800CCA.	YES	NO	
5	Frame mounted corrosion resistant battery box with cover to secure all batteries. Batteries shall be easily accessible for replacement. Slide-out design battery tray is acceptable if required for easy access.	YES	NO	
6	Battery disconnect at battery box	YES	NO	
7	Battery jumper lugs at battery box	YES	NO	
8	On board battery trickle charger capable of maintaining charge for all batteries (115 volt ac). Shoreline receptacles for battery charger and engine block heaters shall be at the same location.	YES	NO	
9	Vehicle Back-up alarm shall be automatically adjustable to maintain a sound level between 87 -112 decibels and 5 decibels above the surrounding noise level. (ECCO SA 914 or equal)	YES	NO	
10	Wiring shall be SLX nomenclature type color coded and continuously numbered / labeled.	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
11	All wiring shall be protected with manual reset circuit breakers w/ trip indicators located in an easily accessible panel. Panel shall be located as to not be affected by moisture or condensation	YES	NO	
12	All wiring passing through cab shell shall be in weather proof connectors.	YES	NO	

M. LIGHTING SYSTEM: The Lighting System and all related components shall be 12 volt DC. The vehicle lighting system shall conform to applicable FMVSS / FMCSR requirements. All wiring is to be concealed and secured in industry standard wire loom/conduit with all connectors being of the **weatherproof** style. **No Butt Connectors or Scotch Lock Style Connectors shall be used. All stop, tail, turn, and clearance lighting shall be of LED design.** The Lighting System shall include but not be limited to:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Two (2) fender mounted high / low beam halogen headlights w/ integral turn signals.	YES	NO	
2	Two (2) mid cab height mounted high / low beam halogen fully adjustable driving lights w/ integral turn signals capable of being alternately switched with item 1 above.	YES	NO	
3	Two high cab mounted fully adjustable HID work lights. (Speaker Model #9710-12v or approved equal with Trapezoid Light Pattern)	YES	NO	
4	Two additional high cab mounted fully adjustable HID work lights mounted and aimed approximately 15 degrees off centerline. (Speaker Model #9710-12v or approved equal with Trapezoid Light Pattern)	YES	NO	
5	Cab clearance lights of LED design	YES	NO	
6	Standard chassis marker lights of LED design	YES	NO	
7	Dual stop and tail lights of LED design. As a reference, use Truck-lite / Signal Stat part #4050, 24 diode pattern, grommet mount.	YES	NO	
8	Dual Amber rear turn signal lights of LED design. As a reference, use Truck-lite / Signal Stat part #4050A, 24 diode pattern, grommet mount.	YES	NO	
9	Dual back-up lights of LED design. As a reference, use Truck-lite Model 44, 27 diode pattern, grommet mount.	YES	NO	
10	Roof mounted beacon light. As a reference use Soundoff 4500 Series Amber LED Beacon #ELB45BCH0AA. Light shall be controlled by a dash mounted switch. Switch shall be illuminated and labeled "RAMP LIGHT".	YES	NO	
11	Engine compartment lights of white LED design for carrier and auxiliary engine. Lights shall be controlled by a conveniently located switch inside each engine compartment.	YES	NO	
12	A marker light shall be placed at the left and right side of the lowest step on the catwalk access steps/ladder. The lights shall be placed on the inside of the steps/ladder and mounted in a fashion to avoid damage by climbing the ladder. Lights shall be the same as chassis marker lights.	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
13	All wiring passing through cab shell shall be in weather proof connectors	YES	NO	
14	Exact Driving and Work Light locations may be determined during a pre-performance conference call.	YES	NO	

N. STEERING SYSTEM: Front axle steering shall be accomplished through an integral hydraulic power assist type steering gear. The steering gear shall be rated for heavy duty service. For safety, a mechanical linkage shall be maintained between the operator's steering wheel and front axle, allowing manual steering in the event of a hydraulic or electrical system failure.

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Gear driven power steering pump	YES	NO	

O. FUEL SYSTEM: Configuration shall be as follows:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Dual, heavy gauge, all metal, cylindrical fuel tanks with 100 gallon minimum draw per tank. Each tank shall be equipped with a brass tank drain plug.	YES	NO	
2	Tanks shall be frame mounted and secured with heavy duty stainless steel straps.	YES	NO	
3	Tanks shall have a four inch filler opening and a chain connected cap.	YES	NO	
4	Tanks shall be interconnected with a crossover line of adequate size and proper venting to allow rapid filling of both tanks from either side of the vehicle. Crossover line shall have a ball type shut off valve at each end.	YES	NO	
5	Carrier and Auxiliary engines shall each be equipped with a dedicated 12 volt electrically heated fuel filter / water separator, Davco Model 382 without Fluid Heating, or Authority approved equal. Installation shall be in the supply line for each engine.	YES	NO	
6	Fuel filter / water separators shall be installed in locations convenient for maintenance and visual inspection of fuel bowls.	YES	NO	

P. BRAKE SYSTEM: The Brake system shall be of split type design. The service brakes shall be fully air operated mechanical type, drum and shoe, S-cam design front and rear. The parking brakes shall be spring actuated, at the rear axle service brake air chambers. An Electronic Anti-lock Brake System is required. A quick disconnect coupler, located within easy access, shall allow introduction of shop air into the air system upstream of the air dryer. Brake System shall be configured as follows:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	4-wheel / 4 channel electronic Anti-lock Brake System	YES	NO	
2	Gear driven air compressor rated 15.5 c.f.m. minimum	YES	NO	
3	Frame mounted desiccant type heated air dryer, Bendix model AD-9 with automatic moisture ejector.	YES	NO	
4	Front Brakes shall be Air, S-cam design, 16.5" x 7" minimum.	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
5	Rear Brakes shall be Air, S-cam design, 16.5" x 5" minimum with spring actuated brake chambers for parking brake.	YES	NO	
6	Automatic slack adjusters front and rear	YES	NO	
7	Outboard design brake drums front and rear	YES	NO	
8	Backing plates / dust shields front and rear	YES	NO	
9	Manual drains with cable lanyards on all air tanks	YES	NO	
10	Dash mounted parking brake release	YES	NO	
11	Parking brakes shall be spring actuated at the rear axle service brake air chambers.	YES	NO	
12	Quick disconnect coupler, located within easy access, shall allow introduction of shop air into the air system upstream of the air dryer.	YES	NO	
13	Brake lines shall be color coded Reinforced nylon tubing and stainless steel braided hose as applicable.	YES	NO	
14	Quick drain lanyards on all tanks.	YES	NO	

Q. WINDSHIELD WASHER DELUGE SYSTEM: The vehicle shall have a heavy duty windshield washer deluge system to maintain maximum operator visibility in the extreme weather conditions encountered during continuous hi-speed snow removal operations. The washer system shall be configured as follows:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Discharge nozzles located above front windshield, above left and right side door glass, and above left and right side rear view mirrors.	YES	NO	
2	15 gallon minimum reservoir	YES	NO	
3	Reservoir sight glass and fill point shall be below cab door height for ease of visibility and filling.	YES	NO	
4	Pump with a minimum flow rate of 5 gpm.	YES	NO	
5	System shall be operated by a momentary dash mounted switch and operate independently of the standard washer system. Switch shall be labeled and illuminated.	YES	NO	

R. AUXILIARY ENGINE: The Auxiliary engine shall be an inline six cylinder, four cycle, turbo charged, inter-cooled, diesel. It shall be equipped with the most recent electronic fuel injection and electronic engine management systems. The engine shall meet all current federal emissions standards and regulations for this application and, as a reference, the engine shall have the pertinent salient characteristics of a Caterpillar C-13 engine. ***Certification of engine cooling tests provided by the engine manufacturer for this application shall be provided with offer. Certification shall state engine manufactures approval of installation and suitable cooling capacity for this application in ambient temperatures up to 115 degrees F when operated at maximum horsepower. Carrier and Auxiliary engines shall be of the same manufacturer. State Manufacturer, Model / Displacement, Horsepower, and Torque of engine being offered.***

Manufacturer: _____ Model / Displacement: _____

Horsepower: _____ Torque: _____

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Inline six cylinder, four cycle, turbo charged, inter-cooled, diesel with 12.5L minimum displacement.	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
2	Rated @ 475 HP minimum @ 2,100 rpm 1650 lb ft torque minimum @ 1,200 rpm.	YES	NO	
3	<i>Certification of engine cooling tests for this application, provided by the engine manufacturer, authorized distributors, or authorized representatives, shall be provided with offer.</i>	YES	NO	
3	Electronic fuel injection and electronic engine management system	YES	NO	
4	Emergency shut down/power derate system with warning light and audible alarm in event of high coolant temperature and/or low oil pressure.	YES	NO	
5	1500 watt / 115 volt ac engine block heater. Shoreline receptacles for battery charger and engine block heaters shall be at the same location.	YES	NO	
6	Automatic measured shot ether starting aid with thermostatic control	YES	NO	
7	Spin-on full flow oil filters	YES	NO	
8	Spin-on fuel filters	YES	NO	
9	Spin-on coolant additive filter if applicable	YES	NO	
10	Heated fuel filter / water separator described in section O. FUEL SYSTEM item #5	YES	NO	
11	High idle mode	YES	NO	
12	Dry type two stage air cleaner w/ restriction indicator located inside of the auxiliary engine compartment	YES	NO	
13	Two position air intake offering both fresh and under hood air intake	YES	NO	
14	Heavy duty radiator. Construction shall be of bolted tank design. Radiator shall be shock mounted	YES	NO	
15	Radiator mounted Charge Air Cooler	YES	NO	
16	Thermostatically controlled air disengaging type fan clutch	YES	NO	
17	Fan belt shall be serpentine type with automatic tensioner	YES	NO	
18	Coolant protection to -35 degrees	YES	NO	
19	All coolant hoses shall be heavy duty silicone type	YES	NO	
20	Exhaust system shall be manufacturer's standard system with stainless steel heat shields where required to protect personnel.	YES	NO	
21	Covered centralized metal enclosures shall be incorporated within the chassis where all oils and coolants from both the Carrier and Auxiliary engines and transmission can be drained from easily accessible locations during maintenance routines. Each enclosure shall be of a shallow design where drain valves must be in the closed position for enclosure cover to close. Each drain line shall be controlled by a ball type valve located at the panel and capped for drip free operation. Caps shall be attached to each valve by means of a stainless steel lanyard. All drain valves shall be permanently labeled.	YES	NO	

S. RUNWAY BROOM: The Runway Broom shall be a Front Mounted Runway Broom with Automatic Broom Pattern Adjustment designed for continuous high-speed airport runway snow removal operations. The Broom Hitch shall be of a Quick Hitch and Weight Transfer design. The Runway Broom shall be hydrostatic dual end drive and have the capability to change the angle of attack, rotational speed, and degree of brush pressure applied to the surface area. At a minimum, the Runway Broom shall have the ability to remove three inches of light snow with a density of 15 pounds per cubic foot or one inch of slush with a density of 40 pounds per cubic foot, sand, and other debris, to clean pavement at speeds not less than 25 MPH and up to 40 MPH minimum as per FAA Advisory Circular 150/5220-20. The Broom Head shall consist of the hitch, frame with attaching mounts for casters, angle reversing frame or turntable, brush housing, brush hood, deflector, end plates, and brush cores. As a reference, the unit as described herein shall have the pertinent salient characteristics of a MB Companies HP3-4618 Runway Broom or a Wausau HSB5218 SNOsaw Runway Broom. ***State Manufacturer and Model of Runway Broom being offered.***

Manufacturer: _____ **Model:** _____

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Complete assembly including hitch, frame, head, hood, and deflector shall be of heavy duty welded steel construction throughout. Frame shall have welded mounts for caster assemblies.	YES	NO	
2	Broom angle of attack shall be not less than 35 degrees to the left and right allowing discharge on either side of the vehicle. Broom angle shall be accomplished by means of two hydraulic cylinders.	YES	NO	
3	Broom shall provide a clear swept path of 14.5 feet minimum while fully angled left or right.	YES	NO	
4	Broom shall have 8 degrees of free floating oscillation independent of chassis to allow for runway surface irregularities.	YES	NO	
5	Broom head raise and lower function shall be achieved by two hydraulic lift cylinders	YES	NO	
6	Functions, such as Broom Up/Down, Broom Left/Right, Deflector position, Hitch, and Airblast directional functions shall be through a carrier engine driven pressure compensated pump and related components.	YES	NO	
7	Brush cores and Airblast impellers shall be driven through the auxiliary engine driven variable flow pumps and related components.	YES	NO	
8	Functions, such as Broom Up/Down, Broom Angle Left/Right, and Deflector position shall be through a dual axis joystick controller located within convenient reach of the single operator. All functions, including Airblast, not controlled by the joystick shall be electric/hydraulic and have electronic controls located within convenient reach of the operator. All switches, controls, potentiometers, and instrumentation shall be permanently labeled and have variable intensity back-lit illumination.	YES	NO	
9	Brush shall be hydrostatically driven by dual end drive high speed hydraulic motors.	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
10	Brush drive motors shall provide a variable brush speed of 0-525 rpm minimum and have available torque of 4800 ft. lb. minimum.	YES	NO	
11	The Broom Hitch shall be of a Quick Hitch and Weight Transfer design. The hitch shall be capable of transferring a predetermined amount of the broom's weight to the chassis allowing optimum levels of traction, steering response, and braking.	YES	NO	
12	Truck portion of the hitch shall be bolted to the chassis frame rails with flanged grade 8 bolts and flanged grade 8 thread crimped lock-nuts. Welding is unacceptable.	YES	NO	
13	Brush housing shall be continuous steel construction welded to the frame	YES	NO	
14	Brush hood shall be continuous steel construction and cover the top half of the brush and shall incorporate an adjustable/replaceable stripper plate to eliminates snow carry-over. Brush hood shall be adjustable to compensate for bristle wear.	YES	NO	
15	Brush housing and brush hood shall be of a design which eliminates snow, ice, and slush build-up	YES	NO	
16	Brush hood shall incorporate a means by which snow and ice accumulation on the top of the broom hood, resulting in additional unnecessary weight, is kept to a minimum.	YES	NO	
17	Snow deflector shall be fully adjustable, full width, hydraulically operated by two cylinders and designed to control discharge pattern. Deflector shall be mounted to the most forward section of the brush hood.	YES	NO	
18	End Plates shall be of heavy flat plate construction and provide mounting surfaces for the hydraulic motors and reduction gearboxes. These end plates shall be securely bolted to the broom frame and designed for removal to allow for brush core removal/replacement	YES	NO	
19	<i>Brush pattern adjustment shall be Automatically Controlled and accomplished incrementally through electronic/hydraulic control of the hydraulic lift cylinders. The unit shall also be equipped with a manual and initial brush pattern adjustment which shall be accomplished from both the operator's position, and external of the cab at the broom head. The Manual adjustment function shall be programmable and have the capability to lock out or limit operator control of brush pattern adjustment. To minimize downtime, this manual or initial adjustment shall be accomplished without the use of special tools and accomplished in less than 5 minutes (nominal)</i>	YES	NO	
20	All stands, dollies, jacking devices, or other equipment required for core/brush replacement shall be provided	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
21	All lubrication fittings not readily accessible shall have fittings led to alternate accessible locations. Where the use of high lubricating pressure may damage grease seals or other mechanisms, a suitable pressure release device will be provided.	YES	NO	

T. BRUSH: The Brush shall be cylindrical shaped 18 feet in length and 46 inches diameter and designed for runway use. Configuration shall be as follows:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Brush shall be 18 feet in length and 46 inches diameter minimum.	YES	NO	
2	Brush shall consist of two interchangeable core assemblies and a 50/50 combination of polypropylene wafers and wire wafers separated by spacers.	YES	NO	
3	The brush shall be designed for runway operation and shall be field replaceable.	YES	NO	
4	Brush core assemblies shall be constructed of heavy wall round tubing with removable end plates and shall incorporate four equally spaced stainless steel drive ribs running the complete length of the brush core.	YES	NO	
5	The O.D. of the brush core and drive ribs shall accept 19 ½ inch brush wafers and spacers.	YES	NO	
6	The brush cores shall incorporate replaceable drive ends.	YES	NO	
7	The brush cores shall be dynamically balanced at rated RPM to eliminate broom vibration during operation.	YES	NO	
8	Polypropylene wafers shall be made up of oval shaped bristles measuring .060 x .090 inch minimum and a nominal wafer weight of 8 pounds / wafer.	YES	NO	
9	Wire wafers shall be made up of galvanized wire bristles with a mean diameter of .018 inch and carbon content of .81 to .86 percent and a nominal wafer weight of 12 pounds / wafer.	YES	NO	
10	Maximum allowable distance between the two cores when installed is 2 inches to minimize streaking during operation.	YES	NO	

U. CASTERS: The casters shall be rated to fully support the broom and loads imposed upon the broom at operational speeds. Configuration shall be as follows:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Caster arrangement and number of casters shall be adequate to fully support the broom at operational speeds. Indicate number of casters below: Number of casters: _____	YES	NO	
2	Casters must be able to rotate through 360 degrees without contacting any part of broom, broom frame, hitch, or chassis.	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
	Caster wheels / tires shall be centered between a caster fork and supported with tapered roller bearings and grease seals. The fork shall provide sufficient camber for proper tracking.			
3	Casters shall be bolted at four points minimum to mounting plates. Mounting plates shall be welded to the broom frame	YES	NO	
4	Casters shall incorporate an adjustable friction brake designed to eliminate wheel shimmy at all speeds	YES	NO	
5	Pneumatic tube type tires 180/70R8 16ply minimum	YES	NO	

V. HYDRAULIC SYSTEM: The hydraulic system shall consist of pumps driven by both the carrier engine and the auxiliary engine. Functions, such as Broom Up/Down, Broom Left/Right, Deflector position, Hitch, and Airblast directional functions shall be through a carrier engine driven pressure compensated pump and related components. Brush cores and Airblast impellers shall be driven through the auxiliary engine driven variable flow pumps and related components. All functions shall be electric/hydraulic and have electronic controls located within convenient reach of the operator. The hydraulic system shall consist of but not be limited to the following:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	The system shall be designed with the capability of positioning/operating the hydraulic actuated equipment in any position within the design limits of travel without the use of mechanical locks, and shall be of a capacity where all controls can be operated simultaneously without noticeable reduction in response of any one or more functions.	YES	NO	
2	Carrier engine driven pressure compensated pump and related components for broom functions	YES	NO	
3	Auxiliary engine driven variable flow pumps and related components for driving brush cores and airblast impellers	YES	NO	
4	The hydraulic system shall utilize high quality, synthetic rubber, wire braid reinforced hose rated at 3000 PSI minimum for control circuits such as broom up/down, broom left /right, and 6000 PSI minimum for driving brush cores and airblast impellers.	YES	NO	
5	All fittings shall be of O-ring or JIC design. In situations where design prohibits use of O-ring or JIC design fittings, swivel style fittings shall be used on both ends of all hoses. Steel tubing shall be used wherever possible. All plumbing should be routed and secured to minimize wear and accidental damage.	YES	NO	
6	All quick dis-connects shall be of "non-spill" and "connect under pressure" design.	YES	NO	

ITEM	SPECIFICATION	YES	NO	EXCEPTION
7	The system shall be equipped with a steel or aluminum fluid reservoir and shall have be of a capacity that will provide a minimum of 150% of the fluid required for any combination of attachments. The reservoir is to be equipped with a filler breather cap with screened filler neck and chain, appropriate baffling, magnetic drain plug, fluid level sight glass with integral thermometer, a low fluid level alarm sensor, and a high temperature alarm sensor. Ball type shut off valves shall be incorporated to allow system maintenance without draining the reservoir. The reservoir shall be mounted above the level of the pump intake ports to eliminate pump cavitation.	YES	NO	
8	Hydraulic system filtering shall be done on both high pressure and low pressure circuits and shall conform to SAE J931. All filter housings utilized in the hydraulic system shall incorporate a pressure sensor which will activate a warning light on the control console indicating a clogged filter, and all filter housings shall incorporate a restriction indicator. The filter housings shall be installed where as no valving or shut-offs are required for changing filter element.	YES	NO	
9	The hydraulic system's oil coolers / fans shall be mounted to provide a continuous flow of cooling air to maintain system temperatures below 200°F to ensure continuous operation in ambient temperatures ranging from -30°F to 100°F.	YES	NO	
10	The pump suction line shall be equipped with a 125 micron rated in tank suction strainer with a 3 PSI safety bypass and 2" minimum port.	YES	NO	

W. AIRBLAST SYSTEM: The Vehicle / Runway Broom shall incorporate an Air Blast System designed to work in conjunction with the broom and discharge snow to the left or right side of the chassis. Configuration shall be as follows:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Two centrifugal design impellers, high speed hydrostatic motors, associated ducting, and two directional nozzles making up an assembly to be mounted on the chassis frame rails. Assemblies shall be between front and rear axles and below the catwalk.	YES	NO	
2	Impellers shall be directly coupled to and driven by high speed hydrostatic motors which will provide infinite control of blower speed between 0% and 100%.	YES	NO	
3	Minimum total combined effort of the impellers shall be 22,000 c.f.m. at a minimum velocity of 400 mph.	YES	NO	
4	Impeller assemblies shall be dynamically balanced at rated RPM.	YES	NO	
5	Directional nozzles shall permit forced air to be directed left or right and have the capability to be interlocked with broom left and right function thus allowing broom	YES	NO	

	direction and forced air direction to be controlled by one command at the joystick controller. In addition, the Airblast system shall have the capability to completely function without broom operation.			
6	Directional nozzles shall both discharge in the same direction during operation.	YES	NO	
7	All ducting and nozzles shall be kept within chassis width and maintain a minimum 10 inch ground clearance during transport.	YES	NO	

X. PAINT: The complete unit, chassis/broom, shall be painted in the manufacturer's standard paint scheme using a high solid content, low VOC polyurethane paint. Color shall be National Fleet Yellow, Dupont # 71890J, or Authority approved equal. **State paint manufactures name, color name, and color number below. Provide Manufacturer's paint chip with offer.**

Paint Manufacturer Name: _____

Paint Color Name: _____

Paint Color Number: _____

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	All surfaces shall be thoroughly sanded for removal of rust, scale, and imperfections, and cleaned and degreased before priming.	YES	NO	
2	All surfaces shall be thoroughly sanded and cleaned between primer coats and final paint to insure optimum topcoat appearance.	YES	NO	
3	The truck frame, chassis, axles, fuel tanks, hydraulic tank, front bumper, rear bumper, air blast ducting, and truck portion of broom hitch shall be painted with a high solid content, low VOC polyurethane paint in manufacturer's standard paint scheme, either Gloss Black or job color.	YES	NO	
4	The completed unit including cab/body, carrier and auxiliary engine covers, broom head, broom portion of hitch, and vehicle wheels, shall be painted with a high solid content, low VOC polyurethane paint, National Fleet Yellow, Dupont # 71890J or Authority approved equal.	YES	NO	

Y. SPARE PARTS: The following spare parts shall be provided.

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	A complete set of replacement filters for the carrier engine shall be provided upon delivery.	YES	NO	
2	A complete set of replacement filters for the auxiliary engine shall be provided upon delivery.	YES	NO	
3	One matching new spare vehicle chassis wheel and tire shall be provided. Wheel shall be painted to match body color.	YES	NO	
4	Two matching new spare caster wheel and tire shall be	YES	NO	

	provided. Wheel shall be painted to match original caster wheel color.			
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Z. MANUALS: Vehicle specific manuals shall be provided and shall include, but not be limited to the following:

ITEM	SPECIFICATION	YES	NO	EXCEPTION
1	Manuals shall be formatted as follows: One copy hard bound version and one copy CD / DVD version.	YES	NO	
2	Operators manual for carrier chassis, runway broom, LCD displays and Joystick Controls.	YES	NO	
3	Complete maintenance, overhaul, and troubleshooting manuals for carrier chassis. Carrier chassis maintenance and overhaul manuals shall include engine, transmission, transfer case, driveline, axles, brakes, electrical system and wiring diagrams.	YES	NO	
4	Complete maintenance, overhaul, and troubleshooting manuals for runway broom.			
5	Parts manuals for truck chassis and runway broom. Parts manuals shall include engine, transmission, transfer case, driveline, axles, and brakes.	YES	NO	

AA. WARRANTY: Complete Vehicle Warranty shall be manufactures standard on Vehicle, Frame, Chassis, Engine, Transmission, Transfer Case, Axles, Cab Corrosion/Rust Through, Cab structural, Body and Sheet metal Corrosion/Rust Through, Paint, Electronic/Hydraulic Control System, Lighting, Runway Broom, and all related equipment. ***Submit all warranty information with offer.***

BB. VEHICLE TESTING: The complete unit shall be fully assembled and tested prior to delivery. The entire unit shall be subjected to a complete operational test. This test shall bring all components up to full operating temperature and rated speed for a minimum of twenty minutes. This test shall verify that all components are functioning properly, maintaining proper temperatures, and have no apparent leaks. Any deficiencies or leaks shall be corrected at this time. Components subject to the operational test shall include but are not limited to the following: Carrier Engine, Auxiliary Engine, Transmission, Transfer Case, Driveline, Air Brakes System, Runway Broom Function, Air Blast System, Hydraulic system, Cooling Systems, Charging System, Cab Heater/AC System and Lighting systems.

CC. DELIVERY, SET- UP, and TRAINING: Within 15 calendar days of delivery, offeror shall provide a factory trained and authorized technical representative to completely assemble / set-up, test, and provide training on the unit. The authorized technical representative shall conduct on-site training of Authority operators and maintenance personnel regarding Proper Safe Operation, Basic Maintenance / Daily checks of vehicle chassis, engines, transmission, and runway broom, basic diagnostics and troubleshooting, and instruction and hands-on / demonstration of Brush Core replacement and initial adjustment procedures. The instruction shall be approximately four (4) hours for Proper Safe Operation and approximately four (4) hours for Basic Maintenance / Daily checks and Brush Core replacement procedures. Upon acceptable completion of the training, all operators and maintenance personnel shall be completely confident with the information covered and procedures demonstrated during the training. This training shall consist of two sessions; one day session approximately 7:00 -3:30 pm, and one evening session approximately 3:30 pm – 12:00 pm.

DD. PROGRESS VISITS and INSPECTION: During the manufacturing / assembly stage, technical representatives from MWA will conduct site visits at the Manufacturer's location to view assembly progress. The time frame of the initial site visit shall be mutually agreed upon by the manufacturer and MWA representatives and shall be near mid-point of assembly. Upon notification of completion, a final pre-delivery

inspection shall be conducted at the time of the complete operational test covered in item BB. VEHICLE TESTING.

EE. DOCUMENTATION: The offeror shall provide a Certificate of Origin, Odometer Statement, 30 Day Temporary Tag, and five (5) sets of all keys.

FF. DELIVERY: Completion and Delivery requested 240 days after Contract award.