ROANOKE COUNTY

FINANCE & MANAGEMENT SERVICES DEPARTMENT
PURCHASING DIVISION

REQUEST FOR PROPOSALS
Non Professional Services

RFP # 2021-097
Tractor Drawn Tiller Ladder Truck

OPENING DATE: July 13, 2021
OPENING TIME: 2:00 P.M.

The Request for Proposal and related documents may be obtained during normal business hours from the Purchasing Division, at the Roanoke County Administration Building, 5204 Bernard Drive SW, Suite 300F, Roanoke, VA 24018. This document may be viewed and/or downloaded from the County of Roanoke Purchasing Division's website at https://www.roanokecountyva.gov/bids.aspx. If you have any problems accessing the documents, you may contact Purchasing at (540) 772-2061.

THIS PUBLIC BODY DOES NOT DISCRIMINATE
AGAINST FAITH-BASED ORGANIZATIONS

DATE of RFP: May 13, 2021

REQUEST FOR PROPOSAL

RFP No. 2021-097
Issue Date: May 13, 2021
Title: Tractor Drawn Tiller Ladder Truck

Issued By: **County of Roanoke**
Roanoke County Administration Building
Purchasing Division
5204 Bernard Drive, SW, Suite 300-F
Roanoke, VA 24018-0798
Phone (540) 772-2061
Email: KHoyt@roanokecountyva.gov

Sealed proposals will be received on or before **2:00 P.M., July 13, 2021** for furnishing the services and/or items described herein. The time of receipt shall be determined by the time clock stamp in the Purchasing office.

All questions must be submitted before 5:00 p.m. on July 5, 2021. If necessary, an addendum will be issued and posted to the County website on the Current Bids/RFP Requests tab at https://www.roanokecountyva.gov/bids.aspx.

If proposals are hand delivered or mailed, send directly to the Purchasing Division at the address listed above. If the Roanoke County Administration Building is closed for business at the time scheduled for the proposal opening, the sealed proposal will be accepted and opened on the next business day of the County, at the originally scheduled hour.

THIS PUBLIC BODY DOES NOT DISCRIMINATE AGAINST FAITH-BASED ORGANIZATIONS.

The County reserves the right to cancel this RFP and/or reject any or all proposals and to waive any informalities in any proposal.

This section is to be completed by the Offeror and this page must be returned with the proposal. In compliance with this request for proposal and subject to all terms and conditions imposed herein, which are hereby incorporated herein by reference, the undersigned offers and agrees to furnish the services and/or items requested in this solicitation if the undersigned is selected as the successful Offeror. Unless the proposal is withdrawn, the Offeror agrees that any prices or terms for such proposal shall remain valid for sixty (60) days after opening. Notices of proposal withdrawal must be submitted in writing to the Purchasing Division.

Legal Name and Address of Firm:

_____ Date:_____

_____ By:_____
(Signature in Ink)

_____ Name:_____
(Please Print)

_____ Zip: _____ Title:_____

Phone: _____ FAX:_____

Email: _____ Business License# _____

Virginia State Corporation Commission Identification Number: _____

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Tractor Drawn Tiller Ladder Truck

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COUNTY OF ROANOKE, VIRGINIA
REQUEST FOR PROPOSAL
FOR
TRACTOR DRAWN TILLER LADDER TRUCK
RFP NUMBER 2021-097

INTRODUCTION

The County of Roanoke, Virginia, is seeking proposals and qualifications from Offerors to provide a custom, minimum 100-ft. tiller ladder truck, in accordance with all terms, conditions, and specifications as set out in this Request for Proposal (RFP). The RFP and related documents may be obtained during normal business hours from the Purchasing Division, (540) 772-2061. This document may be viewed and/or downloaded from the County of Roanoke Purchasing Division's Current Bid Opportunities website at https://www.roanokecountyva.gov/bids.aspx. If you have any problems accessing the documents, you may contact Purchasing at (540)772-2061 or KHoyt@roanokecountyva.gov.

Proposals, to be considered and evaluated, must be sealed and received on or before 2:00 p.m. on July 13, 2021 in the Purchasing Division, County of Roanoke, and 5204 Bernard Drive SW, Suite 300- F, Roanoke VA 24018. Proposals appropriately received will be opened at this time. **Proposals received after 2:00 p.m. will not be accepted or considered.** The time of receipt shall be determined by the time clock stamp in the Purchasing Office, or if it is not working, such time shall be determined by the Purchasing official who is to open the proposals. Faxed or e-mailed proposals are not acceptable**.**

Each proposal, **one (1) original, marked as such** and **four (4) copies, marked as such**, must be appropriately signed by an authorized representative of the Offeror, and must be submitted in a sealed envelope or package. A removable media storage device containing two (2) digital copies of the proposal, one as submitted, and one **redacted to remove all confidential and proprietary material**, must be included in the proposal packet. The notation **"Tractor Drawn Tiller Ladder Truck", RFP No. 2021-097** and the specified opening time and date must be clearly marked on the front of that sealed envelope or package. If the Roanoke County Administration Building is closed for business at the time scheduled for the proposal opening, the sealed proposal will be accepted and opened on the next business day of the County, at the originally scheduled hour.

The County of Roanoke, Virginia, and its officers, employees or agents will not be responsible for the opening of a proposal envelope or package prior to the scheduled opening if that envelope or package is not appropriately sealed and marked as specified.

The County of Roanoke, Virginia reserves the right to cancel this RFP and/or reject any or all proposals, to waive informalities in any proposal, to award any whole or part of a proposal, and to award to the Offeror whose proposal is, at the sole discretion of the County of Roanoke, determined to be in the best interest of the County.

Project evaluation and award will be accomplished in accordance with this RFP and Section **10.9** of the County of Roanoke Procurement Policy & Procedures Manual. If an award of a contract is made, notification of such award will be posted for public review on the County of Roanoke Purchasing Division's website under Current Bid Opportunities at https://www.roanokecountyva.gov/bids.aspx or you may contact Purchasing directly at (540) 772-2061 to request a copy of the award notification.

Unless the proposal is withdrawn, the Offeror agrees that any prices or terms for such proposal shall remain valid for sixty (60) days after opening. Notices of proposal withdrawal must be submitted in writing to the Purchasing Manager.

Inquiries regarding this RFP should be directed to Kate Hoyt, at (540) 283-8149 or via email at KHoyt@roanokecountyva.gov. Inquiries for information regarding procurement procedures and/or proposal submission shall be directed to the Purchasing Division.

This RFP consists of this Introduction, ten (10) numbered sections, and the attachments hereto.

Each Offeror is solely responsible for ensuring that such Offeror has the current, complete version of the RFP documents, including any addenda, before submitting a proposal. The County is not responsible for any RFP obtained from any source other than the County. Contact Purchasing by phone at (540) 772-2061, or by email at KHoyt@roanokecountyva.gov.

Respectfully,

Kate Hoyt
Senior Buyer

Date: May 13, 2021

County of Roanoke, Virginia
Request for Proposal No. 2021-097
Tractor Drawn Tiller Ladder Truck

SECTION 1. PURPOSE.

The purpose of this Request for Proposal (RFP) is the procurement of a custom, minimum 100-ft., tiller ladder truck with pre-piped waterway, with an optional minimum 1500 GPM pump and 300-gallon tank, consistent with the specifications, terms and conditions herein set forth. Final scope of services will be negotiated with the successful Offeror.

SECTION 2. BACKGROUND.

NOT USED.

SECTION 3. INSTRUCTIONS TO OFFERORS.

A. Proposals must be submitted in accordance with the instructions and requirements contained in this RFP, including the Introduction. Failure to do so may result in the proposal being considered non-responsive and it may be rejected. An Offeror must promptly notify the Purchasing Division of any ambiguity, inconsistency, or error which may be discovered upon examination of the RFP. An Offeror requiring clarification or interpretation of this RFP should contact Kate Hoyt at (540) 283-8149.

B. Until such time that an award is published, direct contact with any County employee without the express permission of the Purchasing Manager or designated representative, on the subject of this proposal, is strictly forbidden. Violation of this Instruction may result in disqualification of Offeror's proposal.

C. Prospective Offerors, sometimes referred to as providers, operators, contractors, consultants, or vendors, are to address the criteria below at a minimum as part of their submitted proposal. Each proposal should include a transmittal letter and management overview of the proposal. Proposals are to include and may be evaluated on the following factors, together with such other factors as will protect and preserve the interests of the County of Roanoke, which may also be considered.

1. Organizational structure of firm and qualifications of management personnel.

   Prospective Offerors should submit at a minimum the length of time in the business, corporate experience, strengths in the industry, business philosophy, and a description of the organizational structure of the firm; a description of the

organizational structure for the management and operation of the services requested and/or provision of the items referred to in this RFP, including an organizational chart denoting all positions and the number of personnel in each position. (See Attachment B)

2. Financial condition of the firm and ability to perform all obligations of any resultant contract.

   The sufficiency of the financial resources and the ability of the Offeror to comply with the duties and responsibilities described in this RFP. Each Offeror shall provide a current annual financial report and the previous year's report and a statement regarding any recent or foreseeable mergers or acquisitions. Financial statements may be marked as "confidential" in accordance with the requirements set out in Section 4(A) of this RFP. (See Attachment B)

3. Each Offeror is to state whether or not any of Offeror's owners, officers, employees, or agents, or their immediate family members, is currently, or has been in the past year, an employee of the County of Roanoke or has any responsibility or authority with the County that might affect the procurement transaction or any claim resulting therefrom. If so, please state the complete name and address of each such person and their connection to the County of Roanoke. Each Offeror is advised that the Ethics in Public Contracting and Conflict of Interests Act of the Virginia Code, as set forth in Section 4 of this RFP, apply to this RFP. (See Attachment B)

4. Experience in providing the services and/or items requested by this RFP. (See Attachment B)

5. Price: Prospective Offerors must submit the price such Offeror proposes to charge the County for providing the required services and/or items, including all fees and costs and how they are calculated. (See Attachment B)

6. The ability, capacity, and skill of the Offeror to provide the services and/or items described in this RFP and in a prompt and timely manner without delay or interference.

7. The character, integrity, reputation, judgment, experience, efficiency and effectiveness of the Offeror.

8. The quality and timeliness of performance of previous contracts or services of the nature described in this RFP.

9. Compliance by the Offeror with laws and ordinances regarding prior contracts, purchases, or services. (See Attachment B)

10. The conditions, if any, of the proposal. (See Attachment B)

11. Warranty information per specifications.

D. Each Offeror should provide the names, addresses, and telephone numbers of at least three (3) references in connection with supplying the services or items requested in this RFP, especially from other **local government** operations similar to those being requested in this RFP by the County. Each reference should include organizational name, official address, contact person, title of contact, and phone number. (See Attachment B)

E. Also include any other materials you may want to submit as part of your proposal response.

F. Responses to this RFP must be in the prescribed format (Attachment B – Proposal Response and Checklist).

Offeror shall provide one redacted copy of its proposal fit for public dissemination, in the event the County must respond to a Freedom of Information Act request. A removable media storage device containing two (2) digital copies of the proposal, one as submitted, and one **redacted to remove all confidential and proprietary material**, must be included in the proposal packet. Offeror shall not mark its entire proposal as confidential and/or redact the entire proposal; doing so may result in the disqualification of Offeror's proposal.

G. The County may request additional information, clarification, or presentations from any of the Offerors after review of the proposals received.

H. The County has the right to use any or all ideas presented in reply to this RFP, subject only to the limitations regarding proprietary/confidential data of Offeror.

I. The County is not liable for any costs incurred by any Offeror in connection with this RFP or any response by any Offeror to this RFP. The expenses incurred by Offeror in the preparation, submission, and presentation of the proposal are the sole responsibility of the Offeror and may not be charged to the County.

J. **Each proposal must contain a completed and properly signed Specifications Checklist, which form is contained as Attachment C to this RFP.**

K. Only the County will make news releases pertaining to this RFP or the proposed award of a Contract.

L. Each Offeror who is a stock or nonstock corporation, limited liability company, business trust, or a limited partnership or other business entity shall be authorized to transact business in the Commonwealth of Virginia as a domestic or foreign business entity if required by law. Each such Offeror shall include in its proposal response the Identification Number issued to it by the Virginia State Corporation Commission (SCC) and should list its business entity name as it is listed with the SCC. Any Offeror that is not required to be authorized to transact business in the Commonwealth as a domestic or foreign business entity as required by law shall include in its proposal response a statement describing why the Offeror is not required to be so authorized.

(See Va. Code Section 2.2-4311.2).

M. Each Offeror is required to disclose if it has ever been debarred, fined, had a contract terminated, or found not to be a responsible bidder or Offeror by any federal, state, or local government, and/or private entity. If so, please give the details of each such matter and include this information with the proposal response.

SECTION 4. MISCELLANEOUS.

A. Ownership of Material - Ownership of all data, materials, and documentation originated and prepared for the County pursuant to the RFP shall belong exclusively to the County and be subject to public inspection in accordance with the *Virginia Freedom of Information Act*. Trade secrets or proprietary information submitted by the Offeror shall not be subject to public disclosure under the *Freedom of Information Act*, unless otherwise required by law. **However, the Offeror must invoke the protection of Section 2.2-4342(F) of the *Code of Virginia,* in writing, either before or at the time the data or other material is submitted**. **The written notice must SPECIFICALLY identify the data or materials to be protected and state the reason why protection is necessary. The proprietary or trade secret material submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute trade secret or proprietary information.** The classification of an entire proposal document, line item prices, and/or total proposal prices as proprietary, or trade secrets, is NOT ACCEPTABLE and may result in REJECTION of the proposal.

B. As this is a RFP, no information regarding the proposal records or the contents of responses will be released except in accordance with Section 2.2-4342 of the Code of Virginia. Once an award has been made, all proposals will be open to public inspection subject to the provisions set forth above.

C. IMPORTANT NOTICE - ADDENDUMS AND NOTICES OF AWARD

Any interpretation, correction, or change of the RFP will be made by an addendum. The County Purchasing Division or its designee will issue Addenda that will be posted to the County website on the Current Bid Opportunities tab at https://www.roanokecountyva.gov/bids.aspx.

Interpretations, corrections or changes of this RFP made in any other manner will not be binding and Offerors must not rely upon such interpretations, corrections, or changes.

Vendors may visit http://roanokecountyva.gov/list.aspx to sign up via 'Notify Me' to receive emails or text message notices about bids, proposals, addendums, bid tabulation and awards. Vendors can sign up to receive notification in selected

commodity/service categories. It is the vendor's responsibility to keep information current in the system in order to receive the notifications. The sign up only requires an email address and/or a cell phone number for receiving text messages (if your phone is capable) and your choice of categories. **However, each Offeror is solely responsible for ensuring that such Offeror has the current, complete version of the RFP documents, including any addenda, before submitting a proposal. The County is not responsible for any RFP obtained from any source other than the County.**

Although 'Notify Me' will be the only way to receive automatic notification, all BIDS/RFP Information will continue to be posted on our website, and can be picked up at the Purchasing Division, 5204 Bernard Drive, Suite 300F, Roanoke, VA 24018. Phone # (540) 772-2061.

The County is not responsible for any RFP obtained from any source other than the County. Contact Kate Hoyt by phone at 540-283-8149, or by email at KHoyt@roanokecountyva.gov.

D. No Offeror shall confer on any public employee having official responsibility for a purchasing transaction any payment, loan, subscription, advance, deposit or money, service, or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value is exchanged.

E. The County may make investigations to determine the ability of the Offeror to perform or supply the services and/or items as described in this RFP. The County reserves the right to reject any proposal if the Offeror fails to satisfy the County that it is qualified to carry out the obligations of the proposed contract.

F. The successful Offeror must comply with the nondiscrimination provisions of Virginia Code Section 2.2-4311, which are incorporated herein by reference.

G. The successful Offeror must comply with the drug-free workplace provisions of Virginia Code Section 2.2-4312, which are incorporated herein by reference.

H. It is the policy of the County of Roanoke to maximize participation whenever possible by minority and women owned business enterprises in all aspects of County contracting opportunities.

I. The successful Offeror shall comply with all applicable County, State, and Federal laws, codes, provisions, and regulations. The successful Offeror shall not during the performance of any resultant contract knowingly employ an unauthorized alien as defined in the federal Immigration Reform and Control Act of 1986.

J. Providers of any outside services shall be subject to the same conditions and requirements as the successful Offeror in regards to law, code, or regulation

compliance. The County reserves the right of approval for any subcontract work, including costs thereof.

K. Ethics in Public Contracting. The provisions, requirements, and prohibitions as contained in Sections 2.2-4367 through 2.2-4377, of the Virginia Code, pertaining to bidders, offerors, contractors, and subcontractors are applicable to this RFP.

L. Conflict of Interests Act. The provisions, requirements, and prohibitions as contained in Sections 2.2-3100, et seq., of the Virginia Code are applicable to this RFP.

M. The procurement provisions of the Virginia Public Procurement Act as well as the County Procurement Manual, apply to this RFP, unless specifically modified herein. The County's Procurement Manual can be reviewed on the County's electronic procurement website.

N. Insurance Requirements:
Successful Offeror, and any of its subcontractors, shall, at its sole expense, obtain and maintain during the life of the resulting Contract the insurance policies and/or bonds required. Any required insurance policies and/or bonds shall be effective prior to the beginning of any work or other performance by successful Offeror, or any of its subcontractors, under any resultant Contract. The policies and coverages required are those as may be referred to in the sample contract and/or the terms and conditions attached to this RFP. All such insurance shall be primary and noncontributory to any insurance or self-insurance the County may have.

SECTION 5. PROTESTS.

Any Offeror who wishes to protest or object to any award made or other decisions pursuant to this RFP may do so only in accordance with the provisions of Sections 2.2-4357, 4358, 4359, 4360, 4363, and 4364 of the Code of Virginia, and only if such is provided for in such Code section. Any such protest or objection must be in writing signed by a representative of the entity making the protest or objection and contain the information required by the applicable Code Sections set forth above. Such writing must be delivered to the County Purchasing Manager within the required time period.

SECTION 6. SERVICES AND/OR ITEMS REQUIRED.

A description and/or listing of the services and/or items that the successful Offeror will be required to provide to the County under this RFP are those that are set forth in this RFP, below, referred to in any way in the sample contract, in any terms and conditions, and/or in any attachments to this RFP.

Each Offeror should carefully read and review all such items and should address such items in its proposal. However, the final description of the services and/or items to be provided to the County under this RFP is subject to negotiations with the successful Offeror, and final approval by the County.

This RFP is intended to provide the County of Roanoke Fire and Rescue Department with a custom, minimum 100-ft., tractor drawn tiller ladder truck. The apparatus must have a pre-piped waterway. The apparatus shall be otherwise equipped per the specifications listed on **Attachment C: Specifications Checklist**.

The following options should be offered in the successful proposal:

Minimum 1500 GPM pump and 300-gallon tank.

SECTION 7. EVALUATION CRITERIA.

Offerors will be evaluated for selection on the basis of those most qualified to meet the requirements of this RFP. The County of Roanoke does not use a numerical or weighted scoring system when evaluating selection criteria. Major criteria to be considered in the evaluation may include, but shall not necessarily be limited to, the items referred to above and those set forth below:

A. The background, education and experience of the Offeror in providing similar services or items elsewhere, including the level of experience in working with municipalities and the quality of services performed or items supplied.

B. Reasonableness/competitiveness of proposed fee and/or benefits to the County, although the County is not bound to select the Offeror who proposes the lowest fees or most benefits for services. The County reserves the right to negotiate fees and/or benefits to the County with the selected Offeror(s).

C. The Offeror's responsiveness and compliance with the RFP requirements and conditions.

D. Determination that the selected Offeror has no contractual relationships which would result in a conflict of interest with the County's contract.

E. The Offeror's ability, capacity and skill to fully and satisfactorily provide the services and/or items required in this RFP.

F. The quality of Offeror's performance in comparable and/or similar projects.

G. Whether the Offeror can provide the services and/or deliver the items in a prompt and timely fashion.

H. Offeror's willingness to accept the County's sample contract (Attachment A).

SECTION 8. SELECTION PROCESS.

A. Pursuant to Section 2.2-4302.2 (A)(4) of the Code of Virginia, selection of the Offeror will be as follows:

1. The County's designee, shall engage in individual discussions with two or more Offerors, if there be that many deemed fully qualified, responsible and suitable on the basis of initial responses with emphasis on professional competence to provide the required services. Repetitive informal interviews shall be permissible. Such Offerors shall be encouraged to elaborate on their qualifications and performance data or staff expertise pertinent to the proposed projects as well as alternative concepts. These discussions may encompass nonbinding estimates of total project costs including, where appropriate, design, construction, life cycle cost, nonbinding estimates of price for services, and other matters. Methods to be utilized in arriving at a price for services may also be discussed. Properly designated proprietary information from competing Offerors shall not be disclosed to the public or competitors, except as may be required by law.

2. At the conclusion of discussions, outlined in the paragraph above, on the basis of evaluation factors published in the RFP and all information developed in the selection process to this point, the two (2) or more Offerors whose professional qualifications and proposed services are deemed most meritorious shall be ranked in order of preference.

3. Negotiations shall then be conducted, beginning with the Offeror ranked first. If a contract satisfactory and advantageous to the County can be negotiated at a price considered fair and reasonable, the award shall be made to that Offeror. Otherwise, negotiations with the Offeror ranked first shall be formally terminated and negotiations conducted with the Offeror ranked second, and so on until such a contract can be negotiated at a fair and reasonable price. Should the County determine in writing and in its sole discretion that only one Offeror is fully qualified, or that one Offeror is clearly more highly qualified than the others under consideration, a contract may be negotiated and awarded to that Offeror.

B. All proposals submitted in response to this RFP will be reviewed by the Purchasing Division or its designee for responsiveness prior to referral to a selection committee or person. A committee consisting of County personnel and/or others and/or an appropriate individual will then evaluate all responsive proposals, conduct the negotiations, and make recommendations to the County as appropriate. The award of a contract, if made, will be made to the Offeror whose proposal best furthers the interest of the County. The County reserves the right to reject any and all proposals, to waive any informality or irregularity in the proposals received, and to make the award to the Offeror whose proposal is deemed to be in the best interest of the County.

C. Oral Presentation: Offerors who submit a proposal in response to this RFP may be required to give an oral presentation of their proposal to the selection committee or person. This provides an opportunity for the Offeror to clarify or elaborate on the proposal. This is a fact finding and explanation session only and does not include negotiation. Oral presentations are strictly at the option of the County and may or may not be conducted.

D. The County reserves the right to make multiple awards as a result of this solicitation.

SECTION 9. COOPERATIVE PROCUREMENT.

The procurement of goods and/or services provided for in this Contract is being conducted pursuant to Virginia Code Section 2.2-4304 and on behalf of other public bodies in Virginia. Unless specifically prohibited by the Awarded Offeror, any resultant contract may be used by other public bodies in Virginia as allowed by Section 2.2-4304. The Awarded Offeror shall deal directly with each public agency or body seeking to obtain any goods and/or services pursuant to this Contract or from this procurement and in accordance with Virginia Code Section 2.2-4304. The County of Roanoke shall not be responsible or liable for any costs, expenses, or any other matters of any type to either the Contractor or the public agency or body seeking to obtain any goods and/or services pursuant to this cooperative procurement provision.

SECTION 10. INFORMATION ON CONTRACT TO BE AWARDED.

The Sample Contract marked as Attachment A to RFP # 2021-097 contains terms and conditions that the County will include in any contract that may be awarded, but such terms and conditions may be changed, added to, deleted, or modified as may be agreed to between the County and the Offeror during negotiations. However, if an Offeror has any objections to any of the terms or conditions set forth in the Sample Contract or any changes or additions thereto that the Offeror wants to discuss during negotiations, the Offeror should set forth such objections, changes, or additions in such Offeror's proposal submitted in response to this RFP. Otherwise, submission of a proposal by an Offeror will obligate such Offeror, if it is the successful Offeror, to enter into a contract containing the same or substantially similar terms and conditions as contained in such Sample Contract. Other terms and conditions, if necessary, will be negotiated with the successful Offeror.

END

ATTACHMENT A: SAMPLE CONTRACT

COUNTY OF ROANOKE, VIRGINIA
SAMPLE CONTRACT BETWEEN COUNTY OF ROANOKE AND FOR TRACTOR DRAWN TILLER LADDER TRUCK

This Contract # 2021-097 is dated , between the County of Roanoke, Virginia, hereinafter referred to as the "County" or "Owner", and legal name/address of contractor, hereinafter referred to as the "Contractor," Choose an item. .

WITNESSETH:

WHEREAS, Contractor has been awarded this nonexclusive Contract by the County for furnishing all equipment, materials, goods, labor, and services necessary for the provision of a custom tractor drawn tiller ladder truck and associated work in accordance with this Contract and the documents referred to herein, all such items or services also being referred to hereinafter as the Work or Project.

NOW, THEREFORE, THE COUNTY AND THE CONTRACTOR AGREE AS FOLLOWS:

SECTION 1. WORK/ SERVICES TO BE PROVIDED AND DOCUMENTS.

For and in consideration of the money hereinafter specified to be paid by the County to the Contractor for the Work provided for in this Contract to be performed by the Contractor, the Contractor hereby covenants and agrees with the County to fully perform the services, provide any materials called for to construct, and complete the Work called for by this Contract in a good and workmanlike manner in accordance with this Contract and the documents referred to herein in order to fully and properly complete this Contract within the time stipulated, time being made of the essence for this Contract. It is also agreed by the parties hereto that the documents to this Contract consist of this Contract and the following documents listed below (Contract Documents), all of which are and constitute a part of this Contract as if attached hereto or set out in full herein, viz:

1. Insurance Requirements (Exhibit 1).
2. Scope of Work/Fee Schedule (Exhibit 2).
3. Bid Form Completed by Contractor and dated _____ (Exhibit 3). **(To be provided after selection of Successful Bidder.)**
4. Invitation for Bid No. 2021-097, which is incorporated herein by reference.

The parties agree that if there are any differences between the provisions of the above referenced documents, the provisions of the County documents and this Contract will control over any Contractor supplied documents or information.

SECTION 2. CONTRACT AMOUNT.

The County agrees to pay the Contractor for the Contractor's complete and satisfactory performance of the Work/ Service, in the manner and at the time set out in this Contract, but the total amount for all such requests will not exceed $_____ , as provided for in this Contract and that this Contract amount may be increased or decreased by additions and/or reductions in the Work as may be authorized and approved by the County, and the Contract amount may be decreased by the County's assessment of any damages against the Contractor, as may be provided for in this Contractor or by law, and the County retains the right of setoff as to any amounts of money the Contractor may owe the County. However, Contractor further acknowledges and agrees that any request for Contractor to perform Work under this Contract is in the sole discretion of the County and that there is no guarantee of any minimum amount of Work that may be requested by the County and that no Work may be requested.

SECTION 3. TERM OF CONTRACT.

A. The term of this Contract shall be for one (1) year, from _____, through _____, at which time it will terminate, unless sooner terminated pursuant to the terms of the Contract or by law or unless extended as set forth herein at the option of the County.

B. By mutual agreement of the parties, the contract may be renewed for up to four (4) additional one (1) year periods of any combination thereof. If either party wants to renew the Contract that party shall give a written request to renew to the other party before the expiration of the original term or any renewal term of the Contract. The party receiving such request shall either accept or reject in writing such request within ten (10) days of receipt of that request, provided, however, if the party receiving the request to renew fails to respond within ten (10) days, the request to renew shall be deemed to be rejected, unless the parties mutually agree otherwise.

C. All terms and conditions shall remain in force for the term of this Contract and for any renewal period unless modified by mutual agreement of both parties. Prices shall not be increased during the initial term of this Contract.

SECTION 4. TIME OF PERFORMANCE.

The Contractor shall commence the Work to be performed under this Contract on such date as is established and fixed for such commencement by written notice (which may be initially given verbally in an emergency situation) to proceed given by the County representative to the Contractor, and the Contractor covenants and agrees to fully construct, perform, and complete the Work and/or provide the goods called for by this Contract established by such notice. The Contractor further agrees that the Work shall be started promptly upon receipt of such notice and shall be prosecuted regularly, diligently, and uninterruptedly at a rate of progress that will ensure full completion thereof in the shortest length of time consistent with

the Contract Documents and that Contractor will cooperate and coordinate with the other County contractors or employees doing other work or using the area where Contractor is working.

SECTION 5. PAYMENT.

A. The County and Contractor agree that the County will only pay the Contractor for time actually spent and materials actually provided on the Project requested and accepted by the County. Invoices for services rendered and accepted shall be submitted by Contractor directly to the payment address of the requesting County department/division. Payment of such invoices shall be the responsibility of the department/division.

B. The County agrees to pay Contractor for the Contractor's complete and satisfactory performance of the Work, in the manner and at the time set out in this Contract. The County retains the right to setoff as to any amounts of money Contractor may owe the County. A written progress report may be requested by the County to accompany payment request and, if so, such progress report shall detail the work completed. Also, sufficient documentation of all costs, expenses, materials supplies, and/or hours worked may be requested by the County and, if so, may be required prior to the processing of any such request for payment. Payment will only be made for work actually performed, services actually supplied, and/or materials or goods furnished to the County, all of which need to be approved and accepted by the County prior to such payment, unless otherwise provided for in the Contract documents. Once a payment request has been received the County, the County will process such payment request. If there are any objections or problems with the payment request, the County will notify the Contractor of such matters. If the payment request is approved and accepted by the County, payment will be made by the County to the Contractor not more than 30 days after such request has been approved.

C. The services the Contractor may be requested to provide the County are those items set forth in Exhibit 2 (Scope of Work) and/or Exhibit 3 (Bid Form), which list of services may be amended by the mutual agreement of the parties. The prices to be paid to the Contractor for such services provided to and accepted by the County under the provisions of this Contract shall be the current price(s) as set forth in Exhibit 3 (Bid Form). Unless otherwise stated in this Contract, the price(s) shall include all applicable charges such as pick up, delivery, printing, packaging, shipping, and other charges.

SECTION 6. SALES TAX EXEMPTION.

The County is exempt from payment of State Sales and Use Tax on all tangible personal property purchased or leased for the County's use or consumption. The Virginia Sales and Use Tax Certificate of Exemption number is 217-074292-9. The County's tax-exempt status shall not inure to the benefit of Vendor. Vendor shall be liable for all applicable local, state and federal taxes that may arise or be due under this Agreement.

SECTION 7. FREE ON BOARD, RISK OF LOSS, AND TITLE.

All prices include F.O.B Destination, inside delivery, unless otherwise noted in this Contract. The risk of loss from any casualty, regardless of cause, shall be on the Contractor until the items have been delivered to County personnel making the request and accepted by the County. The risk of loss shall also be on the Contractor during the return of any items to the Contractor. Title to the items shall pass to the County upon receipt and acceptance of such items by the County.

SECTION 8. INSPECTION.

The County shall have a reasonable time after receipt of items / services provided and before payment to inspect all items for conformity to this Contract. If all or some of the items delivered to the County do not fully conform to the provisions hereof, the County shall have the right to reject and return such nonconforming items, at the sole cost of the Contractor.

SECTION 9. WARRANTY OF MATERIAL AND WORKMANSHIP.

Contractor agrees that all items provided to the County will be new, or if an item is refurbished or remanufactured, such item will meet the industry standards for such item and the item shall be clearly labeled as refurbished or remanufactured, and that all such items include such warranties as may be provided by Virginia law together with any warranties provided by the manufacturer of the item. Contractor shall use reasonable commercial efforts to assist the County in processing warranty claims against a manufacturer. Contractor also agrees that the services provided under this Contract shall be completed in a professional, good and workmanlike manner, with the degree of skill and care that is required by like contractors in Virginia. Further, Contractor warrants that such services shall be completed in accordance with the applicable requirements of this Contract and shall be correct and appropriate for the purposes contemplated in this Contract. Contractor agrees that Contractor shall repair or replace, at Contractor's sole expense, and to the satisfaction of the County, any items, material, equipment, or part of the item that is found by the County to be defective or not in accordance with the terms of this Contract.

SECTION 10. PAYMENTS TO OTHERS BY CONTRACTOR.

The Contractor agrees that Contractor will comply with the requirements of Section 2.2-4354 of the Virginia Code regarding Contractor's payment to other entities and the Contractor will take one of the two actions permitted therein within 7 days after receipt of amounts paid to Contractor by the County. Contractor further agrees that the Contractor shall indemnify and hold the County harmless for any lawful claims resulting from the failure of the Contractor to make prompt payments to all persons supplying the Contractor equipment, labor, tools, or material in connection with the work provided for in the Contract. In the event of such claims, the County may, in the County's sole discretion, after providing written notice to the Contractor, withhold from any payment request or final payment the unpaid sum of money

deemed sufficient to pay all appropriate claims and associated costs in connection with the Contract and make such payment, if the County determines it to be appropriate to do so.

SECTION 11. HOLD HARMLESS AND INDEMNITY.

Contractor shall indemnify and hold harmless the County and its officers, agents, and employees against any and all liability, losses, damages, claims, causes of action, suits of any nature, costs, and expenses, including reasonable attorney's fees, resulting from or arising out of Contractor's or its employees, agents, or subcontractors actions, activities, or omissions, negligent or otherwise, on or near County's property or arising in any way out of or resulting from any of the work or items to be provided under this Contract, and this includes, without limitation, any fines or penalties, violations of federal, state, or local laws or regulations, personal injury, wrongful death, or property damage claims or suits. Contractor agrees to and shall protect, indemnify, and hold harmless all the parties referred to above from any and all demands for fees, claims, suits, actions, causes of action, settlement or judgments based on the alleged or actual infringement or violation of any copyright, trademark, patent, invention, article, arrangement, or other apparatus that may be used in the performance of this Contract.

SECTION 12. COMPLIANCE WITH LAWS AND REGULATIONS, AND IMMIGRATION LAW.

Contractor agrees to and will comply with all applicable federal, state, and local laws, ordinances, and regulations, including, but not limited to all applicable licensing requirements, environmental regulations, and OSHA regulations. Contractor further agrees that Contractor does not and shall not during the performance of its Contract; knowingly employ an unauthorized alien as defined in the Federal Immigration Reform & Control Act of 1986.

SECTION 13. INDEPENDENT CONTRACTOR.

The relationship between Contractor and the County is a contractual relationship. It is not intended in any way to create a legal agency or employment relationship. Contractor shall, at all times, maintain its status as an independent contractor and both parties acknowledge that neither is an agent, partner or employee of the other for any purpose. Contractor shall be responsible for causing all required insurance, workers' compensation (regardless of number of employees) and unemployment insurance to be provided for all of its employees and subcontractors. Contractor will be responsible for all actions of any of its subcontractors, and that they are properly licensed.

SECTION 14. REPORTS, RECORDS, AND AUDIT.

Contractor agrees to maintain all books, records, electronic data, and other documents relating to this Contract for a period of five (5) years after the end of each fiscal year covered by this Contract. The County, its authorized employees, agents, representatives, and/or state auditors shall have full access to and the right to request, examine, copy,

and/or audit any such materials during the term of the Contract and such retention period, upon prior written notice to Contractor. This includes the County's right to audit and/or examine any of the Contractor's documents and/or data as the County deems appropriate to protect the County's interests.

SECTION 15. INSURANCE REQUIREMENTS.

Contractor and any of its subcontractors involved in this Contract shall maintain the insurance coverage's set forth in Exhibit 1 to this Contract and provide the proof of such insurance coverage as called for in Exhibit 1, including workers' compensation coverage regardless of the number of Contractor's employees. Such insurance coverage shall be obtained at the Contractor's sole expense and maintained during the life of the Contract and shall be effective prior to the beginning of any work or other performance by the Contractor under this Contract. Additional insured endorsements, if required, must be received by the County within 30 days of the execution of this Contract or as otherwise required by the County's Risk Manager.

SECTION 16. DEFAULT.

If Contractor fails or refuses to perform any of the terms of this Contract, including poor services, work or materials, the County may, by written notice to Contractor, terminate this Contract in whole or in part. In addition to any right to terminate, the County may enforce any remedy available at law or in equity in connection with such default, and Contractor shall be liable for any damages to the County resulting from Contractor's default. The County further reserves the right to immediately obtain such work or services from other entities in the event of Contractor's default.

SECTION 17. NONWAIVER.

Contractor agrees that the County's waiver or failure to enforce or require performance of any term or condition of this Contract or the County's waiver of any particular breach of this Contract by the Contractor extends to that instance only. Such waiver or failure is not and shall not be a waiver of any of the terms or conditions of this Contract or a waiver of any other breaches of the Contract by the Contractor and does not bar the County from requiring the Contractor to comply with all the terms and conditions of the Contract and does not bar the County from asserting any and all rights and/or remedies it has or might have against the Contractor under this Contract or by law.

SECTION 18. FORUM SELECTION AND CHOICE OF LAW.

This Contract shall be governed by, and construed in accordance with, the laws of the Commonwealth of Virginia, without application of Virginia's conflict of law provisions. Venue for any litigation, suits, and claims arising from or connected with this Contract shall only be proper in the Roanoke County Circuit Court, or in the Roanoke County General District Court if the amount in controversy is within the jurisdictional limit of such court, and all parties to this Contract voluntarily submit themselves to the jurisdiction and venue of such courts,

regardless of the actual location of such parties. The provisions of this Contract shall not be construed in favor of or against either party, but shall be construed according to their fair and customary meaning as if both parties jointly prepared this Contract.

SECTION 19. SEVERABILITY.

If any provision of this Contract, or the application of any provision hereof to a particular entity or circumstance, shall be held to be invalid or unenforceable by a court of competent jurisdiction, the remaining provisions of this Contract shall not be affected and all other terms and conditions of this Contract shall be valid and enforceable to the fullest extent permitted by law.

SECTION 20. NONDISCRIMINATION.

A. During the performance of this Contract, Contractor agrees as follows:

   i. Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state or federal law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

   ii. Contractor in all solicitations or advertisements for employees placed by or on behalf of Contractor will state that Contractor is an equal opportunity employer.

   iii. 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.

B. Contractor will include the provisions of the foregoing Section A (i, ii, and iii) in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor.

SECTION 21. DRUG-FREE WORKPLACE.

A. During the performance of this Contract, Contractor agrees to (i) provide a drug-free workplace for Contractor's employees; (ii) 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 workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of Contractor that Contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor.

B. 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, 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.

SECTION 22. FAITH BASED ORGANIZATIONS.

Pursuant to Virginia Code Section 2.2-4343.1, be advised that the County does not discriminate against faith-based organizations.

SECTION 23. DATA ON CONVICTIONS FOR CERTAIN CRIMES

The Vendor certifies that none of the persons who will provide services requiring direct contact with students on school property during school hours or during school-sponsored activities has been convicted of any of the following felony or misdemeanor offenses: felony sex or violence offenses, other felony offenses or misdemeanor sex offenses within the past ten years. Upon request by the Schools, Vendor shall provide specific documentation to verify that it has conducted requisite criminal conviction checks on its employees, agents, sub-contractors, and assigns. Schools reserve the right to remove or deny entrance to any employee, agent, sub-contractor, or assign of Vendor when School determines, in its sole discretion, that such person poses a risk to health or safety of others on School property.

The Consultant further understands and acknowledges (1) that if he makes a materially false statement regarding any of the above offenses, he will be guilty of a Class 1 misdemeanor and may forfeit profits derived from the contract. Further, the Consultant understands and acknowledges that before any person is permitted to provide such services subsequent to this certification, he must complete a new certification regarding such person in a form satisfactory to Roanoke County and the Roanoke County School Board. Data and Convictions information will be requested before the County of Roanoke/Schools enters into a contract / when required.

SECTION 24. ASSIGNMENT.

Contractor may not assign or transfer this Contract in whole or in part except with the prior written consent of the County, which consent shall not be unreasonably withheld. If consent to assign is given, no such assignment shall in any way release or relieve the Contractor from any of the covenants or undertakings contained in this Contract and the Contractor shall remain liable for the Contract during the entire term thereof.

SECTION 25. CONTRACTUAL DISPUTES.

Contractual claims, whether for money or for other relief, including any disputes as to change orders or extra work, shall be submitted, in writing, no later than sixty (60) calendar days after

final payment or payment designated as a final payment; however, written notice of the Contractor's intention to file such claim must be given at the time of the occurrence or beginning of the work upon which the claim is based. Such notice is a condition precedent to the assertion of any such claim by the Contractor. A written decision upon any such claims will be made by the Board of Supervisors or its designee (hereafter "BOS"). The Contractor may not institute legal action prior to receipt of the County's decision on the claim unless the BOS fails to render such decision within ninety (90) calendar days from submittal of its claim. The decision of the BOS shall be final and conclusive unless the Contractor within six (6) months of the date of the final decision on a claim or from expiration of the 90 day time limit, whichever occurs first, initiates legal action as provided in Section 2.2-4364 of the Code of Virginia. Failure of the County to render a decision within said ninety (90) calendar days shall not result in the Contractor being awarded the relief claimed nor shall it result in any other relief or penalty. The sole result of the County's failure to render a decision within said ninety (90) calendar days shall be Contractor's right to immediately institute legal action. No administrative appeals procedure pursuant to Section 2.2-4365 of the Code of Virginia has been established for contractual claims under this Contract.

SECTION 26. SUCCESSORS AND ASSIGNS.

The terms, conditions, provisions, and undertakings of this Contract shall be binding upon and inure to the benefit of each of the parties hereto and their respective successors and assigns.

SECTION 27. HEADINGS.

The captions and headings in this Contract are for convenience and reference purposes only and shall not affect in any way the meaning and interpretation of this Contract.

SECTION 28. COUNTERPART COPIES.

This Contract may be executed in any number of counterpart copies, each of which shall be deemed an original, but all of which together shall constitute a single instrument.

SECTION 29. AUTHORITY TO SIGN.

The persons who have executed this Contract represent and warrant that they are duly authorized to execute this Contract on behalf of the party for whom they are signing.

SECTION 30. NOTICES.

All notices must be given in writing and shall be validly given if sent by certified mail, return receipt requested, or by a nationally recognized overnight courier, with a receipt, addressed as follows (or any other address that the party to be notified may have designated to the sender by like notice):

To County:	County of Roanoke Fire & Rescue Department 5925 Cove Road Roanoke, Virginia 24019
Email:	____@ronaokecountyva.gov
Copy to:	County of Roanoke Purchasing Division Attn: Kate Hoyt 5204 Bernard Drive, SW, Suite 300-F Roanoke, Virginia 24018-2020
Email:	KHoyt@ronaokecountyva.gov
If to Contractor:	_____ Attn: _____, President/CEO _____ _____
Email Address:	_____
Phone:	_____

Notices shall be deemed to be effective one day after sending if sent by overnight courier or three (3) days after sending it by certified mail, return receipt requested.

SECTION 31. PROTECTING PERSONS AND PROPERTY.

The Contractor expressly undertakes both directly and through its subcontractors, to take every reasonable precaution at all times for the protection of all persons and property at the location of the Work or in the vicinity of the Work or that may be affected by the Contractor's operation in connection with the Work. The Contractor will maintain adequate protection of all Contractor's Work to prevent damage to it and shall protect the County's property from any injury or loss arising in connection with this Contract and to protect adjacent property to prevent any damage to it or loss of use and enjoyment by its owners. Contractor agrees to be responsible for the entire Work and will be liable for all damages to the Work, including, but not limited to, damages to any property of the County or to any property in the vicinity or adjacent to the Work. All damage with respect to the Work caused by vandalism, weather, or any other cause, other than resulting from the sole negligence of the County shall be the responsibility of the Contractor. Contractor shall also be responsible for any inventory shortages and discrepancies of any type.

SECTION 32. CONTRACT SUBJECT TO FUNDING.

This Contract is subject to funding and/or appropriations from federal, state, and/or local governments and/or agencies. If any such funding is not provided, withdrawn, or otherwise not made available for this Contract, the Contractor agrees that the County may terminate

this Contract on seven (7) days written notice to Contractor, without any penalty or damages being incurred by the County. Contractor further agrees to comply with any applicable requirements of any grants and/or agreements providing such funding.

SECTION 33. SUSPENSION OR TERMINATION OF CONTRACT BY COUNTY.

The County, at any time, may order Contractor to immediately stop work on this Contract, and/or by seven days (7) written notice may terminate this Contract, with or without cause, in whole or in part, at any time. Upon receipt of such notice, the Contractor shall immediately discontinue all services affected (unless the notice directs otherwise), and deliver to the County all data (including electronic data), drawings, specifications, reports, project deliverables, estimates, summaries, and such other information and materials as may have been accumulated by the Contractor in performing this Contract whether completed or in process (unless otherwise directed by the notice).

1. If the termination or stop work order is due to the failure of the Contractor to fulfill any of its Contract obligations, the County may take over the Work and prosecute the same to completion by contract or otherwise. In such case, the Contractor shall be liable to the County for any damages allowed by law, and upon demand of County shall promptly pay the same to County.
2. Should the Contract be terminated or work is stopped not due in any way to the fault of the Contractor, the Contractor shall only be entitled to compensation for services actually performed and materials actually supplied prior to notice of termination or to stop work and which are approved by the County and any applicable federal or state approving agency. No profit, overhead, or any other costs of any type are allowed after the date of such notice of termination or stop work order.

3. The rights and remedies of the County provided in this Section are in addition to any other rights and remedies provided by law or under this Contract and County may pursue any and all such rights and remedies against Contractor as it deems appropriate.

SECTION 34. ETHICS IN PUBLIC CONTRACTING.

The provisions, requirements, and prohibitions as contained in Sections 2.2–4367 through 2.2-4377, of the Va. Code, pertaining to bidders, offerors, contractors, and subcontractors are applicable to this Contract.

SECTION 35. COMPLIANCE WITH STATE LAW; FOREIGN AND DOMESTIC BUSINESSES AUTHORIZED TO TRANSACT BUSINESS IN THE COMMONWEALTH OF VIRGINIA.

Contractor shall comply with the provisions of Virginia Code Section 2.2-4311.2, as amended, which provides that a contractor organized as a stock or nonstock corporation, limited liability

company, business trust, or limited partnership or registered as a registered limited liability partnership shall be authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 or as otherwise required by law. Contractor shall not allow its existence to lapse or its certificate of authority or registration to transact business in the Commonwealth, if so required under Title 13.1 or Title 50, to be revoked or cancelled at any time during the term of the Contract. The County may void the Contract if the Contractor fails to remain in compliance with the provisions of this section.

SECTION 36. OWNERSHIP OF REPORTS AND DOCUMENTS.

Contractor agrees that all reports and any other documents (including electronic data) prepared for, obtained in connection with, and/or required to be produced in connection with this Contract shall be delivered by the Contractor to the County and all such items shall become the sole property of the County. The Contractor agrees that the County shall own all rights of any type in and to all such items, including but not limited to copyrights and trademarks, and the County may reproduce, copy, and use all such items as the County deems appropriate, without any restriction or limitation on their use and without any cost or charges to the County from Contractor. Contractor hereby transfers and assigns all such rights and items to the County. Contractor further agrees Contractor will take any action and execute any documents necessary to accomplish the provisions of this Section. The Contractor also warrants that Contractor has good title to all materials, equipment, documents, and supplies which it uses in the Work or for which it accepts payment in whole or in part.

SECTION 37. ENTIRE CONTRACT.

This Contract, including any attachments, exhibits, and referenced documents, constitutes the complete understanding between the parties. This Contract may be modified only by written agreement properly executed by the parties.

SIGNATURE PAGE TO FOLLOW.

THIS AGREEMENT may be modified in writing by mutual agreement of both parties.

IN WITNESS WHEREOF, the parties hereto have signed this Contract by their authorized representatives.

(Full Legal Name of Vendor)

By_____

_____
Printed Name and Title

COUNTY OF ROANOKE, VIRGINIA

By_____

_____
Printed Name and Title

Approved as to execution:

_____
County Attorney/Assistant County Attorney

CONTRACT 2021-097
BETWEEN COUNTY OF ROANOKE AND [VENDOR NAME]
FOR TRACTOR DRAWN TILLER LADDER TRUCK

EXHIBIT 1: SAMPLE CONTRACTOR'S INSURANCE AND BOND REQUIREMENTS

REFERENCE: IFB # 2021-097

INSURANCE REQUIREMENTS SECTION

The Contractor shall comply with the insurance requirements set forth in the Contract, including the items set forth below:

A. Neither the Contractor nor any subcontractor shall commence work under this Contract until the Contractor has obtained and provided proof of the required insurance coverages to the County, and such proof has been approved by the County. The Contractor confirms to the County that all subcontractors have provided Contractor with proof of such insurance, or will do so prior to commencing any work under this Contract.

B. Contractor, including all subcontractors, shall, at its and/or their sole expense, obtain and maintain during the life of this Contract the insurance policies and/or coverages required by this section. The County and its officers, employees, agents, assigns, and volunteers shall be added as an additional insured, by endorsement, to the general liability and automobile coverages of any such policies and such insurance coverages shall be primary and noncontributory to any insurance and/or self-insurance such additional insureds may have. The Contractor shall immediately notify in writing the County of any changes, modifications, and/or termination of any insurance coverages and/or policies required by this Contract. The Contractor shall provide to the County with the signed Contract an Acord certificate of insurance which states in the description of operations section one of the two paragraphs below:

(1) The County and its officers, employees, agents, assigns, and volunteers are additional insureds by endorsement as coverage under this policy includes ISO endorsement CG 20 33 which provides that the insured status of such entities is automatic if required by a contract or a written agreement. (If additional insured status is automatic under a different coverage form, Contractor must attach a copy of the coverage form to its certificate. Any required insurance policies shall be effective prior to the beginning of any work or other performance by Contractor and any subcontractors under this Contract).

OR

(2) ISO endorsement CG 20 10 will be issued, prior to the beginning of any work or other performance by Contractor under this Contract, to the County and its

officers, employees, agents, assigns, and volunteers naming them as an additional insured under the general liability coverage. (A copy of the binder confirming the issuance must be attached to the certificate. Any required insurance policies shall be effective prior to the beginning of any work or other performance by Contractor and any subcontractors under this Contract).

However, if B (1) or (2) cannot be provided, the County's Risk Manager, in such Manager's sole discretion, may approve such other certificate of insurance or insurance document(s) that the Risk Manager deems acceptable. The County of Roanoke shall also be named as the Certificate Holder.

C. **The following insurance coverages and limits are required in order to provide services or materials to Roanoke County general government agencies and the Roanoke County Public Schools. These limits may be adjusted depending on the type of service or materials being provided and the exposure to risk.**

The Successful Offeror shall carry Liability Insurance in the amount specified below, including contractual liability assumed by the Successful Offeror, and shall deliver a Certificate of Insurance from carriers acceptable to the owner specifying such limits. The Certificate shall show the County of Roanoke and Roanoke County Public Schools, their supervisory boards and members thereof, officers, agents, employees and volunteers as additional insureds, by endorsement, on the Commercial General Liability, Automobile Liability and Excess/Umbrella Liability coverage. The additional insured status shall be endorsed to the coverage with the provision that this coverage "is primary to all other coverage the County of Roanoke and/or Roanoke County Public Schools may possess." A Certificate of Insurance evidencing the additional insured status must be presented to the County of Roanoke and/or Roanoke County Public Schools along with a copy of the Endorsement prior to work or services beginning.

The coverage shall be provided by a carrier(s) rated "Excellent" by A.M. Best. In addition, the insurer shall agree to give the County 30 days' notice of its decision to cancel coverage.

(1) **<u>Workers' Compensation</u>**

Statutory Virginia Limits
Employers' Liability Insurance

- $100,000 for each Accident by employee
- $100,000 for each Disease by employee
- $500,000 policy limit by Disease

(2) **<u>Commercial General Liability - Combined Single Limit</u>**

- $1,000,000 each occurrence including contractual liability for specified agreement
- $2,000,000 General Aggregate (other than Products/Completed Operations)

- $2,000,000 General Liability-Products/Completed Operations
- $1,000,000 Personal and Advertising injury
- $ 100,000 Fire Damage Legal Liability

Coverage must include Broad Form property damage and (XCU) Explosion, Collapse and Underground Coverage

(3) **Business Automobile Liability** – including owned, non-owned and hired car coverage

- Combined Single Limit - $1,000,000 each accident

Compliance by the Contractor with the foregoing requirements as to carrying insurance shall not relieve the Contractor of their liabilities provisions of the Contract

D. Contractual Liability covers the following indemnity agreement: "The Successful Offeror agrees to indemnify, defend and hold harmless the County of Roanoke and Roanoke County Public Schools, their supervisory boards and members thereof, officers, agents, employees and volunteers from any claims, damages, suits, actions, liabilities and costs of any kind or nature, including attorneys' fees, arising from or caused by the provision of any services, the failure to provide any services or the use of any services or materials furnished (or made available) by the Successful Offeror, provided that such liability is not attributable to the County or School Division's sole negligence."

E. The continued maintenance of the insurance policies and coverages required by the Agreement is a continuing obligation, and the lapse and/or termination of any such policies or coverages without approved replacement policies and/or coverages being obtained shall be grounds for termination of the Consultant/Contractor for default.

F. Nothing contained in the insurance requirements is to be construed as limiting the liability of the Consultant/Contractor, and/or its subcontractors, or their insurance carriers. The County does not in any way represent that the coverages or the limits of insurance specified are sufficient or adequate to protect the Consultant/Contractor's interest or liabilities, but are merely minimums. The obligation of the Consultant/Contractor, and its subcontractors, to purchase insurance shall not in any way limit the obligations of the Consultant/Contractor in the event that the County or any of those named above should suffer any injury or loss in excess of the amount actually recoverable through insurance.

G. The classification code numbers appearing on the Commercial General Liability coverage parts shall not exclude the symbols "X-C-U".

H. The intent of this insurance specification is to provide the coverage required and the limits expected for each type of coverage. With regard to the Business Automobile

Liability and Commercial General Liability, the total amount of coverage can be accomplished through any combination of primary and excess/umbrella insurance. However, the total insurance protection provided for Commercial General Liability or for Business Automobile Liability, either individually or in combination with the Excess/Umbrella Liability, must total $1,000,000 per occurrence. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded the County of Roanoke and Roanoke County Public Schools. This policy shall be endorsed to be primary with respect to the additional insured.

I. The certificate holders on the Accord form Certificates of Insurance shall be:

Roanoke County Board of Supervisors
5204 Bernard Drive, Suite 300F
Roanoke, VA 24019-0798
Attn: Purchasing Dept.

J. **Claims Made Policies**

If the liability insurance has been issued on a "claims made" basis, the Successful Offeror must either:

(1) Agree to provide certificates of insurance evidencing the above coverage for a period of three (3) years after final payment under the Agreement for General Liability policies. This certificate shall evidence a "retroactive date" no later than the beginning of the Offeror's work; or

(2) Purchase the extended reporting period endorsement for the policies and provide certificates of insurance and a copy of the endorsement.

BOND REQUIREMENTS SECTION

The Contractor shall comply with the bond requirements set forth in the Contract, including the items set forth below:

A. Except in cases of emergency, all bids for construction contracts shall be accompanied by a bid bond from a surety company selected by the bidder, which is legally authorized to do business in Virginia.

(1) A bid, payment or performance bond for contracts for goods or services other than construction may be required if provided in the Invitation for Bid.

(2) The amount of the bid bond shall not exceed five percent (5%) of the total amount of the bid.

(3) In lieu of a bid bond, a bidder may furnish a certified check or cash escrow in the face amount required for the bond.

(4) Upon award of any public construction contract exceeding $100,000 awarded to any prime contractor, such contractor shall furnish:
   i. Performance bond in the sum of the contract amount.
   ii. Payment bond in the sum of the contract amount.

(5) Performance and/or payment bonds may be required for construction contracts below $100,000 at the discretion of the County.

(6) In cases of emergency performance bonds/payment bonds are required within ten (10) calendar days of notice to proceed/project commencement.

END

CONTRACT 2021-097
BETWEEN COUNTY OF ROANOKE AND VENDOR NAME
FOR TRACTOR DRAWN TILLER LADDER TRUCK

EXHIBIT 2: SCOPE OF WORK/FEE SCHEDULE

REFERENCE: RFP# 2021-097

The services, work, and/or items that the Contractor shall provide in a timely and proper manner in accordance with the Contract include, but are not necessarily limited to, the following: Reference RFP 2021-097 and specifications.

The final scope of services will be negotiated with the Selected Offeror.

RFP No. 2021-097

ATTACHMENT B: PROPOSAL RESPONSE AND CHECKLIST

Fully complete the following pages and submit along with Page 2 (Signature Page) of the RFP and all applicable attachments.

I. General Information

Offeror's (Legal Business) Name: _____

Doing Business As (If Different Name): _____

Person to Contact Regarding this RFP (Name): _____

Telephone Number: ( ) _____

Email Address: _____

Check type of organization:

Corporation ___ Partnership ___

Sole Proprietor (Individual) ___ Other (describe) _____

If Sole Proprietor (individually owned), number of years in business: ____

Have you ever operated under another name? Yes ___ No ___

If yes -

Other name: _____

Number of years in business under this name: _____

State license number under this name: _____

II. Organization of Firm

The Offeror should submit as **Attachment 1** to their proposal, at a minimum the length of time in the business, corporate experience, strengths in the industry, business philosophy, and a description of the organizational structure of the firm; a description of the organizational structure for the management and operation of the services requested and/or provision of the items referred to in this RFP, including an organizational chart denoting all positions and the number of personnel in each position.

III. Financial Condition of Offeror

The sufficiency of the financial resources and the ability of the Offeror to comply with the duties and responsibilities described in this RFP.

The Offeror shall submit as **Attachment 2**, a current annual financial report and the previous year's report and a statement regarding any recent or foreseeable mergers or acquisitions. Financial statements may be marked as "confidential" in accordance with the requirements set out in Section 3(G) of this RFP.

IV. Experience

The Offeror shall submit as **Attachment 3**, a narrative of their firm's experience in providing the services and/or items in this RFP, including type of business, business location, and number of years in business.

V. References

Each Offeror should provide as **Attachment 4**, the names, addresses, and telephone numbers of at least three (3) references in connection with supplying the services or items requested in this RFP, especially from other local government operations similar to those being requested in this RFP by the County. Each reference should include organizational name, official address, contact person, title of contact, and phone number.

VI. Conditions of Offeror's Proposal

Offeror shall submit as **Attachment 5**, any conditions to the Offeror's proposal or exceptions to the sample contract (Attachment A to the RFP).

VII. Conflict of Interest

_____ Offeror, owner, officer, employees, agents and immediate family members are not now, and have not been in the past year, an employee of the County of Roanoke

or has no responsibility or authority with the County that might affect the procurement transaction or any claim resulting therefrom. (Initial above.)

OR

State the complete name and address of each such person and their connection to the County of Roanoke. Each Offeror is advised that the Ethics in Public Contracting and Conflict of Interests Act of the Virginia Code, as set forth in Section 4 (L) of the RFP, apply to this RFP.

Name	Address
_____	_____
_____	_____
_____	_____

VIII. Convictions and Debarment

If you answer yes to any of the following, state on **Attachment 6** the person or entity against whom the conviction or debarment was entered, give the location and date of the conviction or debarment, describe the project involved, and explain the circumstances relating to the conviction or debarment, including the names, addresses and phone numbers of persons who might be contacted for additional information.

1. In the last ten years, has your organization or any officer, director, partner, owner, project manager, procurement manager or chief financial officer of your organization:

   a. ever been found guilty on charges relating to conflicts of interest?
   Yes ___ No ___

2. a. Is your organization or any officer, director, partner or owner currently debarred or enjoined from doing federal, state or local government work for any reason?
   Yes ___ No ___

   b. Has your organization or any officer, director, partner or owner ever been debarred or enjoined from doing federal, state or local government work for any reason?
   Yes ___ No ___

IX. Compliance

If you answer yes to any of the following, give the date of the termination order, or payment, describe the project involved, and explain the circumstances relating to same, including the names, addresses and phone numbers of persons who might be contacted for additional information on **Attachment 7**.

1. Has your organization:

   a. ever been terminated on a contract for cause?
   Yes ___ No ___

X. Confidential & Proprietary Information

Identify the section and page number of any information in your proposal that has been identified as confidential, proprietary or a trade secret (see Section 4(A) of the RFP.

Page Number	Section	Description of Confidential and/or Proprietary Information
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Offeror shall provide one redacted copy of its proposal fit for public dissemination, in the event the County must respond to a Freedom of Information Act request. The redacted copy of Offeror's proposal shall be provided on USB Drive or other electronically transferable media and shall be redacted to protect any confidential and/or proprietary information and shall be labeled as such. Offeror shall not mark its entire proposal as confidential and/or redact the entire proposal; doing so may result in the disqualification of Offeror's proposal.

XI. Warranty Information

Offeror shall provide as **Attachment 8** all relevant information regarding warranties offered.

XII. Specifications Checklist

Each Offeror shall provide a completed and signed copy of the Specifications Checklist provided as **Attachment C to RFP 2021-097**, as a part of their proposal submission. Failure to include this document may result in an Offeror's submission being eliminated from consideration.

Attachments:

The following items should be included with your RFP response. Place a check mark on the line next to each applicable item submitted with your proposal. Write N/A (not applicable) next to those items that do not apply to your response.
Offerors shall submit one (1) original copy of the proposal documents and four (4) full copies for review.

Signature Page (p. 2) of RFP _____

Removable Media _____
(Containing complete and redacted versions of Proposal) _____

Attachment B to RFP 2021-097 _____
(Proposal Response and Checklist)

1. Organization of Firm
2. Financial Reports
3. Experience
4. References
5. Conditions of Proposal (if applicable)
6. Debarment Explanation (if applicable)
7. Compliance Explanation (if applicable)

Attachment C to RFP 2021-097 _____
(Specifications Checklist)

RFP No. 2021-097

ATTACHMENT C: SPECIFICATIONS CHECKLIST

Offerors must complete all areas of the following checklist, indicating compliance, and return a signed copy with their proposal response.

Manufacturer Complies:

		YES	NO
1.	**GENERAL**		
1.1	These specifications are intended to provide the County of Roanoke with a custom minimum 100-ft. plus tiller ladder truck with an optional minimum 1500 GPM Pump and 300 gallon tank, fire apparatus with pre-piped waterway as described herein and equipped as specified.		
1.2	The bid forms provided herein shall be completed and returned with the appropriate "YES" or "NO" box marked by each paragraph in the Manufacturer Complies column. **Roanoke County reserves the right to reject any bid that it deems does not meet the specifications listed below. Roanoke County will be the sole decider that will judge which RFP meets the best interest of Roanoke County.** Exceptions will be allowed as long as they are equal to or better than what is specified in this RFP. The vendor must list and give a detailed description of exception on a separate page. Any and all deviations will be clearly explained and state which page and line item the exception will take place. Roanoke County does reserve the right to require a vendor to prove that a substituted item is either equal to or better that what was requested. Roanoke County will be the only reviewer to determine if the proposed substitutes are acceptable. Any changes that are found that are not listed with explanations will be – with no exception- rejected.		
1.3	Roanoke County Fire and Rescue Department uses National Standard Threads for all threaded plumbing fittings, except for NH threads used on terminal fire hose connections.		
1.4	The apparatus must comply with all applicable provisions of the most current NFPA pamphlets #1901 & #1904 unless specifically altered by these specifications. Each bid shall be accompanied by a detailed description of the aerial and the apparatus being proposed. The apparatus should be independently third-party tested through the Underwriters Laboratory (UL) that meets the most current edition and standards of NFPA 1901. This certification should include all production, performance testing, operations, design and components that were installed on this apparatus. A placard shall be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.		
1.5	The apparent silence of these specifications and any supplemental specifications, as to any detail or the omission from the specifications of detailed description concerning any point shall be regarded as meaning that only materials of highest quality and correct type, size and design are to be used. Likewise, all workmanship is to be of highest quality. All interpretations of these specifications shall be made on the basis of this statement.		
1.6	Delivery time is of the essence to the County of Roanoke Fire and Rescue Department and will be considered as part of the bid evaluation. Earliest possible delivery time must be provided.		

1.7	Permission to keep or store the apparatus in any building owned by the purchaser or its use by the Roanoke County Fire and Rescue Department during the delivery or acceptance period shall not constitute acceptance of same.		
1.8	Manufacturer must have a significant number of similar apparatus currently in service. NO PROTO-TYPES. Manufacturer should provide list of contacts of 10 like vehicles.		
1.9	Unless otherwise provided in the invitation to bid, the number of a certain brand, make or manufacturer does not restrict manufacturers to the specific brand, make or manufacturer named; it conveys the general style, type, character and quality of the article desired, and any article which the County, in its sole discretion, determines to be the equal of that specified, considering quality, workmanship, economy of operation and suitability for purpose intended, shall be accepted.		
1.10	Unit must have Federal or VA state inspection sticker prior to acceptance.		
1.11	If the apparatus is supplied with a pump, a pump test will be conducted to ensure there are no leaks or loose connections. A final inspection of apparatus will be conducted to ensure everything is in working order before delivery of the apparatus. An inspection sheet will be included at the time of delivery to Roanoke County Fire & Rescue.		
1.12	The chassis, cab, body and pump module (if included) will be completely designed, assembled and painted by the primary apparatus manufacturer, which in turn will minimize any third party involvement when it comes to the aspects of the design layout, engineering, service and warranty issues. Any apparatus found using any subcontracted chassis, cab, body, electrical system or pump module (if included) shall not be accepted. All weight-balance distribution shall be in accordance with the most current recommendations of the National Fire Protection Association (NFPA) and a statement must be provided with the apparatus accurate weight and dimensions.		
1.13	The design of the apparatus shall employ the most up-to-date appropriate automotive engineering practices. The workmanship shall be of the highest quality in its respective field. All wielding of the apparatus will follow the American Welding Society recommendations and requirements of sections D1.1-2004, ANSI D1.2-2003, B2.1-2000 and A5.20-E70T1, respectively.		
1.14	A road test shall be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axle shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. Vehicle shall adhere to the following parameters: A) The apparatus, when fully equipped and loaded, shall have not less than 25 percent nor more than 50 percent of the weight on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle. B) The apparatus shall be capable of accelerating to 35 mph from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed rpm of the engine. C) The service brakes shall be capable of stopping a fully loaded vehicle in 35 feet at 20 mph on a level concrete highway. The air brake system shall conform to Federal Motor vehicle Safety Standards (FMVSS) 121. D) The apparatus, fully loaded, shall be capable of obtaining a speed of 50 mph on a level concrete highway with the engine not exceeding the governed rpm (full load).		
1.15	Bids should only be accepted from a single source apparatus manufacturer. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) must be from a single source manufacturer and not split between manufacturers (i.e. body, pump house, cab weldment, chassis and aerial). The bidder should provide evidence that they comply with this requirement. The bidder should state the location of the factory where the apparatus is to be built.		

		YES	NO
1.16	This unit shall comply with the most current NFPA standards, except for fire department specifications that differ from NFPA specifications. These exceptions shall be set forth in the Statement of Exceptions. A plate that is highly visible to the driver while seated shall be provided. This plate shall show the overall height, length, and gross vehicle weight rating.		
1.17	Apparatus proposed by the bidder shall meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in the most current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications shall be indicated in the proposal as "non-NFPA".		
1.18	A third party inspection Underwriters Laboratories Inc. Type 1 certificate for the aerial device should be furnished upon delivery of the aerial device to show that the aerial device has been inspected on the production line and after final assembly. Visual structural inspections shall be performed on all welds on both aluminum and steel ladders. On critical weld areas, or on any suspected defective area, the following tests shall be conducted: • Magnetic particle inspection shall be conducted on steel aerials to assure the integrity of the weldments and to detect any flaws or weaknesses. • Ultrasonic inspection shall conducted on all aerials to detect any flaws in pins, bolts and other critical mounting components. In addition to the tests above, functional tests, load tests, and stability tests should be performed on the aerial as well. These tests will determine any unusual deflection, noise, vibration, or instability characteristics of the ladder.		
1.19	If purchased, the pump shall be tested, approved and certified by the Underwriter's Laboratory at the manufacturer's expense. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the manufacturer's record of pump construction details shall be forwarded to the Fire Department.		
1.20	The generator shall be tested, approved, and certified by Underwriters Laboratories at the manufacturer's expense. The test results shall be provided to the Fire Department at the time of delivery.		
1.21	A fully engineered drawing of the proposed apparatus shall be included with the proposal. Drawing should be 24" x 36" and shall include the chassis make and model, location of the lights, siren, horns, compartments, major components, etc. similar or like vehicles drawings shall not be accepted.		
1.22	A factory weight review of the proposed apparatus shall be included with the proposal. (no exceptions) The weight review shall include the following; • Front Axle Weight – loaded and empty • Rear Axle Weight – loaded and empty • Total GVW		
1.23	A turning radius report shall be included with the proposal for the proposed apparatus. (no exceptions)		
1.24	A drawing of the proposed apparatus shall be provided for approval before construction begins. The sales representative shall also have a copy of the same drawing. The finalized and approved drawing shall become part of the contract documents. This drawing shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc. A "revised" approval drawing of the apparatus shall be prepared and submitted by the manufacturer to the purchaser showing any changes made to the approval drawing. On the sales drawing a top view of the cab seating shall be provided. The top view shall be a reference only of the seating in the order.		

	A sales drawing shall be provided as if the rear body compartment doors are open. This drawing shall be provided for graphic representation only and shall include such things as shelves, trays, reels, dividers, air control panels, air bottle storage bins, poly boxes, etc.		
1.25	Two (2) printed electrical wiring diagrams, prepared for the model of chassis and body, shall be provided. The bidder shall provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system. The manufacturer of the apparatus shall provide the following: • Documentation of the electrical system performance tests. • A written load analysis, which shall include the following: o The nameplate rating of the alternator. o The alternator rating under the conditions specified per: ▪ Applicable NFPA 1901(Most Current Edition). o The minimum continuous load of each component that is specified per: ▪ Applicable NFPA 1901(Most Current Edition). o Additional loads that, when added to the minimum continuous load, determine the total connected load. o Each individual intermittent load. All of the above listed items shall be provided by the bidder per the applicable NFPA 1901 (Most Current Edition).		
2.	**GUARANTEE AND DELIVERY**		
2.1	Each new piece of apparatus shall be provided with a minimum **one (1) year** basic apparatus material and workmanship limited warranty. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package.		
2.2	A Detroit Diesel or Cummins with a minimum **five (5) year** limited engine warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.		
2.3	The fire apparatus manufacturer shall provide, at the time of delivery, an Engine Installation Certification letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The approval of the engine installation shall be at full horsepower rating in a continuous duty application under all operating conditions, including road and pump. No type of automatic horsepower reduction feature shall be allowed. There shall be no exception to any portion of the engine installation certification. Non-conformance shall lead to immediate rejection of bid.		
2.4	A steering gear with a minimum **one (1) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.		
2.5	The chassis frame and cross-members shall be provided with a minimum **fifty (50) year** material and workmanship limited warranty. The warranty shall cover the chassis frame and cross-members as being free from defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package.		
2.6	A minimum **five (5) year** limited warranty shall be provided for both front and rear axles.		
2.7	An ABS brake system with a minimum **three (3) year** limited warranty shall be provided.		

		YES	NO
2.8	The new cab shall be provided with a minimum **ten (10) year** material and workmanship limited warranty. The warranty shall cover such portions of the cab built by the manufacturer as being free from structural failures caused by defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package.		
2.9	Each new piece of apparatus shall be provided with a minimum **ten (10) year pro-rated** paint and corrosion limited warranty on the apparatus cab and body. The warranty shall cover painted exterior surfaces of the body to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service.		
2.10	The transmission shall have a **minimum five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty is to be provided by Allison Transmission and not the apparatus builder. The transmission cooler shall carry a **five (5) year** parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty shall also be in effect for the first **three (3) years** of the warranty coverage and shall not exceed $10,000 per occurrence. A copy of the warranty certificate shall be submitted with the bid package.		
2.11	If the unit has a tank, the UPF or equivalent poly water tank shall be provided with a **lifetime** material and workmanship limited warranty that covers the lid as well. A copy of the warranty certificate shall be submitted with the bid package.		
2.12	Each new piece of apparatus shall be provided with a minimum **ten (10) year** material and workmanship limited warranty on the apparatus body. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package.		
2.13	The roll-up doors shall have a limited warranty. The mechanical components of the roll-up door shall be warranted against defects in material and workmanship for the lifetime of the vehicle. A minimum **six (6) year** limited warranty shall be provided on painted and satin roll up doors. A copy of the warranty certificate shall be submitted with the bid package.		
2.14	If the unit has a pump the Waterous pump shall be provided with a minimum **seven (7) year** limited warranty on parts and with a minimum two (2) year limited warranty on labor for the pump. A copy of the warranty certificate shall be submitted with the bid package.		
2.15	The stainless steel plumbing components and ancillary brass fittings used in the construction of the water/foam plumbing system should be warranted for a minimum period of **ten (10) years or 100,000 miles**. This covers structural failures caused by defective design or workmanship, or perforation caused by corrosion, provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original purchaser for a period of ten years from the date of delivery. A copy of the warranty certificate shall be submitted with the bid package.		
2.16	The aerial device shall be provided with a minimum **twenty (20) year** material and workmanship limited warranty. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service. This warranty shall be limited to the torque box, turntable, aerial sections and other structural components. A copy of the warranty certificate shall be submitted with the bid package.		
2.17	A minimum **five (5) year** limited aerial swivel warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.		
2.18	Aerial hydraulic system components shall be provided with a minimum **five (5) year** material and workmanship limited warranty.		
2.19	Aerial hydraulic seals shall be provided with a minimum **three (3) year** material and workmanship limited warranty. A copy of the warranty certificates shall be submitted with the bid package.		

2.20	A minimum **ten (10) year** limited waterway warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.		
2.21	The aerial device shall be provided with a minimum **four (4) year** pro-rated paint and corrosion limited warranty. The warranty shall cover exterior painted surfaces of the aerial device to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package.		
2.22	The electronic modules and display(s) shall be provided with a minimum **five (5) year** material and workmanship limited warranty. The warranty shall cover electronic modules to be free from failures caused by defects in material and workmanship. A copy of the warranty certificate shall be submitted with the bid package.		
2.23	There shall be a minimum **two (2) year** limited warranty provided for the hydraulic generators.		
2.24	The fire apparatus manufacturer shall provide a certification stating the apparatus complies with NFPA 1901, most current edition, section 4.13, Vehicle Stability. The certification shall be provided at the time of bid.		
2.25	The fire apparatus manufacturer shall provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification shall be provided at the time of bid.		
2.26	The fire apparatus manufacturer shall provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification shall be provided at the time of bid.		
2.27	The fire apparatus manufacturer shall provide a cab crash test certification with this proposal. The certification states that the cab must meet or exceed the requirements below: - European Occupant Protection Standard ECE Regulation No.29 - SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks - SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks There shall be no exception to any portion of the cab integrity certification. Nonconformance shall lead to immediate rejection of bid.		
2.28	Windshield wipers will be in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles.* The bidder shall certify that the wiper system design has been tested and that the wiper system has met these criteria.		
2.29	All four (4) cab doors shall be equipped with electric operated windows with one (1) flush mounted automotive style switch on each door. The driver's door shall have four (4) switches, one (1) to control each door window. Each switch shall allow intermittent or auto down operation for ease of use. Auto down operation shall be actuated by holding the window down switch for approximately 1 second.		
2.30	Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will be in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder shall certify that each anchor design was pull tested to the required force and met the appropriate criteria.		
2.31	Seat attachment strength should be validated through testing. Each seat mounting design shall be tested in accordance with FMVSS 571.207 Seating Systems. The bidder shall certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.		
2.32	The defroster system shall clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, and Multipurpose Vehicles. The bidder shall certify that the defrost system design has passed the SAE J381 criteria.		
2.33	The cab heaters will meet the stands addressed under SAE J381. The bidder shall certify that a substantially similar cab has been tested and has met these criteria.		

		YES	NO
2.34	The cab air conditioning system should cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 72 degrees Fahrenheit in 30 minutes. The bidder shall certify that a substantially similar cab has been tested and has met these criteria.		
2.35	To eliminate split responsibility the final manufacturer shall provide a guarantee and warranty this apparatus to be free of defects in material and workmanship. This shall include the cab shell, chassis assembly, and complete body structure, aerial device and components. Any part or parts thereof, including all equipment or trade accessories supplied by the manufacturer for duration of specified warranty, and deemed to have been defective, shall be replaced and repaired free of charge and without charge for installation.		
2.36	A full service center (paint, warranty work & body shop) **within 100 miles** of the Roanoke County Fire and Rescue. Mobile Service Vehicles and 24/7 Emergency Service shall also be available from the successful bidder. Mileage to the service center shall be included in your proposal. Sub-contracting is not acceptable. (No Exceptions)		
2.37	A complete set of drawings, showing all four sides and top, shall be submitted to the Roanoke County Fire-Rescue Department for approval after award, but before any construction. Drawing approval should be done at the Roanoke County Fire and Rescue Administration Office or over Zoom. If however the manufacturer prefers a factory trip to review drawings, the trip for three (3) personnel should be planned to the requirements in section 2.37.		
2.38	Final Inspection shall be at the factory and shall be made by three (3) representatives from Roanoke County Fire & Rescue. Transportation must be by regularly scheduled commercial airline from the Roanoke-Blacksburg Regional Airport. All cost of transportation, meals and lodging with individual hotel rooms for each person are to be borne by the contractor.		
2.39	Apparatus, to insure proper break in of all components while still under warranty, **shall be delivered under its own power** - by the manufacturer. Rail or truck freight shall not be acceptable.		
2.40	Training on the completed apparatus shall be provided after delivery of the completed apparatus. Training shall be provided by a factory trained technician and not sales representative. Training shall be for three (3) consecutive days with training days to be determined by Roanoke County Fire and Rescue.		
2.41	A DVD or Flash Drive format video shall be provided to address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus at time of delivery. Safety procedures for the following shall be included on the video: vehicle pre trip inspection, chassis operation, pump operation and maintenance.		
2.4	To be furnished upon delivery: One (1) custom parts manuals for the complete fire apparatus shall be provided in hard copy with the completed unit. Two (2) compact disc (CD) or Flash Drive shall also be provided that shall include all of the information from the above manual. The manual shall contain the following: • Job number • Part numbers with full descriptions • Table of contents • Parts section sorted in functional groups reflecting a major system, component, or assembly • Parts section sorted in Alphabetical order • Instructions on how to locate a parts One (1) printed chassis service manuals containing parts and service information on major components shall be provided with the completed unit.		

Two (2) compact disk (CD) shall also be provided that shall include all of the information from the above manual.

The manuals shall contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes
- Engine
- Tires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

The manuals shall be specifically written for the chassis and body model being purchased. It shall not be a generic manual for a multitude of different chassis and bodies.

2.43 A penalty of $200.00 per calendar day will be deducted from the final payment for each day the delivery of the Ladder Truck to the County of Roanoke exceeds the delivery stipulated.

3. ENGINE

3.1 The chassis should be powered by an electronically controlled engine as described below:

Make:	Detroit or Cummins
Model:	DD13 or X 15
Power:	Minimum 525 hp
Torque:	Minimum 1850 lb-ft
Emissions Certification:	EPA 2021
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	A minimum of 781 cubic inches (12.8L)
Fuel Filters:	Spin-on style primary filter with water separator and water-in-fuel sensor. Secondary spin-on style filter.
By-Pass Fuel Filter	A Davco Diesel Fuel filtering system or equivalent should be provided. The fuel filtering system should be remote mounted on the chassis. The system should have the following features: • Self-priming port • Clear cover • Single filter system (replaces primary and secondary filters) • Fuel heater • Drain valve • Aluminum cylinder (act as fuel cooler).

The engine should include On-board diagnostics (OBD), which provides self-diagnostic and reporting. The system shall give the owner or repair technician access to state of health information for various vehicle sub systems. The system shall monitor vehicle systems, engine and after

	treatment. The system shall illuminate a malfunction indicator light on the dash console if a problem is detected.		
3.2	Standard equipment on the engine should include the following: Governor: Limiting speed type Injectors: Cam operated, unit type, clean tip Starting Motor: 12-volt Turbocharger Air To Air Aftercooled Lube Oil Cooler Lube Oil Filter: Full flow Air Cleaner: Farr or equal Fuel Filters: Dual, with check valve and water separator Coolant Filter: Spin-on with shut off valves (precharged with coolant inhibitor)		
3.3	The engine shall be equipped with all necessary filters, coolers and other items recommended by the engine manufacturer.		
3.4	An engine stop control shall be installed on the cab dash.		
3.5	A high idle switch should be provided, inside the cab, on the instrument panel, that should automatically maintain a preset engine rpm. A switch should be installed, at the cab instrument panel, for activation/deactivation. The high idle should be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light should be provided, adjacent to the switch. The light should illuminate when the above conditions are met. The light should be labeled "OK to Engage High Idle."		
3.6	A Jacobs® engine brake or similar compression brake is to be installed with the controls located on the instrument panel within easy reach of the driver. The driver shall be able to turn the engine brake system on/off and have a high, medium and low setting. The engine brake shall be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated. The ABS system should automatically disengage the auxiliary braking device when required.		
4.	**APPARATUS ELECTRICAL SYSTEM**		
4.1	The primary power distribution should be located where it is easily accessible for simplified maintenance and troubleshooting. Additional electrical distribution centers should be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers should be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers shall be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays shall be easily accessible. Distribution centers located throughout the vehicle should contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership. Circuit protection devices, which conform to SAE standards, shall be utilized to protect electrical circuits. All circuit protection devices shall be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers shall be Type-I automatic reset (continuously resetting). When required, automotive type fuses shall be utilized to protect electronic equipment. Control relays and solenoid shall have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.		
4.2	If possible a solid-state electronics based control system should be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network should consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system shall comply with SAE J1939-11 recommended practices.		

		YES	NO
4.3	A voltage monitor system should be provided to indicate the status of each battery system connected to the vehicles electrical load. The monitor system shall provide visual and audio warning when the system voltage is above or below optimum levels.		
4.4	To prevent erroneous signals from crosstalk contamination and interference, the electrical system should meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. The apparatus shall have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system should meet, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10Khz-1GHz to 100 Volts/Meter. EMI/RFI susceptibility should be controlled by applying appropriate circuit designs and shielding. The electrical system shall be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing shall be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.		
4.5	All 12-volt electrical equipment installed by the apparatus manufacturer shall conform to modern automotive practices. All wiring shall be high temperature crosslink type. Wiring shall be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers shall be provided which conform to SAE Standards. Wiring shall be color, function and number coded. Function and number codes shall be continuously imprinted on all wiring harness conductors at 2" intervals. Exterior exposed wire connectors shall be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment shall be installed utilizing the following guidelines: 1. All holes made in the roof shall be caulked with silicon, rope caulk is not acceptable. Large fender washers, liberally caulked, shall be used when fastening equipment to the underside of the cab roof. 2. Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body. 3. Electrical components designed to be removed for maintenance shall not be fastened with nuts and bolts. Metal screws shall be used in mounting these devices. Also a coil of wire shall be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work. 4. Corrosion preventative compound shall be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections shall require this compound in the plug to prevent corrosion and for easy separation (of the plug). 5. All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area. 6. All electrical terminals in exposed areas shall have silicon (1890) applied completely over the metal portion of the terminal. All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, shall be furnished. Rear identification lights shall be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads shall be protected from damage by installing a false bulkhead inside the rear compartments. An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests shall be recorded and provided to the purchaser at time of delivery.		

4.6	Advanced on-board diagnostic messages should be provided to support rapid troubleshooting of the electrical power and control system. The diagnostic messages should be displayed on the information center located at the driver's position. The on-board information center should include the following type diagnostic information: • Text description of active warning or caution alarms • Simplified warning indicators • Amber caution indication with intermittent alarm Red warning indication with steady tone alarm.		
4.7	A system should be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.		
4.8	Spare circuits shall be provided in the primary distribution center for two-way radio equipment. The spare circuits shall consist of the following: • One (1) 12-volt DC, 30 amp battery direct spare One (1) 12-volt DC ground and un-fused switched battery stud located in or adjacent to the power distribution center.		
4.9	If possible, a solid-state control system should include the following software enhancements: All perimeter lights and scene lights should be deactivated when the parking brake is released. Cab and crew cab dome lights should remain on for 10 seconds for improved visibility after the doors close. The dome lights should dim after 10 seconds or immediately if the vehicle is put into gear. Cab and crew cab perimeter lights should remain on for 10 seconds for improved visibility after the doors close. The dome lights should dim immediately if the vehicle is put into gear.		
4.10	Six (6) 12 volt, group 31 batteries that include the following features should be provided: • 950 CCA, cold cranking amps • 190 amp reserve capacity • High cycle • Rating of 5700 CCA at 0 degrees Fahrenheit • 1140 minutes of reserve capacity • SAE Posts Each battery case should be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover shall be manifold vented with a central venting location to allow a 45 degree tilt capacity. The inside of each battery shall consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.		
4.11	One (1) set of battery jumper studs with plastic color-coded covers shall be included on the battery compartments. This shall allow enough room for easy jumper cable access. A tag shall be provided for positive/negative terminals.		
4.12	An electronic load management (ELM) system should be provided that monitors the vehicles 12-volt electrical system. This ensures the integrity of the electrical system. The load manager system should be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components should not be allowed. Some of the features that this system should include area: • System voltage monitoring. • A shed load should remain inactive for a minimum of five minutes to prevent the load from cycling on and off.		

	• High Idle to activate before any electric loads are shed and deactivate with the service brake.
	  ○ If enabled:
	  ▪ "Load Man Hi-Idle On" shall display on the information center.
	  ▪ Hi-Idle shall not activate until 30 seconds after engine start up.
	• Individual switch "on" indicator to flash when the particular load has been shed.
	• The information center indicates system voltage and a list of items shed.		

4.13	A sequencer should be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation should allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator. The load sequencing system should be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components should not be allowed. Emergency light sequencing should operate in conjunction with the emergency master light switch.		
4.14	A Delco Remy®, Model 55SI, alternator or equivalent should be provided. It shall have a rated output current of 430 amps, as measured by SAE method J56. The alternator shall be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.		
4.15	There shall be a master battery switch provided within the cab within easy reach of the driver to activate the battery system. An indicator light shall be provided on the instrument panel to notify the driver of the status of the battery system.		
4.16	There should be a Kussmaul Auto Charge 12 HO or equivalent, battery charger provided. A bar graph display indicating the state of charge shall be provided. The charger should have a maximum output of 20 amps and a fully automatic regulation. The battery charger shall be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger.		
4.17	One (1) shoreline receptacle should be provided to operate the dedicated 120-volt circuits located in the EMS compartments on the truck without the use of the generator. The shoreline receptacle (s) should be provided with a Marinco 301EL-B 30 amp or equivalent inlet easy lock with weather proof cover. The unit is completely sealed to prevent road dirt contamination. The shoreline receptacle should be mounted in rear wall of step well underneath driver's door.		
4.18	The bidder shall provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system. The manufacturer of the apparatus shall provide the following: • Documentation of the electrical system performance tests. A written load analysis, which shall include the following: • The nameplate rating of the alternator. The alternator rating under the conditions specified per: NFPA 1901, 1999 Edition, section 11-3.2. The minimum continuous load of each component that is specified per: NFPA 1901, 1999 Edition, section 11-3.2. Additional loads that, when added to the minimum continuous load, determine the total connected load. Each individual intermittent load. All of the above listed items shall be provided by the bidder per NFPA 1901, 1999 Edition, section 11-15.		

		YES	NO
5.	**COOLING SYSTEM**		
5.1	The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system standards. For maximum corrosion resistance and cooling performance, the entire radiator core should be constructed using long life aluminum alloy. The core should be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes should be brazed to aluminum headers. No solder joints or leaded material of any kind shall be acceptable in the core assembly. Supply tank made of glass-reinforced nylon and a return tank of cast aluminum alloy should be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator should be compatible with commercial antifreeze solutions. There should be a full steel frame around the entire radiator core assembly. The radiator core assembly should be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator should be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly should be isolated from the chassis frame rails with rubber isolators. The radiator assembly should include an integral de-aeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow tank. For visual coolant level inspection, the radiator shall have a built-in sight glass. A drain port should be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system. A heavy-duty fan shall draw in fresh, cool air through the radiator. Shields or baffles shall be provided to prevent recirculation of hot air to the inlet side of the radiator. A coolant reservoir should be installed.		
5.2	Recommend Engine Manufacture's Coolant to be provided.		
5.3	Audible and visual temperature gauges on the cab dash and pump panel – if included.		
5.4	Silicone hoses shall be used for all engine/heater coolant lines installed by the chassis manufacturer. Hose clamps should be stainless steel constant torque type to prevent coolant leakage.		
5.5	The engine air intake should be located above the engine cooling package. It shall draw fresh air from the front of the apparatus through the radiator grille. A stainless steel metal screen shall be installed at the inlet of the air intake system that shall meet NFPA 1901 requirements. The air cleaner and stainless steel screen shall be easily accessible by tilting the cab.		
6.	**TRANSMISSION**		
6.1	An Allison 5th generation, model EVS 4500P, electronic, torque converting, automatic transmission or equivalent should be provided. The transmission shall be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display shall indicate when service is due. Two (2) PTO openings shall be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock). A transmission temperature gauge with red light and buzzer shall be installed on the cab instrument panel.		
6.2	A push button shift transmission module shall be mounted to right of driver on console. Shift position indicator shall be indirectly lit for after dark operation.		
6.3	The transmission should be provided with an aggressive downshift mode. This should provide earlier transmission downshifts from top gear to 3rd gear, resulting in improved engine braking performance.		
7.	**BRAKES**		
7.1	The service brake system should be full air type by Bendix or equivalent.		

	Front brakes should be disc type with automatic pad wear adjustment and 17.00" ventilated rotors for improved stopping distance. The rear brakes should be Meritor™ 16.50" x 8.63" cam operated with automatic slack adjusters or equivalent.		
7.2	The air compressor should be a Cummins/WABCO or equivalent.		
7.3	The brake system should include: • Dual brake treadle valve • Heated automatic moisture ejector on air dryer • Total air system capacity of a minimum of 5,000 cubic inches • Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi • Spring set parking brake system • Parking brake operated by a push-pull style control valve • A parking "brake on" indicator light on instrument panel • Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, should be provided with an automatic spring brake application at 40 psi • A pressure protection valve should be provided to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa) • 1/4 turn drain valve on each air tank The air tank should be primed and painted to meet a minimum 750 hour salt spray test. To reduce the effects of corrosion, the air tank should be mounted with stainless steel brackets.		
7.4	The air dryer should be WABCO System Saver 1200 or equivalent with spin-on coalescing filter cartridge and 100 watt heater.		
7.5	Color-coded nylon brake lines shall be provided. The lines shall be wrapped in a heat protective loom where necessary in the chassis. (copper not acceptable)		
7.6	One (1) air inlet with male coupling shall be provided. It shall allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet shall be located on the driver side. A check valve shall be provided to prevent reverse flow of air. The inlet shall discharge into the "wet" tank of the brake system. A mating female coupling shall also be provided with the loose equipment.		
7.7	An all-wheel lock-up system should be installed which applies air to the front brakes and uses the spring-brake at the rear. Front brakes should apply with the standard parking brake control. The all wheel lock-up system should be operational only when the parking brake is applied, the truck transmission is in neutral and engine is running.		
7.8	The vehicle should be equipped with a Wabco tractor 4S4M and tiller tractor 2S2M anti-lock braking system or equivalent. The ABS should provide a four (4) channel anti-lock braking control on both the front, rear tractor axle, and a two (2) channel system on the tiller axle. This anti-lock brake system should eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.		
7.9	An additional air tank with at least 1400 cubic inch displacement should be provided to increase the capacity of the main air brake system. This tank should be plumbed into the rear half of the brake system. The air tank shall be primed and painted to meet a minimum 750 hour spray test. To reduce the effects of corrosion, the air tank should be mounted with stainless steel brackets.		

		YES	NO
7.10	A vehicle stability control system should be provided as an integral part of the ABS brake system from Meritor Wabco, Bendix or equivalent.		
7.11	An anti-slip feature should be included with the ABS. The Automatic Traction Control shall be used for traction in poor road and weather conditions. The Automatic Traction Control shall act as an electronic differential lock that shall not allow a driving wheel to spin, thereby supplying traction at all times. An "off road traction" switch should be provided on the instrument panel. Activation of the switch shall allow additional tire slip to let the truck climb out and get on top of deep snow or mud.		
7.12	Must have a rapid build-up brake air system.		
7.13	There shall be one (1) U-bolt type or sheet metal protective guard(s) installed over the "Parking Brake" knob to prevent accidental activation of the brake. The guard shall be located on the driver's side.		
7.14	An automatic moisture ejector shall be installed on the (wet) tank. The moisture ejector shall be equipped with a 12-volt heater.		
8.	**FRONT AXLE**		
8.1	It should be a Meritor™ axle, Model MFS-20 or equivalent based on the manufacturer's GVW rating. The turning angle shall be 45 degrees or greater. A viewing window should be provided on each side of the axle for checking the oil level.		
8.2	Front suspension springs should be a heavy-duty, taper leaf design based on the manufacturer's GVW rating.		
8.3	Oil seals with viewing window should be provided on the front axle.		
9.	**REAR AXLE**		
9.1	The tractor rear axle should be a Meritor™, Model RS-30-185 or equivalent based on the manufacturer's GVW rating.		
9.2	A rear axle ratio shall be furnished to allow the vehicle to reach a top speed of 60 mph.		
9.3	Rear suspension should be Standens or equivalent, semi-elliptical, approximately 3" wide x 53" long based on the manufacturer's GVW rating. The spring hangers should be castings.		
9.4	Oil seals should be provided on the rear axle(s).		
10.	**SHOCK ABSORBERS**		
10.1	Monroe® Gas-Magnum® 65 heavy-duty telescoping shock absorbers or equivalent should be provided on the front axle.		
10.2	Heavy-duty Monroe Magnum 70 telescoping shock absorbers or equivalent should be provided on the rear axle.		
11.	**WHEELS AND TIRES**		
11.1	Front tires should be Goodyear 425/65R22.50 radials, 20 ply all-position wide base tread, maximum front axle load and 65 mph maximum speed or equivalent. The tires should be mounted on 22.50" x 12.25" painted steel wheels – color TBD		
11.2	Rear tires should be four (4) Goodyear 315/80R22.50 radials, load range L, traction tread, maximum rear axles load and 75 mph maximum speed or equivalent. The tires should be mounted on 22.50" x 9.00" painted steel wheels – color TBD		

11.3	There should be a RealWheels LED AirSecure™ tire alert pressure management system or equivalent provided, that shall monitor each tire's pressure. A sensor should be provided on the valve stem of each tire for a total of six (6) tires.		
11.4	A rear axle shall be equipped with a driver controlled differential lock (DCDL). The rocker style switch shall be located within easy reach of the driver. An indicator light shall be provided next to the control switch.		
11.5	An oil level viewing window should be provided on the front axle, as well as the tiller trailer axle.		
11.6	Provide mud flaps behind all tires. Mud flaps to be black in color.		
11.7	There shall be two (2) pairs of folding Ziamatic, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks with easy-grip handle or equivalent provided. There should be one (1) pair of Zico, Model SQCH-44-H or equivalent, horizontal mounting wheel chock brackets provided for the Ziamatic, Model SAC-44-E, folding wheel chocks. The brackets should be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets should be mounted forward of the left side rear tire.		
12.	**STEERING**		
12.1	A Ross, Model TAS-85, steering gear or equivalent, with integral heavy-duty power steering, should be provided. The power steering should incorporate an air to oil cooler and an Eaton, Model VN20, hydraulic pump or equivalent with integral pressure and flow control. All power steering lines should have wire braided lines with crimped fittings. A tilt and telescopic steering column shall be provided to improve fit for a broader range of driver configurations.		
12.2	The front axle shall be equipped with a Ross power assist cylinder or equivalent to aid in the steering of the apparatus.		
13.	**DRIVELINE**		
13.1	Drivelines should be a heavy-duty metal tube and be equipped with Spicer® 1810 or equivalent universal joints. The shafts should be dynamically balanced before installation. A splined slip joint should be provided in each driveshaft where the driveline design requires it. The slip joint shall be coated with Glidecoat® or equivalent.		
14.	**FUEL SYSTEM**		
14.1	A minimum 65 gallon fuel tank should be provided and mounted at the rear of the chassis. The tank should be constructed of 12-gauge, hot rolled steel or equivalent. It shall be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank should be mounted with stainless steel straps. A .75" drain plug shall be provided in a low point of the tank for drainage. A fill inlet shall be located on the left hand side of the body and be covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only." A .5" diameter vent should be provided running from top of tank to just below fuel fill inlet. The tank shall meet all FHWA 393.67 requirements, including a fill capacity of 95 percent of tank volume. All fuel lines shall be provided as recommended by the engine manufacturer.		
14.2	A minimum 4.5 gallon diesel exhaust fluid (DEF) tank should be provided and mounted in the driver's side body forward of the rear axle. A 0.5" drain plug shall be provided in a low point of the tank for drainage. A fill inlet shall be located on the driver's side of the body and be covered with a hinged, spring loaded, polished stainless steel door that is marked "Diesel Exhaust Fluid Only". The tank shall meet the engine manufacturer's requirement for 10 percent expansion space in the event of tank freezing. The tank shall include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.		

		YES	NO
14.3	An auxiliary electric fuel pump should be added to the fuel line for repriming the engine. A switch located on the cab instrument panel shall be provided to operate the pump.		
15.	**TRACTOR CHASSIS**		
15.1	Chassis provided shall be a new, tilt-type custom fire apparatus. The chassis shall be manufactured in the apparatus body builder's facility eliminating any split responsibility. The tractor chassis shall be designed and manufactured for heavy-duty service, with adequate strength, capacity for the intended load to be sustained, and the type of service required. Chassis designed for fire service only.		
15.2	The manufacturer will provide a complete description of the apparatus frame. It should be the best available and designed with strength and safety in mind.		
15.3	A rubber flap guard should be provided to protect the wires and relays around the u-joints of the driveshaft from grease build-up on the driver's side of the frame.		
15.4	The gross vehicle weight rating should allow for truck empty weight plus full load of equipment, crew, and water (if equipped with a tank).		
15.5	The wheelbase of the vehicle should be no greater than approximately 173".		
15.6	It is most desired that overall height be kept as low as possible and wheelbase be short as possible. Manufacturer to indicate dimensions in proposal. To accurately compare the turning radius of the apparatus, the manufacturer shall submit a turning radius performance sheet indicating turning radius of apparatus within a 12-foot high wall. Turning radius and wheelbase will be given the utmost consideration in the award evaluation.		
16.	**EXHAUST SYSTEM**		
16.1	The exhaust system shall meet the most current EPA standards. The exhaust should terminate horizontally ahead of the right side rear wheels. A tailpipe diffuser shall be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields shall be provided to isolate chassis and body components from the heat of the tailpipe diffuser.		
17.	**TOWING EYES**		
17.1	Mounted to the frame extension should be lift and tow mounts. The lift and tow mounts should be designed and positioned to adapt to certain tow truck lift systems. The lift and tow mounts with eyes shall be painted the same color as the frame.		
17.2	No tow hooks are to be provided. This truck shall be equipped with a lift and tow package with integral tow eyes.		
17.3	Rear - Two (2) rear painted tow eyes should be located at the rear of the apparatus and should be mounted directly to the torque box. The inner and outer edges of the tow eyes should be radiused.		
18.	**BUMPER**		
18.1	Manufacturer's standard heavy-duty chrome plated steel or heavy-duty polished stainless steel bumper should be provided on the front of the chassis.		
18.2	Front bumper should be mounted as close to cab as possible allowing for mounting of warning devices with an aluminum diamond plate skirt or equivalent between the bumper and the cab, contoured to match.		
19.	**FENDERS**		
19.1	Full circular inner fender liners in the wheel wells shall be provided.		
19.2	Rubber fender crowns should be installed at the cab wheel openings. The fender crowns should		

	have a radius outside corner that allows the fender crown to extend beyond the side wall of the front tires and also allow the crew cab doors to open fully.		
19.3	The chassis behind the cab should be assembled with fender panels over the wheels, running boards and steps for access to the turntable and decking over the frame rails. The fender panels should be fabricated of aluminum or equivalent. The fenders shall be designed with enough clearance to allow for the use of wrap around tire chains. The fenders radius should be approximately 1.5" wider. Fender design should be provided for prevention of rust pockets and ease of maintenance. Rubber fender crowns should be provided around the rear wheel openings. A rubber welting should be provided between the body and the crown to seal the seam and restrict moisture from entering. A dielectric barrier should be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion. The area over the frame rails between the cab and fifth wheel should be covered with aluminum treadplate to serve as a walkway area. The walkway area should be properly reinforced with a steel substructure attached to the frame rails. Running boards should be installed on each side directly behind the cab for access to the walkway area behind the cab and the turntable. The running boards should be covered with aluminum treadplate.		
20.	**FIFTH WHEEL**		
20.1	The fifth wheel should be designed to allow the tiller trailer to pivot fore & aft and be rotated. The fifth wheel should also be capable of full operation up to a 14 degree break over angle. A fifth wheel lockout system should be provided to limit motion during aerial operations. The fifth wheel lockout system, when activated, should prevent movement between the upper and lower plates of the fifth wheel assembly. In the normal road travel condition the cylinder mounted solenoid valves should be open and allow transfer of oil between the front and rear pair of cylinders. When the stabilizers are in their proper supporting position and as the aerial leaves the boom support, the solenoid valves should close. The closed valves should allow no oil to be transferred and the fifth wheel assembly shall become rigid. A fill and a gauge port shall be provided on the top of the trailer goose neck for maintenance.		
21.	**RUNNING BOARDS/STEPS**		
21.1	All areas to be potential walking or stepping areas such as running boards, tops of compartments, turntable, and so forth shall meet current NFPA non-skid standards.		

		YES	NO
21.2	The running boards should be fabricated of bright aluminum treadplate or equivalent and supported by structural steel angle assemblies bolted to the chassis frame rails. Running boards should be 13" deep and should be spaced away from the body 0.5". A splash guard should be provided to keep road dirt or water from splashing up onto the pump panels. The running boards should have a riser on the body to protect the painted surface from damage by stepping on the running boards. The entire surface of the running boards should be covered with bright aluminum treadplate or equivalent.		
21.3	The rear wall should be smooth aluminum or equivalent.		
22.	**ENGINE TUNNEL**		
22.1	Engine tunnel shall be adequately insulated against heat and sound. Must meet the most current NFPA 1901 standards.		
22.2	An aluminum treadplate scuffplate should be provided on the rear of engine tunnel, vertical surface. Scuffplate should be full width and full height.		
23.	**CAB**		
23.1	The cab shall be designed specifically for the fire service and shall be manufactured by the chassis builder. The cab shall be built by the apparatus manufacturer in a facility located on the manufacturer's premises. For reasons of structural integrity and enhanced occupant protection, the cab shall be of heavy duty design, with a minimum $3/16^{th}$ aluminum construction. The cab floors should be constructed with thick aluminum plate and reinforced at the firewall with an additional cross-floor support. The cab should be approximately 95" wide (outside door skin to outside door skin) to maintain maximum maneuverability. The overall height (from the cab roof to the ground) should be approximately 103". The overall height listed shall be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension should increase the overall height listed. The cab shall be a full tilt cab style.		
23.2	The exterior surface of the rear wall of the cab shall be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.		
23.3	A hydraulic cab lift system should be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves. The hydraulic pump shall have a manual override for backup in the event of electrical failure. Lift controls should be on a panel located on the right side pump panel or immediately behind the cab in a convenient location. The engine shall be easily accessible and capable of being removed with the cab tilted. The cab shall be capable of tilting 45 degrees and 90 degrees with crane assist. Cab should be locked down by a 2-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.		

	The hydraulic cylinders should be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located in the tilt position. For increased safety, a redundant mechanical stay arm shall be provided that must be manually put in place on the driver side between the chassis and cab frame when the cab is in the raised position. This device shall be manually stowed to its original position before the cab can be lowered.		
23.4	The cab lift system shall be interlocked to the parking brake. The cab tilt mechanism shall be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism shall be disabled.		
23.5	The forward cab doors should be full length doors. The crew cab doors shall be located on the sides of the cab and shall be constructed in the same manner as the forward cab doors. The crew cab doors should measure a minimum of 35" wide x 62" high. The forward cab and crew cab doors should be constructed of extruded aluminum. The exterior door skins should be constructed from aluminum. A flush mounted, chrome plated paddle type door handle should be provided on the exterior of each cab door. Each door should also be provided with an interior flush paddle handle. The cab doors should be provided with both interior (rotary knob) and exterior (keyed) locks as required by FMVSS 206. There should be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit. A chrome grab handle should be provided on the inside of each cab and crew cab door. The cab steps at each door location should be located below the cab doors and should be exposed to the exterior of the cab. All cab door jambs should be furnished with a scuffplate, mounted on the striker side of the jamb.		
23.6	The forward cab and crew cab access steps should be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps should be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps should be a bolt-in design to minimize repair costs should they need to be replaced. Three (3) step entrance designs shall not be acceptable due to safety concerns.		
23.7	A 1.25" diameter slip-resistant, knurled aluminum handrail or equivalent should be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress.		
23.8	For reduced overall maintenance costs compared to incandescent lighting, there should be a minimum of four (4) white LED step lights provided. The lights should be installed at each cab and crew cab door, at least one (1) per step. The lights should be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep. The lights shall be activated when the adjacent door is opened.		
23.9	The left and right side dash and center console should be a flat faced design to provide easy maintenance and should be constructed out of painted aluminum. The engine tunnel should be padded and covered with leather grain vinyl or equivalent resistant to oil, grease and mildew. For durability and ease of maintenance, the cab interior side walls should be painted aluminum. The rear wall should be painted aluminum. The headliner should be installed in both forward and rear cab sections. Headliner material shall be vinyl. A sound barrier shall be part of its composition. Material should be installed on aluminum sheet and securely fastened to interior cab ceiling. Forward portion of cab headliner shall provide easy access for servicing electrical wiring or for other maintenance needs without removing the entire unit. The cab interior upholstery should be a black vinyl.		
23.10	The cab and crew cab floor areas should be covered with diamond plate or equivalent. The cab should include approximately 1.5" insulation in the ceiling and side walls, and approximately 2" insulation in the rear wall to maximize acoustic absorption and thermal insulation.		

		YES	NO
23.11	A curved safety glass windshield should be provided with a minimum of 2,700 square inches of clear viewing area. The cab windshield shall have bright trim inserts in the rubber molding holding the glass in place. Economical windshield replacement glass shall be readily available from local auto glass suppliers. All exterior cab glass located behind the driver and passenger front doors should be tinted.		
23.12	Two (2) solid (opaque) sun visors or equivalent are to be provided. The sun visors should be located above the windshield with one (1) mounted on each side of the cab. There should be retention bracket provided to help secure each sun visor in the stowed position.		
23.13	Two (2) electric windshield wipers with washer shall be provided that meet FMVSS and SAE requirements. The washer reservoir shall be able to be filled without raising the cab. Windshield wipers should be configured to provide a clear view for both driver and officer.		
23.14	A Retrac, Model 613423 or equivalent, dual vision, motorized, west coast style mirror, with chrome finish, shall be mounted on each side of the front cab door with spring loaded retractable arms. The flat glass and convex glass shall be heated and adjustable with remote control within reach of the driver.		
23.15	A 10" diameter round convex mirror with adjustable arm should be installed on each side rear of the tiller body.		
23.16	A Grote 8" diameter convex mirror should be provided for the driver with a view of the right front bumper corner and the area several feet in front of the truck. The mirror housing, tubing, clamps and hardware should be constructed of corrosion resistant stainless steel or equivalent.		
23.17	A defroster in the cab located under the engine tunnel should be provided. The defroster ventilation should be built into the design of the cab dash instrument panel and shall be easily removable for maintenance. The defroster should have a 3-speed blower and temperature controls accessible to the driver and officer. The defroster ducts should be designed to provide maximum defrosting capabilities for the front cab windows. The defroster system shall meet or exceed SAE J382 requirements.		
23.18	Two (2) auxiliary heaters with a minimum 31,000 BTU each should be provided in the cab. The heaters shall have a 3-speed blower and temperature controls accessible to the driver and officer. There shall also be louvers located below the rear facing seat riser and below the driver and officer positions for airflow. The heaters should be mounted, one (1) within each rear facing seat riser.		
23.19	A high-performance air conditioning system should be furnished inside the cab and crew cab. An approximate 19 cubic inch compressor should be installed on the engine. The air conditioning system shall be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 72 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. A roof-mounted condenser that meets and exceeds the performance specification should be installed on the cab roof. Mounting the condenser below the cab or body would reduce the performance of the system and shall not be acceptable. The condenser cover and mounting legs to be painted as provided by the A/C manufacturer. An evaporator unit that meets and exceeds the performance specification should be installed in the cab, located in the center of the cab ceiling over the engine tunnel. The evaporator should include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab. The evaporator unit should be provided with adjustable air outlets strategically located to direct air flow to the driver, officer and crew cab area. All hose used should be class 1 type to reduce moisture ingression into the air conditioning system.		

	The air conditioner refrigerant shall be R-134A. The air conditioner shall be controlled by a single electronic control panel. For ease of operation, the control panel shall include variable adjustment for temperature and fan control and be conveniently located on the dash in clear view of the driver.		
23.20	Two (2) window defrost fans shall be mounted on the ceiling of the cab, one (1) on each side of the cab.		
23.21	There shall be four (4) dual LED dome lights provided. Two (2) lights should be mounted above the inside shoulder of the driver and officer and two (2) lights shall be installed and located, one (1) on each side of the crew cab. The color of the LED's shall be red and white. The white LED's shall be controlled by the door switches and the lens switch. The color LED's shall be controlled by the lens switch.		
23.22	The seating capacity in the cab shall be four (4).		
23.23	A seat shall be provided in the cab for the driver. The seat design shall be a cam action type, with air suspension. For increased convenience, the seat shall include a manual control to adjust the horizontal position. The manual horizontal control shall be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat shall have an adjustable reclining back. The seat back shall be a high back style with side bolster pads for maximum support. For optimal comfort, the seat should be provided with deep foam cushions designed with EVC (elastomeric vibration control). The seat shall include the following features: • Side air curtain • A suspension seat safety system The seat shall be furnished with a 3-point, shoulder type seat belt. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position. A retaining strap or device should be provided to keep the female end of the seat belt within easy reach, so it does not fall down beside the seat.		
23.24	A seat shall be provided in the cab for the officer. The seat shall be a fixed type, with no suspension. For optimal comfort, the seat should be provided with deep foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled. The seat back shall be an SCBA back style. This seat should be equipped with an IMMI SmartDock SCBA pack braket to hold an MSA G1 airpack. The seat shall include the following features: • Side air curtain • A seat safety system The seat shall be furnished with a 3-point, shoulder type seat belt. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position. A retaining strap or device should be provided to keep the female end of the seat belt within easy reach, so it does not fall down beside the seat.		
23.25	There should be two (2) forward-facing cushioned seats mounted on a full-width pedestal compartment against the back cab wall. Each seat should be equipped with an IMMI SmartDock SCBA pack bracket to hold an MSA G1 airpack. The seats should be spaced as wide apart as practical given the width of the base compartment and cab steps. For optimal comfort, the seats should be provided with deep foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat shall be equipped with seat belt		

	sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled. The seat back shall be an SCBA back style. The seat shall include the following features: • Side air curtain • A seat safety system The seat shall be furnished with a 3-point, shoulder type seat belt. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position. The seat base compartment should be accessible by hinged doors on each end of the compartment facing the cab doors, should be an open pass-through compartment without interior partitions, with the doors hinged so that they open against the back wall of the cab. These doors should have a clear opening minimum 12-1/2 inches wide by 13 inches high and should each be equipped with a lock.		
23.26	All seat upholstery should be leather grain black vinyl resistant to oil, grease and mildew (no cloth or woven fabric exposed).		
23.27	All SCBA type seats in the cab should be equipped with an IMMI SmartDock SCBA pack bracket to hold an MSA G1 airpack. For efficiency and convenience, the bracket shall include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp shall constrain the SCBA bottle in the seat and shall exceed the NFPA standard of 9G. Bracket designs with manual restraints (belts, straps, buckles) that could be inadvertently left unlocked and allow the SCBA to move freely within the cab during an accident, shall not be acceptable. There shall be a quantity of three (3) SCBA brackets.		
23.28	All seating positions in the cab shall have red or orange seat belts. To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length shall meet or exceed the most current edition of NFPA 1901 and CAN/ULC - S515 standards. The 3-point shoulder type seat belts should also include the ReadyReach or equivalent D-loop assembly to the shoulder belt system. All seating positions furnished with 3-point shoulder type seat belts shall include a height adjustment.		
23.29	There should be two aluminum full-height storage compartments, one behind the driver's seat and one behind the passenger's seat. Each compartment should have an aluminum roll-up door facing the rear of the truck, with a minimum opening width of 22 inches. Each compartment should have a minimum of two adjustable shelves, and should be supplied with two 120VAC single-gang duplex receptacles (for a total of four receptacles per compartment). These compartments should have LED lighting strips along at least one interior side of the door that are activated when the doors are opened.		
23.30	A seat belt monitoring system (SBMS) shall be provided. The SBMS shall be capable of monitoring all seating positions indicating the status of each seat position per the following: • Seat Occupied & Buckled = Green LED indicator illuminated • Seat Occupied & Unbuckled = Red LED indicator with audible alarm • No Occupant & Buckled = Red LED indicator with audible alarm • No Occupant & Unbuckled = No indicator and no alarm The SBMS shall include an audible alarm that shall warn that an unbuckled occupant condition exists and the parking brake is released, or the transmission is not in park.		
23.31	The cab instrument panel shall include gauges, telltale indicator lamps, control switches, alarms, and a diagnostic panel. The function of the instrument panel controls and switches shall be identified by a label adjacent to each item. Actuation of the headlight switch shall illuminate the labels in low light conditions. Telltale indicator lamps shall not be illuminated unless necessary. The cab		

	instruments and controls shall be conveniently located within the forward cab section, forward of the driver. The gauge assembly and switch panels are designed to be removable for ease of service and low cost of ownership.		

23.32	The gauge panel should include the following ten (10) black faced gauges with black bezels to monitor vehicle performance:
	• Voltmeter Gauge (volts):
	  • Low volts (11.8 VDC)
	  • Amber telltale light on indicator light display with steady tone alarm
	  • High volts (15.5 VDC)
	  • Amber telltale light on indicator light display with steady tone alarm
	• Engine Tachometer (RPM)
	• Speedometer MPH
	• Fuel Level Gauge (Empty - Full in fractions):
	  • Low fuel (1/8 full)
	  • Amber telltale light on indicator light display with steady tone alarm
	• Engine Oil Pressure Gauge (PSI):
	  • Low oil pressure to activate engine warning lights and alarms
	  • Red telltale light on indicator light display with steady tone alarm
	• Front Air Pressure Gauges (PSI):
	  • Low air pressure to activate warning lights and alarm
	  • Red telltale light on indicator light display with steady tone alarm
	• Rear Air Pressure Gauges (PSI):
	  • Low air pressure to activate warning lights and alarm
	  • Red telltale light on indicator light display with steady tone alarm
	• Transmission Oil Temperature Gauge (Fahrenheit):
	  • High transmission oil temperature activates warning lights and alarm
	  • Amber telltale light on indicator light display with steady tone alarm
	• Engine Coolant Temperature Gauge (Fahrenheit):
	  • High engine temperature activates an engine warning light and alarms
	  • Red telltale light on indicator light display with steady tone alarm
	• Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):
	  • Low fluid (1/8 full)
	  • Amber telltale light on indicator light display
	
	All gauges shall perform prove out at initial power-up to ensure proper performance.		

23.33	To promote safety, the following telltale indicator lamps shall be located on the instrument panel in clear view of the driver. The indicator lamps shall be "dead-front" design that is only visible when active. The colored indicator lights shall have descriptive text or symbols. The following amber telltale lamps shall be present: • Low coolant • Trac cntl (traction control) (where applicable)		

	• Check engine • Check trans (check transmission) • Air rest (air restriction) • Driver door open • Passenger door open • DPF (engine diesel particulate filter regeneration) • HET (engine high exhaust temperature) (where applicable) • ABS (antilock brake system) • MIL (engine emissions system malfunction indicator lamp) (where applicable) • Regen inhibit (engine emissions regeneration inhibit) (where applicable) • Trans temp (transmission temperature) • SRS (supplemental restraint system) fault (where applicable) • DEF (low diesel exhaust fluid level) The following red telltale lamps shall be present: • Parking brake • Stop engine • Seat Belt The following green telltale lamps shall be present: • Left turn • Right turn • Battery on The following blue telltale lamps shall be present: • High beam A steady audible tone alarm shall be provided whenever a warning message is present. A pulsing audible tone alarm (chime/chirp) shall be provided whenever a caution message is present without a warning message being present.		
23.34	The following controls should be provided immediately adjacent to the cab instrument panel within easy reach of the driver. All switches shall have backlit labels for low light applications. **Emergency master switch:** A switch with integral indicator lamp should be provided. Pressing the switch should activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode. **Headlight/Parking light switch:** A three (3)-position maintained rocker switch shall be provided. The first switch position shall deactivate all parking and headlights. The second switch position shall activate the parking lights. The third switch shall activate the headlights. **Panel back lighting intensity control switch:** A variable voltage control switch should be provided. The switch moved in the up direction increases the panel back lighting intensity to a		

	maximum and the switch moved in a down direction decreases the panel back lighting intensity to a minimum level. **High idle engagement switch:** A two (2)-position momentary rocker switch with integral indicator lamp should be provided. The first switch position is the default switch position. The second switch position should activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch should indicate when the high idle function is engaged. **"Ok To Engage High Idle" indicator lamp**: A green indicator light shall be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement. **Ignition switch:** A three (3)-position maintained/momentary rocker switch should be provided. The first switch position shall deactivate vehicle ignition. The second switch position shall activate vehicle ignition. The third momentary position shall perform prove-out on the telltale indicators and alarms when the ignition switch is held in the up position for three (3) to five (5) seconds to ensure proper performance. A green indicator lamp is activated with vehicle ignition. **Engine start switch:** A two (2)-position momentary rocker switch should be provided. The first switch position is the default switch position. The second switch position shall activate the vehicle's engine. The switch actuator is designed to prevent accidental activation. **Heater, defroster, and optional air conditioning control panel:** A control panel with membrane switches shall be provided to control heater/defroster temperature and heater, defroster, and air conditioning fan speeds. **Hazard switch** shall be incorporated into the steering column. **Turn signal arm:** A self-canceling turn signal with high beam headlight controls. **Windshield wiper control** shall have high, low, and intermittent modes. **Parking brake control:** An air actuated push/pull park brake control. **Chassis horn control:** Activation of the chassis horn control shall be provided through the center of the steering wheel.		
23.35	The following controls should be provided within easy reach of the officer. All switches shall have backlit labels for low light applications. • A speedometer • A brow light switch • A siren brake • Right and left cab scene lights • Rear body scene/flood lights		
23.36	The design of cab instrumentation shall allow for emergency lighting and other switches to be placed within easy reach of the operator, thus improving safety. All switches have backlit labels for low light applications.		
23.37	The doghouse should have provisions for radio wells or console for mobile radio, siren control,		

	directional bar control, and back-up camera display screen.		
23.38	An antenna mounting base, Model MATM with 17 feet of coax cable and weatherproof cap shall be provided for a two way radio. The mount shall be located on the cab roof just to the rear of the officer seat. The cable shall be routed to the officer side seat box with enough cable for customer to route to the instrument panel if needed. One (1) additional antenna mounting bases, Model MATM with coax cable and weatherproof cap shall be provided for a two way radio. The mount shall be located one each side behind the A/C unit. The cable shall be routed to the center dash board area under the access panel.		
23.39	Four (4) power and ground studs should be provided in the electrical component compartment for two way radio equipment. The studs shall consist of the following: Stud #1 shall be 12-volt 40-amp, controlled by battery switch. Stud #2 shall be 12-volt 100-amp, ground. Stud #3 shall be 12-volt 60-amp, controlled by ignition switch. Stud #4 shall be 12-volt 60-amp, battery direct.		
23.40	The body builder shall supply and install the required radio interface cable for the system to work with the Motorola APX4500 mobile radio before delivery of the vehicle.		
23.41	A four (4) position David Clark, model U3800, intercom system with radio interface at three (3) positions and four (4) headsets shall be provided: Driver position shall have radio interface capability Officer position shall have radio interface capability Pump Panel shall have radio interface capability – if a pump is included Two (2) Crew cab positions at both forward facing seats shall have intercom only The following components shall be supplied with this system: One (1)-U3800 Intercom Unit (2 Crew) One (1)-U3815 Radio Interface Module (Driver) One (1)-U3811 Radio Interface Module (Officer) Two (2)-U3802 Intercom Only Modules (2 Crew) One (1)-U3815A Radio Interface Module (Pump Panel – if a pump is included) Four (4)-H3342 Headsets (Behind the head style) One (1)-H3341 Headset (Behind the head style, slotted) One (1) C3023 Belt Station (Pump Panel – if a pump is included) One (1)-C3820 Power Cable. All necessary cables and connectors shall be provided.		

		YES	NO
23.42	A diagnostic panel should be accessible while standing on the ground and shall be located inside the driver's side door, left of the steering column. The diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches shall allow ABS systems to provide blink codes should a problem exist. The diagnostic panel shall include the following: • Engine diagnostic port • Transmission diagnostic port • ABS diagnostic port • Roll sensor diagnostic port • MultiPlex USB diagnostic port • ABS diagnostic switch (blink codes flashed on ABS telltale indicator) • Diesel particulate filter regeneration switch (where applicable) • Diesel particulate filter regeneration inhibit switch (where applicable)		
23.43	A flashing red indicator light, located in the driving compartment, shall be illuminated automatically per the most current NFPA requirements. The light shall be labeled "Do Not Move Apparatus If Light Is On." The same circuit that activates the Do Not Move Apparatus indicator shall activate a pulsing alarm when the parking brake is released.		
23.44	There should be two (2) indicator lights provided and located in clear view of the driver, warning of any open passenger or equipment compartment door(s). • One (1) light shall indicate status of doors on the driver's side of the vehicle • One (1) light shall indicate the status of the passenger side and rear compartment doors		
23.45	The built-in emergency light switch panel should have a master switch plus individual switches for selective control. The switch panel should be located in the "overhead" position above the windshield on the driver's side to allow for easy access. Switches shall be rocker type with an indicator light, of which is an integral part of the switch.		
23.46	There shall be a master switch for the aerial operating electrical system provided.		
23.47	The cab shall be provided with an air bag safety system designed to protect occupants in the event of a side roll or frontal impact, and shall include the following: • A driver side front air bag shall be mounted in the steering wheel and shall be designed to protect the head and upper torso of the occupant, when used in combination with the 3-point seat belt. • A passenger side knee bolster air bag shall be mounted in the modesty panel below the dash panel and shall be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt. • Air curtains shall be provided in the outboard bolster of outboard seat backs or an appropriate location the cab to provide a cushion between occupant and the cab wall. • Suspension seats shall be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event. Seat belts shall be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.		

23.48	The air bag system shall provide protection during a frontal or oblique impact event. The air bag system shall deploy the following components in the event of a frontal or oblique impact event: • Driver side front air bag • Passenger side knee bolster air bag • Air curtains mounted in the outboard bolster of outboard seat backs an appropriate location the cab • Suspension seats shall be retracted to the lowest travel position • Seat belts shall be pre-tensioned to firmly hold the occupant in place		
23.49	The air bag system shall provide protection during a fast or slow 90 degree roll to the side, in which the vehicle comes to rest on its side. The air bag system shall deploy the following components in the event of a side roll: • Air curtains mounted in the outboard bolster of outboard seat backs an appropriate location the cab • Suspension seats shall be retracted to the lowest travel position Seat belts shall be pre-tensioned to firmly hold the occupant in place		
23.50	The cab dash in front of the officer shall be designed to give the officer as much room as possible.		
23.51	All exterior surfaces designated as stepping, standing, and walking areas shall comply with the required average slip resistance of the most current NFPA standards.		
23.52	For enhanced protection from inclement weather, a drip rail should be furnished on the sides of the cab. The drip rail should be constructed of bright polished extruded aluminum or equivalent, and be bonded to the sides of the cab. The drip rail should extend the full length of the cab roof.		
22.53	Checking the fluids should be able without raising the cab. For access to the engine oil and transmission fluid dipsticks, there should be a door on the engine tunnel, inside the crew cab or a door on the grille. The engine oil dipstick should allow for checking and if possible, filling with oil. The transmission dipstick shall allow for both checking and filling.		
23.54	The following metal surfaces should be painted black, vinyl textured paint or severe duty: • Modesty panel in front of driver • Vertical surface of dash in front of the officer (not applicable for recessed dash) • Glove box in front of the officer (if applicable) • Power distribution in front of the officer • Rear heater vent panels The remaining cab interior metal surfaces should be painted black, vinyl texture paint or severe duty.		
24.	**WARNING DEVICES**		
24.1	There should be one (1) Federal, Model Q2B, mechanical siren furnished. A siren brake button shall be installed on the switch panel. The control solenoid should be powered up after the emergency master switch is activated and shall be interlocked to the parking brake so that the siren cannot be accidentally activated when the parking brake is applied. The mechanical siren should be recessed in the front bumper on the left side. The siren shall be supported by the bumper framework. The mechanical siren should be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side. A second siren brake switch should be installed on the passenger side.		
24.2	A "Code 3", model 3692 or equivalent, electronic siren with noise canceling microphone shall be provided.		

	Siren head shall be located on a swivel bracket mounted on the headliner so that it is accessible to both the driver and officer. The swivel bracket shall be capable of rotating a minimum of 180 degrees. The electronic siren shall be controlled on the siren head only. No horn button or foot switches shall be required. The siren should be wired to the emergency master power switch.		
24.3	There shall be one (1) speaker recessed in the front bumper. Each speaker shall be a Cast Products, Model: SA2401, 100 watt, inside-the-bumper mount, with trim bezel. Each speaker shall be connected to the siren amplifier.		
24.4	Two (2) 24" Grover air horns recessed in front bumper. Air horns to be activated by two (2) floor foot switches, one (1) each side of cab floor.		
24.5	There should be one (1) 72" Whelen Freedom IV LED or equivalent lightbar mounted on the cab roof. The lightbar should include the following: • One (1) red flashing LED module in the driver's side end position. • One (1) red flashing LED module in the driver's side front corner position. • One (1) red flashing LED module in the driver's side first front position. • One (1) red flashing LED module in the driver's side second front position. • One (1) white flashing LED module in the driver's side third front position. • One (1) red flashing LED module in the driver's side fourth front position. • One (1) red flashing LED module in the driver's side fifth front position. • One (1) 795 LED traffic light controller or equivalent Opticom set to national standard high priority in the center positions. • One (1) red flashing LED module in the passenger's side fifth front position. • One (1) red flashing LED module in the passenger's side fourth front position. • One (1) white flashing LED module in the passenger's side third front position. • One (1) red flashing LED module in the passenger's side second front position. • One (1) red flashing LED module in the passenger's side first front position. • One (1) red flashing LED module in the passenger's side front corner position. • One (1) red flashing LED module in the passenger's side end position. There shall be clear lenses included on the lightbar. The following switches may be installed in the cab on the switch panel to control the lightbar: • a switch to control the flashing LED modules. • the traffic light controller shall be activated by a cab switch with emergency master control, • and there should be no momentary switch to activate the traffic light controller. The two (2) white flashing LED modules and the traffic light controller shall be disabled when the parking brake is applied. The eight (8) red flashing LED modules in the front positions may be load managed when the parking brake is applied.		
24.6	There shall be four (4) Whelen Model M6*C or equivalent LED flashing warning lights installed on the cab face, above the headlights, mounted in a common bezel. • The driver's side front outside warning light to be red		

	• The driver's side front inside warning light to be red • The passenger's side front inside warning light to be red • The passenger's side front outside warning light to be red All four (4) lights should include a clear lens. There should be a switch located in the cab, on the switch panel, to control the four (4) lights. The inside lights may be load managed if colored or disabled if white, when the parking brake is set.		
24.7	There should be four (6) Whelen Model M6*C or equivalent LED flashing warning lights with chrome trim installed per the following: • Two (2) lights, one (1) each side on the front cab corner. The side front lights to be red. • Two (2) lights, one (1) each side above the front wheels. The side middle lights to be red. • Two (2) lights, one (1) each side above rear wheels. The side rear lights to be red. • The lights shall include clear lenses. There should be a switch in the cab on the switch panel to control the lights.		
24.8	There should be four (4) Weldon, Model 8401-0000-20, amber 12 volt DC LED flashing strip lights or equivalent provided. • One (1) light on the driver's side cab door over the window. • One (1) light on the passenger's side cab door over the window. • One (1) light on the passenger's side crew cab door over the window. • One (1) light on the driver's side crew cab door over the window. Each light should be activated when the battery switch is on and the adjacent door is opened. Each light should be installed so the flash pattern directs traffic away from the doors.		
24.9	There should be two (2) Whelen, Model M6*C LED or equivalent flashing warning light(s) with bezel(s) provided one (1) each side in the turntable steps - bottom step area. The color of the lights shall be red. All of these lights shall include a clear lens. These lights should be activated with the Side Zone Lower warning lights. White LEDs shall be deactivated when the parking brake is applied.		
24.10	There should be four (4) Whelen, Model WION* wide angle flashing LED or equivalent warning lights with Whelen, Model IONK1B black bail mounts or equivalent provided: • One (1) recessed in the driver's side cab step on the front, vertical surface, below bottom of door. • One (1) recessed in the driver's side crew cab step on the front, vertical surface, below bottom of door. • One (1) recessed in the passenger's side crew cab on the front, vertical surface, below bottom of door. • One (1) recessed in the passenger's side cab step on the front, vertical surface, below bottom of door. The color of the lights shall be red. These lights shall be activated with the side warning switch. These lights may be load managed when the parking brake is applied.		
24.11	There should be Whelen, Model WIONSMC* or equivalent LED light(s) provided and located in the body rub rails one (1) each centered under at least two (2) of the trailer body compartments. The lights should not be mounted with the rubber gasket behind the light which will allow the light(s) to fit in the rub rails. The color of each light shall be red LED with a clear lens. Each light should be provided with a chrome plated ABS flange. The light(s) shall be activated with the side warning switch.		

		YES	NO
24.12	There should be two (2) Whelen®, Model M6*C or equivalent, LED flashing warning lights located at the rear of the apparatus. • The driver's side rear light to be red • The passenger's side rear light to be red Both lights should include a lens that is clear. There shall be a switch located in the cab on the switch panel to control the lights.		
24.13	There should be two (2) Whelen, Model M6** or equivalent, 4" high x 7" wide x 1" deep flashing LED warning light(s) with chrome trim provided at the rear of the apparatus, one (1) each side on the tiller box under the rear tiller cab window. The light(s) to include red flashing LEDs. The warning light lens color(s) to be clear. These light(s) shall be controlled with the rear upper warning switch. The light(s) may be load managed when the parking brake is applied.		
24.14	There should be two (2) Whelen, Model MCFLED2* or equivalent LED warning beacons provided at the rear of the truck, one (1) each side. The color of the lights shall be: • The rear upper light(s) on the driver's side to be red. • The rear upper light(s) on the passenger's side to be red. • All lenses shall be clear. There shall be a switch located in the cab on the switch panel to control the beacons.		
24.15	One (1) Federal Signalmaster traffic advisor or equivalent directional signaling device should be mounted on rear of the apparatus. The control panel to be mounted within reach of both the driver and officer and shall only operate when the parking brake is set.		
24.16	Front-facing emergency lights (lights on front of cab, and light bar) should be on a separate switch so they may be disabled to reduce oncoming driver distraction.		
25.	**LIGHTING EQUIPMENT**		
25.1	There should be four (4) JW Speaker®, Model 8800, 4" x 6" rectangular LED lights or equivalent mounted in the front quad style, chrome housing on each side of the cab grille: • The outside light on each side shall contain a part number 055***1 low beam module • The inside light on each side shall contain a part number 055***1 high beam module • The headlight to include chrome bezels.		
25.2	There should be two (2) Whelen 600 series or equivalent LED combination directional/marker lights provided. The lights should be located on the outside cab corners, next to the headlights. The color of the lenses should be the same color as the LED's.		
25.3	There should be two (2) Weldon Model 9186-8580-29 or equivalent intermediate, amber LED turn signal marker lights furnished, one (1) each side, in the rear fender panel. The light should double as a turn signal and marker light.		
25.4	There should be seven (7) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations: • Three (3) amber LED identification lights should be installed in the center of the cab above the windshield. • Two (2) amber LED clearance lights should be installed, one (1) on each outboard side of the cab above the windshield. Two (2) amber LED marker lights should be installed, one (1) on each side above the cab doors.		

25.5	There should be two (2) Truck-Lite Model 19036Y or equivalent front cab side directional/marker, amber LED lights, one (1) on each side of the cab. The lights should activate as marker lights with the headlight switch and directional lights with the corresponding directional circuit.		
25.6	There should be three (3) Truck-Lite Model 33050R or equivalent LED lights used as identification lights recessed and located at the rear of the apparatus per the following: • As close as practical to the vertical centerline • Centers spaced not less than 6" or more than 12" apart • Red in color • All at the same height There should be two (2) Truck-Lite Model 33050R or equivalent LED lights recessed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following: • To indicate the overall width of the vehicle • One (1) each side of the vertical centerline • As near the top as practical • Red in color • To be visible from the rear • All at the same height There should be two (2) Truck-Lite Model 330350R or equivalent LED lights recessed on the side of the apparatus as marker lights as close to the rear as practical per the following: • To indicate the overall length of the vehicle • One (1) each side of the vertical centerline • As near the top as practical • Red in color • To be visible from the side • All at the same height There should be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15", but no more than 60", above the ground. There should be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15", but no more than 60", above the ground. Per FMVSS 108 and CMVSS 108 requirements.		
25.7	There should be one (1) pair of amber and red LED marker lights with rubber stalk arm, located at the rear most-lower corner of the body. The amber lens should face the front and the red lens shall face the rear of the truck. These lights shall be activated with the running lights of the vehicle.		
25.8	The rear stop/tail and directional LED lighting should consist of the following: • Two (2), Whelen Model M6BTT or equivalent, red LED stop/tail lights • Two (2) Whelen Model M6T or equivalent amber LED arrow turn lights		

	The lights shall be provided with color lenses. Each light should be installed separately at the rear with Whelen, Model M6FC or equivalent, chrome flanges. There shall be two (2) Whelen Model M6BUW or equivalent, LED backup lights provided with a flange.		
25.9	A PRECO, Model 1040 or equivalent, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse shall be provided. The device shall sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.		
25.10	There should be two (2) buzzers and buttons supplied. One (1) control shall be a push button style located in the cab at RS floor in tiller cab and shall activate a buzzer in the tiller cab. One (1) control shall be a foot switch in the tiller cab and shall activate a buzzer in the cab. The buzzers shall be different from the standard tones and be loud enough to be heard over the engine and cab noise during normal operation. Both shall locations shall have a tag labeled: 1- Stop 2- Go 3- Back-up		
25.11	There should be one (1) pair of amber and red LED marker lights with rubber stalk arm, located just to the rear of the trailer axle per print. There should be an amber lens that faces the front and the red lens shall face the rear of the truck. These lights shall be activated with the running lights of the vehicle.		
25.12	There should be four (4) 20" white LED or equivalent strip lights provided, one (1) for each cab door. These lights shall be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body perimeter scene lights.		
25.13	There should be one (1) 20" or equivalent LED weatherproof strip light with bracket provided under the passenger's side pump panel running board. If the combination of options in the vehicle does not permit clearance for a 20" light, a 12" version of the Amdor or equivalent light shall be installed. The light shall be activated when the battery switch is on, and controlled by the same means as the body perimeter lights.		
25.14	There should be four (4) Amdor or equivalent LED lights with brackets provided. The lights shall be mounted in the following locations: • One (1) 20" long light shall be provided under the driver's side turntable access steps. • One (1) 20" long light shall be provided under the driver's side tiller cab access steps. • One (1) 20" long light shall be provided under the passenger's side tiller cab access steps. • One (1) 12" long light shall be provided under the passenger's side turntable access steps. The perimeter scene lights should be activated when the battery switch is on, and the parking brake is applied, either directional light is activated, activating all side facing perimeter lights and the reverse signal activated, activating all the side facing perimeter lights.		

		YES	NO
25.15	White LED lighting should be provided immediately forward of or above the trailer and tractor wheels to provide ground lighting when the truck is placed in reverse. These white lights may be separate lights or may be in combination with the emergency warning lights such as Whelen M6V2R light assemblies.		
25.16	There should be 20" long white LED's installed under most of not all compartments. With the chassis battery switch energized, the lights should be activated by the same means as the body perimeter lights.		
25.17	There should be a total of sixteen (16) white LED step lights provided for access to the tiller cab and turntable. The step lights should be activated with the battery switch is on and the parking brake is applied. All other steps on the apparatus shall be illuminated per the current edition of NFPA 1901.		
25.18	There should one (1) pair of TecNiq, Model E960 or equivalent, 4" high x 8" long oval LED scene light(s) with stainless steel housing, installed on the side of the apparatus rotated 15 degrees down, One (1) each side Rearward of the Tiller Rear Wheels (one (1) LS and RS). The lights should be controlled by a switch in the tiller cab. These lights may be load managed when the parking brake is applied.		
25.19	There should be one (1) pair of TecNiq, Model E960 or equivalent, 4" high x 8" long oval LED scene light(s) with stainless steel housing, installed on the side of the apparatus rotated 15 degrees down, One (1) each side forward of the Tiller Rear Wheels one (1) LS and RS. The lights should be controlled by a switch in the tiller cab. These lights may be load managed when the parking brake is applied.		
25.20	There should be one (1) pair of Whelen, Model M9LZC or equivalent, LED scene lights installed on the rear exterior wall of the tractor cab with chrome flanges. The lights should be controlled by the aerial master switch.		
25.21	There should be one (1) 12 volt DC LED or equivalent light(s) with combination spot/flood optics fixed or flush-mounted above DS crew cab window. The painted parts of the light housing and brackets should be white. The light(s) selected above should be controlled by a switch at the driver's side switch panel, by a switch at the driver's side pump panel if equipped with a pump, by a switch at the passenger's side switch panel and when the cab or crew cab doors on the driver's side are open. These light(s) may be load managed when the parking brake is applied.		
25.22	There should be one (1) HiViz, part number FT-MB-24-TRGWA-FT-**or equivalent, 2.5" high x 31" long x 3" deep 8,880 lumens 12 volt DC LED light(s) installed with TRGWA adjustable tilt mounts located tiller cab, centered above the rear window. The lights shall be supplied with with a combination of flood and spot optics. The color of the light housing(s) and brackets should be white. The light(s) selected above should be controlled by a switch at the driver's side switch panel, by a switch at the passenger's side switch panel, by a switch in a recessed cup located at the driver's side rear bulkhead and by a switch in the tiller cab. These light(s) may be load managed when the parking brake is applied.		
25.23	There should be one (1) 12 volt DC LED or equivalent, light(s) with combination spot/flood optics optics fixed or flush-mounted above PS crew cab window. The painted parts of the light housing and brackets should be white. The light(s) selected above should be controlled by a switch at the driver's side switch panel, by a switch at the driver's side pump panel –if equipped with a pump, by a switch at the passenger's side switch panel and when the cab or crew cab doors on the passenger's side are open. These light(s) may be load managed when the parking brake is applied.		

25.24	There should be one (1) Whelen®, Model 0S*00MCR or equivalent, 1" high x 1.5" long x 0.5" deep 12 volt DC light(s) with amber LEDs and chrome trim installed on a collapsible bracket. The bracket(s) should be 6" tall depending on the overall height restrictions. The light(s) should be mounted at the rear of the crew cab center of cab at the rear and should be used by the tillerman to center the tiller trailer to the tractor. The light(s) should be activated with a separate switch in cab.		
25.25	There should be two (2) Whelen® Model P*H1*, 8,875 lumens 12 volt DC LED or equivalent, light(s) with a combination of flood and spot optics provided on the front visor, driver's and passenger's. The housing(s) painted parts of this light assembly should be white. The light(s) should be controlled by a switch at the driver's side switch panel and by a switch at the passenger's side switch panel. These light(s) may be load managed when the parking brake is applied.		
25.26	There should be Model FRP or equivalent, 4" round black 12 volt DC LED floodlight(s) with bolt mount provided to illuminate the entire designated walking surface on top of the body. The light(s) should be activated when the body step lights are on.		
25.27	All lighting equipment to meet Federal and VA state motor vehicle inspection standards.		
26.	**ELECTRICAL SYSTEM GENERAL DESIGN for ALTERNATING CURRENT**		
26.1	The following guidelines should apply to the 120/240 VAC system installation: Any fixed line voltage power source producing alternating current (ac) line voltage should produce electric power at 60 cycles plus or minus 3 cycles. Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures shall conform to NFPA 70, National Electrical Code (herein referred to as the NEC). All products shall be used only in the manner for which they have been listed.		
26.2	All line voltage conductors located in the main panel board should be individually and permanently identified. The identification shall reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends should be labeled showing function and wire size.		
26.3	Grounding shall be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems shall not be used. Only stranded or braided copper conductors shall be used for grounding and bonding. An equipment grounding means shall be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC. The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC. In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. This conductor shall have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements shall be permitted to be used.All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.		

		YES	NO
26.4	Fixed wiring systems shall be limited to the following: - Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius) or - Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius) Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring shall be run as follows: - Separated by a minimum of 12 inches (305 mm), or properly shielded, from exhaust piping - Separated from fuel lines by a minimum of six (6) inches (152 mm) distance. Electrical cord or conduit shall be supported within six (6) inches (152 mm) of any junction box and at a minimum of every 24 inches (610 mm) of continuous run. Supports shall be made of nonmetallic materials or corrosion protected metal. All supports shall be of a design that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle.		
26.5	Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the apparatus at any point where such operations can take place. Provisions should be made for quickly and easily placing the power source into operation. The control should be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train should be equipped with a means to prevent the unintentional movement of the control device from its set position. A power source specification label shall be permanently attached to the apparatus near the operator's control station. The label shall provide the operator with the following information: • Rated voltage(s) and type (ac or dc) • Phase • Rated frequency • Rated amperage • Continuous rated watts • Power source engine speed Direct drive (PTO) and portable generator installations shall comply with Article 445 (Generators) of the NEC.		
26.6	The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device should not exceed 144" in length. For fixed power supplies, all conductors in the power supply assembly should be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit. For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device should be type SO or type SEO with suffix WA flexible cord. *Wiring Methods* Fixed wiring systems should be limited to the following:		

	• Metallic or nonmetallic liquid tight flexible conduit or • Type SO or Type SEO cord with a WA suffix Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring should be run as follows: • Separated by a minimum of 12", or properly shielded, from exhaust piping • Separated from fuel lines by a minimum of 6" distance Supports shall be made of nonmetallic materials or corrosion protected metal. All supports shall be of a design that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle.		
26.7	All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, shall be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC. All receptacles located in a wet location should be not less than 24" from the ground. The face of any wet location receptacle should be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle shall be installed in a face up position.		
26.8	All receptacles located in a dry location should be of the grounding type. Receptacles should be not less than 30" above the interior floor height. All receptacles shall be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they shall be so marked.		
26.9	All receptacles and electrical inlet devices shall be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages shall be rated for the appropriate service.		
26.10	The wiring and associated equipment shall be tested by the apparatus manufacturer or the installer of the line voltage system. **Operational Test per Most Current NFPA 1901 Standard** The power source should be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in the most current NFPA 1901 standard. Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in the most current NFPA 1901 standard shall be applied to the low voltage electrical system during the operational test.		
26.11	The apparatus shall be equipped with a complete electrical power system. The generator should be a Harrison Model MCR Stealth 10.0 KW or equivalent Hydraulic unit. The wiring and generator installation shall conform to the present National Electrical Codes Standards of the National Fire Protection Association. The installation shall be designed for continuous operation without overheating and undue stress on components. <u>Generator Performance should be:</u> - Continuous Duty Rating: 10,000 watts - Nominal Volts: 120/240 - Amperage: 80 @ 120 volts, 40 @ 240 volts - Phase: Single - Cycles: 60 hertz - Engine Speed at Engagement: Idle - RPM range: 900 to 3,000 (hydraulic pump)		

	The output of the generator should be controlled by an internal hydraulic system. An electrical instrument gauge panel should be provided for the operator to monitor and control all electrical operations and output. The generator should be driven by a transmission power take off unit, through a hydraulic pump and motor. The generator should include an electrical control inside the cab. The hydraulic engagement supply shall be operational at any time (no interlocks). An electric/hydraulic valve should supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive. <u>Generator Instruments and Controls:</u> To properly monitor the generator performance a digital meter panel should be furnished and mounted next to the circuit breaker panel. The meter should indicate the following items: - Voltage - Amperage for both lines - Frequency - Generator run hours - Over current indication - Over temperature indication - "Power On" indication - Two (2) fuse holders with two (2) amp fuses (for indicator light protection) The meter and indicators should be installed near eye level in the compartment. Instruments shall be flush mounted in an appropriate sized weatherproof electrical enclosure. All instruments used should be accurate within +/- two (2) percent. Individual breakers shall be provided for all on-line equipment to isolate a tripped breaker from affecting any other on-line equipment.		
26.12	The generator should be mounted in the area above the goose neck of the tiller trailer. The flooring in this area shall be either reinforced or constructed, in such a manner, that it shall handle the additional weight of the generator.		
26.13	A switch should be located on the driver and passenger cab instrument panel and at the pump panel area to engage the generator. The single switch in all locations should engage the generator PTO and the electric field simultaneously.		
26.14	Furnished with the 120-volt AC electrical system should be a Hannay, series 1600 or equivalent electrical cord reel. The reel shall be provided with a 12 volt electric rewind switch that is guarded to prevent accidental operation and labeled for its intended use. The switch should be protected with a fuse and installed at a height not to exceed 72" above the operators standing position. A captive roller assembly to be provided to aid in the payout and loading of the reel. A ball stop shall be provided to prevent the cord from being wound on the reel. A label shall be provided in a readily visible location adjacent to the reel. The label shall indicate current rating, current type, phase, voltage and total cable length. A total of two (2) cord reels shall be provided one (1) outboard on the driver's side gooseneck and one (1) outboard on the passenger's side gooseneck. The cord reel should be configured with three (3) conductors. Provided for electric distribution should be two (2) lengths, one (1) for each reel, of 200 feet of black 10/3 electrical cord. A Hubbell L5-20, 20 amp, 120 volt, twist lock connector body or equivalent should be installed on the end of the cord.		

		YES	NO
26.15	Provide two (2) 20 AMP three-prong twist lock NEMA L5-20 receptacles complete with hinges weatherproof covers on rear of apparatus. One each side. Receptacle area to be illuminated by courtesy LED light, 12 volt. A 120-volt, 20 amp, three (3)-prong twist lock receptacle, with weatherproof cover shall be provided at the tip of the aerial device.		
26.16	All electrical wiring should be fine stranded copper S.O. Type. The wire shall be sized to the load and circuit breaker rating; ten (10) gauge on 30 amp circuits, 12 gauge on 20 amp circuits and 14 gauge on 15 amp circuits. The S.O. cable should be run in corner areas and extruded aluminum pathways built into the body for easy access.		
26.17	The main load center should be a Cutler Hammer or equivalent with circuit breakers rated to load demand. The circuit breaker panel should be located in the right front body compartment.		
27.	**COMPARTMENTATION**		
27.1	Compartmentation should be fabricated of minimum 3/16" aluminum. The side compartments are an integral assembly with the rear fenders. Circular fender liners should be provided. For prevention of rust pockets and ease of maintenance, the fender liners should be formed from aluminum and removable for maintenance. Compartment flooring should be of the sweep out design with the floor higher than the compartment door lip. Drip protection shall be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate or polished stainless steel. The top of the compartment should be covered with bright aluminum treadplate rolled over the edges on the front, rear and outward side. These covers should have the corners welded. Side compartment covers should be separate from the compartment tops. All screws and bolts, should be stainless steel and where they protrude into a compartment shall have acorn nuts on the ends to prevent injury. A support system should be used which should incorporate a floating substructure by using Neoprene Elastomer isolators or equivalent to allow the body to remain rigid while the chassis goes through its natural flex. The isolators should have a broad range of proven viability in vehicular applications, be of a failsafe design, and allow for all necessary movement in three (3) transitional and rotational modes. This should result in a 500 lb equipment rating for each lower compartment of the body. The compartmentation should include steel support assemblies which are bolted to the chassis frame rails. A steel framework should be mounted to the body above these support assemblies connected to the support assemblies with isolators. There should be one (1) support assembly mounted to each chassis frame rail.		
27.2	If the truck is not purchased with a pump and tank, there should be a full-width transverse compartment a minimum of 16" wide immediately behind the cab of the tractor. The compartment should be the same height as the cab, and have roll-up doors on each side. The trailer should have at least one full-width transverse compartment with a minimum door opening width of 30 inches. There should be a full-width roll-out tray/toolboard shaped like an		

	inverted “T” that will slide at least two-thirds of its width out either side of the truck (sliding completely out both sides would be preferred).		
27.3	One compartment should be able to hold a minimum of 12 MSA 45-minute SCBA bottles in individual bins or trays.		
27.4	Other compartmentation is at the discretion of the manufacturer, or as agreed on in the pre-build meeting, but should make maximum use of available space, and all compartments taller than 16"should have roll-up doors. RCFRD puts a premium on compartment storage space, so maximizing compartment space by the effective and efficient use of all available space on the tractor and trailer body will figure heavily into the decision on this RFP.		
27.5	The compartment doors installed on the side compartments, double faced, aluminum construction or equivalent, satin aluminum with roll-up doors. Door(s) should be constructed using extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats should be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain should be done with a clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats should be mounted in reusable slat shoes with positive snap-lock securement. Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin should be designed to locate the seal within the extrusion. The second should serve as a wiping seal which will also allow for compression to prevent water ingression. The doors should be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel should be manufactured utilizing non-marring materials. Bottom panel flange of roll-up door should be equipped with two (2) cut-outs to allow for easier access with gloved hands. A stainless steel lift bar should be provided for opening the door and located at the bottom of each door with latches on the outer extrusion of the door frame. A ledge should be supplied over lift bar for additional area to aid in closing the door. The lift bar should be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers should include support beneath the stainless steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals. All injection molded roll-up door wear components should be constructed of Type 6 nylon or equivalent. Each roll-up door should have a 3” diameter balancer/tensioner drum to assist in lifting the door. A garage door style shall not acceptable. The header for the roll-up door assembly should not exceed 4". A heavy-duty magnetic switch should be used for control of open compartment door warning lights.		
27.6	All compartment doors shall be roll-up type - ROM (preferred). Lath sections shall be a driven ball and socket design and shall be individually replaceable without complete disassembly of door. To conserve space in compartment, the spring roller assembly should not exceed 2.5" in diameter. A roll-up door which retracts below compartment ceiling (garage door style) shall not be acceptable.		

	The header for the roll-up door assembly should not exceed 4". Doors that are immediately above the lower body rub rail should have the optional tall bottom slat installed to move the grab handle up away from the rub rail to allow easy access with a gloved hand. A heavy-duty magnetic switch should be used for control of "open compartment door" warning lights.		
27.7	A bright aluminum treadplate scuffplate or equivalent should installed on the left side front quadrant in the front of the pump house –if a pump is included. This scuffplate should be fastened with self-tapping screws. The cover should be provided to cover wiring.		
27.8	Brushed stainless steel or equivalent scuffplates should be furnished full height and width each side of the recessed pump house walls. The bottom edge of the pump house running board should be covered with brushed stainless steel or equivalent.		
27.9	All compartment doors should include a guard/drip pan designed to protect the roll-up door from damage when in the retracted position and contain any water drips or runoff. The guard should be fabricated from aluminum or equivalent. There should be a removable plate or tray immediately below the door roll at the top of the compartment, to protect the finished surface of the door from being damaged by objects stored in the top of the compartment.		
27.10	All compartments should come with white full height 12 volt DC LED compartment light strips. The lights should be mounted with mechanical fasteners. There shall be two (2) strip lights installed vertically in each compartment opening per the latest NFPA requirements. The lights shall be activated when the battery switch is on and the respective compartment door is opened.		
27.11	There should be tracks for mounting adjustable shelf(s) in any compartment taller than 16". These tracks should be installed vertically to support the adjustable shelf(s), and shall be full height of the compartment. The tracks should be unpainted with a natural finish. The location(s) TBD.		
27.12	Toolboards or “false walls” should be located on rear walls on both high-side compartments and top of left front body compartment, made of 3/16” aluminum, to facilitate tool mounting.		
27.13	The ground ladders should be removable from the center rear of the apparatus. The ladders shall be individually stored in stainless steel slides or equivalents and shall be arranged in such a manner that any one (1) ladder can be removed without having to move or remove any other ladder. Black Dura-Surf friction reducing material or equivalent should be added to the stainless steel slides, on the bottom horizontal surfaces, of the ladder storage rack. A roll up door should be provided at the rear to close the ladder compartment.		
27.14	There should be two (2) full length white 12 volt DC LED strip lights used to illuminate the torque box ladder storage compartment. One (1) each side shall be located on the side wall of the torque box near the ladder storage entry area. The lights should be activated when the ladder storage compartment door is opened.		
27.15	All body compartments should have a minimum of one (1) set of louvers stamped or added as a plate into a wall to provide the proper airflow inside the compartment and to prevent water from dripping into the compartment. These louvers should be formed into the metal and not added to the compartment as a separate plate.		
27.16	There should be nested ladders on the left and right side of the ladder storage compartment. The ladders should be nested so that one ladder can be removed without removing the adjoining ladder.		
27.17	There should be ABS tubing provided in the torque box/ladder storage area for a total of six (6) pike poles and three (3) NY Hooks. If the head of a pike pole or NY Hook can come into contact with a painted surface, a stainless steel scuffplate should be provided. There should be two (2) vertical slide-out or swing-out toolboard(s) provided based on the		

	compartment configuration submitted by the manufacturer. The location(s) TBD. The toolboard should be a minimum of 0.188" thick with .281" diameter holes in a pegboard pattern with 1" centers between holes. The board shall be mounted on an under-mount roller bearing type slide rated at 250 lb with a factor of safety of 2. The slide should be mounted on adjustable tracks side to side within the compartment. The board should have positive lock in the stowed and extended position. The toolboard(s) should be with a brushed finish.		
28.	**BODY**		
28.1	Bottom edge of the side compartments should be trimmed with a bright aluminum extruded rub rail. The rub rails should not be an integral part of the body construction, which allows replacement in the event of damage.		
28.2	The tops of all compartments and other areas where a walking surface exists should be covered with aluminum diamondette or equivalent.		
29.	**FOUR(4) SECTION MINIMUM 100 FOOT TRACTOR DRAWN AERIAL LADDER**		
29.1	The ladder shall be constructed to meet all of the requirements as described in the most current NFPA 1901 standards. The aerial device shall be a true ladder type device; therefore ladders attached to booms shall not be considered. These capabilities shall be established in an unsupported configuration. All structural load supporting elements of the aerial device that are made of a ductile material shall have a design stress of not more than 50% of the minimum yield strength of the material based on the combination of the live load and the dead load. This 2:1 structural safety factor meets the most current NFPA 1901 standard. All structural load supporting elements of the aerial device that are made of non-ductile material shall have a design stress of not more than 20% of the minimum ultimate strength of the material, based on the combination of the rated capacity and the dead load. This 5:1 safety factor meets the most current NFPA 1901 standard. Wire ropes and attaching systems used to extend and retract the fly sections shall have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of safety for the wire rope shall remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used should be 1:12. Wire ropes should be constructed of seven (7) strands over an inner wire core for increased flexibility. The wire rope should be galvanized to reduce corrosion. The aerial base pivot bearings should be maintenance free type bearings and require no external lubrication. The aerial device should be capable of sustaining a static load one and one-half times its rated tip load capacity (live load) in every position in which the aerial device can be placed when the vehicle is on a firm level surface. The aerial device should be capable of sustaining a static load one and one-third times its rated tip load capacity (live load) in every position the aerial device can be placed when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning. With the aerial device out of the cradle and in the fully extended position at zero degrees elevation, a test load shall be applied in a horizontal direction normal to the centerline of the ladder. The turntable shall not rotate and the ladder shall not deflect beyond what the product specification allows.		

	All welding of aerial components, including the aerial ladder sections, turntable, pedestal, and outriggers, should be in compliance with the American Welding Society standards. The aerial device should be capable of operating in conditions of wind up to 50 mph and icing conditions of up to a .25" coating over the aerial structure.		
29.2	The ladder is comprised of four (4) sections constructed of steel or galvanized steel. The ladder should have the capability to support a minimum of 750 pounds at the tip in the unsupported configuration, based upon 360 degree rotation, up to full extension and from -10 degrees to +77 degrees. The ladder (handrails, baserails, trusses, K-braces and rungs) should be constructed of high strength low alloy steel. The min. inside width dimensions of the ladder should be approximately 21” The min. height of the handrails above the centerline of the rungs should be approximately 17” The ladder shall be designed to provide continuous egress for firefighters and civilians from an elevated position to the ground. The egress section should be designed to maintain the rated load of the aerial device. It shall be bolted on for easy replacement. There should be a tow eye welded on to each side of the egress.		
29.3	The height of the unit shall extend to a minimum 100' above the ground at full extension and elevation. The measurement of height shall be consistent with NFPA standards.		
29.4	The rated horizontal reach shall be a minimum 100' (no exceptions). The measurement of horizontal reach shall be consistent with NFPA standards.		
29.5	The upper turntable assembly should connect the aerial ladder to the turntable bearing. The steel structure or equivalent should have a mounting position for the aerial elevation cylinders, ladder connecting pins, and upper turntable operator's position. The turntable should be steel deck or equivalent, coated with an non-skid, chemical resistant material in the walking areas. The stepping surfaces shall meet the skid-resistance requirements of the most current NFPA 1901 standard. The turntable handrails shall be a minimum 42" high and shall not increase the overall travel height of the vehicle. The handrails should be constructed from aluminum or equivalent and have a slip resistant knurled surface. The turntable vertical handrail spacing should be designed with an approximately 44" wide x 27" high opening to allow for equipment to pass through from the ground to the aerial ladder. The opening should be located at the center, rear of the turntable.		
29.6	Dual elevating cylinders should be mounted on the underside of the base section of the ladder, one (1) on each side. One stainless steel pin or equivalent should fasten each cylinder to the ladder and one (1) stainless steel pin or equivalent should fasten each cylinder to the turntable. The bolts are to ensure that the pins do not walk out of the mounting brackets on the turntable and base section. The elevating cylinders should be mounted utilizing maintenance-free spherical bearings on both ends of the cylinders. The aerial base pivot bearings should be maintenance-free type bearings with no external lubrication required. The cylinders should function only to elevate the ladder and not as a structural member to stabilize the ladder side movement. The elevating cylinders should be provided with pilot-operated check valves on the barrel and rod side of the piston to prevent movement of the ladder in case of a loss of hydraulic pressure. The operation envelope should be at minimum 10 degrees below horizontal to 77 degrees above horizontal. The elevation system shall be designed following NFPA standards. The elevation hydraulic cylinders shall incorporate cushions on the upper limit of travel. The lift cylinders shall be equipped with integral holding valves located in the cylinder to prevent the unit from descending should the charged lines be severed, at any point within the hydraulic system and to maintain the ladder in the bedded position during road travel. The integral holding valves should not be located in the transfer tubes.		

		YES	NO
29.7	A hydraulically powered, extension and retraction system should be provided through dual hydraulic cylinders and wire ropes. Each set shall be capable of operating the ladder in the event of a failure, of the other. For safety, systems that use only a single extension/retraction system shall not be acceptable. The extension cylinder rod should be chrome plated to provide smooth operation of the aerial device and reduce seal wear. The extension/retraction cylinders should be equipped, with integral holding valves, to prevent the unit from retracting should the charged line be severed, at any point within the hydraulic system. The integral holding valves should not be located in the transfer tubes. Wire ropes and attaching systems used to extend and retract the fly sections should have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of safety for the wire rope shall remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used should be 1:12. Wire ropes should be constructed of seven (7) strands over an inner wire for increased flexibility. The wire rope should be galvanized to reduce corrosion. All sheaves should require lubrication.		
29.8	Manual override controls shall be provided for all aerial and stabilizer functions.		
29.9	UHMW polyethylene wear pads should be used between the telescoping ladder sections, to provide greater bearing surface area for load transfer. Adjustable slide pads should be used to control side play between the ladder sections.		
29.10	The aerial shall be supplied with a powered rotation system as outlined in NFPA standards. The hydraulic rotation motor shall provide continuous rotation under all rated conditions and be supplied with a brake to prevent unintentional rotation. Provisions shall be made for emergency operation of the rotation system should complete loss of normal hydraulic power occur. The hydraulic system should be equipped with pressure relief valves which should limit the rotational torque to a nondestructive power. The turntable bearing, ring gear teeth, pinion gear, planetary gearbox, and output shaft shall be certified by the manufacturer of the components for the application.		
29.11	Two (2) rope rescue eyelets shall be installed with one on each side and at the tip of the fly section. Each anchor shall be rated at 500 pounds for a total combined weight rating of 1000 pounds.		
29.12	A ladder cradle interlock system should be provided to prevent the lifting of the aerial device from the nested position until the operator places all the stabilizers in a load supporting configuration. A switch should be installed at the boom support to prevent operation of the stabilizers once the aerial has been elevated from the nested position.		
29.13	The following load capacities should be established with the stabilizers at full horizontal extension and placed in the down position to level the truck and to relieve the weight from the tires and axles. Capacities should be based upon full extension and 360 degree rotation. A load chart, visible at the operator's station, shall be provided. The load chart shall show the recommended safe load at any condition of the aerial device's elevation and extension. Reduced loads at the tip can be redistributed in 250 lb. increments to the fly, mid, or base sections as needed. The tip capacity should be reduced to zero when flowing water with the nozzle above the waterway centerline. Side to side monitor travel shall be reduced with a 50MPH wind rating on the device.		
29.14	A heavy-duty boom support should be provided for support of the ladder in the travel position. On the base section of the ladder, a stainless steel scuffplate or equivalent should be provided where the ladder comes into contact with the boom support.		
29.15	There should be one (1) white LED strip light mounted on the boom support cradle. This light shall be activated when the aerial master switch is activated.		
29.16	There should be two (2) pairs of rope tie downs provided each side of the tiller gooseneck in the forward and rearward locations. Equal quantities should be provided on each side. The tie downs		

	should be rated for a straight line pull of 9000 lb and should be chrome plated.		
29.17	There should be one boom panel provided on each side of the aerial ladder base section. The boom panel should be painted white. The boom panels should be designed so no mounting bolts are in the face of the panel. This should keep the lettering surface free of holes.		
29.18	Extension markings and corresponding numerical indicators should be provided along each inside and outside top rail of the base section of the aerial every 10'. They should indicate various positions of extension up to full. Markings and indicators shall be clearly visible to the console operator. To aid in visibility during hours of darkness, the markings and numerical indicators should be red reflective material.		
29.19	Each rung should be covered with a secure, heavy-duty, fiberglass pultrusion that incorporates an aggressive, no-slip coating. The rung covers should be glued to each rung, and should be easily replaceable should the rung cover become damaged. Under no circumstances should the rung covers be fastened to the rungs using screws or rivets. The rung covers should have a minimum 10-year, limited warranty.		
29.20	A special egress section should be provided on the aerial ladder. The egress should be shortened by one (1) rung.		
29.21	There should be white LED lights provided at the aerial turntable. The lights should be located to illuminate the entire walking surface of the turntable including the area around the turntable console. These lights shall be activated by the aerial master switch.		
29.22	There should be one (1) 12" long white LED light strip mounted in the turntable console cover to illuminate the controls located on both the upper and lower portion of the turntable control station. These lights should be activated by the aerial master switch.		
29.23	An aluminum tread plate cover or equivalent should be fitted over the aerial rotation bearing and drive pinion gear(s). The cover should be attached to the underside of the turntable deck.		
29.24	There should be an information center provided. The information center should operate in temperatures from -40 to 185 degrees Fahrenheit. The information center should have a minimum 7" (diagonal measurement) LCD display. The LCD shall have a minimum 400nits rated, color display. The LCD shall be sunlight readable. The LCD display should be encased in an ABS, black plastic housing.		
29.25	The information center shall be designed for easy operation in everyday use. There should be a page button to cycle from one screen to the next screen in a rotating fashion. There should be a menu button to provide access to maintenance, setup, and diagnostic screens. All other button labels shall be specific to the information being viewed.		
29.26	Where possible, background colors should be used to provide vehicle information *At A Glance*. If the information provided on a screen is within acceptable limits, a green background color shall be used. If the information provided on a screen is not within acceptable limits, an amber background color shall indicate a caution condition and a red background color shall indicate a warning condition. Every screen in the information center should include the aerial tip temperature, the time (12- or 24-hour mode) and a text Alert Center. The Alert Center shall display text messages for audible alarms. The text messages shall identify any items causing the audible alarm to sound. If more than one (1) audible alarm is activated, the text message for each alarm shall cycle every second until the problems have been resolved. The background for the Alert Center shall change to indicate the severity of the warning message. Amber shall indicate a caution condition and red shall indicate a warning condition. If a warning and a caution condition occur simultaneously,		

	the red background color shall be shown for all Alert Center messages. A label shall be provided for each button. The label shall indicate the function for each active button for each screen. If the button is not utilized on specific screens, it shall have a button label with no text. Symbols shall accurately depict the aerial device type the information pertains to such as rear mount ladder, rear mount platform, mid-mount ladder or mid-mount platform.		
29.27	An Information center should be included and include most if not all of the following pages: - Rungs Aligned and Rungs Not Aligned should be indicated with text and respective green or red colored ladder symbols. - Ladder Elevation should be indicated via a fire apparatus vehicle with ladder symbol with the degree of elevation indicated between the vehicle and ladder. - Water Flow (if applicable) should be indicated via a water nozzle symbol and text indicating flow in GPM and elapsed time. - The Aerial Load Chart should indicate the load limit on each section of the ladder based on actual ladder position and water flow (if applicable). - *At A Glance* color features should be utilized on this screen. Caution type conditions should be indicated via a yellow background. Warning type conditions should be indicated via a red background. Conditions operating within acceptable limits should be indicated via a green background. The Aerial Reach and Hydraulic Systems page should indicate the following information: - Aerial Hydraulic Oil Temperature should be indicated with symbol and text. At a glance features should be utilized. - Aerial Hydraulic Oil Pressure should be indicated with a symbol and text. At a glance features should be utilized. - The following calculations should be indicated on a representative vehicle symbol: - Aerial Device Extension length. - Aerial Device Height indicating the height of the aerial device tip from the ground. - Aerial Device Reach indicating the horizontal distance the aerial reaches from the turntable. - Aerial Device Angle indicating the angle from the vehicle which the device is at. - *At A Glance* color features should be utilized on this screen. Caution type conditions should be indicated via a yellow background. Warning type conditions should be indicated via a red background. Conditions operating within acceptable limits should be indicated via a green background. - The grade of the vehicle should be indicated via a fire apparatus vehicle symbol with the degree of grade shown in text format. The symbol should tilt dependent on the vehicle grade. - The slope of the vehicle should be indicated via a fire apparatus vehicle symbol with the degree of slope shown in text format. The symbol should tilt dependent on the vehicle slope. - Outriggers status should be indicated via a colored symbol for each outrigger present. Each outrigger status should be defined as one of the following: - Outrigger stowed indicated with a silver pan located close to the vehicle - Outrigger fully extended indicated with a fully deployed green outrigger - Outrigger short-jacked indicated by a yellow outrigger partially deployed - Outrigger not set indicated by a red outrigger that is not set on the ground - A text box located on the vehicle symbol should be utilized to identify the overall status of the outrigger leveling system. The following status should be indicated in the text box: - Deployed status should indicate all outriggers are properly set on the ground at full extension - Short-jacked status should indicate one or more outriggers are set on the ground but not fully extended.		

	- Not Set status should indicate one or more outriggers is not properly set on the ground. - Stowed status should indicate all outriggers are stowed for vehicle travel. - A bedding assist alert should indicate that the aerial device is being aligned by the Command Zone system as the operator lowers the aerial device into the cradle with the joystick. - *At A Glance* color features should be utilized on this screen. Caution type conditions should be indicated via a yellow background. Warning type conditions should be indicated via a red background. Conditions operating within acceptable limits should be indicated via a green background.		
29.28	There should be an easily accessible control station located on the trailer gooseneck, one (1) each side of the apparatus. The following controls and indicator lights should be clearly identified and conveniently located for ease of operation and viewing at each control station. - Driver Side/Passenger Side In/Out control switches - Driver Side/Passenger Side Up/Down control switches - Driver Side/Passenger Side Fully Extended indicator lights - Driver Side/Passenger Side Firm On Ground indicator lights - Stabilizer Emergency Power control switch - Trailer Level Assist control toggle switch - Global Safety Interlock Override red guarded switch - Aerial system Emergency Stop switch - Aerial system Emergency Stop Activated indicator light		
29.29	There should be one (1) device control station located on the left side of the turntable so the operator may easily observe the ladder tip while operating the controls. All elevation, extension and rotation controls shall operate from this location. The controls shall permit the operator to regulate the speed of the aerial functions, within the safe limits, as determined by the manufacturer and NFPA standards. Each control should be equipped, with a positive lock to hold the control in a neutral position, preventing accidental activation. In addition to the neutral lock, a console cover should be provided at the turntable control station. The following items should also be provided at the turntable control station, clearly identified and lighted for nighttime operation and conveniently located for ease of operation and viewing: - Intercom controls - Tip tracking light switch - Emergency stop switch - Emergency power unit switch - Operator's load chart - Two (2) position switch for selecting aerial operational speed		
29.30	The high idle system should include a safety device that allows activation of the high idle only when the parking brake is set and the transmission is placed in neutral.		
29.31	ManSaver™ bars shall be installed at the aerial turntable.		

		YES	NO
30.	**STABILIZING JACKS**		
30.1	The vehicle should come equipped with a stabilization system consisting of two (2) hydraulically operated out and down style stabilizers. This system shall meet or exceed all requirements of the NFPA specifications related to stabilization and setup on sloped surfaces. The stabilizer/leveling jacks should have a maximum spread of 17' measured from the centerline of the jack footpads when the beams are fully extended. The cylinders should have pilot-operated check valves with thermal relief designed to insure that the beams shall not drift out of the stowed position during travel. Wear pads should guide the stabilizers. The horizontal extension cylinders should be totally enclosed within the beams and should incorporate telescoping hydraulic tubing to supply the jack cylinder hydraulic power. Stabilizer hydraulic hoses should remain stationary during operation of the stabilizers to prevent hose wear and potential failure. The cylinders should be equipped with decelerators to reduce the speed of extension and retraction when the beams are near the fully retracted and extended positions. The vertical jack cylinders should be capable of approximately 12" ground penetration. The cylinders should be supplied with pilot operated check valves on each jack cylinder to hold the cylinder in the stowed or working position, should a charged line be severed at any point in the hydraulic system. The integral holding valves should be located in the cylinder base end, not in the transfer tube. Vertical jack cylinder rods should be fully enclosed by a telescoping inner box to protect the cylinder rods from damage. Each stabilizer jack should have a polished stainless steel shield or equivalent. The stainless steel shield should be of the split-pan design and should be a maximum 12.5" wide so as to allow the extension of the stabilizer between parked cars or other obstacles. This plate should serve as a protective guard and a mounting surface for warning lights. The top, forward, and rear edges should be flanged back 90 degrees for added strength.		
30.2	The stabilizer footpad should be a minimum 12" in diameter or width. The footpad should have the ability to pivot 20 degrees from horizontal in any direction to allow setup on uneven terrain.		
30.3	An auxiliary ground pad should be supplied for each stabilizer to provide additional load distribution on soft surfaces. The pads should be 24" square and should be made from aluminum. There should be one (1) pair of pads located on each side of the apparatus, near the stabilizers.		
30.4	An electrically controlled hydraulic valve should power stabilizer movement. The valve can also be manually controlled in the event of electrical malfunction. Hydraulic power override controls shall be incorporated into the valve. The manual override mechanism should be completely sealed within the valve assembly to prevent any possibility of corrosion. The stabilizer controls should be located on the trailer gooseneck, one (1) each side of the apparatus, to provide the operator with a full view of each stabilizer being positioned. Each stabilizer control panel should include the following: - Driver Side/Passenger Side In/Out control toggle switches - Driver Side/Passenger Side Up/Down control toggle switches - Driver Side/Passenger Side Fully Extended indicator lights		

	- Driver Side/Passenger Side Firm On Ground indicator lights - Stabilizer Emergency Power control toggle switch - Trailer Level Assist control toggle switch - Global Safety Interlock Override red guarded toggle switch - Aerial system Emergency Stop mushroom switch - Aerial system Emergency Stop Activated indicator light An electrically actuated diverter valve should be provided. The hydraulic power should be diverted to the aerial ladder controls automatically the instant all stabilizer jacks are firmly planted on the ground. Once the aerial ladder is raised from the bedded position, the stabilizer hydraulic power is cut off so the stabilizers shall not accidentally be moved while the aerial is being operated. To aid in leveling the unit, two bubble type angle indicators should be located near the stabilizer controls. One indicator should show the angle of the truck from the front to rear and the other should show the side to side angle of the truck. The indicators should be color coded green to show when the truck has been properly leveled allowing the aerial device to be operated at full capacity. A stabilizer deployment audible warning alarm should be provided at each side of the body, activated by the stabilizer movement. A "Stabilizers Not Stowed" indicator light shall be provided in the cab within view of the driver. It shall illuminate automatically whenever the stabilizers are not fully stowed to prevent damage to the vehicle if it is moved. The stabilizer system shall also be wired to the "Do Not Move Truck" indicator light. This light shall flash whenever the apparatus parking brake is not engaged and the stabilizers are not fully stowed.		
30.5	The stabilizer jacks should have holes for the stabilizer pins.		
30.6	There should be aluminum treadplate or equivalent doors hinged on the bottom with a flush lift and turn latch provided over each stabilizer control box.		
30.7	There should be aluminum treadplate or equivalent doors with a flush lift and turn latch provided over the valve and power distribution box doors. These doors should be bottom hinged.		
31.	**HYDRAULIC SYSTEM**		
31.1	Hoses used in the aerial hydraulic system shall be of a premium quality hose with a high abrasion resistant cover. All hydraulic fittings and tubing should be plated to minimize corrosion. The fitting should use an O-ring seal where possible to minimize hydraulic leaks. An interlock shall be provided that prevents activation of the hydraulic pump until the transmission is placed in neutral and the parking brake is set as outlined in the most current NFPA 1901 standard. The system shall meet the performance requirement of the most current NFPA 1901 standard, which requires adequate cooling less than 2.5 hours of operations.		

	All hydraulic components that are non-sealing whose failure could result in the movement of the aerial shall comply with the most current NFPA 1901 standards and have burst strength of 4:1. Dynamic sealing components whose failure could cause aerial movement shall have a margin of 2:1 on maximum operating pressure per the most current NFPA 1901 standard. All hydraulic hoses, tubes, and connections shall have a minimum burst strength of 4:1 per the most current NFPA 1901 standard. Ball valves should be provided in the hydraulic suction lines to permit component servicing without draining the oil reservoir. The aerial should incorporate the use of trombone steel tubes inside the stabilizer beams to eliminate hydraulic hose wear and leaks. Hydraulic power to the ladder should be transferred from the pedestal by a hydraulic swivel. The system hydraulic pressure should be displayed on the turntable display. The hydraulic system shall be additionally protected from excessive pressure by a secondary pressure relief valve. In the event the main hydraulic pump compensator malfunctions, the secondary relief shall prevent system damage.		
31.2	Each cylinder should include integral safety holding cartridges. No manifold or transfer tube mounted cartridge should be acceptable. Each cylinder should be designed to a minimum safety factor of 4:1 to failure.		
31.3	The apparatus should be equipped with a power takeoff driven by the chassis transmission and actuated by an electric shift located inside the cab. The power takeoff, which drives the hydraulic pump, shall meet all the requirements for the aerial unit operations. A indicator light should be installed on the cab instrument panel to notify the operator that the power takeoff is engaged. An interlock should be provided that allows operation of the aerial power takeoff shift only after the chassis spring brake has been set and the chassis transmission has either been placed in the neutral position or drive position after the driveline has been disengaged from the rear axle. The hydraulic system should be supplied by a variable displacement load and pressure compensating piston pump. The pump shall meet the demands of all three simultaneous aerial functions. The pump shall provide proper flow for single aerial function with the engine at idle speed. A switch shall be provided on the control console to increase the engine speed for multiple function operation.		
31.4	The hydraulic system shall be designed with an auxiliary power unit meeting the guidelines of the most current 1901 NFPA standards. The aerial should be equipped with an emergency hydraulic pump, electrically driven from the truck batteries. The pump should be capable of running for 30 minutes for limited aerial functions to stow the unit in case of a main pump or truck system failure. A momentary switch should be located at the stabilizer and aerial control locations to activate the emergency pump.		

		YES	NO
31.5	The aerial ladder should be equipped with a three (3) port, high pressure hydraulic swivel which shall connect the hydraulic lines from the hydraulic pump and reservoir through the rotation point to the aerial control bank. The hydraulic swivel shall allow for 360 degree continuous rotation of the aerial.		
31.6	A combination sight glass and thermometer should be mounted to the reservoir in an easily viewable location. The hydraulic oil reservoir shall be labeled per the current edition of NFPA 1901 standard. The low pressure oil return filter should be remote mounted and designed to prevent oil loss during filter change.		
32.	**AERIAL ELECTRICAL SYSTEM:**		
32.1	A hardwired camera to be added to the tip of the ladder with a minimum 7" LCD or equivalent screen at the pedestal. The preferred camera system and display should be from Safety Vision.		
32.2	For Tip and Tracking lights, there should be six (6) Whelen® Micro Pioneer, Model MPB* or equivalent, 12 volt DC LED bail mount lights furnished. • One (1) should be mounted on the driver's side of the base section of the ladder • One (1) should be mounted on the passenger's side of the base section of the ladder • One (1) should be mounted high on the driver's side tip of aerial • One (1) should be mounted high on the passenger's side tip of aerial The painted parts of this light assembly should be white. Power to the lights should be controlled by turntable only.		
32.3	There should be two (2) 12 volt flashing LED lights installed at the aerial tip facing out when the aerial boom is in the stowed position. There should be one (1) light on the driver's side and one (1) light on the passenger's side. The color of the lights should be, green. The warning light lens color(s) to be clear. The light should be activated when the aerial is raised from the cradle.		
32.4	There should be LED rung lighting provided on both sides of the aerial ladder base, lower and upper mid, and fly sections. The lighting should be located adjacent to the ladder rungs along the lower rail of the ladder sections and shall run the length of the ladder section. The color of the sections should be: • Each section of the ladder to be green for the first three (3) rungs and the rest white. The LED rung lighting shall be activated when the aerial master switch is activated and a switch at the turntable operator's panel is activated through the master battery switch. The lights may be load managed when the parking brake is applied.		
32.5	There should be two (2) Whelen®, Model M6* or equivalent, LED flashing warning lights with clear lenses and Whelen, Model M6FC or equivalent, chrome flanges installed on the stabilizer cover panels, one (1) each side. • The LED lights shall be red. These warning lights shall be activated by the same switch as the side warning lights.		

		YES	NO
32.6	Two (2) 4" diameter red LED flashing lights should be mounted on each stabilizer, one (1) facing forward and one (1) facing rearward. These warning lights shall be activated with the aerial master switch.		
32.7	There should be one (1) Truck-Lite, Model 44042C or equivalent 4" LED, scene light installed under each stabilizer beam to illuminate the surrounding area. A total of two (2) lights should be installed. These lights shall be activated by the aerial master switch.		
32.8	There should be a 20 amp 120-volt, three (3)-prong twist lock NEMA L5-20R receptacle with weatherproof cover provided at the tip of the aerial device.		
32.9	There shall be a two-way intercom system provided. The control module should be located on the turntable operator console and have a volume display and push-button volume control. A hands free module should be located at the aerial tip or platform and constantly transmit to the other module unless the control module push-to-talk button is pressed. Each intercom unit shall be weatherproof.		
33.	**AERIAL WATERWAY**		
33.1	A waterway system should be provided consisting of the following components and features: A 5" pipe should be connected to the water supply on one end and to a 5" internal diameter water swivel at the rotation point of the turntable. The water swivel shall permit 360 degree continuous rotation of the aerial device. The 5" waterway swivel should to be routed through the rotation point up to the heel pin swivel. The heel pin swivel should allow the water to flow to the ladder pipe while elevating the aerial ladder from -10 degrees to 77 degrees. The heel pivot pin is not integral with the waterway swivel at any point. The design of the waterway should allow complete servicing of the waterway swivel without disturbing the heel pivot pin. The aerial should be capable of discharging up to 1000 gpm at 100 psi parallel to the ladder and 90 degrees to each side of center while maintaining the rated tip load. The aerial should be capable of discharging between 1001 and up to 1500 gallons per minute at 100 psi parallel to the ladder and 40 degrees to each side of center while maintaining the rated tip load. The master stream should be capable of flow up to 30 degrees above horizontal. An adjustable pressure relief valve should be furnished to protect the aerial waterway from a pressure surge. There should be a drain valve located at the lowest points of the waterway system and should be routed to drain through the center of the 5th wheel.		
33.2	The waterway seals should be of type-B PolyPak design or equivalent, composed of nitroxile seal and a nitrile wiper. The seals shall be internally lubricated. The waterway seals should have automatic centering guides constructed of synthetic thermalpolymer or equivalent.		
33.3	An Akron Model 3480 monitor or equivalent with stow and deploy should be provided at the tip with an Akron 1250 gpm Model 5177 or equivalent. This monitor should have two interchangeable options provided by the manufacture. Smoothbore tip sizes 1 3/8, 1.5, 1 ¾, 2" shall also be included. Flow should be up to 1500 GPM.		

	This monitor should allow for an additional 30 degrees of travel above horizontal at the aerial tip. The monitor's functions should be controlled electrically from two (2) separate locations. One (1) control should be located at the control console and the other at the tip of the aerial. There should be a courtesy light at the tip of the aerial to illuminate the controls. If the aerial has a quick-lock waterway, a limit switch should be provided to disable the extended vertical travel when the monitor is locked to the lower ladder section.		
33.4	An LCD display should be located at the turntable control station to display the screens for the Information Center detailed in 29.27. Additionally, if the truck is purchased with a pump, there should be an electronic digital display on the pump panel indicating aerial water flow in GPM.		
33.5	The aerial waterway should be plumbed from the fifth wheel area to the waterway swivel with 4" pipe. A 5" Storz inlet should be located on each side of the apparatus complete with a cap. The individual "line" pressure gauges for the inlets should be manufactured by Class 1. They should be a minimum of 3.5" in diameter and should have white faces with black lettering. Gauges should be compound type with a vacuum/pressure range of 30"-0-600#. The individual pressure gauge should be installed as close to the inlet as practical.		
33.6	The aerial ladder waterway monitor should be capable of being positioned at either the fly section or at the next lower section of the ladder. The monitor location should be changeable by the use of a single handle, located at the side of the ladder. The handle, attached to a cam bracket or other latching mechanism, should simply be moved forward to lock the monitor at the fly section and back to lock it to the previous section. The handle should be clearly labeled as to which section of the ladder the monitor is latched. There should be no pins to remove and reinstall. The monitor should be operational at all times, regardless of its position, without connecting or disconnecting electrical lines.		
33.7	There should be two (2) 5" Storz adapter with blind cap provided on the aerial inlet.		
33.8	An Akron Aerial Valve Manifold (AVM) valve and manifold or equivalent, Model S2 should be provided at the aerial waterway monitor inlet. This configuration provides a valve to control flow through the monitor and an additional valve as a discharge connection for hose. The AVM monitor flow control valve should be manually operated at the tip of the ladder with a slow close gear valve. The valve should have an integral automatic drain valve. The hose connection valve, located on the left side of the ladder should have a 90 degree, 1/4 turn ball valve with 2.5" NH outlet threads. A 2.5" NH cap with chain should be provided. A pressure relief valve should be installed to prevent incidental damage to the waterway system when both valves are closed.		
34.	**TILLER CAB**		
34.1	A permanently mounted tiller cab should be located on top of the tiller trailer, to the rear of the aerial ladder. The maximum overall height of the tiller cab should not exceed 134".		

The tiller cab shall be totally enclosed.

The cab windshield should be automotive approved tinted safety glass and should provide a minimum of 1,500 square inches of clear viewing area.

A smoked Lexan™ or equivalent sun visor should be provided in the tiller cab above the windshield. There should be no retention bracket provided to help secure the sun visor in the stowed position.

Each side window, directly rearward of the windshield, should be more than 500 square inches. The side windows, combined with the windshield, should provide a minimum of 2,500 square inches of unobstructed viewing area.

In order to provide maximum visibility for the tillerman, there should be no corner posts at the forward corners of the windshield.

The upper area of each tiller cab door should be contoured into the roof, providing greater clearance when entering and exiting the tiller cab.

The tiller cab doors should be equipped with drop-down sliding window. The windows should be approximately 18" wide x 31" high.

The rear wall of the tiller cab should have a vertically-split sliding window. The window shall be approximately 33" wide x 27" high.

The tiller cab floor should be constructed of aluminum treadplate or equivalent.

A two (2) speed electric windshield wiper with washer should be provided for the front windshield.

The windshield washer reservoir should have a capacity of two (2) quarts and should be located forward of the tiller cab.

An adjustable, telescopic steering column should be provided.

The diagnostic plug for the trailer ABS system should be provided in the driver side tiller access stepwell, behind the fuel fill door.

The following controls/alarms should be provided inside the tiller cab:

- Buzzer signaling system with push button in tiller cab steering wheel as well as a labeled push button in the tractor cab, within reach of the driver.

- Jackknife alarm

The following should be provided on the steering column support pedestal:

- Two (2) heater/defroster outlets

- Heater/defroster control switch

The following controls/gauges should be located in the upper control panel:

- Step light switch

- Tiller wheel position indicator gauge. (L-C-R)

	- Two (2) 2" diameter amber turn signals - Windshield wiper/washer control switch		
34.2	There should be one (1) dual LED dome light with black bezel installed in the tiller cab. The color of the LED should be red and white. The white LED should be controlled by the door switches and the lens switch. The color LED should be controlled by the lens switch.		
34.3	For the tillerman's comfort, the cab should be equipped with a minimum 13,000 BTU heater/defroster. The heater should have a multi-speed motor and thermostatic control located in the tiller cab within reach of the tillerman. The heater should be diesel fueled and should have a separate three (3) gallon fuel tank which should provide a minimum of 23 hours of continuous running time. The fuel tank should be recessed in the body, behind the driver side tiller cab access steps. There should be a minimum of two (2) defrost outlets in the cab for maximum defrost performance.		
34.4	A seat should be provided in the tiller cab. The seat shall be a cam action type, with air suspension. For increased convenience, the seat should include a manual control to adjust the horizontal position (6" travel). The manual horizontal control should be a towel-bar style located below the forward part of the seat cushion. The seat should have a reclining back adjustable from 20 degrees back to 0 degrees forward. The seat back should be a high back style with manual lumbar adjustment lever, and should include minimum 7.5" deep side bolster pads for maximum support. For optimal comfort, the seat should be provided with 17" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat should be equipped with seat belt sensors in the seat cushion and belt receptacle that should activate an alarm indicating a seat is occupied but not buckled. The seat should be furnished with a 3-point, shoulder type seat belt. The seat belt should be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.		
34.5	For access to the tiller cab, two (2) sets of steps should be furnished at the rear of the apparatus, one set each side. The bottom three (3) access steps should be full width, approximately 21" wide, and located just behind the tiller axle. The top step should be full width, approximately 18.5" wide. The steps should be securely reinforced and constructed of aluminum treadplate or equivalent. The outside corners at the rear edges of the steps should be mitered at 45 degrees. Handrails shall be provided on each side of the step assemblies for maximum safety. The steps shall be illuminated for nighttime operation.		
34.6	An audible and visual warning system should be provided to warn both drivers when the jackknife position approaches the maximum allowable angle.		
34.7	A warning indicator in the tractor cab should be activated if the parking brake is released and the tiller driver is not present in the tiller cab.		
34.8	A 6" diameter round convex mirror with adjustable arm shall be installed on each side of tiller cab.		
34.9	Two (2) window defrost fans should be mounted one (1) each side.		
34.10	The gooseneck area and frame of the tiller trailer should be constructed of steel.		
34.11	A walkway should be provided from the aerial turntable to the tiller body.		
34.12	The tiller trailer axle should have a ground rating to match manufacturer's GVWR. Tiller trailer axle should be easy to adjust for caster, camber, and toe-in. The turning angle should be 24 degrees or greater.		
34.13	The non-drive axle system should have a minimum three (3) year parts and labor warranty.		

		YES	NO
34.14	Dual Sheppard M110 steering gears or equivalent, with integral heavy-duty power steering, should be provided. The steering wheel should be approximately 18" in diameter, and capable of tilting and telescoping.		
34.15	The tiller trailer brake calipers should be Meritor® DiscPlus™ EX225 or equivalent air disc type. The brake rotors should be 17" ventilated.		
34.16	Tiller trailer tires should be Goodyear 425/65R22.50 radials or equivalent, load range L, wide base tread, rated for 22,800 lb maximum axle load and 65 mph maximum speed.		
34.17	The tires should be mounted on 22.50" x 12.25" painted steel wheels – color TBD.		
34.18	Oil seals with viewing window should be provided on the tiller axle.		
35.	**GROUND LADDERS**		
35.1	All ground ladders to be ALCO-LITE or DUO SAFETY aluminum. Roanoke County specifies both ISO and NFPA compliance on ground ladders that is why the minimum NFPA requirement is exceeded in the following ground ladder complement. • One (1) 10' Folding Step located in the aerial torque box • Two (2) 20' Roof • One (1) 14' Roof provided aerial base section • One (1) 10' Attic Ladder • One (1) 24' Two Section • Two (2) 28' Two Section • Two (2) 35' Two Section		
35.2	Ground ladder compartment should have a single roll-up door.		
36.	**PIKE POLE STORAGE**		
36.1	Pike poles, NY Hooks and dry wall hooks to be stored in ground ladder compartment in tubes. • 6 ft Pike Pole. • 8 ft Pike Pole. • 12 ft Pike Pole. • 6 ft NY Hook • 8 ft NY Hook • 6 ft Dry Wall Hook • 1- 8 ft Dry Wall Hook		
37.	**GRAB RAILS AND TRIM**		
37.1	The handrails should be 1.25" diameter anodized aluminum extrusion or equivalent, with a ribbed design, to provide a positive gripping surface. Chrome plated end stanchions should support the handrail. Plastic gaskets should be used between end stanchions and any painted surfaces. Drain holes shall be provided in the bottom of all vertically mounted handrails. Handrails shall be provided to meet the most current NFPA 1901 section 15.8 requirements. The handrails shall be installed as noted on the sales drawing. LED lights in the handle if possible.		
37.2	Four (4) grab rails 18" long shall be provided; one behind each cab door, with safety grips.		
37.3	Swimming-pool type grab rail at turntable access ladder.		

37.4	No "pop rivets" shall be used in the construction of this apparatus.		
38.	**FINISH**		
38.1	The chassis frame assembly shall be finished with a single system black top coat before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc. Components that are included with the chassis frame assembly that shall be painted are: • Frame rails • Frame liners • Cross members • Axles • Suspensions • Steering gear • Battery boxes • Bumper extension weldment • Frame extensions • Body mounting angles • Rear Body support substructure (front and rear) • Pump house substructure • Air tanks • Steel fuel tank • Castings • Individual piece parts used in chassis and body assembly Components treated with epoxy or galvanic protection prior to paint: • Two (2) C-channel frame rails • Two (2) frame liners • Frame Crossmembers		
38.2	The paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) are to meet or exceed Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels are to meet or exceed the #6 A.C.T.standard in critical areas. All removable items such as brackets, compartment doors, door hinges, and trim shall be removed and separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly shall be finish painted before assembly. Color to be a white cab and body – Sikkens FNLA 4041with the large Roanoke County Fire and Rescue yellow and outline blue striping. Stripe to start at the front by the grill, at the headlight level and wrap back about the height of the middle of the doors/cab and continuing straight back to the rear of the truck. The large Roanoke County Fire and Rescue seal in the center of the stripe on driver/passenger side doors and on the crew doors a centered large number "1".		
38.3	The tiller cab should be painted White – Sikkens FNLA 4041.		
38.4	The interior of the compartments shall be dual action finished and not painted.		

		YES	NO
38.5	Surfaces that shall not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate. All buy out components, such as monitor, nozzle, gauges, etc. shall be supplied as received from the vendor. Removable items such as brackets shall be removed and painted separately to ensure paint coverage behind all mounted items. The aerial device components shall be painted as: • Aerial device ladder sections and extension cylinders: Hot dip galvanized metal (preferred) or silver • Aerial lift cylinders: silver • Aerial egress: Green (shall be contrasting color to the aerial device ladder sections) • Aerial turntable: silver • Aerial control console: silver • Aerial rotation motor (if applicable): silver • Aerial torque box, support structure and components below the rotation point: Hot dip galvanized metal (preferred) or silver • Aerial stabilizers: Hot dip galvanized metal (preferred) or silver • Aerial boom support: gloss black		
38.6	There should be a 4" wide fluorescent yellow green diamond grade reflective stripe provided on the forward and rear facing side of all aerial stabilizers.		
38.7	There shall be alternating chevron striping located on the rear-facing vertical surface of the apparatus. Covered surfaces shall include the rear wall and aluminum doors. Rear compartment doors, stainless steel access doors, and the rear bumper shall not be covered. The colors shall be red and fluorescent yellow green diamond grade. Each stripe shall be 6" in width. This shall meet the requirements of the most current edition of NFPA 1901, which states that 50% of the rear surface shall be covered with chevron striping.		
38.8	A 6" x 16" white reflective stripe shall be provided across the interior of each tillerman's entry door. The stripe shall be located approximately 1.00" up from the bottom, on the door panel. This stripe shall meet the most current NFPA 1901 requirement.		
38.9	Affixed to the outside of the bed section of the aerial there shall be two (2) panels with " **ROANOKE COUNTY**" in 10" gold with black shadowing reflective letters, one (1) each side.		
39.	**LOOSE EQUIPMENT**		
39.1	Items listed to be supplied with mounting hardware. Manufacturer to mount most equipment in locations to be determined at pre-construction conference. There should be one (1) Akron gray electric junction box or equivalent provided. There should be a 1' pigtail with a NEMA L5-20 twist lock plug provided for connection to the cord reel(s). The unit shall gave an integral pilot light to indicate electrical current The unit shall be equipped with one (1) 120 volt 20 amp NEMA 5-20 straight blade receptacles, three (3) L5-20 twist locks each with a hinged, weatherproof cover.		

40.	**OPTIONS** Please indicate if manufacturer can provide, and assign an installed cost for each option.		
40.1	**BOOSTER TANK**		
40.1.1	It shall have a capacity of 300 gallons and should be constructed of polypropylene plastic in a rectangular shape. The joints and seams should be nitrogen welded inside and out. The tank shall be baffled in accordance with NFPA Bulletin 1901 requirements. The baffles shall have vent openings at both the top and bottom of each baffle to permit movement of air and water between compartments. The longitudinal partitions should be constructed of polypropylene plastic and extend from the bottom of the tank through the top cover to allow positive welding. The transverse partitions extend from 4" off the bottom to the underside of the top cover. All partitions interlock and should be welded to the tank bottom and sides. The tank top should be constructed of polypropylene. It should be supported to keep it rigid during fast filling conditions. Construction should include polypropylene dowels spaced no more than 30" apart and welded to the transverse partitions. Two of the dowels should be drilled and tapped (0.5" diameter, 13" deep) to accommodate lifting eyes. A sump should be provided at the bottom of the water tank. The sump shall include a drain plug and the tank outlet. Tank should be installed on top of the torque box with the use of two (2) brackets constructed of structural steel. The torque box should resist transferring any torsional stress caused by the chassis frame flexing to the water tank. Rubber cushions, 0.5" thick x 3" wide, should be placed on all horizontal surfaces that the tank rests on. Stops should be provided to prevent an empty tank from bouncing excessively while moving vehicle. Tank mounting system shall be approved by the manufacturer. Fill tower should be constructed of .5" polypropylene and shall be a minimum of 6" wide x 12" long. Fill tower should be furnished with a .25" thick polypropylene screen and a hinged cover. An overflow pipe, constructed of 4" schedule 40 polypropylene, should be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.		

	The water tank fill tower should be rotated 90 degrees to accommodate a larger hose bed storage area.		
40.1.2	Rubber cushions should be provided on all vertical corner surfaces of the water tank cradle where tank contact could occur.		
40.2	**CROSSLAY HOSE BED**		
40.2.1	Two (2) crosslays with 1.5" outlets shall be provided. Each bed to be capable of carrying 200' of 1.75" double jacket fire hose and shall be plumbed with 2" i.d. pipe and gated with a 2" quarter turn ball valve. Outlets to be equipped with a 1.5" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus. The swivels shall be located a maximum of 10 inches in from the side of the pump house. The crosslay controls shall be at the pump operator's panel. The center crosslay dividers should be fabricated of .25" aluminum and should provide adjustment from side to side. The divider shall be unpainted with a DA finish. Stainless steel vertical scuffplates or equivalent should be provided at the front and rear ends of the bed on each side of vehicle. Crosslay bed flooring should consist of removable perforated brushed aluminum.		
40.2.2	One (1) crosslay with 2.5" outlets shall be provided. Each bed to be capable of carrying 200 feet of 2.5" double jacket hose and shall be plumbed with 2.5" i.d. pipe and gated with a 2.5" quarter turn ball valve. Outlets to be equipped with a 2.5" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus. The crosslay controls shall be at the pump operator's panel. The crosslay bed should be painted job color. Stainless steel vertical scuffplates should be provided at hose bed ends (each side of vehicle). Bottom of hose bed ends (each side) should also be equipped with a stainless steel scuffplate. Crosslay bed flooring should consist of removable perforated brushed aluminum.		
40.2.3	An aluminum treadplate cover or equivalent, hinged at the front should be installed over the top of the crosslay/deadlay(s). It shall include a latch at each end of the cover to hold it securely in place, a chrome grab handle or equivalent at each end for opening and closing the cover and a foam rubber gasket where the cover comes into contact to a painted surface. The cover should be provided with rubber latch hold open device.		
40.2.4	A bi-fold .19" aluminum treadplate cover or equivalent should be installed over the crosslay hose beds. It shall include a latch at each end of the cover to hold it securely in place, a chrome grab handle or equivalent at each end for opening and closing the cover and a foam rubber gasket where the cover comes into contact to a painted surface.		
40.2.5	A black 1" nylon webbing design with 2" box pattern should be provided across each end of three (3) crosslay(s) to secure the hose during travel. The webbing shall be removable from the crosslay opening(s). 1" web straps should loop through footman loops located at the bottom of the crosslay opening. The straps should attach with a pair of spring clip and hook fasteners. There should be an orange pull strap that is connected to a seatbelt fastener centered at the top, attached to the aluminum cover to disconnect the webbing.		

		YES	NO
40.3	**PIPING AND VALVES**		
40.3.1	All inlet and outlet lines should be plumbed with either stainless steel pipe, flexible polypropylene tubing or synthetic rubber hose reinforced with hi-tensile polyester braid. All hose's shall be equipped with brass or stainless steel couplings. All stainless steel hard plumbing should be a minimum of a schedule 10 wall thickness. Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping should be equipped with victaulic or rubber couplings. Plumbing manifold bodies should be ductile cast iron or stainless steel. All piping lines are to be drained through a master drain valve or should be equipped with individual drain valves. All drain lines shall be extended with a hose to drain below the chassis frame. All water carrying gauge lines should be of flexible polypropylene tubing. All piping, hose and fittings should have a minimum of a 500 PSI hydrodynamic pressure rating.		
40.3.2	All ball valves should be Akron Brass in-line valves. The Akron valves should be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve. Valves should have a **ten (10) year** warranty.		
40.3.3	The discharge outlets should incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism shall indicate the position of the valve. If a handwheel control valve is used, the control should be a minimum of a 3.9" diameter stainless steel or equivalent handwheel with a dial position indicator built in to the center of the handwheel.		
40.3.4	All terminal plumbing threads for hose attachment shall be NH/NST threads.		
40.3.5	There should be one (1) auxiliary inlet with a 2.5" valve at the left side pump panel, terminating with a 2.5" (F). The auxiliary inlet shall be provided with a strainer, chrome swivel and plug.		
40.3.6	There should be one (1) auxiliary inlet with a 2.5" valve at the right side pump panel, terminating with a 2.5" (F). The auxiliary inlet shall be provided with a strainer, chrome swivel and plug. Inlet valve location shall be outside of the pump panel.		
40.3.7	There should be one (1) discharge outlet with a 2.5" valve on the left side of the apparatus, terminating with a 2.5" (M). There should be one (1) discharge outlet with a 2.5" valve on the right side of the apparatus, terminating with a 2.5" (M). The 2.5" discharge outlets located on the left and right side pump panel shall be furnished with a 2.5" (F) x 2.5" (M), chrome plated, 45 degree elbow and 1.5" reducer caps.		
40.3.8	There should be a 4" discharge outlet with a 4" Akron or equivalent valve installed on the right side of the apparatus, terminating with a 4" (M) adapter. This discharge outlet shall be actuated with a handwheel control at the pump operator's control panel. The 4" outlet(s) shall be furnished with one (1) 4" (F) x 5" Storz elbow adapter with Storz cap. An indicator shall be provided to show the position of the valve.		
40.3.9	The aerial waterway shall be plumbed from the pump and the rear of the apparatus to the water tower line with 5" pipe and a 4" valve. The handwheel control for the waterway valve shall be located at the pump operator's panel. An indicator shall be provided to show the position of the valve.		
40.3.10	A waterway diverter valve shall be included with a bleeder valve on inlet.		
40.3.11	The booster tank should be connected to the intake side of the pump with stainless steel piping and a quarter turn 3" full flow line valve with the control remotely located at the operator's panel. Tank to pump line should run straight (no elbows) from the pump into the front face of the water tank and		

	angle down into the tank sump. A rubber coupling should be included in this line to prevent damage from vibration or chassis flexing. A check valve should be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank. A 1.5" combination tank refill and pump re-circulation line should be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.		
40.3.12	A 6" pump manifold inlet should be provided on each side of the vehicle. The suction inlets should include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump. The right-hand pump inlet should be gated, with electronic control valve and bleeder valve control on left-hand pump panel. The suction tube(s) on the water pump shall have short suction tube(s) installed to allow for installation of adapters, elbows or intake valves without excessive overhang.		
40.3.13	There should be a 0.75" bleeder valve provided for each side gated inlet. The valves should be located behind the panel with a swing style handle control extended to the outside of the panel. The handles should be chrome plated and provide a visual indication of valve position. The swing handle should provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. The water discharged by the bleeders should be routed below the chassis frame rails.		
40.4	**PUMP CONTROLS**		
40.4.1	All pump controls and gauges shall be located at the left (driver's) side of the apparatus and properly marked. The pump panel on the right side shall be full height and fully hinged. The left (driver's) side should be fastened with screws. The gauge and control panels should be two (2) separate panels for ease of maintenance. The side gauge panel should be hinged at the bottom with a full length stainless steel hinge. The fasteners used to hold the panel in the upright position shall be quarter-turn type. Vinyl covered cable or chains should be used to hold the gauge panel in the dropped position. Polished stainless steel trim collars should be installed around all inlets and outlets. All push/pull valve controls should have 1/4 turn locking control rods with polished chrome plated zinc tee handles. Guides for the push/pull control rods should be chrome plated zinc castings securely mounted to the pump panel. Push/pull valve controls should be capable of locking in any position. The control rods should pull straight out of the panel and shall be equipped with universal joints to eliminate binding. The identification tag for each valve control should be recessed in the face of the tee handle. All discharge outlets shall have color coded identification tags, with each discharge having its own unique color. Color coding shall include the labeling of the outlet and the drain for each corresponding discharge. All line pressure gauges should be mounted in individual chrome plated castings with the identification tag recessed in the casting below the gauge. All remaining identification tags should be mounted on the pump panel in chrome plated bezels. Mounting of the castings and identification bezels should be done with a threaded peg cast on the back side of the bezel or screws. The pump panel configuration shall be neat and orderly.		
40.4.2	The pump and gauge panels should be constructed of aluminum with a black vinyl finish. A polished aluminum trim molding should be provided around each panel.		
40.4.3	A pull out, flip down platform shall be provided at the pump operator's control panel. The front edge and the top surface of the platform should be made of DA finished aluminum with a Morton Cass insert. The platform should be approximately 14" deep when in the stowed position and approximately 22" deep when extended. The platform stepping surface should be approximately 28" wide. The		

	platform shall lock in the retracted and the extended position. The platform shall be wired to the "step not stowed" indicator in the cab.		
40.4.4	There should be a 20” white 12 volt DC LED strip light or equivalent provided to illuminate the ground area at the step.		
40.4.5	There should be one (1) Whelen®, Model 3SC0CDCR or equivalent, 3" white 12 volt DC LED light(s) with Whelen, Model 3FLANGEC or equivalent, flange(s) installed in the pump compartment.		
40.4.6	There should be a green indicator light installed on the pump operator’s panel that is activated when the pump is in Ok To Pump mode.		
40.4.7	There should be a polished, 16 gauge stainless steel light shield installed over the pump operator's panel. • There should be 12 volt DC white LED lights installed under the stainless steel light shield to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights shall be activated by the pump panel light switch. Additional lights shall be included every 18" depending on the size of the pump house. • One (1) pump panel light shall come on when the pump is in ok to pump mode. There should be a light activated above the pump panel light switch when the parking brake is set. This is to afford the operator some illumination when first approaching the control panel.		
40.4.8	An air horn control switch should be provided at the pump operator's control panel. This switch should be red and properly labeled. The switch should be located within easy reach of the operator in the electrical switch panel.		
40.4.9	The pump vacuum and pressure gauges shall be liquid filled and manufactured by Class 1 Incorporated ©. The gauges shall be a minimum of 4" in diameter and shall have white faces with black markings, with a pressure range of 30" 0-400 psi. The pump pressure and vacuum gauges shall be installed adjacent to each other at the pump operator's control panel. Test port connections shall be provided at the pump operator's panel. One (1) shall be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They shall have 0.25 in. standard pipe thread connections and polished stainless steel plugs. They shall be marked with a label. This gauge should include a minimum 10 year warranty against leakage, pointer defect, and defective bourdon tube.		
40.4.10	The individual "line" pressure gauges for the discharges shall be interlube filled and manufactured by Class 1©. The gauges shall be a minimum of 2" in diameter and shall have white faces with black markings. Gauge construction shall include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut. Gauges shall have a pressure rating of 0-300 psi. The individual pressure gauge shall be installed as close to the outlet control as practical. This gauge should include a minimum 10 year warranty against leakage, pointer defect, and defective bourdon tube.		

		YES	NO
40.4.11	There shall be an electronic water level gauge provided on the operator's panel that registers water level by means of five (5) colored LED lights. The lights shall be durable, ultra-bright five (5) LED design viewable through 180 degrees. The water level indicators shall be as follows: • 100 percent = Green • 75 percent = Yellow • 50 percent = Yellow • 25 percent = Yellow • Refill = Red The light shall flash when the level drops below the given level indicator to provide an eighth of a tank indication. To further alert the pump operator, the lights shall flash sequentially when the water tank is empty. The level measurement shall be based on the sensing of head pressure of the fluid in the tank. The display shall be constructed of a solid plastic material with a chrome plated die cast bezel to reduce vibrations that can cause broken wires and loose electronic components. The encapsulated design shall provide complete protection from water and environmental elements. An industrial pressure transducer shall be mounted to the outside of the tank. The field calibratable display measures head pressure to accurately show the tank level.		
40.5	**FIRE PUMP**		
40.5.1	The fire pump shall be a minimum Waterous, 1500 gpm single (1) stage mid-ship mounted centrifugal type. Pump shall be the class "A" type. Pump shall deliver the percentage of rated discharges at the pressures indicated below: - 100% of rated capacity at 150 psi net pump pressure. - 100% of rated capacity at 165 psi net pump pressure. -70% of rated capacity at 200 psi net pump pressure. -50% of rated capacity at 250 psi net pump pressure. Entire pump and both suction and discharge passages shall be hydrostatically tested to a pressure of 500 psi. Impeller shaft shall be stainless steel, accurately ground to size. It shall be supported by oil or grease lubricated, anti-friction ball bearings for rigid precise support. Impeller shall have flame-plated hubs assuring maximum pump life and efficiency despite any presence of abrasive matter in the water supply. Bearings shall be protected from water and sediment by suitable stuffing boxes, slinger rings, and oil seals. No special or sleeve type bearings shall be used. Pump shall be equipped with a self-adjusting, maintenance-free, mechanical shaft seal. The mechanical seal shall consist of a flat, highly polished, spring fed carbon ring that rotates with the impeller shaft. The carbon ring shall press against a highly polished stainless steel stationary ring that is sealed within the pump body. In addition, a throttling ring shall be pressed into the steel chamber cover, providing a very small clearance around the rotating shaft in the event of a mechanical seal failure. The pump performance shall not deteriorate, nor shall the pump lose prime, while drafting if the seal fails during pump operation.		

	Wear rings shall be bronze and easily replaceable to restore original pump efficiency and eliminate the need to replace the entire pump casing due to wear.		
40.5.2	Pump transmission should be made of a three (3) piece, high tensile aluminum, horizontally split casing. Power transfer to pump should be through a passive lubricated, Morse HY-VO drive chain. Drive shafts should be a minimum of 2.35" diameter hardened and ground alloy steel. All shafts should be ball bearing supported. The case should be designed as to eliminate the need for water cooling. The direct gear transmission lock-up for the fire pump operation shall engage automatically when the pump shift control in the cab is activated.		
40.5.3	A supplementary heat exchange cooling system should be provided to allow the use of water from the discharge side of the pump for cooling the engine water. Heat exchanger should be cylindrical type and shall be a separate unit. It should be installed in the pump or engine compartment with the control located on the pump operator's control panel. Exchanger should be plumbed to the master drain valve.		
40.5.4	An interlock system should be provided to ensure that the pump drive system components are properly engaged so that the apparatus can be safely operated. The interlock system shall be designed to allow stationary pumping only.		
40.5.5	Pump shift engagement should be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab. A manual back-up shift control shall also be located on the left side pump panel. Two (2) indicator lights should be provided adjacent to the pump shift inside the cab. One (1) green light shall indicate the pump shift has been completed and be labeled "pump engaged". The second green light shall indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light shall be labeled "OK to pump". Another green indicator light should be installed adjacent to the hand throttle on the pump panel and indicate either the pump is engaged and the road transmission is in pump gear, or the road transmission is in neutral and the pump is not engaged. This indicator light shall be labeled "Warning: Do not open throttle unless light is on". The pump shift shall be interlocked to prevent the pump from being shifted out of gear when the chassis transmission is in gear to meet NFPA requirements. The pump shift control in the cab shall be illuminated to meet NFPA requirements.		
40.5.6	There shall be One (1) relief valve(s) installed on the suction side of the pump preset at 125 psig. The relief valve(s) should have a working range of 75 psi to 250 psi. The outlet should terminate below the frame rails with a 2.5" National Standard hose thread adapter and shall have a "do not cap" warning tag. The relief valve pressure control shall be located behind the right side pump with an access door.		
40.5.7	A Fire Research Pump Boss Model PBA200 or equivalent pressure governor should be provided. A pressure transducer should be installed in the water discharge manifold on the pump. The display panel shall be located at the pump operator's panel.		
40.5.8	The priming pump should a Waterous rotary vane pump conforming to standards outlined in the current edition of NFPA 1901. All wetted metallic parts of the priming system should be of brass and stainless steel construction. One (1) priming control shall open the priming valve and start the pump primer.		
40.5.9	A Waterous Overheat Protection Manager (OPM) or equivalent should be included on the pump that monitors pump water temperature and opens to relieve water to cool the pump when the temperature of the pump water exceeds 140 Degrees F (60 C) and a red warning light that is triggered when the water in the pump reaches 180 F (82 C). The warning light shall act as an additional protection device if the temperature in the pump keeps rising after the valve opens. The warning light and audible alarm with a test switch shall be mounted		

	on the pump operator panel. The discharge line should be plumbed to ground.		
40.5.10	The pump compartment should be separate from the hose body and compartments so that each may flex independently of the other. It should be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards. The pump compartment should be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist. Pump compartment, pump, plumbing and gauge panels should be removable from the chassis in a single assembly. On both sides, the pump compartment should extend outward to the outside edge of the body. The area where the outlets and inlets are located should be recessed. The area above the pump inlets and outlets should be full width to support the water tank. The pump compartment shall be accessed through a roll up door.		
40.5.11	Pump should be mounted to a substructure which shall be mounted to the chassis frame rail using rubber isolators. The mounting shall allow chassis frame rails to flex independently without damage to the fire pump.		
40.6	**OPTIONAL GALVANIZED PROTECTION**		
40.6.1	The manufacturer shall quote a cost for optional hot-dipped galvanized metal protection of the following components: - Frame rails and crossmembers - Outrigger structural components (including boxes and beams) - All torque box structural components - All aerial ladder structural components (should be galvanized internally and externally)		
40.7	**TANDEM AXLE TRACTOR**		
40.7.1	Same tractor set up as above except with the addition of a tandem axle instead of single axle tractor.		
40.8	**POLISHED ALUMINUM DISC TYPE WHEELS**		
40.8.1	Replace all steel wheels with aluminum wheels.		
40.9	**PAINTED ROLLUP DOORS**		
40.9.1	Configure a cost to paint all the rollup doors the same as the body of the truck - white.		
40.10	**SAW HOLDERS**		
40.10.1	Provide two saw holders at the tip of the ladder. Each holder should be able to hold either a normal chainsaw with 20" bar, or a 14" rotary saw ("K-12" type), safely while the ladder is being operated. If one holder cannot be provided to hold both types of saw, then separate holders to hold one of each type of saw should be provided. These holders are not expected to hold the saws during road travel, only to facilitate lifting of the saws on the fire ground.		
40.11	**TRIP TO THE MANUFACTURER FOR INSPECTION OF APPARATUS**		
40.11.1	The manufacturer shall quote a cost to include all transportation costs of the one (1) factory trip for three (3) people for midpoint inspection.		
40.12	**MULTIPLEX VS HARDWIRED SYSTEM**		
40.12.1	A cost comparison of using a Multiplex system over a Hardwired system for the apparatus.		

Signature of Authorized Representative:

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Date: _____