



INVITATION FOR BID #2017-014

**Multipurpose Unit with interchangeable Snow Blower, Broom Sweeper
and Snow Plow Attachments for the Lynchburg Regional Airport**

DUE: 3:00 PM September 22, 2016

Invitation for Bid Prepared By:
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www.lynchburgva.gov

THE CITY OF LYNCHBURG
LYNCHBURG, VIRGINIA

GENERAL CONDITIONS AND INSTRUCTIONS TO BIDDERS

(Bidder: The general rules and conditions that follow apply to all purchases by the City of Lynchburg, through its Procurement Division and become a definite part of each formal solicitation, purchase order or other award issued by the Procurement Division, unless otherwise specified. Bidders or their authorized representatives are expected to fully inform themselves as to the conditions, requirements and specifications before submitting bids. Failure to do so will be at the bidder's own risk, and a bidder cannot secure relief from the conditions on the plea of error.)

Subject to all applicable laws, ordinances, policies, resolutions, regulations and all limitations imposed thereby, bids on all solicitations issued by the Procurement Division will bind bidders to the conditions and requirements herein set forth unless otherwise specified in the solicitation.

1. **DEFINITIONS:** The definitions in the Virginia Public Procurement Act and Lynchburg Public Procurement Code apply. In addition, the following definitions apply to these General Conditions and Instructions to Bidders:
 - a. **BID:** The written offer of a bidder to the City, submitted in response to a solicitation by the City, to provide the City specific goods or services at specified prices and/or other conditions specified in the solicitation, unless indicated to the contrary, as used herein, bid includes a bid submitted in response to an Invitation for Bid.
 - b. **BIDDER:** Any person who submits a bid to the City.
 - c. **CITY:** The City of Lynchburg, Virginia
 - d. **CONTRACTOR:** Any person, including without limitation, any company, individual, firm, corporation, partnership joint venture, or other organization with which the City contracts.
 - e. **INVITATION FOR BID (IFB):** A written request made to prospective vendors (bidders) for their bids on goods or services desired by the City when initiating Contractor selection by means of Competitive Sealed Bidding.
 - f. **NON-PROFESSIONAL SERVICES:** Any services not specifically identified as professional services in the definition of professional services
 - g. **PROCUREMENT MANAGER:** The Procurement Manager employed by the City.
 - h. **SOLICITATION:** The document published by the City notifying the public and prospective bidders that the City is seeking vendors to submit bids to provide goods or services to the City and providing information regarding the procurement process, the City's requirements, and terms and conditions of any resulting contract.
 - i. **STATE:** Commonwealth of Virginia.

SPECIFICATIONS

2. **QUESTIONS OR COMMENTS:** For City solicitations done through the Procurement Division, all contact between bidders or prospective bidders and the City shall be only with the Procurement Division. Any questions which may arise as a result of this solicitation may be addressed to Lisa Moss, CPPB, Buyer at 434-455-4228, or by email to lisa.moss@lynchburgva.gov. Inquiries must be received at least 7 business days prior to the due date in order to be considered. Contact initiated by a bidder concerning this solicitation with any other City representative, not expressly authorized elsewhere in this document, is prohibited. No bidder or potential bidder shall initiate or engage in any discussions with any other employee of the City or any member of the City Council while a solicitation is outstanding concerning the

contents of such solicitation or with the intent to influence or interfere with the contract award authorized by and described in such solicitation. A violation hereof may result in the disqualification of such bidder.

3. ADDENDA: Any changes or supplemental instructions to this Invitation for Bid shall be in the form of written addenda. All addenda are downloadable from the Procurement web site at <http://www.lynchburgva.gov/current-solicitations>. Each bidder is responsible for determining that all addenda issued have been received and shall acknowledge receipt of all addenda in the space provided or by returning a copy of each signed addendum. Failure to do so may result in rejection of the bid. All addenda so issued shall become part of the IFB and any resulting contract documents. Oral answers shall not be authoritative and shall not provide any basis for reliance by a bidder.
4. BRAND NAME OR EQUAL ITEMS: Unless otherwise provided in the Invitation for Bid, the name of a certain brand, make or manufacturer does not restrict bidders to the specific brand, make or manufacturer named. Such a brand name conveys the general style, type, character and quality of the article desired, and any article which the City, in its sole discretion, determines to be the equal of that specified, considering quality, workmanship, economy of operation, and suitability for the purpose intended shall be accepted.
5. FORMAL SPECIFICATIONS: When an Invitation for Bid indicates that it is a "formal specification" (no substitute), or otherwise states that the article specified, and no other, shall be provided, then the bidder shall furnish the article in strict conformity with the specification and may not offer a purported equal or substitute. The bidder shall abide by and comply with the true intent of the specifications and not take advantage of any unintentional error or omission. The bidder shall fully complete every part as the true intent and meaning of the specifications and drawings. Whenever a specification requires articles, materials, or workmanship to conform to laws, ordinances, regulations, building codes, underwriter laboratory standards, ASTM standards, or similar law or standards, the specification shall be construed to require at least the minimum acceptable standard allowed by the cited law or standard under the circumstances unless otherwise indicated.
6. OMISSIONS AND DISCREPANCIES: Unless otherwise indicated, any specification for an item of equipment shall be interpreted to include not only the item of equipment specified, but also those parts, items, appurtenances and accessories reasonably necessary to make the equipment complete and working.

BID PROCESS

7. TIME FOR RECEIVING BIDS: All sealed bids will be received in the Procurement Division Office, Third Floor, City Hall. It is the responsibility of the bidder to ensure bids are received by Procurement Staff and time stamped prior to the deadline for bids. Bids received prior to the time of opening will be securely kept unopened. No responsibility will be attached to the Procurement Division for the premature opening of a bid not properly addressed, received, and identified. Any bid opened prematurely will be resealed and kept securely until the time of opening. Bids, to include addenda or changes to a response, shall not be accepted via a FAX machine or by Internet E-mail. Late bids will not be accepted and will be returned unopened.
8. SIGNATURE: All bids shall be signed on the Terms and Signature Sheet in order to be considered. Bids submitted without a signature shall be rejected. If the Bidder is a partnership or corporation, the Bidder shall show the title of the individual signing the bid, and if the individual is not an officer of the partnership or corporation, if requested, the Bidder shall submit proof that the individual has the authority to bind the partnership or corporation.
9. BID BONDS: Only when specifically requested in the bid documents shall each bid be accompanied by a bid bond with surety satisfactory to the City or a Cashier's or a Certified Check, made payable to the City of Lynchburg. In the event of default by the Bidder, the deposit shall be and represent liquidated damages to the City. Bids received without a bid bond, when specifically requested, shall be rejected.
10. BID MODIFICATION AND WITHDRAWAL: Any bidder may withdraw or modify its bid, in writing

containing the original signature of the bidder, which writing must be received by the City prior to the date and time set for submission of bids. Withdrawal or modification must be in writing and be delivered by one of the following means: (i) hand delivery by the bidder itself, a courier, or other delivery service; (ii) by mail (no consideration shall be given to any postmark); or (iii) by marking(s) on the exterior of the bid submission envelope, but only if the marking is dated and includes the original signature of the bidder. Written modifications of bids should not reveal the bid price contained in the previously submitted sealed bid, but should simply provide the desired addition, subtraction or modification, so that the final price or terms of the bid will not be known to the City until the sealed bids are opened. Modifications shall be on the interior envelope and sealed prior to submittal. No bid shall be altered or amended after the specified time for opening.

11. **BIDDERS PRESENT**: At the time fixed for the opening of sealed bids, their contents will be made public for the information of bidders and other interested parties who may be present either in person or by representative. All bids will be opened at the time and place specified and read publicly and remain available for inspection in the Procurement Division during regular City business hours by bidders prior to award (unless a determination is made not to make an award) and by the general public after an award is made. The City will post all notices of award to the Procurement Website.

12. **WITHDRAWAL OF BIDS**: A bidder may withdraw its bid from consideration if the price bid was substantially lower than the other bids due solely to a mistake therein, provided the bid was submitted in good faith, and the mistake was a clerical mistake, as opposed to a judgment mistake, and was actually due to an unintentional arithmetic error or an unintentional omission of a quantity of work, labor or material made directly in the compilation of a bid, which can be clearly shown by objective evidence drawn from inspection of original working papers, documents and materials used in the preparation of the bid sought to be withdrawn. The following procedure as stated in Section 18.1-11 of the Lynchburg Procurement Code shall be used to request withdrawal of a bid:

- a. To withdraw a bid after bid opening due to error, a bidder must satisfy the substantive requirements of Va. Code §2.2-4330. In addition, the following procedures shall apply:
 1. The bidder shall give notice in writing of his claim of right to withdraw his bid within two business days after the conclusion of the bid opening procedure and shall submit original work papers with such notice.
 2. The mistake may be proved only from the original work papers, documents and materials delivered as required herein.
- b. This section shall be deemed to be incorporated automatically into all invitations to bid issued by the city pursuant to the Lynchburg public procurement code. Nonetheless, the city manager or his designee(s) should ensure that this section is set out in all invitations to bid.

If a bid is withdrawn under the authority of this section and the solicitation is not cancelled, the lowest responsive and responsible remaining bid shall be deemed to be the low bid. No bidder who is permitted to withdraw a bid shall, for compensation, supply any materials or labor to or perform any contract or other work agreement for the person or firm to whom the contract is awarded or otherwise benefit, directly or indirectly, from the performance of the project for which the withdrawn bid was submitted.

13. **ERRORS IN BID**: When an error is made in extending the total prices, the unit bid price will govern. Erasures in bids must be initialed by the bidder. Carelessness in quoting prices or in preparation of the bid otherwise will not relieve the bidder. Bidders are cautioned to recheck their bids for possible errors. Errors discovered after public opening cannot be corrected, and the bidder will be required to perform if his bid is accepted, unless the bidder successfully withdraws its bid in accordance with paragraph 12, Withdrawal of Bids.

14. **BIDDERS INTERESTED IN MORE THAN ONE BID**: If more than one bid is offered by any one person, by or in the name of their clerk, partner, firm, or corporation, all such bids may be rejected. A contractor who has quoted prices on work or supplies to a bidder is not thereby disqualified from quoting prices to other bidders or firms submitting a bid directly for the work, material or supplies.

15. **TAX EXEMPTION:** The City of Lynchburg is exempt from payment of Federal Excise Tax and State and Local Sales and Use Tax on all tangible personal property purchased or leased by the City for its use or consumption. Tax exemption certification will be furnished upon request. Sales tax, however, is paid by the City on materials and supplies that are installed by a contractor and become a part of real property. Contractors are not exempt from paying taxes on these categories, as they are considered to be a cost of doing business and should be considered in pricing when preparing a bid.
16. **PROPRIETARY INFORMATION:** Section 2.2-4342-F of the Code of Virginia states: “Trade secrets or proprietary information submitted by a bidder, offeror, or contractor in connection with a procurement transaction or prequalification application submitted pursuant to subsection B of 2.2-4317 shall not be subject to the Virginia Freedom of Information Act (2.2-3700 et seq.); however, the bidder, offeror, or contractor shall (i) invoke the protections of this section prior to or upon submission of the data or other materials, (ii) identify the data or other materials to be protected, and (iii) state the reasons why protection is necessary.” Bids not in compliance with section 2.2-4342F will be subject to disclosure.
17. **GOVERNING LAW:** Any contract resulting from this Invitation for Bid shall be governed by the provisions hereof and by the laws of the Commonwealth of Virginia. Any dispute arising out of this Contract shall be resolved in the Courts of the Commonwealth of Virginia, in and for the City of Lynchburg.

AWARD

18. **AWARD DECISION:** Before the Contract is awarded, the bidder submitting the lowest responsive bid must satisfy the City that it has the requisite organization, capital, equipment, ability, resources, personnel, management, business integrity, and experience in the type municipal work for which it has submitted a bid. The bidder shall verify to the City that it has the sufficient and qualified personnel to provide for the Contract Work. Failure by the lowest responsive bidder to sufficiently satisfy the City of its ability to meet any of the above requirements may serve as grounds for rejection of the bid.

The Owner reserves the right to cancel the Advertisement for Bids, reject any and all bids, waive any and all informalities, and disregard all conforming, nonconforming, conditional bids or counterproposals.
19. **FACTORS OTHER THAN PRICE IN AWARD DECISION:** The following factors in addition to price (as they apply) shall be a consideration in the award decision:
 - a. The ability to provide references which may substantiate past work performance and experience in the type of work required for the contract. The lowest responsive bidder(s) may be required to furnish a contractor qualifications statement, to include references, prior to any such award. The City may contact all references furnished by bidders. The right is further reserved by the City to contact references other than, and/or in addition to, those furnished by the bidder. If, in the sole opinion of the City, a bidder is determined to be non responsible as a result of any investigation conducted by or for the City, award will not be made to that bidder.
 - b. The previous and existing compliance by the bidder with laws and ordinances relating to the contract or services.
 - c. Whether the bidder is in arrears on a debt or contract or is in default on a security to the City or whether the bidder's county taxes or assessments are delinquent.
 - d. The quality of performance/workmanship of previous contracts for goods and/or services delivered to or performed for the City.
 - e. The timely completion of previous contracts for services or the timely delivery of past orders for goods.
 - f. The sufficiency of financial resources and its impact on ability of the bidder to perform the contract or provide the services.

- g. The City reserves the right, at its option, to conduct on-site inspections of any bidder's facilities prior to award. The results of any such inspection will be considered by the City in determining bidder's capabilities of successfully administering the contract.
 - h. The ability and availability of the bidder to provide both quality and timely maintenance, service, and/or parts.
 - i. The resale value, life cycle costing and value analysis of a product.
 - j. The availability and capability of local and regional vendor support as it affects the quantity, quality, and timeliness of the goods and/or services.
 - k. Timely delivery of goods or timely completion of services as stated by bidder.
 - l. Substantial compliance or noncompliance with specifications set forth in bid as determined by the City.
 - m. Inventory capability as it relates to a particular bid.
 - n. Results of product testing.
 - o. Such other information as may be secured by the Procurement Manager having a bearing on the decision to award the contract.
20. AVAILABLE FUNDS: If the bid from the lowest responsible, responsive bidder exceeds available funding, pursuant to Section 18.1-9 of the Lynchburg Public Procurement Code, the Owner may negotiate with the apparent low bidder to obtain a contract price within available funds.
21. NOTICE OF AWARD/CONTRACT DOCUMENTS: A Notice of Award will be posted to the City's Procurement website within the time for acceptance specified in the solicitation shall be deemed to result in a contract binding on the bidder. To the extent they are included in or incorporated by the solicitation, the following documents are hereby incorporated in and shall form a part of the resulting contract:
- a. City Solicitation Form/Award Notice and other documents which may be incorporated by reference, if applicable.
 - b. General Conditions and Instructions to Bidders.
 - c. Special Provisions.
 - d. Pricing Schedule.
 - e. Any Addenda/Amendments.
 - f. Purchase Order.
22. TIE BIDS: In the case of a tie bid, the City may give preference to goods, services, and construction produced in the City or provided by persons, firms or corporations having principal places of business in the City. If such choice is not available, preference shall then be given to goods and services produced in the Commonwealth pursuant to Section 2.2-4324 of the Code of Virginia. If no City or Commonwealth choice is available, the tie shall be decided by lot.
23. PROMPT PAYMENT DISCOUNT: If discounts for prompt payment are offered by the bidder, it is required that a minimum of twenty (20) days be allowed for payment. Discounts for prompt payment will not be considered in the evaluation of bids. Discounts for prompt payment will be shown on the purchase order/contract and taken if invoices are processed and payment made within the stipulated time frame. If discounts are not offered, payment shall be made thirty (30) days after receipt of an approved invoice by the City.
24. INSPECTION-ACCEPTANCE: The goods and/or services delivered as a result of this bid shall remain the property of the seller until a physical inspection is made, and thereafter accepted to the satisfaction of the City. In the event the goods and/or services supplied to the City are found to be defective or do not

conform to specifications, the City reserves the right to cancel the order upon notice (verbal or in writing) to the seller and return goods to seller at the seller's expense.

25. DEFINITE BID QUANTITIES: Subject to the City's right to termination for convenience, where quantities are specifically stated, acceptance will bind the City to order quantities specified and to pay for, at contract prices, all such supplies or services delivered that meet specifications and conditions of the contract. However, the City will not be required to accept delivery of any balances unordered, as of the contract expiration date, unless the Contractor furnished the Procurement Manager with a statement of unordered balances not later than ten (10) days after the termination date of the contract.
26. REQUIREMENTS BID QUANTITIES: On "Requirement" bids, acceptance will bind the City to pay for, at unit bid prices, only quantities ordered and delivered.
- a. Whenever a bid is sought seeking a source of supply for a requirements contract for goods and/or services, the quantities or usage shown are estimates only. No guarantee or warranty is given or implied by the City as to any minimum or total amount that may or may not be purchased from any resulting contracts.
 - b. The City reserves the right, at its sole option, to renew the contract for consecutive terms.
 - c. The City reserves the right to award bids for requirements contracts based on the pricing of the initial term of the contract or any combination of initial and renewal terms.
 - d. The City may award a bid to a single contractor or to multiple contractors.
 - e. The City reserves the right not to renew the contract at the end of the initial term or any subsequent term.
 - f. The City reserves the right to terminate the contract upon written notice to the contractor(s).
 - g. In the event that a requirements contract is awarded for goods and/or services, the City reserves the right to bid individual purchases if the City deems it will best serve their interest.
 - h. It is understood and agreed to between the parties in a resulting contract that the City shall not be obligated to purchase or pay for materials under such contract unless and until they are ordered and delivered.
 - i. Bids based on a firm price or those including a "downward escalator" clause for a requirements contract term may be given preference over lower ones bearing an "escalator" clause.
 - j. The City has the right to extend this contract up to and not to exceed one hundred eighty (180) days following any term of the contract.
27. SCHOOL BOARD: When goods and/or services are for the benefit of Lynchburg City Schools, the contract shall be entered into on behalf of the Lynchburg City School Board.

CONTRACT PROVISIONS

28. TERMINATION OF CONTRACTS: Contracts will remain in force for full periods specified and/or until all articles ordered before date of termination shall have been satisfactorily delivered and accepted and thereafter until all requirements and conditions shall have been met unless:
- a. Terminated prior to expiration date by satisfactory deliveries of entire contract requirements, or upon termination by the City for convenience or cause, or upon termination by Contractor for material breach by the City.
 - b. Extended upon written authorization of the Procurement Manager and accepted by Contractor, to permit ordering of unordered balances or additional quantities at contract prices and in accordance with contract terms.
29. TERMINATION FOR CONVENIENCE: A contract may be terminated by the City in accordance with this clause in whole or in part whenever the Procurement Manager shall determine that such a termination

is in the best interests of the City. Any such termination shall be effected by delivery to the Contractor at least (5) working days prior to the termination date of a Notice of Termination specifying the extent to which performance shall be terminated and date upon which such termination becomes effective. An adjustment in the contract price shall be made to compensate the contractor for his/her actual costs incurred in performance prior to termination that, as determined in the City's discretion, are reasonable, allocable, and allowable, plus a reasonable amount of profit on such costs. In no event shall the City be liable to the contractor for anticipated profits for unperformed work or undelivered goods or for any consequential, special, incidental, or punitive damages of any kind. In no event shall the City be liable for any amount over the contract price.

30. TERMINATION OF CONTRACT FOR CAUSE:

- a. The City may, by written notice of termination to the Contractor specifying a termination date at least five days thereafter, terminate this contract for cause in whole or in part if the Contractor (1) fails to deliver the goods or perform the services this contract requires within the time this contract specifies, or (2) fails to perform any of its other obligations under this contract or violates any provision of this contract.
- b. If this contract is terminated for cause, the Procurement Manager may require the Contractor to transfer title and deliver to the City, as directed by the Procurement Manager, any completed or partially completed goods and documents, data, studies, surveys, drawings, maps, models and reports ("deliverables") prepared by the Contractor under the contract. The City shall pay the contract price for such completed goods and deliverables. The Contractor and Procurement Manager shall agree on the amount of payment for partially-completed goods and deliverables the City requires the Contractor to transfer and deliver to it. If the parties fail to agree, then the Contractor may present a claim to the City for its reasonable costs for the partially-completed goods and deliverables. Costs recoverable shall be limited to those that, as determined in the City's discretion, are reasonable, allocable, and allowable. Such costs in no event shall exceed the contract price for the goods and deliverables if completed.
- c. Notwithstanding the above, the Contractor shall not be relieved of liability to the City for damages sustained by the City by virtue of any breach of contract by the Contractor for the purpose of setoff until such time as the exact amount of damages due to the City from the Contractor is determined.
- d. If the City terminates this contract for cause when cause, in fact, does not exist, then the termination shall for all purposes be deemed a termination for convenience under this contract, and the termination for convenience clause shall apply for all purposes.
- e. If Contractor properly terminates this contract for material breach by the City, Contractor's damages shall be limited to the amounts recoverable by Contractor for a termination for convenience.

31. CONTRACT MODIFICATIONS: No modifications in the terms of a contract shall be valid or binding upon the City unless made in writing, signed, and duly authorized by the City.

32. FUNDING: The continuation of the terms, conditions, and provisions of any resulting contract beyond June 30 of any year, the end of the City's fiscal year, are subject to approval and ratification by Lynchburg City Council and appropriation by them of the necessary money to fund said contract for each succeeding year.

33. NEW GOODS, FRESH STOCK: Unless otherwise specifically stated, the Contractor shall provide new rather than used goods, fresh stock, and the latest model, version, design or pack of any item specified.

34. NON-DISCRIMINATION: During the performance of this contract the Contractor agrees as follows:

- a. The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability or other basis prohibited by state law relating to discrimination in employment except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in

conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause.

- b. The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such Contractor is an Equal Opportunity Employer.
- c. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.
- d. The Contractor will include the provisions of the foregoing paragraphs a, b, and c above in every subcontract or purchase order of over ten thousand dollars so that the provisions will be binding upon each subcontractor or vendor.

35. DRUG FREE WORKPLACE: Section 2.2-4312 Code of Virginia. For the purposes of this section, “drug-free workplace” means a site for the performance of work done in connection with a specific contract awarded to a contractor in accordance with this chapter, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

During the performance of this contract, the contractor agrees to:

- a. Provide a drug-free workplace for the contractor’s employees
- b. Post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the contractor’s workplace and specifying the actions that will be taken against employees for violations of such prohibition
- c. State in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace
- d. Include the provisions of the foregoing clauses in every subcontract or purchase order over \$10,000, so that the provisions will be binding upon each subcontractor or vendor

36. MINORITY AND WOMEN OWNED BUSINESS ENTERPRISES: It is the policy of the City to undertake every effort to increase opportunity for utilization of small, minority-owned, and women-owned businesses in all aspects of procurement to the maximum extent feasible.

- a. In connection with the performance of this contract, the Contractor agrees to use his/her best effort to carry out this policy and ensure that Small, minority-owned, and women-owned businesses shall have the maximum practicable opportunity to compete for subcontract work under this contract consistent with the efficient performance of this contract.
- b. As used in this contract, the term "Small Business" is defined as a business, independently owned and controlled by one or more individuals who are U.S. citizens or legal resident aliens, and together with affiliates, has 250 or fewer employees, or average annual gross receipts of \$10 million or less averaged over the previous three years. One or more of the individual owners shall control both the management and daily business operations of the small business. (Code of Virginia 2.2-4310)
- c. As used in this contract, the term “Minority-Owned Business” is defined as a business that is at least 51% owned by one or more minority individuals who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership, or limited liability company or other entity, at least 51% of the equity ownership interest in the corporation, partnership, or limited liability company or other entity is owned by one or more minority individuals who are U.S. citizens or legal resident aliens, and both the management and daily business operations are controlled by one or more minority individuals. (Code of Virginia 2.2-4310)
- d. As used in this contract, the term “Woman-Owned Business” is defined as a business that is at least 51% owned by one or more women who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership, or limited liability company or other entity, at least 51% of the equity ownership interest is owned by one or more women who are U.S. citizens or legal resident aliens, and

both the management and daily business operations are controlled by one or more women. (Code of Virginia 2.2-4310)

- e. Where federal grants or monies are involved, it is the policy of the City through its agents and employees to comply with the requirements set forth - Standards Governing State and Local Grantee Procurement - of the U.S. Office of Management and Budget Circular N. A-102, Uniform Administrative Requirements for Grants-in-Aid to State and Local Governments, as they pertain to small and minority business utilization.

37. **GUARANTEES & WARRANTIES:** Unless otherwise specifically indicated in the solicitation, by entering into the contract, the Contractor itself warrants and guarantees all goods and services furnished (1) in accordance with the General Guaranty and Service Contract Guaranty paragraphs herein, and (2) in accordance with the provisions of the Uniform Commercial Code. In addition, the Contractor shall properly transfer to the City all standard warranties given by the manufacturer(s) of any goods furnished. The Contractor shall deliver all manufacturers' warranties to the Procurement Manager before final payment on the contract.
38. **PRICE REDUCTION:** If any time after the date of the bid the Contractor makes a general price reduction in the comparable price of any material covered by the contract to customers generally, an equivalent price reduction based on similar quantities and/or considerations shall apply to the contract for the duration of the contract period (or until the price is further reduced). Such price reduction shall be effective at the same time and in the same manner as the reduction in the price to customers generally. For purpose of this provision, a "general price reduction" shall mean any horizontal reduction in the price of an article or service offered (1) to contractor's wholesalers, jobbers, retailers, etc., which was used as the basis for bidding on this solicitation. An occasional sale at a lower price, or sale of distressed merchandise at a lower price, would not be considered a "general price reduction" under this provision. The Contractor shall submit invoices at such reduced prices indicating on the invoice that the reduction is pursuant to the "Price Reduction" provision of the contract documents. The Contractor in addition will, within ten (10) days of any general price reduction, notify the Procurement Division of such reduction by letter. **FAILURE TO DO SO WILL BE A BREACH OF THE CONTRACT AND MAY REQUIRE TERMINATION OF THE CONTRACT.** Upon receipt of any such notice of a general price reduction, all ordering offices will be duly notified by Procurement.
39. **CHANGES:** The City may, at any time, without notice to any sureties, by written order indicated to be a change order, make changes within the general scope of the contract, including without limitation, changes in (1) specifications (including drawings and designs), (2) method of packing and shipment, (3) method or manner of performance, (4) place of delivery, and (5) time for performance and completion.
- a. Within fifteen (15) days of receipt of a change order, the Contractor shall submit a written proposal for any equitable adjustment to the contract price, delivery schedule, or both, that should in fairness be made due to the change order. The parties shall then agree to and sign a modification to the contract that makes an equitable adjustment to the contract price, delivery schedule, or both.
 - b. If the parties cannot agree to a modification to the contract, then the City may either cancel the change order at no expense to the City or order in writing that the Contractor proceed with the change order.
 - c. If the City orders in writing that the Contractor proceed with the change order and no adjustment is agreed upon, then the Contractor or City may submit a claim for an equitable adjustment to the contract price, delivery schedule, or both, due to the change order. Any equitable adjustment as to contract price shall be limited to the increase or decrease in cost reasonably attributable to the change order that, as determined in the City's discretion, are reasonable, allocable, and allowable. Any equitable adjustment as to delivery schedule shall be limited to an increase or decrease in schedule reasonably attributable to the change order.
 - d. Nothing shall excuse the Contractor from proceeding with the contract as changed by written change order.

e. No payment shall be made to the Contractor for any extra material or services or for any greater amount of money than the written contract stipulates unless the procedures of this clause have been strictly followed.

40. PLACING OF ORDERS: Orders against contracts will be placed with the Contractors on a Purchase Order executed and released by the Procurement Division. The Purchase Order must bear the appropriate contract number and date. Where Blanket Purchase Agreements (BPAs) have been executed and a Purchase Order has been released by Procurement, telephonic orders may be placed directly with the Contractor by the ordering office. Such agreements (BPA) are normally reserved for the purchase of highly repetitive items on a day-to-day basis.

DELIVERY PROVISIONS

41. SHIPPING INSTRUCTIONS-CONSIGNMENT: Unless otherwise specified in the solicitation, each case, crate, barrel, package, etc., delivered under the contract must be plainly stenciled or securely tagged, stating the Contractor's name, purchase order number, and delivery address as indicated in the order. Where shipping containers are to be used, each container must be marked with the purchase order number, contract number, name of the Contractor, the name of the item, the item number, and quantity contained therein. In case of carload lots, the Contractor shall tag the car, stating Contractor's name and purchase order number. Any failure to mark items as required by the instructions will cause the Contractor to bear the risk of any resulting loss of or damage to material, or late delivery or misdelivery of material and any damages resulting therefrom. Deliveries must be made during the City's normal business day (Monday to Friday, except holidays, from 9:00 A.M. to 4:00 P.M.) and sufficiently before closing time to permit unloading, inspection, and storage, unless specific arrangements have previously been agreed upon with the City's storekeeper at the delivery point. The Contractor shall ensure compliance with these instructions for items that are drop-shipped.

42. RESPONSIBILITY FOR SUPPLIES TENDERED: The Contractor shall be responsible for the materials or supplies covered by the contract until they are delivered at the designated point, but the Contractor shall bear all risk on rejected materials or supplies after notice of rejection. Rejected materials or supplies must be removed by and at the expense of the Contractor promptly after notification of rejection, unless public health and safety require immediate destruction or other disposal of rejected delivery. If rejected materials are not removed by the contractor within ten (10) days after date of notification, the City may return the rejected materials or supplies to the Contractor at Contractor's risk and expense or dispose of them as its own property.

43. INSPECTIONS: Inspection and acceptance of materials or supplies will be made after delivery at destination herein specified unless otherwise stated. If inspection is made after delivery at destination herein specified, the City will bear the expense of inspection except for the value of samples used in case of rejection. Final inspection shall be conclusive except in regards to latent defects, fraud, or such gross mistakes as amount to fraud. Final inspection and acceptance or rejection of the materials or supplies will be made as promptly as practicable, but failure to inspect and accept or reject materials or supplies shall not impose liability on the City for such materials or supplies as are not in accordance with the specifications.

44. COMPLIANCE: Delivery must be made as ordered and in accordance with the solicitation or as directed by the Procurement when not in conflict with the bid. The decision of Procurement as to reasonable compliance with delivery terms shall be final. Burden of proof of delivery in receipt of goods by the purchaser shall rest with the Contractor. Any request for extension of time of delivery from that specified must be approved by Procurement, such extension applying only to the particular item or shipment affected.

45. DELAY: Should the Contractor be delayed by the City, there shall be added to the time of completion a time equal to the period of such delay caused by the City. However, the Contractor shall not be entitled to claim damages or extra compensation for such delay or suspension. This provision does not apply to public construction contracts.

46. METHOD AND CONTAINERS: Unless otherwise specified, goods shall be delivered in commercial packages in standard commercial containers, so constructed as to ensure acceptance by common or other carrier for safe transportation to the point of delivery. Containers become property of the City unless otherwise specified by bidder.
47. REPLACEMENT: Materials or components that have been rejected by the City in accordance with the terms of this contract shall be promptly replaced by the Contractor at no cost to the City.
48. PACKING SLIPS OR DELIVERY TICKETS-All shipments shall be accompanied by Packing Slips or Delivery Tickets, and shall contain the following information for each item delivered:
- (1) The Purchase Order Number
 - (2) The Name of the Article and Supplier's Stock Number
 - (3) The Quantity Ordered
 - (4) The Quantity Shipped
 - (5) The Quantity Back Ordered
 - (6) The Name of the Contractor

Bidders are cautioned that failure to comply with these conditions shall be considered sufficient reason for refusal to accept the goods.

PAYMENTS

49. PAYMENT: Payment shall be made after satisfactory performance of the contract, in accordance with all of the provisions thereof, and upon receipt of a properly completed invoice. The City reserves the right to withhold any or all payments or portions thereof for Contractor's failure to perform in accordance with the provisions of the contract or any modifications thereto.
50. PARTIAL PAYMENTS-Unless otherwise specified, partial payments will be made upon acceptance of materials or services so invoiced if in accordance with completion date. However, 10 percent (10%) of the value of the entire order may be retained until the completion of the contract.
51. PAYMENTS FOR EQUIPMENT, INSTALLATION, AND TESTING: When equipment involves installation (which shall also be interpreted to mean erection and/or setting upon or placing in position, service or use) and test, and where such installation or testing is delayed, payment may be made on the basis of fifty percent (50%) of the contract price when such equipment is delivered on the site. A further allowance of twenty five percent (25%) may be made when the equipment is installed and ready for test. The balance shall be paid after the equipment is tested and found to be satisfactory. If the equipment must be tested, but installation is not required to be made by the Contractor or if the equipment must be installed but testing is not required, payment may be made on the basis of seventy five percent (75%) at the time of delivery and the balance shall be paid after satisfactory test or installation is completed.
52. PAYMENTS TO SUBCONTRACTORS: Within seven (7) days after receipt of amounts paid to the Contractor by the City for work performed by subcontractor under that contract, the Contractor shall either (a) pay the subcontractor for the proportionate share of the total payment received from the City attributable to the work performed by the subcontractor under that contract; or (b) notify the City and subcontractor, in writing, of Contractor's intention to withhold all or a part of the subcontractor's payment with the reason for nonpayment. The Contractor must pay interest at the rate of one percent per month unless provided otherwise to the subcontractor on all amounts owed by the Contractor that remain unpaid after seven days following receipt by the Contractor of payment from the City for work performed by the subcontractor under that contract, except for amounts withheld as allowed in (b) above. The Contractor's obligation to pay an interest charge to a subcontractor may not be construed to be an obligation of the City.

In order to receive payment, individual Contractors must provide their social security numbers; and proprietorships, partnerships, limited liability companies, and corporations must provide their federal employer identification numbers on a completed Federal W-9 form.

GENERAL

53. GENERAL GUARANTY: Contractor agrees to:
- a. Indemnify and save the City, its agents and employees harmless from any claim or liability of any nature or kind for unauthorized use of any copyrighted or uncopyrighted compositions, secret process, patented or unpatented invention, article or appliance furnished or used in the performance of the contract.
 - b. Protect the City against latent defective materials or workmanship and to repair or replace any damages or marring occasioned in transit or delivery.
 - c. Furnish adequate protection against damage to all work and to repair damages of any kind, to the building or equipment, to his/her own work or to the work of other contractors, for which his/her workers or those providing work through Contractor are responsible.
 - d. Pay for all permits, licenses and fees and give all notices and comply with all laws, ordinances, rules and regulations of the United States, State, County, and City.
 - e. Protect the City from loss or damage to City-owned property while it is in the custody or control of the Contractor.
54. SERVICE CONTRACT GUARANTY: Contractor agrees:
- a. To furnish services described in the solicitation at the times and places and in the manner and subject to conditions therein set forth, provided, however, that the City may reduce the said service at any time.
 - b. To enter upon the performance of services with all due diligence and dispatch; assiduously press to its complete performance and exercise therein the highest degree of skill and competence.
 - c. All work performed and services rendered shall strictly conform to all laws, statutes, regulations, and ordinances and the applicable rules, regulations, methods and procedures of all government boards, bureaus, offices, and other agencies.
 - d. Said services may be inspected by an employee of the City at any reasonable time and place selected by the City. The City shall be under no obligation to compensate Contractor for any services not rendered in strict conformity with the contract.
 - e. The presence of a City/County/State Inspector shall not lessen the obligation of the Contractor for performance in accordance with the contract requirements or be deemed a defense on the part of the Contractor for infraction thereof. The Inspector is not authorized to revoke, alter, enlarge, relax, or release any of the requirements of the contract documents. Any omission or failure on the part of the Inspector to disapprove or reject any work or material shall not be construed to be an acceptance of any such defective work or material.
55. INDEMNIFICATION: Contractor shall indemnify, keep and save harmless the City, its agents, officials, employees, and volunteers against all injuries, death, loss, damage, claims, patent claims, suits, liabilities, judgements, costs and expenses, (collectively "Losses") which may or otherwise accrue against the City in consequence of the granting of a contract or which may or otherwise result therefrom, if it shall be determined that the Loss was caused through negligence or omission by the Contractor or its employees, of any subcontractor of Contractor or its employees, if any, or providing goods or services through Contractor, and the Contractor shall, at his own expense, appear, defend and pay all charges of attorneys and all costs and other expenses arising therefrom or incurred in connection therewith. If any judgment shall be rendered against the City in any such action, the Contractor shall at his own expense, satisfy and discharge the same. Contractor expressly understands and agrees that any performance bond or insurance

protection required by this contract, or otherwise provided by Contractor, shall in no way limit the Contractor's responsibility to indemnify, keep and save harmless and defend the City as herein provided.

56. OFFICIALS NOT TO BENEFIT: Each bidder shall certify, upon signing a bid, that to the best of his or her knowledge no City official or employee having official responsibility for the procurement transaction, or member of his or her immediate family, has received or will receive any financial benefit relating to the award of this contract. If such a benefit has been received or will be received, this fact shall be disclosed with the bid or as soon thereafter as it appears that such a benefit will be received. Failure to disclose the information prescribed above may result in suspension or debarment or rescission of the contract made, or could affect payment pursuant to the terms of the contract.

Whenever there is reason to believe that benefit of the sort described in paragraph a has been or will be received in connection with a bid or contract, and that the Contractor has failed to disclose such benefit or has inadequately disclosed it, the City, as a prerequisite to payment pursuant to the Contractor, or at any time, may require the Contractor to furnish, under oath, answers to any questions related to such possible benefit.

In the event the bidder has knowledge of benefits as outlined above, this information should be submitted with its bid. If the above does not apply at time of award of contract and becomes known after inception of a contract, the bidder shall address the disclosure of such facts to the Procurement Manager. The relevant Invitation for Bid Number (see cover sheet) should be referenced in the disclosure.

57. CITY LICENSE: All firms doing business in the City are required to be licensed in accordance with the City's Business, Professional, and Occupational Licensing Tax Ordinance. Wholesale and retail merchants without a business location in Lynchburg are exempt from this requirement. Questions concerning the BPOL tax should be directed to the Office of the Commissioner of Revenue, phone: 434-455-3880.
58. REGISTERING OF CORPORATIONS: In accordance with the Code of Virginia, any foreign corporation, partnership or limited liability company transacting business in Virginia is required to secure a certificate of authority from the Virginia State Corporation Commission. Contractor shall ensure it is duly registered in Virginia and such status shall be maintained during the term of the contract
59. COVENANT AGAINST CONTINGENT FEES: The Contractor warrants that no person or selling agent has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by the contractor for the purpose of securing business. For violation of this warranty, the City shall have the right to terminate or suspend this contract without liability to the City, or in its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of such commission percentage, brokerage, or contingent fee.
60. VIRGINIA FREEDOM OF INFORMATION ACT: All proceedings, records, contacts and other public records relating to procurement transactions shall be open to the inspection of any citizen, or any interested person, firm or corporation, in accordance with the Virginia Freedom of Information Act, except as provided in Virginia Code § 2.2-4342 and paragraph 16 of this bid document.
61. SECTION 2.2-4311.1 CODE OF VIRGINIA – ILLEGAL ALIENS: The Contractor agrees that he does not, and shall not during the performance of this contract knowingly employ an unauthorized alien as defined in the federal Immigration Reform and Control Act of 1986.
62. COOPERATIVE PROCUREMENT: This procurement is being conducted by the City of Lynchburg in accordance with the provisions of 2.2-4304 CODE OF VIRGINIA. Except for contracts for architectural and engineering services, if agreed to by the contractor, other public bodies may utilize this contract. The Contractor shall deal directly with any public body it authorizes to use the contract. The City, its officials and staff are not responsible for placement of orders, invoicing, payments, contractual disputes, or any other transactions between the Contractor and any other public bodies, and in no event shall the City, its officials or staff be responsible for any costs, damages or injury resulting to any party from use of a City

Contract. The City assumes no responsibility for any notification of the availability of the contract for use by other public bodies, but the Contractor may conduct such notification.

63. **PRECEDENCE OF TERMS AND CONDITIONS:** Any and all Special Terms and Conditions contained in this Invitation for Bid that may be in variance or conflict with these General Terms, Conditions, and Instructions shall have precedence over these General Terms, Conditions, and Instructions. If no changes or deletions to General Terms, Conditions, and Instructions are made in the Special Terms and Conditions, then the General Terms, Conditions, and Instructions shall prevail in their entirety.
64. **INSURANCE:**
- a. The contractor/vendor shall procure, maintain and provide proof of insurance coverage for injuries to persons or damages to property which may arise from or in connection with the work performed on behalf of the City by the contractor, his agents, representatives, employees or subcontractor. Such coverage shall be maintained by the contractor/vendor for the duration of the contract period.
1. **Broad Form Commercial General Liability:** (Occurrence Form CG0001, Ed. 11/88): \$1,000,000 CSL, BI & PD.
 2. **Automobile Liability:** Code 1 “ANY AUTO” (Form CA0001 Ed. 6/92): \$1,000,000 CSL, BI & PD.
 3. **Workers’ Compensation:** Statutory Amount.
 4. The insurance policies shall include or be endorsed to include the following provisions:
 - (1) The City of Lynchburg, Virginia, its officers/officials, employees, agents and volunteers (the City) shall be endorsed as “insureds” under the terms and conditions of the policies for liabilities which may arise out of the contractor/vendor’s operations or activities in these projects.
 - (2) The contractor/vendor shall send an **actual copy of the policy endorsement document** from the insurance carrier that provides this coverage (ISO Form CG20100704 or similar); **OR**, send an **actual copy of the policy endorsement** that provides blanket additional insured coverage when required by a written agreement (ISO Form CG20331001 or similar), to: Risk Management, 900 Church Street, Lynchburg, VA 24504, Phone: (434) 455-3815; Fax: (434) 847-1684.
 - (3) In addition to #2, above, the contractor/vendor shall provide the City with a certificate of insurance with applicable endorsements effecting coverages, signed by a person authorized by the insurance company to bind coverage on its behalf. Certificates of insurance shall be received by the City within 5 days of notice of intent to award.
 - (4) Any deductibles or self-insured retentions applicable to required coverages shall be paid by the contractor/vendor, and the City shall not be required to participate therewith.
 - (5) The contractor/vendor shall agree to provide the City with 30 days written notice of any cancellation of or reduction in the required coverages.
 - (6) The insurance required hereunder shall be primary and any insurance or self-insurance maintained by the City shall be excess of the contractors/vendors insurance and shall not contribute therewith.
 - (7) Failure of the contractor/vendor to comply with any reporting provisions of the insurance policies required hereunder shall not affect coverage provided to the City.
 - (8) All rights of subrogation against the City shall be waived.

- (9) All coverages for subcontractors of the contractors/vendors, if any, shall be subject to all of the requirements stated herein.

BIDDER/CONTRACTOR REMEDIES

65. PROTEST OF AWARD OR DECISION TO AWARD: The following are the exclusive procedures for a bidder or offeror to protest the City's award or decision to award a contract. A protest may not be based upon the alleged non-responsibility of a person to whom the City awards or makes a decision to award a contract.
- a. Any protest to award a contract shall be in writing and shall be delivered so that it is received by the City Manager not later than five (5) business days after announcement of the award or decision to award, whichever comes first. Otherwise any such protest shall be deemed to be waived.
 - b. Except for a protest of an emergency or sole source procurement, a protest of a City award or decision to award a contract may only be made by a person who submitted a bid or proposal for the procurement at issue and who was reasonably likely to have its bid or proposal accepted but for the City's decision. In the case of an emergency or sole source procurement, a protest may only be made by a person who can show that he was reasonably likely to have submitted a successful bid or proposal if the procurement had been other than emergency or sole source.
 - c. Protests shall only be granted if (1) the protester has complied fully with Sec. 18.1-6 of the Lynchburg Public Procurement Code and there has been a violation of law, the Lynchburg Public Procurement Code, or mandatory terms of the solicitation that clearly prejudiced the protester in a material way, or (2) a statute requires voiding of the decision.
 - d. The City Manager shall issue a written decision on a protest within ten (10) days of its receipt by the City Manager.
 - e. If the protest is denied, the protester may only appeal the denial or otherwise contest or challenge the procurement by then filing suit in the Lynchburg Circuit Court, Lynchburg, Virginia, and serving the city with such suit within ten (10) days of such denial. Otherwise, the City Manager's decision shall be final and conclusive, and the protester's right to appeal the denial or to otherwise contest or challenge the procurement shall be deemed to be waived.
 - f. Strictly following these procedures shall be a mandatory prerequisite for protest of the City's award or decision to award a contract. Failure by a bidder to follow these procedures strictly shall preclude that bidder's protest and be deemed to constitute a waiver of any protest.
66. EXHAUSTION OF ADMINISTRATIVE REMEDIES: No bidder, offeror, potential bidder or offeror, or Contractor shall institute any legal action against the City until all administrative remedies available under the above paragraphs have been exhausted and until all requirements of the Lynchburg Public Procurement Code, and, to the extent applicable, the Virginia Public Procurement Act, have been met.
67. CONTRACTUAL CLAIMS AND DISPUTES: Any claim by a Contractor shall be resolved in accordance with the Lynchburg Public Procurement Code.
68. INSPECTION AND REVIEW OF RECORDS: The City reserves the right to perform or have performed inspections and reviews of the records of the Contractor for any service contract with the City and to have copies made of such records. Contractor shall maintain and preserve all such records, at its own expense, during contract performance and for a period of at least three years after the contract has terminated. At the City's request at any time during contract performance or within a period of three years after the contract has terminated, the Contractor shall promptly make all records available, at a location within the City of Lynchburg, to the City or those retained by the City, for inspection, review and copying.

INSTRUCTIONS TO BIDDERS

Sealed bids, subject to the specifications and conditions contained herein and attached hereto, will be received in the Procurement Division Office, Third Floor City Hall, 900 Church Street, Lynchburg, Virginia, 24504, until, but no later than **3:00 p.m.** Local Time Prevailing, **September 22, 2016**, and then publicly opened and read aloud in the Bidder's Room.

Any questions which may arise as a result of this solicitation may be addressed to Lisa Moss, CPPB, Buyer at 434-455-4228, or by email to lisa.moss@lynchburgva.gov. Inquiries must be received at least 7 business days prior to the due date in order to be considered. Contact initiated by a bidder concerning this solicitation with any other City representative, not expressly authorized elsewhere in this document, is prohibited. Any such unauthorized contact may result in disqualification of the bidder.

To be considered, your bid must be submitted on a copy of this Invitation for Bid. Bidders shall sign in the space provided on the Terms and Signature Sheet and return all required documents with bid. Mark outside of your envelope with **Invitation for Bid # 2017-014** and opening date of bid. Bids, to include addenda or changes to a response, shall not be accepted via Fax machine or by Internet E-mail. Any bid received after the announced time and date for submittal, whether by mail or otherwise, will be rejected. The time of receipt shall be determined by the time clock stamp in the Procurement Division. Bidders are responsible for ensuring that their bids are stamped by Procurement personnel before the deadline indicated.

Nothing herein is intended to exclude any responsible vendor, his product or service or in any way restrain or restrict competition. All responsible vendors are encouraged to bid.

For information pertaining to this solicitation, including bid documents, addenda, bid tabulation and notice of award, bidders may access public notification electronically on the Procurement website: <http://www.lynchburgva.gov/current-solicitations>.

PURPOSE

The purpose of this Invitation for Bid (IFB) is to obtain bids for the purchase of a new multipurpose unit with interchangeable snow blower, broom sweeper, & snow plow attachments for the removal of snow at the Lynchburg Regional Airport. The unit must meet the technical specifications outlined in the technical specifications

BASIS OF AWARD

Award will be made to the lowest responsive and responsible bidder based on the total base bid.

SCOPE OF WORK

See specifications attached.

SPECIAL INSTRUCTIONS:

Bids received without certified records of compliance tests conducted on standard production models and/or without proof of tests by an operational and component check list with date performed and signature of tester(s), will be considered non-responsive and will not be considered.

Bids are to include the following documentation:

- Buy American Certification Form**
- Engineering hydraulic power calculations**

TERMS AND SIGNATURE SHEET

All bids shall be signed on the Terms and Signature Sheet in order to be considered.

All prices shall be F.O.B.: Destination, Airfield Maintenance Building, 618 Hangar Road Lynchburg, VA 24502. Freight, delivery costs, and incidental charges shall be included in the bid price(s).

In compliance with this Invitation for Bid #2017-014 and subject to all conditions thereof, the undersigned offers and agrees to furnish any or all items and/or services upon which prices are quoted, at the price quoted as specified.

My signature below certifies:

- a. I agree to abide by all conditions of this Bid and that I am authorized to sign this Bid.
- b. The accompanying bid is not the result of or affected by, any act of collusion with another person or company engaged in the same line of business or commerce, or any act of fraud punishable under, Chapter 12, Title 18.2, 498.4 of the Code of Virginia, 1950, as amended. Furthermore, I understand that fraudulent and collusive bidding is a crime under the Virginia Governmental Frauds Act, the Virginia Government Bid Rigging Act, the Virginia Anti-Trust Act, and Federal Law and can result in fines, prison sentences, and civil damage awards.
- c. The accompanying bid is in compliance with the State and Local Government Conflict of Interests Act 2.2-3100, supplemented by Article 6, 2.2-4367-69 of the Code of Virginia. Specifically, no City employee, City employee's partner, or any member of the City employee's immediate family holds a position with the bidder, offeror, or contractor such as an officer, director, trustee, partner or the like, or is employed in a capacity involving personal and substantial participation in the procurement transaction, or owns or controls an interest of more than five percent.

Acknowledge receipt of addenda here: No. ____ Date: _____ No. ____ Date: _____

Complete Legal Name of Company: _____

Order From Address: _____

Remit To Address: _____

Signature: _____

Email: _____

Name(type/print): _____

Title: _____

Fed ID No.: _____ Phone: _____ Fax: _____

We hereby provide the following information to the City regarding our business. We understand that it is provided for statistical purposes only and all firms submitting bids will receive equal consideration.

Minority-Owned Business: Yes _____ No _____

Women Owned Business: Yes _____ No _____

Lynchburg Business: Yes _____ No _____

BID PRICING SHEET

| ITEM | DESCRIPTION | Quantity | Unit | Unit Price | Total Price |
|-------------|--|-----------------|-------------|-------------------|--------------------|
| 1 | Multipurpose Unit (Training included) | 1 | Each | | |
| 2 | Snow Blower Attachment | 1 | Each | | |
| 3 | Broom Sweeper Attachment | 1 | Each | | |
| 4 | Snow Plow Attachment | 1 | Each | | |
| | TOTAL BASE BID: | | | | |

Notes:

1. Prices quoted shall include all delivery charges.
2. Prices quoted shall remain valid for fifteen (15) months from date of original bid.
3. The quantities listed above indicate the actual number of items that may be requested by the City from the successful bidder. However, the City reserves the right to increase and/or decrease any of the item quantities listed in the bid pricing sheet. Each bidder, by submitting a bid, hereby agrees to this provision.
4. The City of Lynchburg reserves the right to purchase additional items listed on this bid for future projects during the life of the contract.

Questions to Bidder

Bidders are to respond to the following question: Have the individual(s), owner(s), or principal officer(s) of the firm submitting the bid ever been convicted of a felony or a misdemeanor involving moral turpitude, which would adversely affect the ability to perform the contract?

YES _____ NO _____

If yes, list individual or officer and title and give details.

NOTE: Answering yes to this question will not necessarily exclude your company from consideration but will be used to weigh the relationship between the offense and the contract to be performed.

Is your firm currently involved in litigation which would adversely affect performance on this contract?

YES _____ NO _____

Limited Liability Form

All Prospective Firms Must Respond To The Following

If a limited liability company, limited liability partnership, or a limited partnership indicate below:
Check one:

___ Limited Liability Company

___ Limited liability partnership

___ Limited partnership

Have you registered with the State Corporation Commission, to conduct business in Virginia?

Yes No If yes, State Corporation Commission # _____

Name(s) and address(es) of the individuals that formed the limited liability organization:

List who is authorized to execute contracts: _____

If conducting business under an assumed business name, fill out the following information:

Name of assumed business: _____

Owner's name and address: _____

Registration date: _____ Expires: _____

If conducting business as a sole proprietorship, fill out the following information:

Individual's name liable for all obligations of business: _____

If you are a sole proprietor using an assumed name, please list below:

Registration date: _____ Expires: _____

LYNCHBURG REGIONAL AIRPORT

LYNCHBURG, VIRGINIA

**TECHNICAL SPECIFICATIONS
FOR
SNOW REMOVAL MULTIPURPOSE UNIT
WITH BLOWER, BROOM SWEEPER,
& SNOW PLOW ATTACHMENTS**

C&PE Project Number 1403-01

August 2016



CAMPBELL & PARIS ENGINEERS

LYNCHBURG REGIONAL AIRPORT
*SNOW REMOVAL MULTIPURPOSE UNIT
WITH BLOWER, BROOM,
& SNOW PLOW ATTACHMENTS*

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TECHNICAL SPECIFICATIONS

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**EQUIPMENT
DESCRIPTION**

In accordance with FAA requirements the snow removal multipurpose unit with blower, broom sweeper, and snow plow attachments must be designed and manufactured in the United States, for the specific purpose of snow removal. The unit shall be capable to blow, sweep, or plow 2,027,927 square feet of paved area at an anticipated operating speed of 25 MPH. The unit shall be designed and line built by the original manufacturer as a 4 X 4 and shall be all wheel drive.

Aftermarket conversions of 4 X 2's are not desired and are not acceptable.

The vehicle may be driven on highways and other public roadways and shall comply with all applicable Federal Motor Carrier Safety Regulations (FMCSR) and Federal Motor Vehicle Safety Standards (FMVSS).

The vehicle shall comply with all applicable requirements of the most current FAA Advisory Circular (AC) 150/5220-20 Airport Snow and Ice Control Equipment and must be in accordance with all applicable Society of Automotive Engineers (SAE) Aerospace Recommended Practices (ARP).

All materials, parts, and components of the unit shall be new and of the size, material and strength to sustain the maximum load limits and severe operating conditions encountered in snow removal operations, while resulting in minimum wear and failure. All materials, parts, and components used shall be heavy duty and manufactured and/or treated to resist rust, corrosion, and wear.

All electrical wiring shall be either harness, cable, split loomed, or shrink wrapped, and shall be watertight and weatherproof. All junction boxes shall be watertight and weatherproof. Wiring shall be secured every 18 inches by means of clips and/or hangars. All electrical wiring shall be color-coded, wire numbered, matching drawing schematics and terminal strip, and labeled what it is used for every three inches.

All items of design and equipment not listed in these specifications, but involved in carrying out their intent, are required to be furnished by the bidder, the same as if these items were specifically mentioned and described in these specifications. This includes but is not limited to software.

The unit must be fully assembled and full functionally tested prior to delivery by a qualified factory representative. If any component(s) of the unit is found to be incomplete, missing, or not fully functional then the unit will not be delivered.

In accordance with FAA AC 150/5220-20, Chapter 8, General: The manufacturer shall be responsible for conducting tests to ensure that its snow and ice control equipment meets the operational and performance requirements it advertises. Certified records of these compliance tests shall be submitted by the manufacturer with each response to an invitation to bid. Equipment tests shall be conducted on standard production models and not on specially constructed prototypes.

Proof of tests by an operational and component check list with date performed and signature of tester(s) is required with the delivery of the unit(s)

Bids received without certified records of compliance tests conducted on standard production models and/or without Proof of tests by an operational and component check list with date performed and signature of tester(s) will be considered non-responsive and will not be considered.

TRAINING

The unit must be fully assembled and tested prior to delivery. Shipping cost is the responsibility of the bidder. A qualified factory representative must fully install, start-up, and test the unit prior to training. Training shall be performed by factory trained, authorized and certified technicians. The training shall be performed at the customer's site and shall be a minimum 16 hours for operators training and an additional minimum 8 hours for mechanics training (mechanics shall attend the operating training first). The purpose of the training is to review safe and effective procedures for use and maintenance of the machine, review and test all systems, assure the full foundation of the machine. The successful bidder shall provide a complete breakdown of training cost when request by the owner. All cost associated with startup and training shall be incidental to Item 1 – Multipurpose Unit.

Training shall include as a minimum the following:

- Operating procedures per operating manual
- Break-in procedures
- Equipment limitations
- Operator maintenance
- Safety
- Cold weather operations
- Jump starting
- Welding on equipment
- Instruments and controls
- Equipment operation

Days and hours of training will be determined by the Lynchburg Regional Airport Commission. The airport is open 365 days a year 7 days a week 24 hours a day and the need for late evening or early morning training could be required. No training would be required during nationally recognized holidays.

The successful bidder shall provide a minimum of two weeks of advanced operational and maintenance training for two service technicians at the broom and chassis manufacturing facilities or other designated training facilities of the manufacturer. Tuition, travel, meals, lodging, and incidental fees in providing advanced training are the responsibility of the bidder. Lynchburg Regional Airport Commission service technicians can wear their uniforms during training. The advanced training shall be provided within 14 months of the award of bid. Training shall not take place between December 16 and March 14 of the following year. The dates of training must be given to the Lynchburg Regional Airport Commission at least four weeks prior to the day training starts. The advanced training must be of the "hands on" type; classroom instruction followed up by actual shop participation in performing what was discussed. Class size for advanced training should be limited to create an optimal learning environment. Advanced training classes should be no smaller than 6 students to ensure open discussion and an exchange of ideas and no larger than 14 students to assure personalized attention. The advanced training must cover all aspects of equipment purchased and should be conducted in two (2) parts. The first half or week should cover universal maintenance with the second half or week covering electronic maintenance. The universal maintenance portion of the advanced training at a minimum must cover vehicle familiarization including but not limited to cab controls, chassis, attachments, engines, transmission, hydraulic, air, and electrical systems; the technician will learn proper operation, lubrication, adjustments, and troubleshooting of the unit bid. The electronic maintenance portion of the advanced training at a minimum must cover but not be limited to theory, operation and logic of advanced electronic systems, interfacing and diagnostics of the drive engine, transmission, auxiliary engine, and various command systems; the technician will learn to identify the electronic system components, understand component operation, practice component diagnostics and repair, and be introduced to computer-based electronic software used for parameter monitoring, system diagnostics, and troubleshooting.

The successful bidder shall provide the following product support information: two complete sets of manuals (operators, parts, and service) including schematics, CAD drawing, and desktop published photos for each component of the vehicle.

One set shall be CD Rom version and one set shall be standard hard copy.

QUALITY AND SAFETY STANDARDS

Vehicle manufactures certifies that the vehicle meets or exceeds FMVSS 571-103 (windshield defrosting and defogging systems in accordance with J1944 and J198) requirements based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds FMVSS 571-101 (controls and displays) requirements based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds FMVSS 571-108 (lamps, reflective devices, and associated equipment) requirements based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds FMVSS 571-120 (tire selection and rims for motor vehicles other than passenger cars) requirements based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds FMVSS 571-121 (air brake systems) requirements based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds FMVSS 571-206 (door locks and door retention components) requirements based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds FMVSS 571-207 (seating systems) requirements based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds FMVSS 571-209 (seat belt assemblies) requirements based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds FMCSR 205 (glazing for windows) based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds FMCSR 302 (flammability of interior materials) based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds FMCSR 393-65 (fuel systems and fuel tank) based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds FMCSR 393.94 (vehicle interior noise levels requirements) based on documented test results. Documented test results shall be provided with the bid or prior to delivery of the vehicle.

Vehicle manufacturer certifies that the vehicle meets or exceeds 40 CFR CH.1 (pass by noise levels in accordance with SAE J366) requirements based on documented test results. Documented test results shall be provided with the bid prior to delivery of the vehicle.

WARRANTIES

All keys shall be provided in duplicate

A complete list of all replaceable filters cross referenced to Fleet Guard must be provided at or before delivery of the unit.

One complete set of extra filters shall be provided for the vehicle.

Only components or systems with a minimum guarantee, against defects in material and workmanship, of one year may be bid with this vehicle.

The vehicle itself shall be guaranteed against defects in material and workmanship for a minimum period of two (2) years.

The axles shall be warranted against defects in material and workmanship for a minimum of three (3) years.

The frame rails shall be warranted for 10 years against defects in material and workmanship.

The cab shall be warranted against inside-out penetrating corrosion for 10 years or 100,000 miles, whichever occurs first.

The vehicle and any of its components or systems with an original manufacturer's standard warranty lasting longer than the minimum required will carry the original manufacturer's standard warranty.

Snow blower chassis manufacturer shall supply a statement on their company letterhead. The statement shall contain an affirmation that the snow blower chassis meets all functionality and capacity requirements. The statement shall also contain an affirmation that the snow blower attachment configuration meets the chassis manufacturer's requirements.

Snow blower attachment manufacturer shall supply a statement on their company letterhead. The statement shall contain an affirmation that the snow blower attachments meet all functionality and capacity requirements. The statement shall also contain an affirmation that the snow blower chassis configuration meets the attachment manufacturer's requirements.

END OF ITEM EQUIPMENT

MULTIPURPOSE UNIT

1.1 - Chassis

The chassis proposed in this bid shall be the manufacturer's latest model and design. It shall allow easy interchange of all the attachments specified in the technical specifications section of this document.

The chassis shall be designed to permit easy and safe mounting and dismounting of the unit for the operators and service personnel following FMCSR standards. The chassis shall have a full width heavy-duty channel type rear bumper with a minimum 12 inch height, to provide protection to the rear of the vehicle. This shall include, but is not limited to the engine, radiator, and protective cowling. The rear bumper shall be painted alternating four (4) inch stripes of FAA approved chrome yellow and black to insure compliance with the most current update of FAA AC 150/5210-5 Painting, Marking, and Lighting of Vehicles Used on an Airport.

No exceptions will be allowed.

The Gross Vehicle Weight Rating (GVWR) shall meet or exceed all minimum requirements for a snow blower to fully meet functionality and capacities of the unit, but shall have no less than a GVWR of 50,000 pounds. The vehicle shall have a maximum weight such that when all liquids required to operate are at full volume and the unit is under maximum listed load capacities with attachments stated the GVWR is not exceeded.

The unit shall be designed for speeds up to 25 MPH during snow removal operations on aprons, ramps, taxiways, and runways.

The design of the unit shall ensure positive tire-to-ground tractive effort while blowing.

1.2 - Engine

The vehicle engine shall be of internal combustion, diesel design having a minimum of six cylinders. It shall be able to meet the performance characteristics specified herein on commercial grade 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.

Axel

The front Gross Axel Weight Rating (GAWR) shall meet or exceed all minimum requirements for a snow blower to fully meet functionality and capabilities of the unit, but shall have no less than a GAWR of 27,000 pounds. The rear GAWR shall meet or exceed all minimum requirements for a snow blower to fully meet functionality and capabilities of the unit, but shall have no less than a GAWR of 23,000 pounds.

The vehicle shall have the axle width required for the snow blower to meet all functionality and capacity requirements of the unit. The axle width shall meet the requirements needed by the body builder. The measurements from the center of the rear axle to the end of the frame shall be no less than the minimum needed by the body builder.

The front and rear axles shall be a full floating, torsion flow type, with a single reduction hypoid gear design, capable of withstanding the loads of the unit being bid.

Double reduction type axles and hubs will not be acceptable.

The front and rear axle shall be of the drive/steer type, shall have a minimum ten (10) inch ground clearance, and a limited slip differential is required.

The steering-drive wheel ends shall be bolted to and removable from the center section of the axle housing.

The cardan drive type joints shall be enclosed in a ball and socket.

The trunnion pins shall be supported by high capacity low friction spherical bushings to insure long life and smooth steering at all cramp angles. The cramp angle of the wheels shall be a minimum of 25 degrees.

The vehicle's angle of departure shall be no less than 20 degrees.

Mud flaps shall be provided behind both axles and in front of the rear axle to reduce snow and debris on the unit.

1.3 - Suspension

The front suspension shall meet or exceed all minimum requirements for a snow blower to fully meet functionality and capabilities of the unit, but shall have no less than a 27,000 pound front suspension

The rear suspension shall meet or exceed all minimum requirements for a snow blower to fully meet functionality and capabilities of the unit, but shall have no less than an 18,000 pound rear suspension.

1.4 - Wheel Base

The vehicle shall have the minimum wheelbase required for the snow blower to meet all functionality and capacity requirements of the unit and to have the shortest turning radius possible.

The blower's minimum turning radius using two-wheel steering only shall be less than 100 feet.

The blower's minimum turning radius using all-wheel steering only shall be less than 50 feet.

1.5 - Frame

The chassis frame height shall meet all functionality and capacity requirements of the unit including stability, clearance, and overall unit height.

The rail strength shall meet or exceed minimum requirements for the snow blower to fully meet functionality and capacities of the unit, but shall have no less than 110,000 PSI yield strength.

The resisting bending moment (RBM) shall meet or exceed all minimum requirements for the snow blower to fully meet functionality and capacities of the unit, but shall have no less than a 2,500,000 inch pound RBM per rail.

All sheet metal, cowling, steps, and fenders shall be free of sharp edges and protrusions. All materials for cowling, shrouds and fenders shall include ample supports and bracing to prevent distortion and cracking.

All steps or walkways shall be raised lug or expanded metal type construction.

Grab bars shall be installed as required for safe mounting and dismounting by personnel. Grab handles/bars shall be installed as required to maintain a constant three (3) point contact during all mounting and dismounting activities. Grab handles/bars shall be composed of a one (1) inch diameter minimum round only, no sharp edges or corners for safety, tactilely rough material for improved grip. A full length vertical grab bar shall be installed behind each door. The inside of each door shall include a one (1) foot minimum grab handle positioned under the window.

The frame shall be of Grade 8 bolted construction. It shall be of heat treated single channel carbon manganese steel rails connected by an adequate number of cross members to resist frame distortion from lateral stress expected in this application under maximum load conditions. The minimum bar size shall be 12.375 inches x 3.875 inches x 0.375 inches. The frame shall be an industry standard nominal 34 inch width.

An integral front frame extension shall be provided. There shall be no notches in the frame to accommodate the extension.

Frame liners, wrappers, fish plating, or bolt on extensions are not acceptable.

The vehicle shall have two (2) D-rings of sufficient size and strength mounted to the front and to the rear of the vehicle on a frame of adequate strength to allow towing and/or lifting of the unit. D-rings shall be mounted so as to prevent damage to the vehicle while it is being towed or lifted. D-rings shall be mounted to the frame in an easily accessible location for towing or lifting of the vehicle.

Hooks are not acceptable.

1.6 - Cooling System

The cooling system shall consist of a heavy duty radiator, horizontal or vertical flow cooling with the tanks and side members bolted together for a rigid frame. The cooling system shall be filled with permanent type antifreeze protecting the system to a minimum of negative 34 degrees Fahrenheit. Coolant temperatures shall not exceed 212 degrees Fahrenheit nor be less than 140 degrees Fahrenheit when operated in ambient temperatures during snow removal operations. A coolant filter and silicone radiator and heater hoses shall be provided.

The tanks and the core shall be constructed of aluminum or constructed of steel with the cores constructed of copper and

brass. Support rods and rubber vibration isolating pucks shall be supplied and placed to adequately protect the unit.

A thermostatically controlled, reversible type fan shall be provided. Even upon failure of the thermostat, the design of the system shall allow the engine to continue temporary operation without overheating.

The engine shall be equipped with an automatic belt tensioning device. The fan belt shall be serpentine type.

Certification and proof of carrier engine cooling tests is required with the delivery of the unit.

1.7 - Fuel System

The fuel system shall comply with Title 48 and shall be designed to eliminate the possibility of vapor lock. The system shall include a fuel injector, choke system, fuel pump, fuel strainers, dry filter type air cleaners, fuel lines, valves, drains, and all other accessories or required items to provide a complete operational system.

The fuel tanks shall have a minimum total capacity of 250 gallons. It is desired that the fuel tanks shall have the capacity to supply fuel continuously with an uninterrupted flow to the engine for a period of not less than 12 hours while it is operating at its rated horsepower under normal conditions and a capacity of not less than eight (8) hours is required.

The tanks shall be constructed of heavy gauge steel and be properly fastened to the frame. The tanks shall have four inch diameter filler necks with chain connected caps and brass tank drain plugs. Fuel tanks shall be interconnected to allow equalized fuel so fueling of can be done only from one side or the other without shutoff valves at each end. The tanks shall be placed so fueling can be easily done from ground level. The fuel tanks shall be painted bright green, color to be DuPont Centari Signal Green, or equivalent. **No Exceptions.**

A heated fuel water separator with 200-watt heater to remove water and contamination in the fuel supply shall be installed in the supply line to each engine.

All engines shall use the same fuel tanks.

1.8 - Transmission

The transmission shall be a heavy duty fully automatic RDS series of the latest model design of the manufacture and shall perform to all applicable usage criteria as it pertains to the GVWR of the vehicle and its intended use.

Light or medium duty transmissions are not acceptable.

Drivetrains shall be in conformance with SAE requirements and shall be designed to minimize the number of joints.

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. The transmission shall be supplied with the appropriate torque converter for this application. The torque converter shall not operate at less than 70%.

Shifting shall be accomplished via a shift control within easy reach of the operator. The gear range selector shall have all positions clearly identified and readable in bright and no light conditions.

A low transmission oil level sensor system shall be included in the electronic transmission.

Transmission and vehicle manufactures shall provide an application approval at the time of vehicle delivery, which states the transmission is suitable for use in the vehicle as configured.

1.9 - Transfer case

Transfer case assemblies shall provide positive drive to the front and rear axles and shall be of single or dual speed design.

The transfer case shall contain a differential which automatically proportions torque between the front and rear axles as needed.

The Transfer case shall have a torque transmission capacity exceeding the maximum torque developed by the engine and transmission, and shall be approved for the application and be manufactured by the chassis builder.

Transfer case and vehicle manufacturers shall provide an application approval at the time of vehicle delivery, which states the transfer case is suitable for use in the vehicle configured.

1.10 - Steering

The four (4) wheel steering system shall allow the vehicle with blower attached to accomplish a complete wall to wall turning circle of 50 feet or less to assure the blower can be turned within the confines of a taxiway without damage to lighting or infield surfaces and to ensure good maneuverability when traveling through congested areas. Four (4) wheel steering shall be electronically coordinated through the standard steering wheel.

The system shall consist of a mechanical front steering system with hydraulic assist. Front axle steering shall be integral hydraulic power assist gear type. The steering gear shall be rated for heavy duty service.

The system shall consist of the front and rear driving, steerable axles.

The electronic over hydraulic controlled rear axle steering system shall operate in conjunction with the mechanically controlled front wheel steering system. 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.

The system shall consist of various hydraulic control valves, wheel position sensors, speed sensor, and a steering cylinder located on the rear axle.

The steering system Electronic Control Unit (ECU) is integral to the vehicle ECU. The ECU shall not switch modes unless the front axle crosses center for operator safety. If the front axle does not cross center the system shall remain in the previous mode until the front axle crosses center. The rear wheels must also be in the straight ahead position before the mode change occurs. The mode switch shall be active at all times.

A selector switch within easy reach of the operator shall provide the option of front steer only, crab steer, or coordinated front/rear steer. All of the four (4) wheel steering system controls are to be located in the cab easily accessible to the operator. The all-wheel steering system must be pre-programmed with multiple steering modes for improved maneuverability. The operator shall have the ability to select the desired mode of operation "on the go" with provisions made for safe transition from one mode to the other. A thumb switch control on the joystick shall be provided for controlling rear steer only. An indicator shall be provided in the cab to display mode selected and rear wheel position. The system must include a wheel position indicator which shows the front and rear axle position at all times. An auto-center feature shall assist in relocating the rear axle to the straight ahead position after use of the operator controlled rear steer mode. A mode indicator feature shall be part of the system consisting of one of four icons on the operator display indicating which mode is selected and whether the rear axle is locked.

The system shall include safety provisions for dampening of all wheel steer effects at higher speeds, but it shall also allow full operation while the vehicle is moving at lower speeds. Safety dampening of all wheel steer effects shall be related to vehicle speed

When in Front Steer mode, the rear axle is locked and does not steer. This mode is used when enhance maneuverability is not needed or during operations at speeds greater than 25 mph.

When in Coordinated Steer mode, the operator shall have the tightest turning radius of any of the available modes. When the front axle is steered, the rear axle turns in the opposite direction of the front and enhances maneuverability. This mode shall have a deadband feature allowing the vehicle front axle to be turned a predetermined number of degrees in either direction before the rear axle steers. The deadband shall vary according to the speed of the vehicle.

When in Crab Steer mode, the front axle is steered, the rear axle steers in the same direction as the front axle. This makes the vehicle travel in a diagonal motion. This mode shall have a deadband feature allowing the vehicle front axle to be turned a predetermined number of degrees in either direction before the rear axle steers. The deadband shall vary according to the speed of the vehicle.

When in Operator Controlled Rear Steer mode, the rear axle shall be controlled only by a dedicated control in the cab, independent of the front wheel position. The hydraulic locks shall remain operational; however, the mechanical lock is disengaged (unlocked) at all times when in this mode.

A password shall be provided which will allow supervisory personnel to "lockout" or "enable" operation of the all-wheel steering system. This password is included to insure that only those operators who are qualified to operate the all-wheel steering system are permitted to do so.

1.11 - Springs

The vehicle shall be equipped with a current production model suspension system having a minimum rated capacity equal to the GVWR of the carrier vehicle.

The system capacity may be determined by taking measurements from ground level with the vehicle loaded to its rated GVWR and the attached equipment in its storage position.

The unit shall have alloy steel springs of the parabolic taper type.

The front springs shall have a minimum 27,000 pound rating.

The rear springs shall have a minimum 18,000 pound rating.

The spring hangers, pins, and supports shall be heavy duty to give long life.

The pins shall be of the grease type with substantial bronze bushings.

1.12 - Brakes

The service brakes shall be documented to conform to FMVSS 121 and shall be fully air actuated, drum and shoe, S-cam type front and rear.

Disc Brakes and Driveline Brakes are not acceptable.

The system shall have an air compressor with a minimum 16 CFM.

The parking brakes shall be spring actuated, air released at the rear service brake air chambers with the air switch mounted within the cab and in easy reach of the operator.

An electronic anti-lock brake system is required, 4 Sensor-4 Modules. The ABS system shall provide traction control for the rear axle to provide maximum available pushing power without operator interaction.

The air system for this unit shall be equipped with a frame mounted, heated Bendix AD-IS, or approved equal, air drier system.

Remote cable drains shall be provided for each air tank.

The engine shall also derate until traction is reestablished in addition to the brake system traction control.

1.13 - Wheels and Tires

Each tire shall have a rated carrying capacity at least equal to the loads imposed on them by a fully loaded vehicle measured at each wheel. The tires shall be 395/85 R20 XZL or approved equal.

The wheels shall be of the steel disc type with an 11.25 inch bolt circle. Single wheels shall be furnished for the front and rear axles. Supplied tires must be readily available from commercial truck tire outlets. One new extra wheel and tire mounted thereon shall be furnished with unit.

This unit shall be equipped with proper sized wheels and tires for the GAWR and the GVWR of the unit being bid. If the unit is equipped with more than one configuration of wheel and tire combinations, a spare shall be provided for each configuration.

All vehicle wheels, including spares, to be painted FAA approved Chrome Yellow to match the cab or be chrome finished.

1.14 - Cab

The cab of the unit shall be mounted center frame. The unit shall be designed for one-man operation with all controls within easy reach of the operator while sitting in a normal operation position. The operator shall be positioned slightly right of center. The cab shall accommodate operators up to and including height of 6'5" while seated in the normal operating position. The unit shall be equipped with two (2) auxiliary 12 volt power outlets located near center of cab for access by operator or passenger.

The minimum cab height shall be 132 inches as measured from the ground to the top of the cab. The minimum operational

height shall be 72 inches as measured from the ground to the floor of the cab where the operator seat is attached. The minimum maneuverability height shall be 60 inches as measured from the floor to the ceiling in both entering and debarkation movement areas of the cab.

The unit shall have two cab doors, one on the left and one on the right side. Cab doors shall be provided with full length stainless steel piano type hinges. Hinges shall be bolted to the door and bolted to the cab frame. Hinges shall not be welded to the doors or welded to the cab. Interior lower panels of doors shall include a nonmetallic liner to assist in sound absorption. Egress/ingress from either door will not be impeded in any way. A warning device is required to indicate door open, transmission in gear.

The unit shall have a fully enclosed, thermally and acoustically insulated, rust and corrosion resistant, metal, fiberglass, aluminum, and glass cab. The unit shall be acoustically insulated so as to achieve no more than 81 dB as measured 6 inches from the driver's ear at full engine RPM. The floor of the cab shall be insulated with a thermal-acoustical sound barrier floor mat. The interior of the cab shall be fully insulated, including the cab ceiling and walls.

The operator's seat shall be an air ride, high back, fully adjustable in the horizontal and vertical positions, adjustable arm rests, adjustable lumbar support, cloth covered, load adjustable, and furnished with a three point type safety belt. Custom right side adjustable arm rest shall contain joystick for implement control. Arm rest control shall include a vertical stow feature to facilitate easy egress/ingress of operator. A detent shall hold arm rest in the stowed position, with release control provided for operator. The trainer's/passenger's seat shall be an air ride, high back, cloth covered, equipped with a three point type safety belt, and stationed to the left of the operator's seat.

The unit shall have a panoramic, single piece or multi-section, windshield. The windshield shall have a minimum 2,500 square inch area. The unit shall have a heated windshield. The unit shall have power roll down type side windows, one on each side of the cab in each door, having a minimum 5 square foot area each. All windows shall be tinted safety glass, DOT approved and marked.

The unit shall have a minimum of four (4) heated electric variable speed wipers, providing operator an absolute, clear line of vision, providing a minimum of 75% swept surface of the windshield. The system shall include an automated sequence which soaks the windshield and performs wiper sweep with the press of a single button, minimizing dry wipe. Each upper door window on both sides of the unit shall have heated, pneumatic or electric variable speed, side wipers. The unit shall have dual, heated, motorized West Coast type mirrors with the manual control mounted in the cab within easy reach of the operator.

The unit shall be equipped with a "Windshield Deluge System" to maintain operator visibility during snow removal operations. The deluge system shall dispense windshield washer solvent at a minimum rate of four gallons per minute at the nozzles using at least a five gallon per minute pump. As a minimum, the deluge system shall consist of two discharge nozzles above the front windshield, one discharge nozzle above each side window, one discharge nozzle above the left and the right rear view mirrors, and the associated plumbing to make a fully functional system. The deluge system shall include a 16 gallon minimum reservoir with a site glass near the fill point. The reservoir shall be filled from the ground with the fill point conveniently located for the operator, but no higher than the bottom of the cab door. The deluge system discharge shall be controlled by a dash mounted switch in conjunction with the wiper controls. This system **shall not** rely on regular wet wiper discharge for function, but shall allow single shot discharge for best operation. The system shall have a minimum six (6) quart reservoir for wet arm wipers separate from the cab deluge system.

The chassis engine shall have a key type starter switch. Integrated safety checks shall prevent starting when an unsafe condition is detected. When engine start is prevented, real time feedback to the message center will report what condition is preventing the system from attempting an engine start. The unit shall have a tilt and telescoping steering column. The unit shall be equipped with self-canceling turn signals with hazard switch. Instrumentation shall be centered on a color liquid crystal display mounted to the tilt and telescoping steering wheel. An air switch to release the parking brakes shall be mounted in the dash within easy reach of the operator. Vehicle shall have a rechargeable, ABC class; five (5) pound fire extinguisher mounted in the cab so as not to interfere with normal operation but is easily accessible.

The screen display shall be grouped in a logical manner to provide precise and clear information quickly. The display shall show, ground speed, date, time, an hour meter than registers time only when the engine is running, and fuel level with low level indicated by color yellow at 15% remaining and color red with an audible alarm at 5 percent remaining. The display shall be equipped with a speedometer, odometer, voltmeter, dual system air pressure gauge, tachometer, and

hour meter with no tenths position. The hour meter shall register when the engine is running only. The display shall be easily read during full day light and night time operation. The unit shall be equipped with both air and electric activated horns or a single dual activated horn. The display shall also include an icon warning light for ABS fail, ABS communications lost, control systems node communication lost, engine air intake restriction, engine fail warning, low oil pressure, engine overheat, engine stop, high beam indicator, hydraulic fluid level low, hydraulic temperature warning, left and right turn indicators, low air pressure, low voltage, message center fault messages affecting operation, parking brake applied, traction lock engaged, transmission communication lost, transmission fail, transmission overheat, transmission range, and windshield washer fluid low level indicator.

Multiple sections of display shall be provided for operation and maintenance. The display shall include selectors to page through digitally displayed instrumentation for maintenance.

Fault codes shall be “notify of failure” with operator attention drawn to the area of fault. A summary of fault messages with most probable resolutions shall be provided in the service manuals required elsewhere in this specification.

The unit shall have high output, fresh air type heater/defroster, with multi-speed fan motor, mounted behind the operator to minimize visibility obstructions to the front. The cab’s heater with defroster shall be capable of maintaining a 50 degrees Fahrenheit inside temperature at sea level when the ambient temperature is negative 40 degrees Fahrenheit. A screened, louvered vent is required near cab rear for fresh air intake into the heater/ventilation unit. The cab’s heater with defroster shall be capable of a minimum air flow of 380 CFM.

The cab shall have air conditioning for summer cooling and to improve windshield defogging in winter. A separate button shall engage the air conditioning compressor to provide dry, heated air to maximize defroster effectiveness. Vent controls shall be provided from panel selection including inside or outside air intake.

All digitally controlled electrical circuits shall be protected by solid state circuitry and logic. All analog circuits and power supplies to control modules shall be protected by manual and automatic reset circuit breakers. Master wiring circuitry boxes shall be mounted behind the operator. All circuit breakers shall be easily accessible without the use of any tools. The unit shall have multiple access panels in upper console to allow easy access to switch and wiring connections. All electrical connections passing through cab shell shall use Deutsch type sealed connectors.

The unit shall have AM/FM stereo radio with weather band and standard features.

Adequate space for the convenient installation of the two communication radios (See Radio Equipment section below) shall be provided within reach of operator and passenger. A master 12 volt electrical connection point for radios shall be located in center of the cab, below the windshield, and within reach of operator and passenger. Connections to be on/off with ignition switch.

Two cup holders shall be located between the seats.

Vehicle cab and armature shall be painted FAA approved chrome yellow, with an 8 inch wide horizontal band of FAA approved high gloss white paint on each side from the front to the rear bumper, and cab and armature to be numbered with a Lynchburg Regional Airport designated number all in accordance with the most current update of FAA Advisory Circular AC 150/5210-5D Painting, Marking, and Lighting of Vehicles Used on an Airport. No exceptions will be allowed. Lynchburg Regional Airport will provide all the outside ID’s.

1.15 - Other Electrical and Lighting

At a minimum all lighting on this vehicle shall conform to FMCSR and FMVSS requirements for on road use. Vehicle lighting shall include two (2) fender mounted halogen headlights with high/low beam and integral turn signals. Vehicle lighting shall include dual LED type back up, clearance, stop, tail, and turn lights. Vehicle lighting shall include two (2) high intensity discharge (HID) work lights mounted on cab light bars activated by a single operator controlled switch in the cab. Vehicle shall have variable intensity instrument lighting, with ramp up push button control through a minimum of 16 steps. The light assemblies shall consist of front facing amber LEDs with rear facing red LED’s. All lighting shall be 12 volts.

A Whelen 800 amber strobe beacon or approved equal shall be center mounted on forward portion of cab roof. An additional amber strobe beacon matching the cab mounted beacon shall be installed on top of the rear engine enclosure. Both beacons shall be activated by a single operator controlled switch in the cab.

Two (2) light bars shall be mounted near front outside corners of cab near leading edge, one on each side. Light bars shall be vertical and made of round material to allow infinite positioning and aiming of auxiliary lighting as specified. Deutsch type sealed connector required at each light bar to pass electrical connections through cab shell. Two (2) headlights with high/low beam and integral turn signals shall be mounted on light bars.

The unit shall have two (2) LED cab dome lights.

Four (4) multipurpose type work lights shall be mounted under chassis engine hood.

LED marker lights shall be located at each end of the blower head.

The unit shall be equipped with Preco 1040 back up alarm or approved equal with auto adjustment for noise level.

The unit shall be equipped with on 12 volt, 240-amp minimum alternator with built-in regulator.

The unit shall be equipped with 1,500 watt, 120 volt block heaters with weatherproof plug in for the carrier engine and the blower engine. The socket for the engine block heaters shall be weather proof receptacle type, mounted below the driver's door and easily accessible from the ground.

The unit shall have an on board 110/12 volt trickle charger, 1.5 amp minimum. The unit shall have four (4) 12 volt maintenance free batteries with a minimum total of 3800 cold cranking amperes. The batteries shall be installed in a frame mounted compartment with corrosion resistant interior. Vehicle to have a single master battery shut-off located in the cab or mounted below the driver's door with a weather tight cover or by one of the battery boxes and reachable from the ground. Switch shall be safety type to prevent accidental shut-off and labeled.

The electrical system shall be multiplex technology for efficiency and maximization of control parameters.

All instruments and controls shall have illuminated labels that can be read during all lighting conditions. All labels shall remain legible for the life of the unit.

1.16 - On Board Diagnostics and Electrical Control System

Functional control of the vehicle shall be centered on an electronic control system utilizing J1939 data bus. Data bus terminal resistors shall be external to control modules for ease and economy of replacement. Terminal resistors within the control boxes shall not be used as part of the electronic system structure. Y's from the data bus to the modules shall be physically labeled in the vehicle for ease of maintenance and troubleshooting.

Reliability and precision operation of the unit requires heavy reliance on solid state circuitry and components and minimized reliance on traditional multi-pin "physical switch" type relays.

Electronic control systems shall include on board diagnostic assistance and other features to simplify the operation, troubleshooting, and repair of the chassis.

High amp manual resettable circuit breaker protection is required upstream from the electronic control modules.

The system shall maintain heartbeats and power indicators at modules and their function without the key switch on. After a five (5) minute period without a change of status in door switches, the unit shall automatically shut down completely. Control boxes shall include a dual external LED tattletale, one LED displaying constant illumination indicating power supply, and one LED displaying a "heartbeat" indicating internal proper function.

A timer module shall serve to keep electronic modules live for five (5) minutes after last cycle of door switches indicating egress from vehicle. Electronic control modules (ECM) shall be of the highest reliability and durability for use in mobile equipment. ECM shall be overload and reverse polarity protected with self-diagnostic capabilities.

System complies with the following certifications of testing and durability of electronic modules:

- a. EMI-RFI (meeting mil-spec of 150 volts/meter)
- b. Salt spray survival for 1,000 hours minimum (ASTM B117)
- c. Water immersion
- d. High temperature tested at 125% overload for 100 hours minimum

- e. Vibration tested to 50 g's

Field Effect Transistors (FETs) shall provide power output to electrical functions, acting as a solid state relay and circuit breaker in one. FETs shall shut off automatically in the event of short to ground, cycling on and off to test itself for proper function to avoid damage while allowing search and repair of fault. Individual FET ratings and over-current protection shall be programmed to values of 1 to 15 amps depending on task assignment.

Electronic control system shall include and enable diagnosis of chassis and engine systems by means of the LCD dash display. Transmission diagnostics shall be accessible through blink codes from the transmission pushbutton shift selector. Chassis anti-lock brake diagnostic codes shall be accessible through blink codes using the chassis ABS indicator on the display and the ABS blink code switch. The system shall have the capability of direct readout of codes on the display.

Message area on LCD shall display error message to operator as any system function fails. Messages shall be available during operation on operations screen. The system shall have the capability of toggling between error messages if more than one failure is present. Failures shall be retained in memory until cleared by maintenance personnel with password access. The system shall have real time operational indicators of system function on diagnostics/maintenance screens. There shall also be diagnostic connection ports for advanced chassis, engine, ABS, and transmission diagnostics.

The system shall include password registration with chassis OEM's Service Department.

1.17 - Consolidated Fluid Drain Lines

For ease of maintenance, drain lines for all fluids which must be routinely changed shall be routed to one of two locations; either the area behind the cab, or the rear area of the vehicle.

At a minimum, drain lines shall be provided for chassis and auxiliary engine oil and coolant, all hydraulic oil reserves, and broom pump drive.

Each drain line shall be clearly labeled and be equipped with a quarter turn ball valve and screw on cap.

1.18 - Radio equipment

Vehicle is to be equipped with two (2) two-way radios that are compatible with radio equipment currently in use at LYH. Frequency will be provided by the Airport. One radio will be for communication with the air traffic control tower and the second for communication with Airport Operations. The Tower Radio is to be an ICOM air band radio or approved equal and the Operation Radio to be a Kenwood, Motorola or approved equal VHF Radio capable of accepting narrow band frequencies.

A complete operations, maintenance, and parts manual shall be provided as detailed in the warranty section.

END OF ITEM MULTIPURPOSE UNIT

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ROTARY PLOW

The multipurpose unit with plow attachment shall meet the requirements of a Very Large, Class V, High-Speed Rotary Plow with a minimum casting distance of 100 feet and a minimum capacity of 4,000 tons/hour.

Measure the casting distance from the longitudinal centerline of the snow removal unit to the center of mass within the perimeter of the cast pattern. Conduct the test when there is no wind.

| High-Speed Rotary Plows | | | |
|-------------------------|-------|--------------------------------------|---|
| Size | Class | Minimum Casting Distance Feet (m) | Minimum Capacity Tons/hour (metric tons/hour) |
| Small | I | 50 (15) | Up to 600 (550) |
| Medium | II | 75 (23) | 1500 (1360) |
| Intermediate | III | 100 (31) | 2500 (2270) |
| Large | IV | 100 (31) | 3000 (2730) |
| Very Large | V | 100 (31) | 4000 (3640) |
| | | 150 (46) | 3000 (2730) |
| Extra Large | VI | 100 (31) | 5000 (4550) or more |

1.19 - Auxiliary Engine Assembly

The engine used to power the snow blower attachment shall be a four (4) stroke six (6) cylinder, turbocharged diesel engine rated a minimum 700 horsepower.

It shall be liquid-cooled, Tier III EPA emission certified, and equipped with latest diesel electronic controls for fuel injection and engine management system including an automatic shutdown system with manual override and an electrical connector for a diagnostic system. The engine’s automatic shutdown system shall include a pre-alarm and indicator in event of high water temperature, low oil pressure, low coolant level, high hydraulic oil temperature, and/or low hydraulic oil level.

The engine shall be provided with a 12 volt starter, equipped with a master battery switch, and provided with a full-flow, replaceable oil filter and bypass filter.

The engine shall have a dual air intake two-stage air cleaner with internal fixed vane centrifugal type pre-cleaner and primary dry element and safety element. The dual air intake shall allow the system to draw under hood air to prevent snow ingestion, outside air during warmer operations or a blend of both to modulate engine intake air temperature for peak performance. The air intake filter canister(s) shall be located under the chassis engine hood.

The engine cooling system shall be filled with permanent type antifreeze protecting the system to minus 34 degrees Fahrenheit with distilled water for anti-corrosion purposes and supplemental coolant additive for cavitation and corrosion protection. The cooling fan for the radiator and charged air cooler shall be hydraulically driven with automatic variable thermostat control.

The exhaust system with rain-cap shall be mounted on top of engine enclosure.

A heated fuel water separator dedicated to the auxiliary engine with 200-watt heater to remove water and contamination in the fuel supply shall be installed in the supply line to each engine. The blower engine shall use the chassis fuel supply.

Application approval from engine manufacture must be supplied at delivery.

1.20 - Engine Enclosure

The fiberglass, steel, or aluminum engine enclosure shall be a two sided butterfly type with a power assisted opening system or a house style with adequate engine/component access doors for the performance of all maintenance/repair tasks.

With the two sided butterfly type lowering shall be accomplished by means of an orifice release valve to provide a slow and safe lowering of the hood.

The cooling system, hydraulics and other required elements of the power pack shall be protected. It shall be weatherproof design and totally enclosed to eliminate snow ingestion.

The engine enclosure shall be pressurized using the cooling fan for the radiator and charged air cooler. Airflow through the enclosure must be controlled. The enclosure shall be provided with internal compartment lights to illuminate the engine.

Daily maintenance points shall be easily accessed through the open covers. It shall have adequate personnel grab handles and work platforms to aid in access for repair and maintenance activities. The platforms shall be continuous along full length of both sides, allowing access to all components requiring periodic maintenance. Steps and assist handles shall be provided for access to both the left and right side platforms. Grab handles/bars shall be installed as required to maintain and constant 3-point contact during all mounting and dismounting activities.

1.21 - Blower Quick Hitch

The vehicle shall be equipped with a hydraulically activated quick hitch device to allow for efficient removal and reattachment of the blower head for maintenance and repair. The hitch shall be powered by a chassis engine driven hydraulic pump and be capable of lifting the entire blower head assembly off the ground.

The truck portion of the hitch shall be parallel, lift to attach type, activated by two double acting cylinders. The upper horizontal sections of the hitch shall be at minimum 3/8 inch walled tubing and act as the receptacle for the head portion of the hitch. All bearing surfaces shall be grease fitting equipped.

The attachment portion of the hitch shall have two flame cut curved arms that hook into the upper receptacle and rest on an angle iron pocket on the lower receptacle. The attachment part of the hitch shall lock by means of a minimum 2 1/2 x 1/2 inch wall tube. This locking tube shall be equipped with a grab handle and slide through the lower receptacles and lock in place with a snap pin. Mating, except for locking, shall be accomplished hydraulically and operated from inside the cab.

There shall be no hydraulic lines in the cab.

1.22 - Blower head

The rotary snow blower shall be a two-stage design unit with a helical ribbon and separate impeller effectively feed and displace snow/ice.

The blower head shall be designed for severe duty and cold temperature usage with the materials, parts, and construction techniques conforming to the best engineering practices.

It shall have a minimum capacity of 6000 tons per hour with a minimum casting distance measured from the blower to the point of maximum deposition under a no-wind condition of 100 feet based on 25 pounds/cf unit snow weight.

The blower shall be a helical ribbon first stage to cut and feed snow to the second stage impeller which forces the snow out of a casting chute.

The rotary head box shall be fabricated of heavy gauge/high wear welded alloy steel including minimum 3/8 inch side plates and 3/16 inch moldboard designed for severe service and formed to the helical ribbon contour.

Provisions on the box shall be made for vehicle mounts, skid pad and castor brackets, scraper blades and associated hardware, drives, and controls.

1.23 - Helical Ribbon

The ribbon shall have a minimum diameter of 52 inches, be driven from both ends for reliability and performance, and have a minimum of two (2) bearing supports (one each end).

Single motor drive or an open propeller shaft drive in the area of snow flow shall not be utilized.

The ribbon flights on each end of the reel shall be two removable halves and mounted on the shaft by an appropriate number of mounts via flat head screws.

The ribbon shall be constructed from ASTM A572 GR 50 steel minimum thickness ½ inch for the intended severe service and its exposed parts protected by a curb ring.

Appropriate close tolerance in construction between the ribbon and rotary head box is needed to reduce snow plowing/carry.

The cutting width shall be a minimum 102 inches and the cutting edge shall be a hardened steel insert type.

Ribbon speed shall be selectable from the cab without altering the impeller speed/cast distance to adjust efficiently varied snow/operating conditions.

The ribbon shall be driven hydrostatically and be reversible from the cab by means of a momentary electric switch.

The pump shall be electronically controlled and hydrostatic relief provided to protect the system if foreign objects are ingested.

A low oil/high oil temperature alarm shall activate in the cab to warn of abnormal conditions.

1.24 - Impeller System

The impeller system shall have a minimum diameter of 59 inches and a minimum depth of 21 inches and designed to be commensurate with the capacity of the feeding helical ribbon.

The opening, blade diameter, and speed ratio shall insure proper snow capacity/flow to the discharge chute.

There shall be 5 replaceable impeller blades with countersunk attaching fasteners.

Impeller blades shall be constructed and balanced to be vibration and shock damage resistant should foreign objects be ingested.

The impeller drive shall be direct mechanical and have swing bolts for fast attachment.

The blower drive shall include a cab controlled full 3-plate 14 inch clutch.

Activation shall be electric over hydraulic and be protected from activation when engine exceeds 800 RPM and automatically engage the ribbon drive forward.

As a safety function, the engage switch shall illuminate green when activated and the ribbon status icon on the LCD will clearly indicate ribbon status to the operator.

The clutch shall automatically disengage at engine shutdown as an additional safety feature.

A single or two speed reduction gear system shall be provided between the auxiliary 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.

When a two speed reduction gear system is used electronically controlled lockout system shall automatically assure that a gear change is made only with the clutch disengaged and shaft movement at low enough speeds to preclude any damage to the gear drive system.

Shifting shall be electric over air control and the switch shall be a stage bump type protected by a timeout with operator warning ceasing the process if the shift is not completed for any reason by the electric/air system.

The gear box shall include helical gears with a pressurized lubrication system.

Chain type drop boxes shall not be utilized.

The driveline shall be Spicer 1710 series, or equal, and shear bolts shall be included in the impeller driveline to preclude any damage from foreign object ingestion or overloading.

The shear bolts shall be accessible/replaceable from behind the intake face of the blower to preclude having to remove snow from the blower intake to change shear bolts.

Five (5) spare sets of shear bolts shall be supplied with the unit.

The snow casting assembly shall consist of a controllable chute, impeller, or turbine snow collector and a control system.

The system shall be designed to accept the maximum output volume of the impeller assembly, with an interior free of sharp bends or obstructions.

The impeller housing shall be minimum 3/8 inch steel and the chute barrel 1/4 inch steel.

The casting chute assembly shall rotate in a vertical plane to the left/right through a minim arc of 125 degrees.

It shall flat cast to the Left.

1.25 - Head Lift and Weight Transfer System.

The rotary head system shall have a provision for raising the head from the pavement.

The hydraulic lift mechanism shall be controlled from the cab via a pump driven by the chassis engine.

The rotary head assembly shall automatically lift when the transmission is put in reverse gear.

Minimum ground clearance fully raised shall be 8 inches

The rotary head system shall not bind, rub, or vibrate when fully raised and be able to travel at minimum 2 inches below grade with positive down pressure and have a vertical float position incorporated in the system.

To maximize traction in the work mode, the blower shall be equipped with a weight transfer system that automatically maintains 60% of the blower head weight on the front axle of the chassis.

This shall be accomplished hydraulically by sensing system pressure and continually adjusting the pressure via electronically controlled hydraulic meeting valves.

A minimum of two approximately 10 inch diameter rubber tired 360 degree rotating castor wheels shall be provided on the blower head.

The tires shall have a minimum load capacity of 2300 pounds each @ 145 psi and be rated for 25 mph operation at full load.

One complete spare castor tire with wheel shall be supplied with the unit.

All vehicle wheels, including spares, to be painted FAA approved Chrome Yellow to match the cab or be chrome finished.

END OF ITEM ROTARY PLOW

DISPLACEMENT PLOW

2.1 - General

These specifications describe a Power Reversible Plow with a tapered style flared discharge and steel moldboard, manufactured expressly for airport runway high speed and ramp plowing. This plow shall be rigidly built of new material suited for continuous work under extreme conditions of snow removal.

The overall width of the plow assembly in the folded position (wings retracted) with required casters must be allowed to enter the federally funded snow removal building (AC 150/5200-18, Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials) that houses the snow plow and other such equipment. Doors are 26' wide.

2.2 - Features

The reversing assembly shall be hydraulically activated and be capable of operating in both raised and lowered positions. The assembly shall provide a minimum of five (5) moldboard positions, two (2) each for the left and right side of the bulldozing position. The maximum left/right plow angle shall be no less than 32°. Large snowplows with moldboards longer than 15 feet shall have a maximum cutting edge angle of no less than 65° measured from the vertical. The unit can be equipped with an automatic moldboard locking and unlocking feature, i.e. lock latch for different angles to relieve pressure from hydraulic cylinders.

2.3 - Assembly

The moldboard shall not be less than 50 inches high in the center portion and not less than 67 inches high at the discharge ends when the moldboard is set at 65 degree attack angle, and formed so as to lend itself to high speed plowing operations. In order to offer a low coefficient of friction and resistance to both corrosion and impact, the moldboard sheet shall be minimum 10 gauge steel. When set at 75 degrees, the moldboard shall overhang the cutting edge by a minimum of twelve (12) inches the entire length of the plow.

The sheet shall be painted to insure compliance with the most current update of FAA AC 150/5210-5 Painting, Marking, and Lighting of Vehicles Used on an Airport. Welding of sheet is not allowed.

Moldboard reinforcement shall include a full length heavy duty angle across the top front of the steel shell and twelve (12) vertical ribs tying the upper shell to the cutting edge mounting angle and its reinforcement. There shall be two ribs at each of the four push points, and three ribs at the end of each flared end of the plow. The twelve (12) steel vertical ribs shall be made from 0.38 inch thick plate and have a varying cross section, becoming wider as they approach the cutting edge mounting angle. A 0.75 inch flat bar shall be welded to the cutting edge angle for additional strength. There shall be no span between reinforcing ribs in excess of 3.5 feet.

The vertical ribs shall provide support and frame work for a series of window openings in the rear steel moldboard backing frame, tying top reinforcement to the bottom reinforcement. Window opening design shall provide long term, stable backing support for the moldboard, and help prevent moisture buildup behind the polymer plow face. The polymer moldboard shall be bolted to this durable framework for maintenance of proper snow handling shape. Moldboard shall consist of three (3) separate polyethylene sheets, one for the center section and one for each flared end of the plow. Polyethylene to be retained by 0.625 inch diameter carriage bolts with locking hardware to avoid loss on the operations area of the airfield. Means of moldboard attack angle adjustment shall be incorporated so to provide 65, 75 and 85 degree settings (from ground plane to back of cutting edge) for use with either steel, carbide, rubber or urethane cutting edges throughout the life of the plow.

2.4 - Spray Guard/Deflector

A spray guard/deflector shall bolt to the top discharge point at the moldboard flange or reinforcement, tangential to the upper radius of the modified "J" style moldboard to direct snow forward, down, and toward the trailing edge of the plow. It shall consist of a heavy duty rubber belting, 0.40 inch thick x 12.00 inches wide, and shall include a metal retaining strap, 0.25 inch thick x 2.00 wide, with necessary mounting hardware. The hardware shall be of the locking type to minimize opportunity for loss on the aircraft operating areas of the airport. Provisions shall be provided in the mounting system to adjust the spray guard perpendicular to the moldboard on a case by case basis as desired by the airport for seasonal variation in operations.

2.5 - Cutting Edge

The cutting edge itself shall be of steel with a 45 degree beveled edge and mounting holes to A.A.S.H.O. standard. An additional beveled steel retaining strap, 0.50 inch thick x 2.50 inches wide to bolt the polyurethane to the adaptor plate shall be supplied. The blade shall be reversible with multiple holes for position adjustment. The overall cutting edge length shall be provided in two segments, each one half of the overall length for ease of installation and handling.

2.6 - Adjustable Pneumatic Dual Caster Wheel Assembly

Casters shall be capable of swiveling 360 degrees. Wheels shall be 10 inch diameter x 6 inch wide minimum, from not less than a combined thickness of 0.25 inch steel. Wheel shall be a five (5) mounting bolt design. They shall ride on hubs fitted with Timken tapered roller bearings. Each bearing shall include seal, dust cap, lubrication fitting and pressure relief plug. Axles shall be a minimum of 1.00 inch in diameter at the ends, 1.06 inch diameter at outer bearings, 1.375 inch diameter at the inner bearings and 1.75 inch diameter at the center. Each caster spindle shall have a rating of no less than 1,750 pounds for a combined caster position rating of 3,500 pounds.

Tires shall be 20.5 x 8.0 on a 10 inch rim for additional load carrying ability, 10 ply (load range "E"), minimum. There shall be a total of at least four (4) tire and wheel assemblies, mounted in dual arrangements, with one dual assembly to each side of the plow center. Dual caster assembly shall include a two piece spindle, separated at the midpoint between caster wheels with left and right halves held in place by a through bolt with nyloc nut. This shall allow for easier and modular maintenance. Tires shall be pneumatic, and delivered with appropriate air pressure as shall be called out in service manuals to be provided with the machine.

Vertical adjustment shall be accomplished through two (2) caster barrel arrangements. The outer barrels of the barrel arrangements shall be heavy duty steel tubing, not less than 4.25 inch OD x 3.75 inch ID, provided as part of the major caster mounting bracketry as a welded unit. Inner tubes shall be from not less than 3.25 inch OD x 2.25 inch ID for grease/lubrication fit. Inner tubing to be ground and hard chrome plated to mate with honed outer steel tube housing. Inner tube shall be held centered in outer tube by means of heavy duty nylon rings at top and bottom. The screw adjustment rod shall be heavy threaded rod fitted with jam nut for maintaining adjustment from not less than 1.375 inch diameter stainless steel.

Each caster assembly shall be equipped with a spring loaded adjustable brake dampener so to minimize wheel wobble.

2.7 - Stands

The moldboard shall have a pair adjustable leg stands to be used for plow removal / storage with the other remaining weight on the caster tires. They shall aid in raising the cutting edge during change. They are required for safety and storage reasons.

2.8 - Color

Moldboard= Safety Yellow for high visibility on airfield

Drive Frame= Flat Black

2.9 - Hitch

The front attachment hitch between the plow and chassis shall be a DIN plate type quick hitch. It shall allow easy interchange of the plow and other attachments. It shall be hydraulically operated (plow lift and swing) and designed for power reversible runway plows. The plow moldboard, push frame, swing, and lift must be capable of being completely removed and reattached to the chassis as a unit. The entire process of hitching or unhitching shall be possible by one man in not more than 10 minutes and shall be positively connected. All hydraulics and structure for plow lift, swing, oscillation, and lock shall be on the plow side of the DIN plate coupling.

2.10 - Hitch (Chassis Side)

A DIN plate style coupler shall be attached to the chassis front frame rails. It shall consist of two side (cheek) plates of adequate size bolted to the chassis frame rails with a welded 0.63 inch thick push plate perpendicular to the truck frame rails. This flat mounting push plate shall have two (2) top mounting pockets to accept the mating portion of the plow or other possible front attachments that are equipped with a similar standard DIN type hitch.

2.11 - Hitch (Plow Side)

The plow shall be mounted and un-mounted from the chassis by means of a mating DIN plate hitch of a size sufficient to support the weight and operation of the plow. It shall allow easy interchange of the plow and other attachments. Two (2) steel claws and slots for two (2) 1 inch diameter swing bolts with nuts that are part of the attachment will lock the connection between the attachment and chassis. All hydraulic lines from the chassis to the plow side of the hitch shall be of quick disconnect type and clearly marked for ease of change.

The moldboard, pushframe frame, and plow side of the hitch once detached, will rest on the ground on the caster tires and the cutting edge stands.

2.12 - Lift

The plow lift system of the hitch shall be a parallel lifting type consisting of two (2) parallel tubular lift arms made from 3 inch x 3 inch x 0.31 inch wall steel tubing. The design shall incorporate a dual acting plow lift cylinder. The dual acting plow lift cylinder shall be 4 inch bore 15.75 inch stroke with a 2 inch diameter rod, minimum. This lift cylinder will also serve to remove and attach the plow. The plow lift hydraulic system will be furnished with a relief valve to prevent down pressure in excess of 200 psi. The lifting cylinder arrangement shall incorporate a mechanical transport lock that shall take the weight of the plow off the hydraulic cylinder during plow transport, and shall act as a safety in the event of a hose failure during transport.

2.13 - Swing

The plow swing system shall consist of two (2) telescoping type hydraulic cylinders able to position the plow to angle left, right or straight ahead. To maximize snow removal production, a wide plowed path is desired. Therefore, maximum angle to the left or right shall be 32 degrees. Pusher vehicle shall have adequate horsepower and durability to work with plow at this shallow angle. The telescopic hydraulic cylinders shall be two stage type with an outside diameter of 4.50 inch and chrome plated rods with a minimum diameter of 2.50 inches. The cylinders shall be 19.50 inch long from center of mounting hole to center of mounting hole when retracted and shall have a stroke of 20.25 inches. The cylinders shall be heavy duty to allow for heavy snow plowing under severe conditions and shall be equipped with a double acting hydraulic cushion valve mounted on the plow to protect the cylinders from damage. Mounting plates for the swing cylinders shall be 0.63 inch in thickness. The cylinder mounting bolts shall be 1.00 inch diameter. The hydraulic port in the angling cylinders shall be 0.75-16 standard straight SAE "O" ring thread. The hoses used shall be standard 0.50 inch SAE 100R2 rated.

The swing pin (center and vertical) shall be 2 inch diameter by 31.75 inch in length with top and bottom yokes. There shall be a bronze bushing installed in the center of each yoke assembly for low friction movement of the swing pin. The two (2) parallel tubular lift arms shall be attached to the top and bottom yokes. The yokes / lifting arms connections shall have a hardened steel sleeve bushing with replaceable trunnion pins. The trunnion pins must be tapered fit into the yoke for positive locking.

2.14 - Oscillation

The plow oscillation system shall incorporate a drive frame that allows oscillation of the plow with respect to the chassis in order to follow the pavement contour. The plow shall oscillate a minimum of 2 degrees overall. The oscillation mechanism shall consist of two front facing vertical plates which can pivot and slide. When the plow is carried in the raised position and angled right or left the plow shall remain approximately level to the pavement.

The front plate shall be 0.50 inch thick steel plate with a bushing on the top for the oscillation pivot tube and slots cut in the bottom for the oscillation slide bushings. It shall be the middle support structure for the push frame. The back plate shall consist of a formed 0.38 inch plate and backing plate to form a boxed section. The oscillation pivot tube and oscillation slide bushings shall be welded in place facing forward on the boxed section. The back side of the boxed section shall attach to the plow swing pivot pin (center vertical). A 0.38 inch thick poly plate shall be sandwiched between the two oscillation plates to reduce friction and wear. No metal on metal. The oscillation assembly (two plates) shall be held together with five (5) bolts, 1.0 inch diameter with backing plates and lock nuts. There shall also be two (2) rubber cushions bolted to the plow push frame to limit and cushion the end of oscillation travel.

2.15 - Push Frame

The push frame shall be of severe duty design, welded construction with no less than three (3) horizontal steel tubes each having a cross section of 3 inch x 5 inch X 0.38 inch wall rectangular tube. There shall be six (6) "Aeon" type isomer rubber cushions on the bottom of the plow frame compressed to a length of 4 inch by means of six (6) bolts – 1.25 inch in diameter and six (6) lock nuts. For durability and safety on the runway, each cushion assembly shall have a 1.50 inch OD hardened steel sleeve tube over each bolt for sliding inside the push frame. This shall prevent over-compression of the rubber cushion when assembling and prevents wear of the bolt. The rubber cushions shall mount to a pivot weldment that connects the push frame to the moldboard via four (4) pivot pins. The pivot pins shall be 1045 CR steel, 1.50 inches in diameter.

The swing stops shall have a poly liner installed to allow free oscillation of the plow frame. When swung to 32-degrees, the plow push frame shall stay against the stops as the operator raises and lowers the plow, no additional swing adjustment needed.

Four (4) heavy-duty braces on top of the plow frame shall allow the plow and cutting edge angle to be adjusted to positions of 65, 75, and 85 degrees from horizontal for optimum snow handling performance.

END OF ITEM DISPLACEMENT PLOW

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BROOM SWEEPER

3.1 - Broom

The multipurpose unit shall accommodate a broom head and air blower system attachment.

The broom head shall be capable of producing 4800 foot-pounds of torque at maximum hydraulic pressure and 500 RPM, with the air blower system capable of producing 23,000 CFM at 400 MPH.

The broom head shall be 46 inches in diameter.

The broom head and air blower shall have hydrostatic drive with infinitely variable speed hydraulic pumps and fixed displacement motors.

The broom shall have the ability to remove snow, ice, slush, sand and other debris at rated speeds up to 30 MPH depending on conditions.

The exact proposed broom and air blower drive power system components including engine, gearbox, and hydrostatic pumps and motors must have in field proven experience. **No prototypes shall be allowed.**

3.2 - Auxiliary Engine Assembly

The engine used to power the broom head and air blower system shall be a four (4) stroke six (6) cylinder, turbocharged diesel engine rated a minimum 500 horsepower.

It shall be liquid-cooled, Tier III EPA emission certified, and equipped with latest diesel electronic controls for fuel injection and engine management system including an automatic shutdown system with manual override and an electrical connector for diagnostic system. The engine's automatic shutdown system shall include a pre-alarm and indicator in event of high water temperature, low oil pressure, low coolant level, high hydraulic oil temperature, and/or low hydraulic oil level.

The engine shall be provided with a mastery battery switch and a full-flow, replaceable oil filter and bypass filter.

The engine shall be provided with a 12 volt starter. The starter shall be Delco or approved equal.

The engine shall have a dual air intake two-stage air cleaner with external turbine type pre-cleaner and primary dry element and safety element. Dual air intake shall allow the system to draw under hood air to prevent snow ingestion, outside air during warmer operations or a blend of both to modulate engine intake air temperature for peak performance.

The air intake filter canister(s) shall be located under the chassis engine hood.

The exhaust system with rain-cap shall be mounted on top of engine enclosure.

The engine cooling system shall be filled with permanent type antifreeze protecting the system to minus 34 degrees Fahrenheit with distilled water for anti-corrosion purposes and supplemental coolant additive for cavitation and corrosion protection. The cooling fan for the radiator and charged air cooler shall be hydraulically driven with automatic variable thermostat control.

A Racor heated fuel water separator with 200-watt heater to remove water and contamination in the fuel supply shall be installed in the supply line to each engine. The broom engine shall use the chassis fuel supply.

Application approval from engine manufacture must be supplied at delivery.

3.3 - Engine Closure

The engine access cover shall be a two sided fiberglass butterfly type enclosure with a hand pump on each side that requires less than 30 strokes to fully open each cover. It shall be weatherproof design and totally enclosed to eliminate snow ingestion. Daily maintenance points shall be easily accessed through the opened full length butterfly covers.

Lowering shall be accomplished by means of an orifice release valve to provide a slow and safe lowering of the hood.

The fiberglass engine enclosure shall cover the chassis including cat walks, fenders, and engine, to eliminate snow accumulation.

The engine enclosure shall be pressurized using the cooling fan for the radiator and charged air cooler. Cooling system,

hydraulics and other required elements of the power pack shall be protected by a fiberglass hood. Airflow through the enclosure must be controlled.

The platforms shall be continuous along full length inside the engine enclosure, both sides, allowing access to all components requiring periodic maintenance. Steps and assist handles shall be provided for access to both the left and right side platforms.

Grab handles/bars shall be installed as required to maintain a constant 3-point contact during all mounting and dismounting activities. Four switched lights in the enclosure, two on left, and two on right side shall be included.

3.4 - Broom Hitch

The broom hitch shall provide low friction, free flotation, shock absorbing, and weight transfer for the broom head. The low friction, free flotation is required so that it is independent of broom chassis for vibration and bounce considerations and to accommodate surface irregularities.

A parallel arm system with four horizontal pins shall be used. A pair of hydraulic cylinders shall support the parallel arms of the hitch. The two arms shall be box construction for torsional stiffness with 2-inch diameter pins on greaseable low friction bushings, DX pre-lubricated type (no metal on metal).

To maximize vehicle tractive effort, braking, steerability, and overall handling of the broom chassis, the broom chassis shall carry approximately 50% of the broom weight by utilizing a weight transfer system. Pressure in the hydraulic cylinders shall provide the lift necessary to transfer approximately 50% of the broom weight to the chassis. A control valve shall adjust the oil in and out of the cylinders to provide the same weight transfer no matter what the surface irregularities.

The pair of hydraulic cylinders shall also “free float and dampen” the parallel arms of the hitch to minimize broom bounce at high vehicle speeds. The broom hitch must have hydraulic cylinders to provide an active shock absorbing systems.

3.5 - Broom Angle

The broom head shall be capable of swinging 35 degrees left or right, selectable from an operator’s joystick. The swing shall be accomplished by means of a single vertical pivot pin, two inches in diameter and a minimum of 14 inches long using greaseable low friction bushings, DX pre-lubricated type (no metal on metal). The swing shall be a smooth, low friction motion. The swing bearing structure shall be machined steel tubing and a boxed beam fabricated from 0.38 inch steel plate minimum. Two double acting hydraulic cylinders with a minimum 3.5 inch bore shall be used to power the swing. Leaning of the chassis in the direction of the broom swing is unacceptable due to effects on chassis handling, turning and braking.

Using a longer broom than specified to accommodate swept path for larger swing angles are unacceptable due to storage and maneuverability reasons.

The broom pattern shall not vary more than 0.5 inches end to end for the whole width of the broom.

3.6 - Broom Oscillation

The broom oscillation shall provide true flotation left to right for the broom head so that it is independent of broom chassis to accommodate surface irregularities and thus minimize brush pattern variation during operation. It shall have at least 8 degrees (+4, -4) of free floating oscillation from left to right.

The ability of the broom head to oscillate shall be provided by means of a spherical bearing assembly and low friction nylon pads.

3.7 - Broom Elevation and Brush Pattern Adjustment

The broom head elevation shall be a vertical lift type such that the relationship of the broom hood and deflector to the ground does not change except the height. The horizontal angle does not change. The lift shall be powered utilizing two 3 inch diameter hydraulic lift cylinders, one on each end of the broom frame, controlled by the operator’s joystick.

The elevation action shall have adequate stroke to achieve ground clearance during transport when not in use.

The lift cylinders shall be equipped with a counterbalance valve, which prevents the broom head from creeping down.

3.8 - Broom Head

The brush itself shall be 46 inches in diameter and 18 feet long comprised of two 9 foot sections. The speed of broom shall be infinitely variable from 0 to 500 RPM. The broom head frame must sustain the loads imposed by the snow removal capacity of the unit. It shall be fabricated from steel tube-in-tube design with 0.44 inch walls and include provisions for grease between the mating surfaces.

The hydrostatic broom drive shall be dual end drive.

Power shall be supplied from two variable displacement hydrostatic pumps mounted on the engine's gearbox.

The gearbox shall be a parallel shaft pump drive with precision gears, AGMA 10 rating and a dipstick for oil level measurement. The motor gearbox connections shall utilize a static O-ring seal, wet spline type. No dynamic seal shall be used for reliability purposes. The motors shall not support the broom core loads and the planetary gear box shall be hydraulic oil bath lubricated (case flushing type). Power shall be transmitted to the broom core from the gearboxes utilizing keyed tapered hubs to prevent any looseness in the connection for vibration concerns and high strength molded urethane drive cogs into replaceable hardened steel core drive sprockets of the core. The broom end plates shall be steel fabricated using 0.38 inch thick welded steel plate construction with 14 inch diameter, 0.38 inch thick steel tube for mounting the broom drive gearboxes.

Two high-speed hydrostatic motors each connected to a planetary reduction gearbox shall be mounted within the inner diameter of the broom cores outer ends to minimize overall width.

The entire broom head shall be vibration analyzed as a final inspection with report on vibration spectra (FFT plot). A sample of QA report with FFT plot shall be included in bid.

Available torque at the broom shaft shall be 4800 foot-pounds at maximum hydraulic pressure for maximum snow moving capabilities.

Hardened steel pilot plates shall support the radial loads.

A maximum 2 inch gap between broom core sections shall be obtained by using a center bearing assembly utilizing the same components as the drive ends.

The center bearings shall be encased in a sealed housing and be provided with oil bath lubrication. Manual greasing of bearings is unacceptable.

The left and right side core sections shall be connected to each other by a center shaft so the two sections rotate at the same speed, and that the power produced by each of the end drive assemblies is transmitted across the full length of the core assembly.

The end plates shall be reinforced horizontally and vertically using formed channel. The broom end plates shall be secured to broom frame with four 1 inch diameter grade 5 bolts. The unbolted end plates shall slide outward to allow easy access for core and bristle replacement.

The slide mechanism shall be round telescoping tube in tube design.

A second 2 inch square tube shall slide on a plastic slide providing additional support and allowing repeatable location of brush centerline alignment during broom core remove and replace operations.

Engineering hydraulic power calculations confirming these values must be provided with the bid.

3.9 - Broom Cores

The two core sections must be split core design for easy handling and efficient (tight) wafer stacking and sustain the loads imposed by the snow removal capacity of the unit. They shall be tubular steel construction with four drive bats, equally spaced around a tube to center each brush wafer. Each core shall be individually dynamically balanced to acceptable values at rated RPM. The brush on the cores shall be full width and designed for runway operation and shall be field replaceable with maximum ease without the use of special tools.

The drive sprockets shall be replaceable hardened steel.

The wafers shall be a 50/50 combination of polypropylene and wire. All wafers shall be a within 50 oz-in static balance

and marked at the heavy location.

The bristles shall be fastened in a radial wafer fashion to a steel ring. Polypropylene bristles shall be fastened to the steel ring by fusing their base to form a solid loop about the circumference of the ring, then mechanically holding them in place by wrapping the top of the ring over the fused bristle ends to form a dovetail. The polypropylene bristles shall be 0.075" x 0.105" oval shaped with an 8 pound total wafer weight minimum. The wire bristles shall have a mean diameter of 0.018 inches, galvanized, with a carbon content of 0.81 to 0.86 percent and a 10 pound total wafer weight minimum. Wire bristles shall be fastened to the steel ring with wire.

A total of one spare broom core assembly (2 sections) shall be provided in order that the cores can be preloaded with new segments for quick change during snow operations. The spare broom core assembly shall comprise of all necessary parts for the spare core to simply be exchanged. This shall include but not be limited to the core end pieces that hold the wafers on.

3.10 - Broom Casters

There shall be four single tire caster assemblies. Supplied tires must be readily available from commercial truck tire outlets. Each caster assembly shall be free to rotate 360 degrees.

Spring-loaded adjustable automotive type disk brake shall be supplied per caster to prevent caster shimmy at all sweeping speeds.

Caster hubs shall be oil filled to provide oil bath lubrication to the caster bearings. **No greasing necessary or allowed.**

The caster assembly shall be non-suspension type allowing the brush to follow the ground contours as close as possible.

The broom head caster support shall be mounted to the main broom frame in back of the brush and within the swept path at all times.

3.11 - Broom Hood

The broom hood shall shield the top half of the brush completely and fabricated from heavy-duty 10-gauge sheet steel securely bolted to the broom frame.

It shall be non-clog design to prevent ice buildup during freezing slush removal operations at rated speeds.

It shall provide the necessary quick access to the brush for replacement of bristles and for inspection.

There shall be an adjustable and replaceable stripper bar across the front of the broom to prevent snow carryover.

The stripper bar shall be near tangential to the broom outside diameter.

The adjustment to bristle diameter wear shall be performed using two mechanical acme thread jacks, one each end of the scoop and broom frame.

The adjustment shall position the stripper bar to the bristle diameter.

A hydraulically adjustable deflector with rubber extension shall be mounted in front of the brush. The rubber deflector keeps snow down and contained to reduce snow buildup on the vehicle. The result is a smooth, consistent, efficient, and controlled flow of the snow leaving the bristles with the operator capable of adjusting the direction of flow.

There shall also be an integral broom hood "shaker" to remove accumulated snow off the broom hood. This shaker is basically a table on top of the hood which shakes fore and aft approximately two inches which forces the snow off and to the front of the brush.

3.12 - Air Blower

The forced air blower shall be dual centrifugal impeller type with dual inlets and dual outlets.

It shall be mounted on the chassis between the front and rear axles with the nozzles directly behind the brush.

It shall produce 23,000 CFM total with 400-mph velocity air out both sides at the same time. The velocity and CFM at each nozzle shall be certified by an independent test facility and supplied with the bid.

Both nozzles shall blow in the same direction at any given time. Deflectors at the nozzle ends shall direct the flow to one

side or the other. The nozzle deflector's control shall be hydraulic and interlocked with the broom head angle to blow in the direction of broom casting thus controlled by the operator's joystick. The nozzle deflectors change direction as the broom swings. A separate control shall allow the nozzle deflectors' direction to be opposite of the broom angle by choice.

An additional control shall permit blowing without broom operation.

The centrifugal impellers shall be independently driven via hydrostatic motors. The two motors, one for each impeller, shall be mounted directly to the impeller shaft. Power to the motors shall be supplied from a variable displacement hydrostatic pump mounted on the engine's gearbox allowing infinite control of blower speed from 0 to 100 percent. Both of the impeller and shaft assemblies shall be dynamically balanced at the rated RPM.

All controls for the air blower shall be remotely operated from within the cab.

3.13 - Hydraulic System

All hoses for all systems shall be of the proper size and strength to work with the pressure and volume of oil required.

All hydraulic positioning functions (broom head lift, broom head swing, deflectors, and air nozzle lift) shall be equipped with a hydraulic position locking system.

A counterbalance valve shall be used for the broom lift and a pilot operated check valve for the other functions including broom swing left and right, and air nozzles left and right.

All hydraulic functions of the broom shall be electric over hydraulic valving.

Connectors to the solenoids shall be interlocking type to provide a secure connection, which can withstand normal pressure washing procedures.

Fluid and components shall be designed for temperatures to minus 20 degrees Fahrenheit ambient cold start.

The hydraulic fluid reservoir shall be a 50-gallon minimum.

Shut off valves for all filters below tank fluid level shall be installed to allow filter changes without loss of oil. Proper filtering shall be done on both the high pressure and low pressure circuits and shall conform to SAE J931. There shall be a 5-micron absolute rating on the hydrostatic pumps' filters placed in the charge pressure lines. There shall be a clogged filter indicator light on the cab control panel indicating filter replacement.

The hydraulic oil cooler shall be mounted with the engine radiator/charge air cooler to ensure adequate airflow. The fans for the hydraulic oil cooler shall be hydraulically driven with automatic variable thermostat control for correct temperature under all conditions, winter and summer. It shall be controlled by a thermostatic switch to avoid excessively cold oil operation and designed such that thermostatic failure results in the cooling fan being engaged. A pressure relief shall allow cold hydraulic oil to bypass the cooler for shorter warm up times. A hydrostatic oil temp gauge and warning light for low hydrostatic oil level shall also be supplied.

3.14 - Controls and Instrumentation

The operator's control for the broom in the chassis cab shall use the same display as the chassis. It shall have a Monitor, Diagnostic and Control (MDC) for the broom. It shall use CAN (Controller Area Network) serial bus system technology. The MDC station must incorporate diagnostics which displays what is wrong with a particular system.

All systems for the broom and broom engine must be part of the diagnostics.

The control in the chassis cab shall have all the necessary functions to operate the broom and air blower systems. The control in the chassis cab shall have a system on/off for the auxiliary engine consisting of a 1.5 inch diameter emergency stop type push button, twist for on/push for off. Controls shall consist of a multi-function CAN controlled joystick for broom lift/lower and left/ right swing using electric over hydraulic controls. The joystick shall contain multiple switches for controlling auxiliary functions including controls for broom only, as well as shaker hood on/off control. All functions and displays must be in easy reach of the operator and integrated into the chassis instrumentation.

The swing, lift, and blower nozzle shall be microprocessor controlled (no relays) and have automatic one touch for cycle complete control that allows the operator to have hands free operation during cycle movement. Moving the joystick in the opposite direction can stop the cycle.

A switch shall allow the operator to use the automatic control or disengage the system.

A touchpad with sealed pushbuttons shall be part of the broom controls and displays. A broom engine main operating screen shall be part of the broom controls and displays. The broom engine main operating screen shall include:

- Engine, broom and air blower speed control and display
- Oil pressure with visual and audible warning alarms
- Coolant temperature with visual and audible warning alarms
- Hydraulic oil temperature with visual and audible warning alarms
- Engine tachometer
- Voltmeter and warning indicators
- Air filter restriction warning and alarm
- Alarms for engine diagnostics and visual warning indicators and displayed faults
- Mode selector: auto / manual
- Broom rotational speed tachometer
- Status display for:
 - Broom / air duct coordination
 - Weight transfer system
 - Front and rear steering position

A menu selection screen, specific MDC function screens are accessed through this screen, shall be part of the broom controls and displays.

A lighting screen with brightness selection for display screen shall be part of the broom controls and displays.

A joystick/touch pad screen shall be part of the broom controls and displays. The joystick/touch pad screen mimics the features of the joystick:

- Broom lift up/down
- Broom swing left/right
- Deflector up/down
- Mode auto/manual
- Broom on/off
- Blower on/off
- Shaker hood on/off
- Vibrator on/off

An auxiliary gauge screen shall be part of the broom controls and displays. The auxiliary gauge screen is used for systems monitoring:

- Engine, broom and air blower speed control and display
- Per cent engine power
- Engine hour meter
- Inlet air temperature
- Broom hydrostatic pressure

A settings screen shall be part of the broom controls and displays. The settings screen shall include:

- Joystick control: broom only, blower duct only, or both
- Air blower nozzle direction: coordinate/opposite broom swing
- Weight transfer with audible alarm when in the off position
- Core life hours
- Maintenance hours
- Broom hydrostatic pressure

An engine diagnostics screen shall be part of the broom controls and displays. The engine diagnostics screen shall include:

- Display of active faults
- Display of active fault codes

An output diagnostics screen shall be part of the broom controls and displays. The output diagnostics screen is for display only and shows the controller output diagnostics.

- Individual system output test function
- Output diagnostics, last 25 fault history

A setup screen shall be part of the broom controls and displays. The setup screen allows authorized personnel to change the vital settings without the use of a notebook computer and is password protected.

END OF ITEM BROOM SWEEPER

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APPENDIX A
ACCESS TO RECORDS AND REPORTS

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ACCESS TO RECORDS AND REPORTS

The Contractor must maintain an acceptable cost accounting system. The Contractor agrees to provide the Sponsor, 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 contract for the purpose of making audit, examination, excerpts and transcriptions. The Contractor agrees to maintain all books, records and reports required under this contract for a period of not less than three years after final payment is made and all pending matters are closed.

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APPENDIX B
BUY AMERICAN PREFERENCES

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BUY AMERICAN CERTIFICATION

The contractor 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 FAA 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.

A bidder or offeror must submit the appropriate Buy America certification (below) with all bids or offers on AIP funded projects. Bids or offers that are not accompanied by a completed Buy America certification must be rejected as nonresponsive.

CERTIFICATE OF BUY AMERICAN COMPLIANCE FOR MANUFACTURED PRODUCTS

(Non-building construction projects, equipment acquisition projects)

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with their proposal. The bidder or offeror must indicate how they intend to comply with 49 USC § 50101 by selecting one on the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (not both) by inserting a checkmark (✓) or the letter "X".

Bidder or offeror hereby certifies that it will comply with 49 USC § 50101 by:

1. Only installing steel and manufactured products produced in the United States, or;
2. Installing manufactured products for which the FAA has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing, or;
3. Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

1. To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
2. To faithfully comply with providing US domestic product
3. To furnish US domestic product for any waiver request that the FAA rejects
4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

The bidder or offeror hereby certifies it cannot comply with the 100% Buy American Preferences of 49 USC § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:

1. To the submit to the Owner within 15 calendar days of the bid opening, a formal waiver request and required documentation that support the type of waiver being requested.
2. That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination may result in rejection of the proposal.
3. To faithfully comply with providing US domestic products at or above the approved US domestic content percentage as approved by the FAA.
4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

Required Documentation

Type 3 Waiver - The cost of the item components and subcomponents produced in the United States is more than 60% of the cost of all components and subcomponents of the “item”. The required documentation for a type 3 waiver is:

Listing of all product components and subcomponents that are not comprised of 100% US domestic content (Excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety)

Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly at place of manufacture.

Percentage of non-domestic component and subcomponent cost as compared to total “item” component and subcomponent costs, excluding labor costs associated with final assembly at place of manufacture.

Type 4 Waiver – Total cost of project using US domestic source product exceeds the total project cost using non-domestic product by 25%. The required documentation for a type 4 waiver is:

Detailed cost information for total project using US domestic product

Detailed cost information for total project using non-domestic product

False Statements: Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

Date

Signature

Company Name

Title

APPENDIX C
CIVIL RIGHTS

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GENERAL CIVIL RIGHTS PROVISIONS

The contractor agrees that it will 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 handicap be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision binds the contractors from the bid solicitation period through the completion of the contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

This provision also obligates the tenant/concessionaire/lessee or its transferee for the period during which Federal assistance is extended to the airport through the Airport Improvement Program, except where Federal assistance is to provide, or is in the form of personal property; real property or interest therein; structures or improvements thereon.

In these cases the provision obligates the party or any transferee for the longer of the following periods:

1. the period during which the property is used by the airport sponsor or any transferee for a purpose for which Federal assistance is extended, or for another purpose involving the provision of similar services or benefits; or
2. The period during which the airport sponsor or any transferee retains ownership or possession of the property.

Title VI Solicitation Notice:

The **Lynchburg Airport Commission**, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

Compliance with Nondiscrimination Requirements

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the **Title VI List of Pertinent Nondiscrimination Statutes and Authorities**, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR part 21.
3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.
4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the sponsor or the Federal Aviation Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the sponsor or the Federal Aviation Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

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5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the sponsor will impose such contract sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:
 - a. Withholding payments to the contractor under the contract until the contractor complies; and/or
 - b. Cancelling, terminating, or suspending a contract, in whole or in part.
 6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the sponsor or the Federal Aviation Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the sponsor to enter into any litigation to protect the interests of the sponsor. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX D
ENERGY CONSERVATION REQUIREMENTS

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ENERGY CONSERVATION REQUIREMENTS

The contractor agrees to comply with mandatory standards and policies relating to energy efficiency that are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163).

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APPENDIX E
FEDERAL FAIR LABOR STANDARDS ACT

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All contracts and subcontracts that result from this solicitation incorporate the following provisions by reference, with the same force and effect as if given in full text. The contractor has full responsibility to monitor compliance to the referenced statute or regulation. The contractor must address any claims or disputes that pertain to a referenced requirement directly with the Federal Agency with enforcement responsibilities.

| Requirement | Federal Agency with Enforcement Responsibilities |
|---|---|
| Federal Fair Labor Standards Act (29 USC 201) | U.S. Department of Labor – Wage and Hour Division |

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APPENDIX F
LOBBYING AND INFLUENCING FEDERAL EMPLOYEES

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LOBBYING AND INFLUENCING FEDERAL EMPLOYEES

The bidder or offeror certifies by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the bidder or offeror, 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 contract, 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 contract, grant, loan, or cooperative agreement.
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 contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

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APPENDIX G
OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

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All contracts and subcontracts that result from this solicitation incorporate the following provisions by reference, with the same force and effect as if given in full text. The contractor has full responsibility to monitor compliance to the referenced statute or regulation. The contractor must address any claims or disputes that pertain to a referenced requirement directly with the Federal Agency with enforcement responsibilities.

| Requirement | Federal Agency with Enforcement Responsibilities |
|---|--|
| Occupational Safety and Health Act of 1970 (20 CFR Part 1910) | U.S. Department of Labor – Occupational Safety and Health Administration |

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APPENDIX H
RIGHTS TO INVENTIONS

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RIGHTS TO INVENTIONS

All rights to inventions and materials generated under this contract are subject to requirements and regulations issued by the FAA and the Sponsor of the Federal grant under which this contract is executed.

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APPENDIX I
TRADE RESTRICTION CLAUSE

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TRADE RESTRICTION CLAUSE

The contractor or subcontractor, by submission of an offer and/or execution of a contract, certifies that it:

- a. 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 published by the Office of the United States Trade Representative (USTR);
- b. has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens or nationals of a foreign country on said list;
- c. has not procured any product nor subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to a contractor or subcontractor who is unable to certify to the above. If the contractor knowingly procures or subcontracts for the supply of any product or service of a foreign country on said list for use on the project, the Federal Aviation Administration may direct through the Sponsor cancellation of the contract at no cost to the Government.

Further, the contractor agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in each contract and in all lower tier subcontracts. The contractor may rely on the certification of a prospective subcontractor unless it has knowledge that the certification is erroneous.

The contractor shall provide immediate written notice to the sponsor if the contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The subcontractor agrees to provide written notice to the contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

This certification is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration may direct through the Sponsor cancellation of the contract or subcontract for default at no cost to the Government.

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.

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, United States Code, Section 1001.

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