



PURCHASING DEPARTMENT
REQUEST FOR BID

17-001

FIRE ENGINE AND AERIAL
APPARATUS

BIDS DUE TUESDAY, OCTOBER 25, 2016
BY 2:00 P.M.

Table of Contents

INVITATION TO BID 3

GENERAL CONDITIONS..... 4

INSURANCE REQUIREMENTS 10

NON-COLLUSION AFFIDAVIT OF BIDDER 11

BID CERTIFICATION 12

COMPLIANCE WITH HOUSE BILL 1295 13

FIRE ENGINE AND AERIAL SPECIFICATIONS 14

INVITATION TO BID

The City of North Richland Hills is accepting sealed bids from all interested parties for:

- Bid Number: 17-001
- Bid Type: REQUEST FOR BID
- Bid Name: Fire Engine and Aerial Apparatus
- Bid Due Date: Tuesday, October 25, 2016
- Bid Due Time: 2:00 P.M. Central Standard Time
- Pre-Bid Conference: Non Mandatory, October 10, 2016 10:00:00 AM CDT
- Pre-Bid Location: North Richland Hills City Hall - 4301 City Point Dr., North Richland Hills, TX 76180
- Deadline for questions:
 - Date: Tuesday, October 18, 2016
 - Time: 12:00 P.M. Central Standard Time

DOCUMENTS MAY BE SUBMITTED ELECTRONICALLY VIA:

www.publicpurchase.com

DOCUMENTS MAY BE DELIVERED TO:

City of North Richland Hills
Purchasing, Attn: 17-001 Fire Engine and Aerial Apparatus
4301 City Point Drive
North Richland Hills, TX 76180

If delivering a bid packet please include ***One (1) hard copy and One (1) soft copy on Flash drive*** . Submit documents in a sealed envelope with the following information marked plainly on the front:

**ATTN: PURCHASING DEPARTMENT
17-001 FIRE ENGINE AND AERIAL APPARATUS**

No oral explanation in regard to the meaning of the specifications will be made, and no oral instructions will be given after the pre-bid meeting and before the award of the contract. Requests from interested vendors for additional information or interpretation of the information included in the specifications should be directed in writing as a question related to this bid on Public Purchase and the question will be answered on Public Purchase. All addendums will also be posted to Public Purchase. It will be the vendor's responsibility to check all information related to this bid on Public Purchase before submitting a response.

The City of North Richland Hills reserves the right to reject in part or in whole all bids submitted, and to waive any technicalities for the best interest of the City of North Richland Hills.

GENERAL CONDITIONS

In submitting this bid, the Bidder understands and agrees to be bound by the following terms and conditions. These terms and conditions shall become a part of the purchase order or contract and will consist of the invitation to bid, specifications, the responsive bid and the contract with attachments, together with any additional documents identified in the contract and any written change orders approved and signed by a city official with authority to do so. All shall have equal weight and be deemed a part of the entire contract. If there is a conflict between contract documents, the provision more favorable to the City shall prevail.

1. **BID TIME**

It shall be the responsibility of each Bidder to ensure his/her bid is turned in to the City of North Richland Hills on or before **2:00 P.M. Tuesday, October 25, 2016**. The official time shall be determined by the clock located at the switchboard in the North Richland Hills City Hall lobby. Bids received after the time stated above will be considered ineligible and returned unopened.

All attached bid documents are to be returned completely filled out, totaled, and signed. Envelopes containing bids must be *sealed*. The City of North Richland Hills will not accept any bid documents other than the attached.

2. **WITHDRAWING BIDS/PROPOSALS/QUOTES**

Bids may be withdrawn at any time prior to the official opening; request for non-consideration of bids must be made in writing to the Purchasing Manager and received prior to the time set for opening bids. The bidder warrants and guarantees that his/her bid has been carefully reviewed and checked and that it is in all things true and accurate and free of mistakes. Bidder agrees that a bid price may not be withdrawn or canceled by the bidder for a period of ninety (90) days following the date designated for the receipt of bids.

3. **IRREGULAR BIDS/PROPOSALS/QUOTES**

Bids will be considered irregular if they show any omissions, alterations of form, additions, or conditions not called for, unauthorized alternate bids, or irregularities of any kind. However, the City of North Richland Hills reserves the right to waive any irregularities and to make the award in the best interest of the City.

4. **REJECTION/DISQUALIFICATION**

Bidders will be disqualified and/or their bids rejected, among other reasons, for any of the specific reasons listed below:

- a) Bid received after the time set for receiving bids as stated in the advertisement;
- b) Reason for believing collusion exists among the Bidders;
- c) Bid containing unbalanced value of any item; bid offering used or reconditioned equipment;
- d) Where the bidder, sub-contractor or supplier is in litigation with the City of North Richland Hills or where such litigation is contemplated or imminent;
- e) Uncompleted work which in the judgment of the City will prevent or hinder the prompt completion of additional work, or having defaulted on a previous contract;
- f) Lack of competency as revealed by reference checks, financial statement, experience and equipment, questionnaires, or qualification statement;
- g) Bid containing special conditions, clauses, alterations, items not called for

or irregularities of any kind, which in the Owner's opinion may disqualify the Bidder.

However, the City of North Richland Hills reserves the right to waive any irregularities and to make the award in the best interest of the City of North Richland Hills.

5. BID EVALUATION

Award of bid, if it be awarded, will be made to the lowest responsible bidder or may be awarded to the bidder that offers the goods and/or services at the *best value* for the City (Texas Local Government Code, 252.043). In determining the best value the City will consider the following:

- a) The purchase price; terms and discounts; delivery schedule;
- b) The reputation of the bidder and of the bidder's goods or services;
- c) The quality of the bidders' goods or services;
- d) The extent to which the bidder's goods or services meet the City specifications and needs;
- e) The bidder's past relationship with the City;
- f) Total long term cost to the city to acquire the bidder's goods or services;
- g) Any relevant criteria specifically listed in the specifications;
- h) Compliance with all State and local laws, general conditions and Specifications;
- i) Results of testing, if required;
- j) Warranty and/or guarantee, maintenance requirements and performance data of the product requested;
- k) City's evaluation of the bidder's ability to perform to specifications.

6. AWARD OF BID

The bid award will be made within sixty (60) days after the opening of bids. No award will be made until after investigations are made as to the responsibilities of the best bidder.

The City of North Richland Hills reserves the right to award bids whole or in part when deemed to be in the best interest of the City. Bidder shall state on bid form if their bid is "all or none", otherwise it shall be considered as agreeing to this section.

Information contained in submitted bid documents shall not be available for inspection until after the award has been made by the City Council. Requests for this information must be submitted in writing.

7. ASSIGNMENT

The successful bidder may not assign his/her rights and duties under an award without the written consent of the North Richland Hills City Manager. Such consent shall not relieve the assignor of liability in the event of default by his assignee.

8. SUBSTITUTIONS/EXCEPTIONS

Exceptions/variations from the specifications may be acceptable provided such variations, in each instance, is noted and fully explained in writing and submitted with bid. NO substitutions or changes in the specifications shall be permitted after award of bid without prior written approval by the Purchasing Manager.

9. DELIVERY / ACCEPTANCE

The delivery date is an important factor of this bid and shall be considered during the evaluation process. The City considers delivery time the period elapsing from the time the order is placed until the City receives the order at the specified delivery location.

All material shall be delivered F.O.B. City of North Richland Hills to the address specified at the time of order. Acceptance by the City of North Richland Hills of any delivery shall not relieve the Contractor of any guarantee or warranty, expressed or implied, nor shall it be considered an acceptance of material not in accordance with the specifications thereby waiving the City of North Richland Hills right to request replacement of defective material or material not meeting specifications.

10. NOTICE OF DELAYS

Whenever the contractor encounters any difficulty which is delaying or threatens to delay timely performance, written notice shall immediately be given to the Purchasing Manager, stating all relevant information. Such notice shall not in any way be construed as a waiver by the City of any rights or remedies to which it is entitled by law. Delays in performance and/or completion may result in cancellation of agreement.

11. SALES TAX

The City of North Richland Hills is exempt from Federal Excise and State sales tax; therefore tax must not be added to bid.

12. TIE BIDS

In the event of a tie bid, State Law provides the bid or contract shall be awarded to the local bidder. In cases where a local bidder is not involved, tie bids shall be awarded by drawing lots at the City Council meeting, or as otherwise directed by the Mayor.

13. BRAND NAME OR EQUAL

If items are identified by a "brand name" description, such identification is intended to be descriptive, not restrictive, and is to indicate the quality and characteristics of products that will be satisfactory. As used in this clause, the term "brand name" includes identification of products by make and model.

Such products must be clearly identified in the bid as an equal product and published specifications of the equal products offered must be included with the bid reply.

Bids offering equal products will be considered for award if determined by the Purchasing Manager and the user department to be equal in all material respects to the brand name products referenced. The decision of acceptable "equal" items or variations in the specifications will solely be the City of North Richland Hills.

Unless the bidder clearly indicates in his/her bid that he is offering an "equal" product, his bid shall be considered as offering the brand name product referenced in the invitation for bids.

14. REFERENCES

A minimum of three (3) references, preferably located within the Dallas/Fort Worth Metroplex, must be submitted with each bid. Company name, contact and phone number must be included with each reference.

15. PROHIBITION AGAINST PERSONAL FINANCIAL INTEREST IN CONTRACTS

No employee of the City of North Richland Hills shall have a direct or indirect financial interest in any proposed or existing contract, purchase, work, sale or service to or by the City (CMA-074, Standards of Conduct, Section IV).

16. DISCLOSURE OF INTEREST

Pursuant to Chapter 176 of the Texas Local Government Code, a person, or agent of a person, who contracts or seeks to contract for the sale or purchase of property, goods, or services with the City of North Richland Hills must file a completed conflict of interest questionnaire which is available online at www.ethics.state.tx.us.

The conflict of interest questionnaire must be filed with the City Secretary of the City of North Richland Hills no later than the seventh business day after the person or agent begins contract discussions or negotiations with the City of North Richland Hills or submits to the City of North Richland Hills an application, response to a request for proposal or bid, correspondence, or another writing related to a potential agreement with the City of North Richland Hills. An updated conflict of interest questionnaire must be filed in accordance with Chapter 176 of the Local Government Code. An offense under Chapter 176 is a Class C misdemeanor.

THE ATTACHED CONFLICT OF INTEREST QUESTIONNAIRE MUST BE COMPLETED TO BE CONSIDERED FOR AWARD.

17. TERMINATION/NON PERFORMANCE

Continuing non-performance of the vendor in terms of Specifications shall be a basis for the termination of the contract by the City. The City of North Richland Hills reserves the right to enforce the performance of this contract in any manner prescribed by law or deemed to be in the best interest of the City in the event of breach or default of this contract. The City reserves the right to terminate the contract immediately in the event the successful bidder fails to 1.) Meet delivery schedules or, 2.) Otherwise not perform in accordance with these specifications.

Breach of contract or default authorizes the City to award to another bidder, and/or purchase elsewhere and charge the full increase in cost and handling to the defaulting successful bidder.

The contract may be terminated by either party upon written thirty (30) days notice prior to cancellation without cause.

18. ATTORNEYS FEES

Neither party to this contract shall be entitled to attorney fees for any matter arising under this contract, whether for additional work, breach of contract, or other claim for goods, services, or compensation. All claims for attorney's fees are hereby WAIVED.

19. INDEMNITY

City shall not be liable or responsible for, and shall be saved and held harmless by Contractor from and against any and all suits, actions, losses, damages, claims, or liability of any character, type, or description, including claims for copyright and patent infringement, and including all expenses of litigation, court costs, and attorney's fees for injury or death to any person, or injury to any property, received or sustained by any person or persons or property, arising out of, or occasioned by, directly or indirectly, the performance of Contractor under this agreement, including claims and damages arising in part from the negligence of City, without; however,

waiving any governmental immunity available to the CITY under Texas law and without waiving any defenses of the parties under Texas law. The provisions of this indemnification are solely for the benefit of the parties hereto and not intended to create or grant any rights, contractual or otherwise, to any other person or entity.

It is the expressed intent of the parties to this Agreement that the indemnity provided for in this section is an indemnity extended by Contractor to indemnify and protect City from the consequences of City's own negligence, provided, however, that the indemnity provided for in this section shall apply only when the negligent act of City is a contributory cause of the resultant injury, death, or damage, and shall have no application when the negligent act of City is the sole cause of the resultant injury, death, or damage, unmixed with the legal fault of another person or entity. Contractor further agrees to defend, at its own expense, and on behalf of City and in the name of City, any claim or litigation brought in connection with any such injury, death, or damage.

The Contractor will secure and maintain Contractual Liability insurance to cover this indemnification agreement that will be primary and noncontributory as to any insurance maintained by the City for its own benefit, including self-insurance.

20. PERFORMANCE AND PAYMENT BONDS

In the event the total contract amount exceeds \$100,000, the Contractor shall be required to execute a performance bond in the amount of one hundred (100) percent of the total contract price; if the total contract amount exceeds \$50,000 the contractor shall be required to execute a payment bond in the amount of one hundred (100) percent of the total contract price, each in standard forms for this purpose, guaranteeing faithful performance of work and guaranteeing payment to all persons supply labor and materials or furnishing any equipment in the execution of the contract. It is agreed that this contract shall not be in effect until such performance and payment bonds are furnished and approved by the City of North Richland Hills. No exceptions to this provision allowed.

Unless otherwise approved in writing by the City of North Richland Hills, the surety company underwriting the bonds shall be acceptable according to the latest list of companies holding certificates of authority from the Secretary of the Treasury of the United States.

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and current copy of their power of attorney.

21. INTERLOCAL AGREEMENT

Successful bidder agrees to extend prices and terms to all entities who have entered into or will enter into joint purchasing interlocal cooperation agreements with the City of North Richland Hills.

22. ELECTRONIC PROCUREMENT

The City of North Richland Hills has adopted policies and procedures complying with Local Government Code Section 252.0415, Section 271.906 and Section 2155.062. The City of North Richland Hills may receive submittals in electronic form in response to procurement requests. However, a bid that is submitted non-electronically by the due date and time will be accepted and then entered electronically by Purchasing after the bid opening.

23. DEPARTMENT OF TRANSPORTATION (TXDOT) RELATED BIDS

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

Due care and diligence has been used in preparation of this information, and it is believed to be substantially correct. However, the responsibility for determining the full extent of the exposure and the verification of all information presented herein shall rest solely with the bidder. The City of North Richland Hills and its representatives will not be responsible for any errors or omissions in these specifications, nor for the failure on the part of the proposer to determine the full extent of the exposures.

INSURANCE REQUIREMENTS

Contractors performing work on City property or public right-of-way for the City of North Richland Hills shall provide the City a certificate of insurance evidencing the coverages and coverage provisions identified herein. Contractors shall provide the City evidence that all subcontractors performing work on the project have the same types and amounts of coverages as required herein or that the subcontractors are included under the contractor's policy. The City, at its own discretion, may require a certified copy of the policy.

All insurance companies and coverages must be authorized by the Texas Department of Insurance to transact business in the State of Texas and must be acceptable to the City of North Richland Hills.

Listed below are the types and amounts of insurance required. The City reserves the right to amend or require additional types and amounts of coverages or provisions depending on the nature of the work

Type of Insurance	Amount of Insurance	Provision
1. Commercial General Liability to include coverage for: a) Premises/Operations b) Products/Completed Operations c) Independent Contractors d) Personal Injury e) Contractual Liability f) Personal/Advertising Injury g) Medial Expense h) Fire Legal Liability i) Underground Hazard j) Explosion/Collapse Hazard k) Patent Infringement l) Copyright Law Violations	\$1,000,000 each occurrence, \$1,000,000 general aggregate; Or \$1,000,000 combined single limits	City to be listed as additional insured and provided 30 day-notice of cancellation or material change in coverage City prefers that insurer be rated B+V1 or higher by A. M. Best or A or higher by Standard & Poors
2. Consultants, architects, engineers, Landscape design specialist, other professional services	\$500,000 Professional Liability with proof that aggregate is still available.	
3. Workers' Compensation & Employers' Liability	Statutory Limits \$500,000 each accident	Alternate employer endorsement required
4. Comprehensive Automobile Liability Insurance, including coverage for loading and unloading hazards, for a) Owned/Leased Vehicles b) Non-Owned Vehicles c) Hired Vehicles	\$500,000 Combined single limit for bodily injury and property damage	

A PURCHASE ORDER WILL NOT BE ISSUED WITHOUT EVIDENCE OF INSURANCE.

NON-COLLUSION AFFIDAVIT OF BIDDER

State of _____ County of _____

_____ verifies that:
(Name)

- (1) He/She is owner, partner, officer, representative, or agent of _____, has submitted the attached bid: (Company Name)
- (2) He/She is fully informed in respect to the preparation, contents and circumstances in regard to attached bid;
- (3) Neither said bidder nor any of its officers, partners, agents or employees has in any way colluded, conspired or agreed, directly or indirectly with any other bidder, firm or person to submit a collusive or sham bid in connection with attached bid and the price or prices quoted herein are fair and proper.

SIGNATURE

PRINTED NAME

Subscribed and sworn to before me this
_____ Day of _____ 2016.

NOTARY PUBLIC in and for
_____ County, Texas.

My commission expires: _____

THIS FORM MUST BE COMPLETED, NOTARIZED AND SUBMITTED WITH BID

BID CERTIFICATION

The Undersigned, in submitting this bid, represents and certifies:

- a. He/she is fully informed regarding the preparation, contents and circumstances of the attached bid;
- b. He/she proposes to furnish all equipment/service at the prices quoted herein and bid is in strict accordance with the conditions and specifications stated herein;
- c. There will be at no time a misunderstanding as to the intent of the specifications or conditions to be overcome or pleaded after the bids are opened;
- d. He/she is an equal opportunity employer, and will not discriminate with regard to race, color, national origin, age or sex in the performance of this contract.
- e. The undersigned hereby certifies that he/she has read, understands and agrees that acceptance by the City of North Richland Hills of the bidder's offer by issuance of a purchase order will create a binding contract. Further, he/she agrees to fully comply with documentary forms herewith made a part of this specific procurement.

COMPANY: _____

ADDRESS: _____

CITY, STATE & ZIP: _____

TELEPHONE: _____

FAX _____

EMAIL: _____

SIGNATURE: _____

PRINTED NAME: _____

DATE: _____

COMPLIANCE WITH HOUSE BILL 1295

In 2015, the Texas Legislature adopted [House Bill 1295](#), which added section 2252.908 of the Government Code. The law states that a governmental entity may not enter into certain contracts with a business entity unless the business entity submits a disclosure of interested parties to the governmental entity at the time the business entity submits the signed contract to the governmental entity.

The law applies only to a contract of a governmental entity that either (1) requires an action or vote by the governing body of the entity or agency before the contract may be signed or (2) has a value of at least \$1 million. The disclosure requirement applies to a contract entered into on or after January 1, 2016.

The Texas Ethics Commission has adopted rules necessary to implement the law, prescribed the disclosure of interested parties form, and posted a copy of the form on the commission's website.

Filing Process:

The commission has made available on its website a new filing application that must be used to file Form 1295. A business entity must:

- 1) use the application to enter the required information on Form 1295,
- 2) print a copy of the completed form, which will include a certification of filing that will contain a unique certification number.
- 3) sign the printed copy of the form (an authorized agent of the business entity must sign),
- 4) have the form notarized,
- 5) file the completed Form 1295 with the certification of filing with the governmental body with which the business entity is entering into the contract.

The governmental entity must notify the commission, using the commission's filing application, of the receipt of the filed Form 1295 with the certification of filing not later than the 30th day after the date the contract binds all parties to the contract. The commission will post the completed Form 1295 to its website within seven business days after receiving notice from the governmental entity.

Information regarding how to use the filing application may be found at https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm.

FIRE ENGINE AND AERIAL SPECIFICATIONS

The City of North Richland Hills is asking for proposals for one fire engine and two aerial fire apparatus. This document outlines fire engine and aerial specifications. **Appendix A** reflects options for the fire engine, **Appendix A1** reflects options specific to the aerial apparatus and **Appendix B** reflects specific details on three fire apparatus that will be traded in on the purchase.

The fire engine specifications establish the generic needs of all three apparatus. Each manufacturer shall use the fire engine specifications as a base line for what is required for all three apparatus.

Measurements and brand specific items are not intended to be restrictive. They have been used in an effort to communicate the cities desired end result.

SUBSTITUTIONS/EXCEPTIONS

Exceptions may be allowed if they are equal to or superior to that specified by this Specification. Exceptions should be noted and fully explained on a separate page entitled "Exceptions to Specifications". The exception list shall refer to specification page number. Vendors will be given the opportunity to more thoroughly explain any exceptions while meeting with City of North Richland Hills representatives during the quote evaluation phase. The City of North Richland Hills reserves the right to determine if an exception is truly "equal to or superior" than what is specified in this document. Apparatus shall be inspected upon apparatus completion for compliance with approved specifications. Deviations will not be tolerated and will be cause for rejection of the apparatus unless they were originally listed in vendor's proposal and accepted in writing by the department.

If the vendor takes an exception, on an exception page, the vendor must state an option price to bring their specifications into full compliance with the Department's specifications. Failure to provide this information shall be cause to reject the proposal as being non-responsive.

DELIVERY / ACCEPTANCE

The delivery date is an important factor and shall be considered during the evaluation process. The City considers delivery time the period elapsing from the time the order is placed until the City receives the order at the specified delivery location.

All material shall be delivered F.O.B. City of North Richland Hills to the address specified at the time of order. Acceptance by the City of North Richland Hills of any delivery shall not relieve the Vendor of any guarantee or warranty, expressed or implied, nor shall it be considered an

acceptance of material not in accordance with the specifications thereby waiving the City of North Richland Hills right to request replacement of defective material or material not meeting specifications.

NOTICE OF DELAYS

Whenever the contractor encounters any difficulty which is delaying or threatens to delay timely performance, written notice shall immediately be given to the Purchasing Manager, stating all relevant information. Such notice shall not in any way be construed as a waiver by the City of any rights or remedies to which it is entitled by law. Delays in performance and/or completion may result in cancellation of agreement.

SALES TAX

The City of North Richland Hills is exempt from Federal Excise and State sales tax; therefore tax must not be added to bid.

BRAND NAME OR EQUAL

If items are identified by a "brand name" description, such identification is intended to be descriptive, not restrictive, and is to indicate the quality and characteristics of products that will be satisfactory. As used in this clause, the term "brand name" includes identification of products by make and model.

Such products must be clearly identified in the bid as an equal product and published specifications of the equal products offered must be included with the bid reply. Bids offering equal products will be considered for award if determined by the Purchasing Manager and the user department to be equal in all material respects to the brand name products referenced. The decision of acceptable "equal" items or variations in the specifications will solely be the City of North Richland Hills.

Unless the vendor clearly indicates in their bid that they are offering an "equal" product, his bid shall be considered as offering the brand name product referenced in the invitation for bids.

INSURANCE

The City requires Vendor(s) to carry the minimum insurance as required by State laws.

TERMINATION/NON PERFORMANCE

Continuing non-performance of the vendor in terms of Specifications shall be a basis for the termination of the contract by the City. The City of North Richland Hills reserves the right to

enforce the performance of this contract in any manner prescribed by law or deemed to be in the best interest of the City in the event of breach or default of this contract. The City reserves the right to terminate the contract immediately in the event the successful vendor fails to 1.) Meet delivery schedules or, 2.) Otherwise not perform in accordance with these specifications. Breach of contract or default authorizes the City to award to another vendor, and/or purchase elsewhere and charge the full increase in cost and handling to the defaulting successful vendor.

Due care and diligence has been used in preparation of this information, and it is believed to be substantially correct. However, the responsibility for determining the full extent of the exposure and the verification of all information presented herein shall rest solely with the vendor. The City of North Richland Hills and its representatives will not be responsible for any errors or omissions in these specifications, nor for the failure on the part of the proposer to determine the full extent of the exposures.

QUOTE SUBMITTALS

Quotes will be addressed and submitted in accordance with the instructions provided. The City's standards must be strictly adhered to and all forms and required information must be complete and submitted with the quote. All quotes must be signed by the President or CEO of the apparatus manufacturer. Failure to do so will cause the quote to be non-responsive and rejected.

If the quote is submitted by a dealer/agent in the name of a particular manufacturer, the vendor will include with the quote, a copy of the appropriate Letter of Authorization, authorizing the dealer/agent to sign on behalf of the manufacturer.

It will be the responsibility of the vendor to insure that their quote arrives at the proper location by the time indicated. Late proposals, telegrams, facsimile, or telephone quotes will not be considered. Quotes will not be considered from firms, individuals or the same owners of separate companies submitting more than one quote.

Any erasures, strike over and/or changes to prices written in numerals should be initialed by the vendor. Failure to initial may be cause to reject the quote as irregular and disqualified from consideration. If a vendor represents more than one Fire Apparatus Company, they will only quote the top of the line that meets specifications.

All specifications herein contained are considered as minimum. Any exceptions to these minimum standards relating to gauge, alloy, and type of metal, size of compartments and overall design must be outlined in detail and submitted with the quote. Vendors must state the brand of any item to be provided which is a substitute for the brand or model specified. The buyer reserves the right to require a vendor to provide proof in each case that a substituted item is equal to that specified. The buyer will be the sole judge in determination of acceptable substitutes.

The competency and responsibility of vendors will be considered in making the award. The City of North Richland Hills reserves the right to reject any or all quotes, or to reject the quote of the vendor who, in the judgment of the City is not in a position to perform the Contract. These specifications, together with any other documents required herein, will be included in the final contract. The purchaser reserves the right to reject a quote based on unacceptable provisions of a vendor's contract and does not obligate itself to accept the lowest or any quote

INFORMATION REQUIRED WITH QUOTE

Manufacturer's History

The apparatus and equipment to be furnished in meeting these specifications must be the product of an established reputable fire apparatus manufacturer of five (5) years or more. Each vendor will furnish satisfactory evidence of the manufacturer's ability to construct, supply service, parts, and technical assistance for the apparatus specified. A written review of the company, in chronological order, detailing the background of the manufacturer shall be provided as part of the quote. The vendor must state the location of the factory and nearest full service center. Because of the severe service requirements the department will impose on this apparatus, each vendor shall provide a list of at least six (6) fire departments serving populations of over 75,000 in which similar apparatus utilizing the brand of chassis proposed have been in service for over one year. Larger fire departments are preferred. This list shall include contact names and phone numbers.

Payment Terms and Contract

All proposals to include in detail the exact terms for payment for said apparatus. If any payment other than "Payment in Full" upon acceptance of apparatus after delivery is offered or expected, these terms must be clearly noted in the proposal. This would also include any discounts for partial payments, the percentage, and the stage throughout the construction process. Each vendor must submit a copy of his proposed contract form if applicable. The City of North Richland Hills may or may not use the vendors' contract form.

Letter of Authorization

If the quote is submitted by a dealer/agent in the name of a particular manufacturer, the vendor will include with the quote, a copy of the appropriate Letter of Authorization, authorizing the dealer/agent to sign on behalf of the manufacturer.

Licenses

The quote must have all current licenses required by State law to do business in the State. This is to include BOTH the automotive manufacturer and automotive dealer licenses if required by State law. If the proposed vendor is a manufacturer quoting direct, not through a dealer or distributor, then the quote will include copies of their manufacturer and automotive dealer licenses. If the proposed is a dealer or distributor, then they will submit a copy of the appropriate dealer license. Quotes failing to meet this legal requirement cannot be considered.

Performance/Supply Bond

If any payment other than "Payment in Full" upon acceptance of apparatus after delivery is offered and accepted by the City of North Richland Hills, the Vendor shall be required to execute a performance/supply bond in the amount of one hundred (100) percent of the total contract price; in standard form for the purpose, guaranteeing faithful performance of work in the execution of the contract. It is agreed that this contract shall not be in effect until such performance/supply bond is furnished and approved by the City of North Richland Hills. No exceptions to this provision allowed.

Unless otherwise approved in writing by the City of North Richland Hills, the surety company underwriting the bond shall be acceptable according to the latest list of companies holding certificates of authority from the Secretary of the Treasury of the United States.

Attorneys-in-fact who sign bonds must file with the bond a certified and current copy of their power of attorney.

Quote/Proposal Drawings

For purposes of evaluation, the vendor shall provide a drawing illustrating, but not limited to, the overall dimensions, wheelbase, and overall length of the proposed apparatus and other specified equipment. Said drawing shall be included with the vendor's proposal package.

The drawings shall be a minimum of 24" x 36". Smaller size drawings, "similar to" drawings or general sales drawings, shall not be acceptable. Failure to provide a quote evaluation drawing in accordance with these specifications may be cause for rejection of the quote proposal.

Each quote shall be accompanied by a set of "Vendor's Specifications" consisting of a detailed description of the apparatus being provided under this contract which conform. Computer runoff sheets are not acceptable.

Weight Review

A Weight Review shall be included in the quote/proposal for the manufacturer's recommended GVWR for both the front and rear axles and suspensions.

ADDITIONAL PRICING – OPTIONS

The City of North Richland Hills seeks additional pricing for optional equipment for this fire apparatus. Vendors should submit their quote/proposal with the base apparatus price and the additional pricing for the options listed in "Appendix A and A1". The Options may or may not be selected; or in any particular order.

TRADE IN VEHICLES

Appendix B provides specific information on three apparatus that the city plans on trading in toward the purchase of the three new apparatus. The vehicles listed below are still in service. The mileage, hours and general condition are continuously changing and should be considered approximate. If you choose to look at the trade in apparatus prior to submitting your bid please contact Battalion Chief Eddy Wood to schedule a viewing. (817)427-6900. **Options regarding proposed surrender times of these vehicles should be considered in determining the value of trade.**

INTENT OF SPECIFICATIONS

It shall be the intent of these specifications to provide a complete apparatus equipped as hereinafter specified. With a view to obtaining the best results and the most acceptable apparatus for service in the North Richland Hills Fire Department, these specifications cover only the general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details as to finish, equipment and appliances with which the successful vendor must conform. Minor details of construction and materials where not otherwise specified are left to the discretion of the vendor/manufacturer, who shall be solely responsible for the design and construction for all features. The National Fire Protection Association Standard 1901, current edition, unless otherwise specified in these specifications, shall prevail.

Each vendor shall provide satisfactory evidence of their ability to construct the apparatus specified, and shall state the location of the factory where the apparatus is to be built. They shall also show that they are in a position to render prompt service and to provide replacement parts for said apparatus.

QUALITY AND WORKMANSHIP

The design of the apparatus must embody the latest approved automotive engineering practices. The workmanship must be of the highest quality in its respective field. Special consideration will be given to the following points: Accessibility of the various units that require periodic maintenance operations, ease of operation (including both pumping and driving) and symmetrical proportions.

Construction shall be rugged and ample safety factors shall be provided to carry loads as specified and to meet both on and off road requirements and to speed conditions as set forth under "Performance tests and requirements".

Welding shall be employed in the assembly of the apparatus in a manner that will not prevent the readily removal of any component part for service or repair.

DELIVERY/TRAINING

To insure proper break-in of all components while still under warranty, the apparatus shall be delivered under its own power. The apparatus will remain insured by the apparatus manufacturer until the City accepts the unit.

A qualified delivery engineer representing the vendor shall instruct City of North Richland Hills personnel in the proper operation, performance, care and maintenance of the equipment delivered. There shall be a minimum of eight hours (8) of instructional training on three (3) separate days for fire department personnel. There shall be a minimum of eight hours (8) of mechanic training for basic maintenance and diagnostics of mechanical and electrical systems.

PERFORMANCE TESTS AND REQUIREMENTS

Road Test

A road test shall be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more will be made, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. The successful vendor shall provide a Weight Certificate showing weights on front axle, rear axles and total weight for the completed apparatus at time of delivery.

Other Requirements

As per NFPA 1901:

- 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.
- From a steady pace of 15 MPH the vehicle shall accelerate to 35 MPH within 30 seconds. This shall be accomplished without moving the gear selector.
- The service brakes shall be capable of stopping the fully loaded vehicle in 35 feet at 20 MPH on level dry concrete highway.
- The apparatus, fully loaded, shall be capable of obtaining a minimum speed of 50 MPH on a level dry concrete highway with the engine not exceeding its governed RPM (fully loaded).
- If optioned, the apparatus shall be tested and approved by the Underwriter's Laboratories Incorporated in accordance with their standard practices for pumping engines.
- The vendor shall provide copies of the Pump Manufacturer's Certification of hydrostatic test, the Engine Manufacturer current certified brake horsepower curve, and the Manufacturer's record of pumper construction details when delivered.
- A copy of all tests provided at the expense of the vendor, shall accompany the Apparatus.
- The vendor shall supply the final manufacturer's certification of GVWR and GAWR on a nameplate affixed to the vehicle.
- A permanent plate shall be mounted in the driver's compartment to specify the quantity and type of the following fluids used in the vehicle: Engine oil, engine coolant, and chassis transmission fluid, pump transmission lubrication fluid, pump primer fluid (if used) and drive axle lubrication fluid.
- A permanent plate in the driver's compartment shall be installed, specifying the seating capacity of the enclosed cab.
- Signs that state "OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION" shall be provided and will be visible from each seated position.

- An accident prevention sign shall be located at the rear step area of the apparatus. It shall warn all personnel that standing on the step while apparatus is in motion shall be prohibited.
- A nameplate indicating the chassis transmission shift selector position to be used when pumping shall be provided in the driving compartment and located so that it can be easily read from the driver's position.

Apparatus Test by Underwriters Laboratories

The following Apparatus shall comply with all NFPA 1901 applicable regulations in effect as of the contract signing date. There shall be multiple tests performed by the vendor and Underwriter's Laboratories when the apparatus has been completed. The manufacturer shall furnish the completed Test Certificate(s) to the purchaser at time of delivery.

Since the inspection services of Underwriters Laboratories are available to all vendors on an equal basis, no other third party testing service shall be acceptable.

The tests conducted on the apparatus shall include, but not be limited to:

Pump & Plumbing Performance Test

The apparatus pump and plumbing system shall be tested and certified.

12 Volt Electrical Test

The apparatus low voltage electrical system shall be tested and certified.

110/220-Volt & Generator

The apparatus electrical and generator system shall be tested and certified.

LIABILITY

The winning vendor shall defend any and all suits and assume all liability for the use of any patented device or article forming part of the apparatus or any appliance provided under the contract.

SUPPLIED INFORMATION & EXTRAS

Manuals

The apparatus manufacturer shall supply two (2) copies of apparatus manuals with all manufactured apparatus. The manuals shall include, but not be limited to: all component warranties, users' manuals and information for supplied products, apparatus engineering information including drawings and build prints, and whatever other pertinent information the manufacturer can supply to its customer regarding the said apparatus.

Operation Manual

There shall be two (2) digital copies of the chassis operation manual provided with the chassis. The digital data shall include a parts list specific to the chassis model.

Engine and Transmission Operation Manuals

There shall be two (2) digital copies of the engine operation manual and two (2) digital copies of the transmission operation manual specific to the model ordered included with the chassis in the ship loose items.

As Built Wiring Diagrams

The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams.

As Built Air System Diagrams

The cab and chassis shall include two (2) digital copies of air system schematics and hose diagrams.

Diagnostic Software Occupant Protection

The cab and chassis shall include diagnostic software for the manufacturer's Occupant Protection System shipped loose with the vehicle. The software kit shall include an interface module with connectors to link a laptop computer to the vehicle for diagnostic purposes.

Construction Details

The manufacturer shall also supply a manufacturer's record of apparatus construction details, including the following information:

Owner name and address;

Apparatus manufacturer, model, and serial number;

Chassis make, model, and serial number;

GAWR of front and rear axles;

Front tire size and total rated capacity in pounds;

Rear tire size and total rated capacity in pounds;

Chassis weight distribution in pounds with water (if applicable) and manufacturer mounted equipment (front and rear)

Engine make, model, serial number, rated horsepower, related speed and no load governed speed;

Type of fuel and fuel tank capacity;

Electrical system voltage and alternator output in amps;

Battery make and model, capacity in CCA:

Paint numbers;

Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle (with the water tank full (if applicable) but without personnel, equipment, and hose).

Written load analysis and results of the electrical system performance tests;

Transmission make, model, and type;

Pump to drive through the transmission (yes or no);

Engine to pump gear ratio and transmission gear ratio used;

Pump make, model, rated capacity in gallons per minute, serial number, and number of stages;

Pump manufacturer's certification of suction capability;

Pump manufacturer's certification of hydrostatic test;

Pump manufacturer's certification of inspection and test for the fire pump;

Copy of the apparatus manufacturer's approval for stationary pumping applications;

Pump transmission make, model and serial number;

Priming device type;

Type of pump pressure control system;

The engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum no load governed speed;

Certification of water tank capacity;

Customer Interaction

Ideally the manufacture will provide the capability for online access through the manufacture's website. City staff can then view digital photos of the apparatus in various phases of construction. Regardless of web access, the following phases will be captured via digital image and made available to fire department representatives by the manufacturer.

1. Chassis assembly
2. Cab construction and assembly
3. Body construction
4. Pump Housing and Plumbing
5. Assembly – approximately 80% complete

PRE- CONSTRUCTION AND INSPECTIONS

Vendors shall plan ample time for engine and aerial meetings. We want to ensure that both type of apparatus get due attention. Please also itemize how much the preconstruction and factory final construction trips are.

Approval/Pre-Con Drawings

After the award of the proposal, the vendor shall provide detailed, colored engineering drawings including, but not limited to, the overall dimensions, wheelbase, and overall length of the proposed apparatus for use of pre-construction conference. The drawings shall include, but shall not be limited to the right, left, top (including seat position and cab layout), front and rear views of the apparatus.

Factory Pre-construction Conference

The factory authorized vendor shall be required, prior to manufacturing, to have a pre-construction conference at the manufacturing facility with factory representatives present and four (4) representatives from the City of North Richland Hills to finalize all construction details.

The factory's authorized vendor shall, at his expense, provide transportation, lodging, and meals for the four (4) City representatives. Any distance greater than 200 miles shall be by commercial air travel from the DFW International Airport.

If parties involved determine no pre-construction conference is necessary, funds allotted for the

trip shall be refunded or discounted from the final purchase price.

Prior to starting construction the manufacturer will submit four (4) copies of the final approval drawings to be approved by representatives of the City of North Richland Hills. A signed approved copy will be returned to the manufacturer.

In addition, a detailed engineering drawing of the pump operator's panel will be provided following the pre-construction meeting.

Final Inspection Conference

The factory authorized vendor shall be required, during manufacturing, to have a final completion inspection conference at the site of the manufacturing facility with three (3), representatives from the City of North Richland Hills to inspect the apparatus. The preferred time would be after the construction & painting of the apparatus and prior to equipment being installed.

The factory's authorized vendor shall, at his expense, provide transportation, lodging, and meals for the three (3) City representatives. Any distance greater than 200 miles shall be by commercial air travel from the DFW International Airport.

As built specifications

After all apparatus are delivered the vendor shall provide accurate and updated (As built) specifications with all changes made. This will help with future apparatus design.

GENERAL CONSTRUCTION

Only apparatus that has been thoroughly evaluated, engineered and proven through rigorous, actual in-service field use will be considered. The purpose of such requirements shall be to ensure the longevity of the apparatus. Further, prototype and unproven construction methods will not be considered.

The apparatus shall be designed so that the operator could perform all recommended daily maintenance checks easily without the need for hand tools. Apparatus components that interfere with repair or removal of other major components must be attached with fasteners (cap, screws, nuts, etc.) so that the components can be removed and installed with normal hand tools. These

components must not be welded or otherwise permanently secured into place.

The apparatus shall be so designed that the various parts are readily accessible for lubrication, inspection, adjustment and repair.

Where specialty tools are manufactured or designed by the apparatus manufacturer necessary for routine service on any component of the apparatus built or supplied by the vendor, such tools shall be provided with the apparatus.

GAWR and GVWR

The GAWR and GVWR of the chassis shall be adequate to carry the fully equipped apparatus including all tanks filled, the specified hose load, unequipped personnel weight, ground ladders and a miscellaneous equipment allowance per NFPA criteria. It shall be the responsibility of the North Richland Hills Fire Department to provide the manufacturer with the weight of equipment to be carried if it is in excess of the allowance as set forth by NFPA for a rescue pumper apparatus. The manufacturer shall provide in the Quote/Proposal a Weight Review for the selected GVWR for both the front and rear suspensions.

Weight Distribution

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles, so that all specified equipment, including filled water tank, a full complement of personnel and fire hose will be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of NFPA 1901.

The unequipped personnel weight shall be calculated at 250 lbs. per person times the maximum number of persons to ride on the apparatus. (4)

The height of the fully loaded vehicle's center of gravity shall not exceed the chassis manufacturer's maximum limit.

The front to rear weight distribution of the fully loaded vehicle shall be within the limits set by the chassis manufacturer. The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer, under full loads and all other loading conditions.

The difference in weight on the end of each axle, from side to side, when the vehicle is fully loaded and equipped shall not exceed 7 percent.

Overall Length Requirement

The apparatus specified shall be constructed with no restrictions to the maximum overall length. However, consideration to overall length should be given.

Height Requirement

The apparatus specified shall be constructed with no restrictions to the maximum overall height. However, consideration to overall height should be given.

Overall Width

The apparatus specified shall be constructed to provide as much usable passenger room for the driver and officer respectively. In an effort to ensure adequate room is provided and allow for needed engine compartmentalization, the cab shall have a minimum width of 99 inches yet not exceed 102 inches in overall width.

This dimension shall include the primary construction of the apparatus body and chassis cab. Any peripherals that are 'removable' shall not be incorporated into this measurement.

Items that are considered 'removable' are: Rub Rails, Fenderettes, Mirrors, Lights, Handrails, Front Bumper, Etc.

Wheel Base Requirement

The apparatus specified shall be constructed as detailed with a wheel base of *approximately* 185 inches.

Rear Overhang

The chassis rear overhang shall be approximately 48.00 inches.

CAB AND CHASSIS

The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty

service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.

Model Year

The apparatus/chassis shall have a vehicle identification number that reflects a 2017 or 2018 model year.

Country of Service

The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis. The manufacturer of the chassis is not responsible for compliance to state, regional, or local regulations. Dealers should identify those regulations and order any necessary optional equipment from the manufacturer or their OEM needed to be in compliance with those regulations.

Apparatus Type

The apparatus shall be a 4 x 2 axle configuration, Fire Service Pumper designed for emergency service use which shall be equipped with a permanently mounted fire pump which has a minimum capacity of 1500 GPM. The apparatus shall include a cab, mid-ship mounted pump, water tank, emergency service body and hose storage whose primary purpose is to combat structural and associated fires.

Cab Style

The cab shall be a custom, four door model with an 8-10 inch raised roof over the crew area. The cab shall include an extended section of approximately 7-10 inches. It shall be designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. As mentioned only field tested and proven cab designs will be considered.

The overall cab length shall be approximately 140 inches (+/- 2 inches) with approximately 60.00 inches (+/- 2 inches) from the centerline of the front axle to the back of the cab.

The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which meets or exceeds industry standards. Preferably, the crew cab floor will be flat the entire walking area for ease of movement inside the cab.

The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The cab shall also include a crew area with two (2) cab doors, also large enough for personnel in full firefighting gear. All doors shall adhere to industry standards in size.

The steps shall be configured to allow for ease of egress by firefighters in full firefighting gear. The steps should extend the full width of each step well and offset so that steps can be easily accessed will exiting the cab.

All steps should meet current NFPA standards.

Occupant Safety Features

The vehicle shall meet all applicable safety requirements including:

- Retractors, pre-tensioners and limiters of seat belt systems designed to fully protect the occupants in the event of an accident.
- A Supplemental Restraint System to include frontal and side impact protection.
- Frontal and side impact heavy restraint module which receives inputs from outboard sensors, selectively deploys integrated systems, and records sensory inputs immediately before and during a detected event.
- Rollover impact protection system

All systems shall be independently tested and shall comply with all NFPA, applicable and practical standards such as the Federal Motor Vehicle Safety Standards (FMVSS).

Cab Front Fascia

The front cab fascia shall be constructed of primarily aluminum plate which shall be an integral part of the cab. Thickness should be adequate to provide reasonable protection against dents or damage from everyday fire service use.

The front cab fascia may include a limited amount of molded plastic modules to accommodate a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4)

warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps.

Front Grille

The grille shall allow for adequate free air intake to provide cooling for the apparatus.

Cab Undercoat

There shall be a rubberized or ceramic undercoating applied to the underside of the cab that provides for heat and abrasion protection, sound deadening and corrosion protection.

Drip Rail

There shall be a drip rail along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side.

Painting Method

The painting process shall be the standard process developed by the apparatus manufacturer for custom apparatus. The following would be a typical example of the paint process.

All metal surfaces on the entire cab shall be degreased and sanded to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is sanded and cleaned a high quality acid etching of base primer shall be applied.

Upon the application of body and seam fillers the cab shall be primed with a minimum of two (2) coats of an intermediate primer or epoxy surfacing agent that is designed for corrosion resistance and surface paint adhesion.

The apparatus then shall be painted with a minimum of two (2) coats of the specific color to achieve a minimum paint coat thickness of 2.00 – 3.00 mils.

Cab Paint Manufacturer

The paint shall be the standard brand name and type utilized by the apparatus manufacturer for custom apparatus.

Cab Paint Color

The paint color shall be American LaFrance Red, 7678UM (PPG FBCH 71528 Red). A color sample of ample size (12" X 12") for comparison to other trucks in North Richland Hills shall be provided by the manufacturer prior to painting for approval. Touch-up paint shall be provided.

Cab Paint Exterior

The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces. Painting method shall strictly conform to all manufacturers requirements.

Cab Paint Interior

The visible interior cab structure surfaces shall be painted grey, black or red. This to be determined in the preconstruction conference.

Cab Entry Doors

All cab entry doors shall be full length in design and to fully enclose cab steps. The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. All door hinges shall be hidden within flush mounted cab doors.

Electrical System

The chassis shall include a single starting electrical system which shall include a 12 volt direct current multiplexing system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.

Multiplex Electrical System

The multiplex electrical system shall be the brand name utilized and commonly advertised by the apparatus manufacturer.

The multiplex system shall include a display/control panel which shall be located on the left side of the dash in the switch panel. An option for a second display/control panel that is mounted on the right hand side of the dash for officer usage is listed in Appendix A. The display panel shall be LCD full color of the newest model available. The display screen shall display the time of day and important messages requiring acknowledgement by the user.

The display screen shall be video ready for back-up cameras, thermal cameras, and DVD. The display panel shall offer varying fonts and background colors. The display shall be fully programmable to the needs of City personnel and shall offer flexibility for screen configuration options.

Vehicle Data Recording System

The chassis shall have a Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Multiplex electrical system. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.

ENGINE AND CONTROLS

The chassis engine shall be a Cummins ISL9 engine. The engine shall be rated of 450 horse power at the governed speed of 2200 RPM.

The ISL9 engine shall be EPA certified to meet the most recently adopted emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system.

Cab Engine Tunnel

If the design of the cab includes an integrated engine tunnel, it shall be constructed entirely of aluminum, of ample thickness to withstand the rigors of the fire service and to accommodate necessary mounting needs of equipment. The North Richland Hills personnel will provide details as necessary to vendors. The tunnel shall be no wider than absolutely necessary and designed so that ample space and comfort are afforded to the driver and the passengers. The engine tunnel shall be painted with Rhino-type liner in black, gray or red. Decision to be made in preconstruction.

Diesel Particulate Filter Controls

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit.

Engine Programming High Idle Speed

The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

Engine High Idle Control

The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or

automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indicator on the display/control panel for the high idle speed control.

Auxiliary Engine Brake

A compression brake, for the engine shall be provided. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine compression brake shall activate upon 0% accelerator when in operation mode and actuate the vehicle's brake lights.

The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.

Auxiliary Engine Brake Control

An engine compression brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected:

- A valid gear ratio is detected.
- The driver has requested or enabled engine compression brake operation.
- The throttle is at a minimum engine speed position.
- The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift.

The compression brake shall be controlled via an off/low/medium/high virtual button on the control panel/display screen. The system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.

Electronic Engine Oil Level Indicator

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

Fluid Fills

The engine oil, coolant, transmission, and power steering fluid fills shall be located under the cab. The windshield washer fill and all other routine fluid checks should be easily accessible without tilting the cab.

Engine Drain Plug

The engine shall include an original equipment manufacturer installed oil drain plug.

Remote Throttle Control

An electronic pressure sensor governor shall be provided for the engine. The control head shall be mounted in a user friendly location on the pump panel. The pressure sensing governor shall regulate the pump pressure and monitor all essential engine parameters. A preset feature shall allow a predetermined pressure to be set.

LED readouts shall display RPM, PSI, pump discharge and intake pressure, engine oil pressure, engine temperature, transmission temperature and battery voltage.

The rpm increase and decrease will be controlled by push buttons on the face of the pressure sensing governor or a vernier style control, with a large control knob for use with a gloved hand. An audible alarm output shall also be part of the system.

Remote Throttle Harness

An apparatus interface wiring harness for the engine shall be supplied with the chassis. Separate circuits shall be included for pump controls, “Pump Engaged” and “OK to Pump” indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, customer ignition, air horn solenoid switch, high idle switch and high idle indication light. The harness shall be designed for a side mount pump panel.

An apparatus interface wiring harness shall also be included which shall be wired to the cab harness interface connectors and shall incorporate circuits with relays to control pump functions. This harness shall control the inputs for the transmission lock up circuits, governor/hand throttle controls and dash display which shall incorporate “Pump Engaged” and “OK to Pump” indicator lights. The harness shall contain circuits for the apparatus builder to wire in a pump switch.

Engine Programming Remote Throttle

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

Engine Programming Idle Speed

The engine low idle speed will be programmed at 700 rpm.

Engine Cooling System

The engine cooling system fan shall be hydraulic or direct drive, belt driven on the engine. In either application adequate cooling of the entire system is required. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations.

Engine Cooling System Protection

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris.

Engine Coolant

The cooling package shall include Extended Life Coolant. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees Fahrenheit.

Electronic Coolant Level Indicator

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

Engine Pump Heat Exchanger

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant. This shall allow the use of water from the discharge side of the pump to assist in cooling the engine.

Coolant Hoses

The cooling system hoses shall be silicone rubber. The radiator hoses shall be formed silicone coolant hoses with formed aluminized or stainless steel tubing. All coolant hose shall be secured with stainless steel constant torque band clamps.

Engine Air Intake

The engine shall also include an air intake filter which shall be installed in accordance to engine manufacture specifications. The engine air intake system shall be fully NFPA compliant and shall include provisions to ensure adequate protection from burning embers or light impacts form road debris or small stones. The engine air intake system shall include a high performance filter cone pack.

The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

Engine Exhaust

The engine exhaust system shall exit the right (curb) side of the body ahead of the rear tires. The exhaust system shall be modified to accept a Plymovent exhaust extraction system collar (magnetic).

DEF Tank

The exhaust system shall include a tank for Diesel Exhaust Fluid (DEF). The tank shall have a minimal capacity of five (5) usable gallons and shall include a drain plug for servicing.

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. Attention should be given to the fill location and the potential for damage should fluid spill while filling the tank.

TRANSMISSION

The drive train shall include an Allison Gen IV-E model EVS 3000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters and Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector. The transmission shall include an original equipment manufacturer installed oil drain plug.

The transmission shall be equipped with prognostics to monitor oil life, filter life, and transmission health.

Transmission Programming

The transmission shall be programmed to automatically shift the transmission to neutral when the parking brake is set to simplify operation and increase operational safety.

The transmission gear ratios shall be:

1st	3.49:1
2nd	1.86:1
3rd	1.41:1
4th	1.00:1
5th	0.75:1
Rev	5.03:1

Transmission Feature Programming

An eight (8) pin Delphi connector will be provided next to the steering column connector. This will contain the following input/output circuits to the transmission control module.

Function ID	Description	Wire assignment
C	PTO Request	142
J	Fire Truck Pump Mode (4th Lockup)	122 / 123
C	Range Indicator	145 (4th)
G	PTO Enable Output	130
	Signal Return	103

Transmission Shift Selector

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall provide a prognostic indicator (wrench symbol) on the digital display between the selected and attained indicators. The prognostics monitor various operating parameters to determine and shall alert you when a specific maintenance function is required.

Electronic Transmission Oil Level Indicator

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

Transmission Pre-Select with Auxiliary Brake

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.

Transmission Cooling System

The transmission shall include a water-to-oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.

Driveline

All drivelines shall be heavy duty metal tube and be dynamically balanced prior to installation.

Fuel Filter/Water Separator

The fuel system shall have a Fleetguard FS1003 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve and shut off located on each side of the filter to facilitate service.

A secondary fuel filter shall be included as approved by the engine manufacturer.

Fuel Lines

The fuel system supply and return lines from the fuel tank to the engine shall be black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall be connected with reusable steel fittings.

Electric Fuel Primer

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

Fuel Tank

The fuel tank shall have a capacity of sixty (60) gallons. The baffled tank shall be made of 14 gauge aluminized steel. The tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.

The tank is designed with dual draw tubes and sender flanges. A drain plug shall be in the bottom of the tank. The fuel tank shall be mounted in a convenient and easily accessible location. Rubber isolating pads shall be provided between the tank and any type of mounting brackets or strapping.

Fuel Tank Fill Port

The fuel tank fill port shall be provided on the driver's side of the vehicle.

Fuel Tank Serviceability Provisions

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes.

SUSPENSION AND STEERING

Front Wheel Bearing Lubrication

The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.

Front Shock Absorbers

Two (2) Bilstein inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system. The Bilstein front shocks shall allow independent tuning of the compression and rebound damping forces.

Front Suspension

A standard beam axle front suspension shall be designed and built to provide ample support, comfort of ride, and handling of the apparatus. A Weight Review is required in the Quote/Proposal.

Steering Column/ Wheel

The cab shall include an adjustable steering column which shall include tilt and telescoping adjustment and an 18.00 inch steering wheel located at the driver's position. The steering wheel shall be covered with black polyurethane foam padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

Power Steering Pump and Gear

The hydraulic power steering pump shall be a TRW and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type. The power steering gear shall be a TRW model TAS 65 or equal with an assist cylinder.

Power Steering Fluid Level Indicator

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

Chassis Alignment

The chassis frame rails shall be measured to insure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer.

Rear Axle

The rear axle shall be a single drive axle build by a brand name truck axle manufacturer and have an appropriately rated capacity for the projected load of the designed apparatus. The axle shall include precision forged and single reduction Hypoid differential gearing.

Rear Axle Ratio

The rear axle ratio shall allow an approximate top speed of 65 mph at the governed engine speed of 2200 RPM.

Rear Suspension

The rear suspension capacity shall be determined by the manufacturer. The single rear axle shall feature a self-leveling captive slipper type parabolic spring suspension. One (1) adjustable and one (1) fixed torque rod shall be provided. A Weight Review is required in the Quote Proposal.

TIRES AND WHEELS

Tires

The front and rear tires shall be Michelin brand tubeless radial XZE2 tread, of an appropriate size for the capacity of the vehicle. The Michelin tires shall have a minimum speed rating of 65 MPH when properly inflated to 120 pounds per square inch.

Tire Pressure Indicator

Provisions for a pop up style tire pressure indicator at each tire valve stem shall be made. The indicator shall provide visual indication of pressure in the specific tire.

Front Wheels

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch LvL One™ polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and shall include Alcoa's Dura-Bright® finish with XBR technology as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water.

Rear Wheels

The rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment with XBR® technology as an integral part of the wheel. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

Wheel Trim

Lug nut covers, baby moons, and high hats shall be provided for each wheel. These shall be constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification.

Wheel Wells

Wheel wells shall have semicircular black polymer composite inner liners that are bolted to the wheel well panel and supported inboard by brackets that are connected to the body framework. Each wheel well shall be a continuous piece with no breaks or ledges where road grime or debris may accumulate. This liner shall be removable for access to suspension assembly for repairs. There shall be no exception to the bolted wheel well inner liner requirement.

Fenderettes

Two (2) polished stainless steel fenderettes shall be provided and installed on body rear wheel well openings, one (1) each side. Rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering. A dielectric barrier shall be provided between the fender crown fasteners (screws) and the fender sheet metal to resist deterioration.

BRAKE AND AIR SYSTEM

ABS and Electronic Stability Control

The brake system shall be a four wheel ABS system and fully meet all DOT and NFPA standards. A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system meeting NFPA recommended capacity at a minimum. All air reservoirs provided on the chassis shall be labeled for identification.

The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.

A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the single rear axle. The ATC system shall apply the ABS when the drive wheels lose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

A switch (virtual or physical) shall be provided and properly labeled “mud/snow”. When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.

The Electronic Stability Control (ESC) unit is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle’s motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle’s lateral acceleration. The Controller Area Network (CAN) bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

Disk Brakes

The front and rear brakes shall be disc brakes with 17.00 inch vented rotors.

Park Brake

Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by satisfying the FMVSS parking brake requirements.

Park Brake Control

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color.

The parking brake actuation valve shall be mounted on the center of the tunnel within easy access of both the driver and officer positions.

Air Dryer

The brake system shall include a Wabco System Saver 1200 air dryer with an integral 100 watt heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the

compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure.

Air Compressor

The air compressor provided for the engine shall be a single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed.

Air Governor

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be mounted to the right frame rail.

Moisture Ejectors

A heated, automatic moisture ejector with a manual drain provision shall be installed on the wet tank of the air supply system. Automatic moisture ejectors with a manual drain provision shall be installed on all remaining reservoirs of the air supply system.

Air Tank Drain Cables (Extended)

There shall be manual pull air tank drain cables provided with the apparatus. The cables shall be extended to the outer edge of the apparatus to facilitate draining moisture from the chassis air tanks. A label shall be affixed indicating "Air Tank Drain".

Air Supply Lines

The air system on the chassis shall be plumbed with color coded reinforced nylon tubing air lines. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.

Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

FRAME

The frame rails shall be constructed of high yield strength low alloy steel. The frame design shall include the appropriate bracing and cross members to meet all Federal and State requirements for the GVWR load rating for this type of apparatus.

Rear Tow Device

The frame rails shall contain holes in each frame section for mounting tow eyes at the rear of the frame at a location defined by the apparatus manufacturer.

Frame Paint

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The powder coating and painting process shall be the standard process developed by the apparatus manufacturer for a custom apparatus.

The frame finish shall be completed prior to any attachment of components.

FRONT BUMPER

Front Bumper

The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be ASTM A36 steel, approximately .03 inches thick, measuring 12.00 inches high with a 3.00 inch flange with angled front corners.

The bumper shall be primed and painted to match the color of the cab.

Front Bumper Extension Length

The front bumper shall be extended approximately 21.00 inches ahead of the cab and shall include an apron constructed of aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

Mechanical Siren

The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ siren produces a distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep.

Mechanical Siren Location

The siren shall be recessed in the bumper on the driver side. If adequate room is not available the siren shall be mounted on a matching chrome pedestal.

Air Horn

The chassis shall include two (2) Buell Dual Emergency Horns 12" and 15" air horns. The air horns shall be trumpet style with a chrome finish.

Air Horn Location

The air horns shall be recess mounted in the front bumper face, one (1) on the right side of the bumper in the inboard position relative to the right hand frame rail and one (1) on the left side of the bumper in the inboard position relative to the left hand frame rail.

Air Horn Reservoir

One (1) air reservoir, with a 2084 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

Electronic Siren Speaker

The bumper shall include two (2) Cast Products Inc. model SA4301, 100 watt speakers which shall be recess mounted within the bumper fascia outboard of the frame rails with one (1) on the right side and one (1) on the left side in the outboard positions. Each speaker shall measure 6.20

inches tall X 7.36 inches wide X 3.06 inches deep. Each speaker shall include a flat mounting flange which shall be polished aluminum.

Bumper Extension Additions

There shall be a hose well provided on the front bumper extension. The hose well shall be made of smooth aluminum and shall have the edges flush with the gravel shield. There shall be modular floor tiles located in the bottom and drain holes provided in the corners.

There shall be an embossed aluminum diamond plate cover installed on the front bumper compartment. There shall be a notch in the front corner adjacent to the front discharge.

The rear edge of the cover shall be attached with a stainless steel hinge. The cover shall be equipped with a D-ring style latch to secure the cover in the closed position and utilize one (1) gas shock hold open device.

The hose well shall be located in the front bumper of the apparatus and shall be designed to hold 150' 1 ¾ DJ fire hose. This well should not extend below the level of the angle of approach.

Front Bumper Tow Hooks

Two (2) heavy duty tow hooks, painted to match the chassis frame, shall be installed in a rearward position out of the approach angle area, bolted directly to the side of the chassis frame.

CAB

Cab Tilt System

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission.

The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the “Down” button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

A safety device shall be installed to prevent accidental cab lowering.

Cab Tilt Auxiliary Pump

A manual cab tilt pump module shall be attached to the cab tilt pump housing.

Cab Tilt Limit Switch

A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The final adjustment of the switch shall be performed by the apparatus manufacturer to prevent damage to the cab or any bumper mounted option mounted in the cab tilt arc.

Cab Tilt Control

There shall be a cab tilt pendant control provided and installed in a convenient location for the operator.

There shall also be a cab tilt instruction plate located as close as possible to the control pendant for ease of operation.

Cab Windshield

The cab windshield shall be a wraparound design for maximum visibility.

The glass utilized for the windshield shall include standard automotive tint. The windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.

Each windshield shall be installed using black self-locking window rubber.

Cab Windows

All cab doors shall include a window. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

Glass Tint

All windows except for the front windshield shall have tinted glass. The specific light transmission shall be established in preconstruction and within legal limits of the law. No surface mounted tint will be accepted. The tint shall be manufactured into the glass assembly itself.

Climate Control

The cab shall be equipped with a combination defrost/heating and air-conditioning system. The system shall include ample rearward facing louvers to direct air for the crew area and ample louvers for driver and officer comfort. The system shall provide ample heating and cooling for the entire cab area.

The HVAC system shall be designed to produce 45,000 BTU of heat and 32,000 BTU of cooling at a minimum. The system shall offer 45,000 BTU of heat at 320 CFM for defrosting.

Climate Control Drain

Provisions should be made to drain and remove any condensation from the air conditioner system. Attention should be directed at keeping the condensation from draining into the cab area.

Climate Control Activation

The heating, defrosting and air conditioning controls shall be located on the LCD display and control screen.

A/C Condenser Location

The A/C condenser shall be installed on the center of the cab, on the lower portion of the roof.

A/C Compressor

The air-conditioning compressor shall be a belt driven, engine mounted, and designed for R-134A refrigerant.

Auxiliary A/C Cab

An auxiliary Danhard™ 125 volt air conditioning and heat system Model 50-2000 shall be installed. The preferable location for the evaporator/heater would be on the rear cab wall above the EMS cabinet. Acceptable locations for mounting the condenser will be discussed at preconstruction, however the vendor should understand the intent of using the Danhard system is to limit the overall height of the truck. Therefore, proposals mounting the unit on the raised portion of the roof will not be considered. The unit shall be approximately 13,500 BTU for A/C and 1250 watts for heat and wired to run off of shore power (and generator power while not plugged into the shore line, if that option is chosen).

Cab Insulation

The cab ceiling and walls shall include a minimum of 1.00 inch thick spray foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

Under Cab Coating and Insulation

Ceramic spray-on insulation and undercoating treatment shall be applied to the underside of the cab, inside the engine tunnel, under the seat risers and inside the cab face double wall area. The insulation shall be applied at a minimum of 0.040" thickness to the entire underside of the cab, inside the engine tunnel and the double wall area at the front of the cab.

Interior Trim

The interior of the Cab shall be completely trimmed in an aesthetically pleasing appearance, with care given to ensure pride of workmanship and quality. Black, Charcoal grey, or Grey are acceptable. Consideration should be given to ensure proper material is used where appropriate. Examples of this are using thicker material on the engine housing or non-slip surfaces on the flooring.

Dash Trim

The dash area shall be constructed of aluminum. Ventilation holes shall be manufactured in the top of the dash to ensure components do not overheat. A Mobile Data Terminal (MDT) provision should be included on the Officer side.

Mobile Data Terminal Locking Slide Tray

A locking slide tray shall be provided in the officer dash area for installation of a laptop computer. The platform shall be capable of sliding towards the officer and lock in the in and/or out positions for ease of operation. The platform shall be constructed of smooth aluminum and finish painted.

Cab Steps

Each cab entry door shall include an aluminum Grip Strut® grating with angled outer corners. The step shall feature a splash guard to reduce water and debris from splashing in to the step. The splash guard shall have an opening on the outer edge to allow debris and water to flow through rather than becoming trapped within the stepping surface. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The risers in each step shall be trimmed in bright aluminum tread-plate.

Interior Door Trim

The interior trim on the doors of the cab shall consist of an aluminum panel. The door panels shall include a Rhino Liner type finish in black, gray, or red. Color to be determined at preconstruction.

Cab Door Trim Reflective

In accordance with the current standards of NFPA, the body builder shall provide 96.00 square inches of reflective material on the interior of each cab door.

Interior Grab Handle "A" Pillar

There shall be two (2) 11.00 inch grab handles installed inside the cab, one on each "A" post at the left and right door openings. The left handle shall be located approximately 7.00 inches above the bottom of the door window opening and the right handle shall be located

approximately 2.00 inches above the bottom of the door window opening. The handles shall assist personnel in entering and exiting the cab.

Interior Grab Handle Front Door

Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab.

Interior Grab Handle Rear Door

A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00 inch long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.

Interior Trim Sun Visor

The header shall include two (2) sun visors, one (1) on each side forward of the driver and officer seating positions above the windshield. The visors are easily adjusted and can be placed into a chosen position with one hand and locked in place by a thumbscrew.

Cab Paint Interior

The inner door panel surfaces shall be coated with Rhino type Liner black pebble-grain texture finish or red. Color to be determined at preconstruction.

Header Trim Interior Paint

The metal surfaces in the header area shall be painted black or grey.

Trim Center Dash Interior Paint

The entire dash shall be coated with black Rhino type Liner or equally durable material.

Windshield Wiper System

The cab shall include a dual arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers which shall be affixed to a radial wet arm. The system shall include a single motor which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position.

Electronic Windshield Fluid Level Indicator

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message.

Cab Door Hardware

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of aluminum with a chrome plated finish.

The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

Door Locks

Power door locks shall be provided for each cab door. The locks can be operated remotely by the driver of the vehicle or individually at each door. An unlabeled door lock switch shall be provided on the pump panel.

Grab Handles

The cab shall include one (1) 18.00 inch knurled, anti-slip, one-piece exterior assist handle behind each cab door. The grab handle shall be made of 14 gauge 304- stainless steel and be 1.25 inch diameter to enable non-slip assistance with a gloved hand.

Rearview Mirrors

Ramco model 6018-FFHR-750HR bus style mirrors shall be provided. The mirror heads shall be polished cast aluminum and shall measure 9.75 inches wide X 13.00 inches high with an additional top mount convex assembly. The mirrors shall be mounted one (1) on each front cab corner radius below the windshield with 18.00 inch long polished cast aluminum arms.

The mirrors shall feature a remote controlled heated full flat glass and a top mounted remote controlled heated convex glass. The mirror control switches shall be located within easy reach of the driver. The mirrors shall be manufactured using the finest quality non-glare glass and shall feature a rigid mounting thereby reducing vibration. The mirrors shall be corrosion free under all weather conditions.

Rearview Mirror Heat Switch

The heat for the rearview mirrors shall be controlled through a virtual button on the multiplex display.

Cab Fender

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 5.00 inches wide made of 12 gauge polished aluminum.

Mud Flaps Front

The front wheel wells shall have mud flaps installed on them.

CAB ELECTRICAL

Ignition

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a one-quarter turn Cole Hersee type switch, both of which shall be mounted to

the left of the steering wheel on the dash. A chrome push type starter button shall be provided adjacent to the master battery and ignition switches.

Each switch shall illuminate a green LED indicator light on the dash when the respective switch is placed in the “ON” position.

The starter button shall only operate when both the master battery and ignition switches are in the “ON” position.

Master Warning Switch

A master switch shall be included, as a virtual button on the display and control screen which shall be labeled “E Master” for identification. The button shall feature control over all devices wired through it. Any warning device switches left in the “ON” position when the master switch is activated shall automatically power up.

Auxiliary 12 volt outlets

The cab shall include two (2) 12 volt cigarette lighter type receptacles in the dash to provide a power source for 12 volt electrical equipment. The receptacles shall be wired to be live with the battery master switch.

The cab shall include two (2) 12 volt USB charging only plugs to accommodate cell phone or computer chargers.

Accessory Power

Provisions should be made to include two (2) power sources. One (1) power source shall be wired direct to battery and one (1) power source shall be wired through the ignition system. Studs or power bars shall provide the necessary access for wiring.

Battery

The single start electrical system shall include six (6) BCI 31 950 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541. The cables shall have encapsulated ends with heat shrink and sealant.

Battery Trays

The batteries shall be securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be properly secured.

Battery Box Cover

Each battery box shall include a steel cover which protects the top of the batteries. Each cover shall include flush latches which shall keep the cover secure as well as a black powder coated handle for convenience when opening.

Battery Cable

The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed and encapsulated at the ends with heat shrink and sealant.

Battery Jumper Stud

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

Alternator

The charging system shall include a 270 amp Leece Neville 12 volt alternator. The alternator shall include a self-excited integral regulator.

Battery Conditioner

A Kussmaul 1200 Pump Plus battery conditioner shall be supplied. The battery conditioner shall be mounted in the cab behind the driver's seat. The battery conditioner shall not be wired to any electrical inlets.

Battery Conditioner Display

A Kussmaul standard bar graph battery condition display shall be installed. Location to be determined at preconstruction meeting.

Auxiliary Air Compressor

A Kussmaul Auto Pump 12V air compressor shall be supplied. The air compressor shall be installed behind the officer's seat. The air compressor shall be plumbed to the air brake system to maintain air pressure.

Electrical Inlet

A Kussmaul 30 amp super auto-eject electrical receptacle with red cover shall be supplied. It shall automatically eject the plug when the starter button is depressed. The receptacle shall be wired for 120 volt, 30 amp single phase service. The receptacle shall be located on the driver's side, at the rear of the apparatus body.

A single item or an addition of multiple items connected to the inlet must not exceed a 30 amp 120-volt electrical rating.

KEY SECURE

A Knox System KeySecure 1 with Blue Strobe (Model 2611) shall be provided by the City of North Richland Hills and installed in the cab in a location determined during the pre-construction conference.

SEATING

Seat Belt Warning

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the display and control screen, an indicator light in the instrument panel, and an audible alarm. The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have the seat belts fastened.

Seat Material

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.

Seat Color

All seats supplied with the chassis shall be gray in color. All seats shall include red seat belts.

Embroidered Seat Backs

All seats shall have the current patch design of the North Richland Hills Fire Department embroidered into the headrest portion of the seat.

Seat Driver

The driver's seat shall be an H.O. Bostrom Sierra model seat with air suspension. The four-way seat shall feature 3.00 inch vertical travel air suspension and manual fore and aft adjustment with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock.

The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semi-rigid stalk extending from the seat base within easy reach of the occupant. Seat belt extensions to accommodate larger firefighters shall be included.

The driver's seat shall feature a two (2) way adjustable lumbar support and offer an infinite fully reclining adjustable titling seat back. The seat back shall also feature a contoured head rest.

The driver's seat shall be installed in an ergonomic position in relation to the cab dash.

Seat Officer

The officer's seat shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat, and cushion. The seat shall be a non-adjustable type seat.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. Seat belt extensions to accommodate larger firefighters shall be included.

The officer's seat back shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

The officer's seat shall be mounted offering increased leg room for the occupant.

Seat Crew Rear Facing

The crew area shall include two seats in the rear facing position located behind the Driver and Officer seats. The seat shall be mounted in a fixed position and set at an approximate 5 degree angle so that crew members are oriented toward the center of cab offering additional room for

each occupant. The seats shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat, and cushion. Armrest shall be provided for the crew seats.

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip. The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. Seat belt extensions to accommodate larger firefighters shall be included.

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

CAB LIGHTING

Headlights

The cab front shall include rectangular LED headlamps with separate high and low beams mounted in bright chrome bezels. The headlights shall be located on the front fascia of the cab directly below the front warning lights.

Front Turn Signals

The front fascia shall include Whelen model M6 4.00 inch X 6.00 inch amber LED turn signals which shall be installed in chrome housing above and outboard of the front warning and head lamps.

Side Turn/Marker Lights

The sides of the cab shall include LED side marker lights which shall be provided just behind the front cab radius corners.

Headlight and Marker Light Activation

The headlights and marker lights shall be controlled via a virtual button on the multiplex display. There shall be a virtual dimmer control on the LCD display to adjust the brightness of the dash lights. The headlamps and markers lamps shall illuminate to 100% brilliance when the ignition switch is in the "On" position and the parking brake is released. The headlights and marker lights shall turn off when the park brake is engaged.

Ground Lights

Each door shall include an NFPA compliant LED ground light mounted to the underside of the cab step below each door. The ground lighting shall be activated by the opening of the door on the respective cab side when the parking brake is set, and through a virtual button on the multiplex display and control screen. The light shall be from a brand name manufacturer and provide adequate lighting.

Step Lights

The step located at each door shall include a LED light which shall activate with the opening of the respective door. The lights shall be from a brand name manufacturer and provide adequate lighting.

Front Scene Lights

The front of the cab shall include two (2) Whelen model Pioneer PFA2 contour roof mount scene lights installed on the brow of the cab inboard of the outer front marker lights.

Each lamp head shall have two (2) 12 volt high intensity LED banks. Each lamp head shall draw 6.0 amps and generate 6,000 lumens. Each lamp head shall be adjustable up to 20-degrees. Each lamp head shall measure 4.25 inches in height X 14.00 inches in width. The lamp heads and brackets shall be powder coated to black

Front Scene Lights Activation

The front scene lighting shall be activated by a button on the display and control screen.

Side Scene Lights

The cab shall include two (2) Whelen model Pioneer PSP1 radius mount lights installed one (1) on each side of the cab and shall be mounted on the upper side radius of the cab above the mid crew area with the rear of the light in line with the center of the front axle.

Each lamp head shall have one (1) 12 volt high intensity LED panel. Each light shall draw 6.0 amps and generate 7,000 lumens. Each lamp head shall be mounted at an 8-degree angle within the radius mount brackets. Each lamp head shall measure 4.25 inches in height X 8.18 inches in width. The lamp heads shall be powder coated black.

Side Scene Activation

The scene lights shall be activated by two (2) buttons on the display and control screen(s), one (1) for each light, and by opening the respective side cab doors.

Interior Overhead Lights

The cab shall include a two-section, red and clear Weldon incandescent dome lamp located over each door. The dome lamps shall be rectangular in shape and shall measure approximately 9.50 inches in length X 5.00 inches in width with a black colored bezel. The clear portion of each lamp shall be activated by opening the respective door and via the multiplex display and both the red and clear portion can be activated by individual switches on each lamp.

An additional two-section Weldon incandescent red and clear lamp shall be provided over the engine tunnel which can be activated by individual switches on the lamp.

Auxiliary 110 Volt LED Light.

An auxiliary 110 volt led light shall be installed in the crew portion of the cab. This light is used to provide adequate lighting while checking equipment stored in the crew area of the cab. The light shall be supplied power from the shore line. Similar to part#PELCC.

Cab Spotlights

The cab shall include two (2) Golight model 3000 remote control spotlights. Each spotlight shall be mounted on the flat surface of the cab roof as far forward and outboard as possible. Each spotlight shall feature a 65 watt halogen lamp with 500,000 candle power output capable of 360-degree rotation and 135-degree vertical adjustment. Each spotlight shall include a wired remote control.

Do Not Move Apparatus Light

The front headliner of the cab shall include an amber light clearly labeled "Do Not Move Apparatus". In addition to the amber light, a distinctive audible alarm shall be included which shall sound while the light is activated.

The light shall be a Whelen L32LF programmed to a unique flash pattern and center mounted between driver and officer to be clearly visible.

The light and alarm shall be interlocked for activation when a cab door is not firmly closed, an apparatus compartment door is not closed or a step is not fully secured when the parking brake is released.

Headlight Flasher

An alternating high beam headlight flashing system shall be installed into the high beam headlight circuit which shall allow the high beams to flash alternately from left to right.

Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled "On Scene" when the park brake is applied.

Headlight Flasher Switch

The flashing headlights shall be activated through a button on the display and control screen.

Inboard Front Warning Lights

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn.

The lights shall be mounted to the front fascia of the cab within a chrome bezel. The warning light patterns will be agreed upon at the preconstruction meeting. The warning lights shall be red with a clear lens.

Outboard Front Warning Lights

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right outboard positions. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted to the front fascia of the cab within a chrome bezel. The warning lights shall be set to emit the “DoubleFlash 150” left/right flash pattern. The warning lights shall be red with a clear lens.

Bumper Face Warning Light

The front bumper face shall include two (2) Whelen M6 series 4.31 inch tall X 6.75 inch wide Super LED® warning lights located between the frame rails in the right and left side outboard positions. The warning lights shall feature multiple flash patterns including steady burn. The lights shall be surface mounted within a chrome bezel. The warning lights shall be set to flash pattern ninety-four (94) DoubleFlash 150 I/O. The warning lights shall be red with a clear lens.

Bumper Corners

The front bumper corners shall include two (2) Whelen M6 series 4.31 inch tall X 6.75 inch wide Super LED® warning lights. These will come on as a steady burn when the respective turn signal is activated.

Front Warning Switch

The front warning lights shall be controlled through the display and control screen. This switch shall be clearly labeled for identification.

Intersection Warning Lights

The chassis shall include two (2) Whelen M6 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn. The lights shall be set to flash pattern DoubleFlash 150 left/right. The lights shall be red with a clear lens and be mounted on the side of the bumper.

Side Warning Lights

The cab sides shall include four (4) Whelen M6 Super LED warning lights, two (2) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel. The light shall be programmed to emit the "DoubleFlash 150 left/right" flash pattern. The warning lights shall be red with clear lens.

One (1) warning light shall be mounted over each front wheel well directly over the center of the front axle and one (1) mounted behind each rear crew doors at a height of approximately 36 inches.

Side and Intersection Warning Switch

The side warning lights shall be controlled through the display and control screen. This button shall be clearly labeled for identification.

Cab Front Lightbar

The lightbar provisions shall be for one (1) Whelen brand Edge Freedom FN72QLED lightbar mounted centered on the front of the cab roof. The lightbar shall be 72.00 inches in length. The lightbar shall feature twelve (12) red LED lights and two (2) clear LED lights. The clear lights shall be disabled with park brake engaged. The cable shall exit the lightbar on the right side of the cab.

The Whelen Edge lightbar shall incorporate a 3M Opticom device. The Opticom shall be wired to only work when the emergency lighting is activated and disengage when the airbrake is applied.

The light bar shall be controlled by the display and control screen. This button shall be clearly labeled for identification.

ROTO-RAY WARNING LIGHT

A Roto-Rays® warning light shall be provided on the cab. The Roto-Rays light shall consist of three (3) round chrome heads, each equipped with an LED light. The lights shall be two (2) red

and one (1) clear. The Roto-Rays light shall be installed on the center of the cab grille using a custom bracket.

When activated, the entire light head assembly shall rotate at 200 RPM. When the parking brake is engaged the light shall stop rotating. The Roto-Rays light shall have individual circuits for rotation and illumination so the lamps can remain illuminated when not rotating. When activated the Roto-Rays lights shall be steady burn while rotating and flashing while not rotating.

The Roto-Rays® front warning light(s) shall be separately controlled through the display and control screen.

SIREN AND HORN CONTROLS

Siren Control Head

A Whelen 295HFS2 electronic siren control head with remote amplifier shall be provided and flush mounted in the switch panel with a location specific to the customer's needs. The siren shall feature 200-watt output, hands free mode and shall be in "standby" mode awaiting instruction. The siren shall offer radio broadcast, public address, wail, yelp, or piercer tones and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected.

Horn Button Selector Switch

A button on the display and control screen shall be provided to allow control of either the electric horn or the electronic siren from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position to meet FMCSA requirements.

Air Horn Activation

The air horn activation shall be accomplished by a Linemaster model SP491-S81 foot switch mounted in the front section of the cab for use by the driver and by a momentary rocker switch in the switch panel on the dash for use by the officer. Rocker switch shall be clustered with other switches utilized for similar purpose. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

Mechanical Siren Activation

The mechanical siren shall be actuated by a Linemaster model SP491-S81 foot switch mounted in the front section of the cab for use by the driver and by a momentary rocker switch in the switch panel on the dash for use by the officer. Rocker switch shall be clustered with other switches utilized for similar purpose. A red momentary siren brake rocker switch shall be provided in the switch panel on the dash.

The siren shall only be active when master warning switch is on to prevent accidental engagement.

Back-Up Alarm

An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring.

The instrument panel shall contain the following gauges:

One (1) electronic speedometer shall be included. The speedometer shall read from 0 to 100 MPH.

One (1) electronic tachometer shall be included. The scale on the tachometer shall read from 0 to 3000 RPM.

One (1) two-movement gauge displaying primary system, and secondary system air volumes and integral LCD odometer/trip odometer shall be included on the lower portion of the LCD. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI). The air pressure scales shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate a low air pressure, as well as a message on the LCD screen. The odometer shall display up to 999,999 miles. The trip odometer shall display 9,999 miles. The

LCD shall display Transmission Temperature in degrees Fahrenheit on the upper portion of the LCD. The LCD screen shall also be capable of displaying certain diagnostic functions.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, fuel level, voltmeter, and an indicator bar displaying Diesel Exhaust Fluid (DEF) LED bar shall be included. The scale on the engine oil pressure gauge shall read from 0 to 120 pounds per square inch (PSI). The engine oil pressure scale shall be linear to operate with an accuracy of 1 degree of the measured. A red indicator light in the gauge shall indicate a low engine oil pressure, as well as a message on the LCD screen. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (F). The coolant temperature scale shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate high coolant temperature, as well as a message on the LCD screen. The scale on the fuel level gauge shall read from empty to full as a percentage of fuel remaining. An amber indicator light shall indicate low fuel at 25% tank level. The scale on the voltmeter shall read from 10 to 16 volts with a red indication zone on the gauge showing critical levels of battery voltage. A red indicator light shall indicate high or low system voltage, as well as a message on the LCD screen. The scale on the DEF LED bar will consist of four (4) LEDs displaying levels in increments of 25% of useable DEF in green. Upon decreasing levels, the indicator bar will change colors to notify the driver of decreasing levels of DEF and action will be required. An amber indicator light shall indicate low levels of DEF, as well as a message on the LCD screen and an audible alarm.

The instrument panel shall include a light bar that will contain the following LED indicator lights:

Red Lamps

Low Primary Air Pressure (located in gauge)

Low Secondary Air Pressure (located in gauge)

Stop Engine-indicates critical engine fault

Air Filter Restricted-indicates excessive engine air intake restriction

Park Brake-indicates parking brake is set

Seat Belt Indicator-indicates when a seat is occupied and corresponding seat belt remains unfastened

Volts-indicates high or low system voltage (located in gauge)

Low Oil Pressure-indicates low engine oil pressure (located in gauge)

High Coolant Temperature-indicates excessive engine coolant temperature (located in gauge)

DEF Level Bar-DEF level is at critically low level (located in gauge)

Amber Lamps

MIL-indicates an engine emission control system fault

Check Engine-indicates engine fault

Check Trans-indicates transmission fault

High Transmission Temperature-indicates excessive transmission oil temperature

ABS-indicates anti-lock brake system fault

Wait to Start-indicates active engine air preheat cycle

HEST-indicates a high exhaust system temperature

Water in Fuel-indicates presence of water in fuel filter

DPF-indicates a restriction of the diesel particulate filter

Regen Inhibit-indicates regeneration has been postponed due to user interaction

Range Inhibit-indicates a transmission operation is prevented and requested shift request may not occur.

SRS-indicates a problem in the RollTek supplemental restraint system

Low Fuel-indicates low fuel, (located in gauge)

DEF-indicates a low level of DEF fluid (located in gauge)

DEF Level Bar-DEF level is at a low level (located in gauge)

Green Lamps

Left and Right turn signal indicators

ATC-indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system

High Idle-indicates engine high idle is active.

Cruise Control-indicates cruise control is active

OK to Pump-indicates the pump engage conditions have been met

Pump Engaged-indicates the pump is currently in use

Auxiliary Brake-indicates secondary braking device is active

DEF Level Bar-indicates useable levels of DEF: 25%, 50%, 75%, 100% (located in gauge)

Constant Audible Alarms from Gauge Package

High Trans Temp

High or Low Voltage

Seatbelt

Check Engine

Check Transmission

Stop Engine

Low Air Pressure

Fuel Low

Water in Fuel

ESC
High Coolant Temperature
Low Engine Oil Pressure
Low Coolant Level
Low DEF Level

Oscillating Audible Alarms from Gauge Package

Air Filter
Extended Left and Right Turn remaining on
Cab Ajar
Door Ajar
Low Oil Level

Backlighting Color

The instrumentation gauges and the switch panel legends shall be backlit using LED backlighting. Manufacturer shall state color options.

Switches Center Panel

The center dash panel shall include no rocker switches or legends.

Switches Left Panel

The left dash panel shall include one (1) windshield wiper/washer control switch located in the left hand side of the panel. The switch shall have backlighting provided.

Switches Right Panel

The right dash panel shall include eight (8) rocker switch positions in a four (4) over four (4) switch configuration.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

Radio

A high quality, brand name, radio with weather band, AM/FM stereo receiver, compact disc (CD) player, rear iPod input pigtail connector, satellite radio capability, a front panel mini stereo input jack, and four (4) speakers shall be installed in the cab. The CD player shall be compatible with CD-R, CD-RW and MP3 format discs. The radio shall be installed in the right hand overhead position. The speakers shall be installed inside the cab with two (2) speakers recessed within the headliner of the front of the cab just behind the windshield and two (2) speakers on the upper rear wall of the cab.

Am/Fm Antenna

A small antenna shall be located on the left hand side of the cab roof for AM/FM and weather band reception.

Camera

A heavy duty rearview camera system from a brand name manufacturer shall be installed in the body to afford the driver a clear view to the rear of the vehicle and one (1) camera with a teardrop shaped chrome plated housing shall be mounted on the officer side of the cab below windshield ahead of the front door at approximately the same level as the cab door handle.

The cameras shall be wired to the driver side multiplex display screen and default to camera view when activated. The rear camera shall activate when the transmission is placed in reverse and the right camera shall activate with the right side turn signal. Each camera shall also be activated by a button on the multiplex display.

Two-Way Radio Installation

The Motorola radio and antenna supplied by the City of North Richland Hills shall be installed as directed. Preferred site for the radio shall be in the overhead position of the officer seat.

Wireless Intercom System

A SetCom wireless headset system shall be installed on the apparatus. The system shall be an IM-900 system designed for four (4)-person headset operation, with a range of over 300 feet. The system shall provide auxiliary input/outputs for optional devices and advanced electronics

for increased performance.

The system shall consist of the following specified components:

- One (1) IM - 900 Master Station.
- One (1) 9RC-18MU4-3 Radio Cable.
- Two (2) CSB-900W3 Kit – Wireless Headset with Base.
- Two (2) JS-900-20 Jump Seat Station.
- Two (2) CSB-901W3-3Kit Wireless Headset with Base
- Four (4) 25-0735-10 Adapter Cable 900 Wireless

The system shall interface with the Motorola Spectra radio provided by the City. The master station shall be installed in the center overhead in the cab in a location accessible for service. Power and ground wires for the intercom system shall be individually labeled.

CAB LABELING

Cab Required Labeling

Signs that state "Occupants must be seated and belted when apparatus is in motion" shall be provided. The signs shall be visible from all seating positions.

There shall be a lubrication plate mounted inside cab listing the type and grade of lubrication used in the following areas on the apparatus and chassis:

- Engine oil
- Engine Coolant
- Transmission Fluid
- Pump Transmission Lubrication Fluid (if applicable)
- Drive Axle Lubrication Fluid
- Generator Lubrication Fluid (if applicable)
- Tire Pressures

There shall be a high-visibility label installed in a location clearly detectable to the driver while in the seated position.

The label shall indicate the following specified information:

- Overall Height listed in feet and inches.
- Overall Length listed in feet and inches.
- Overall GVWR listed in tons or metric tons.

Cab Helmet Warning Label

A high-visibility label shall be installed in a location clearly detectable from each seating position. The label shall indicate the following specified information.

“DO NOT WEAR HELMET WHILE SEATED”

CAB MISCELLANEOUS

EMS Storage Cabinet

There shall be a single cabinet fabricated out of smooth aluminum installed in the chassis cab. The cabinet shall be constructed allowing for an opening of approximately 34" wide x 18" deep and as tall as possible while allowing for installation of auxiliary A/C. The compartment shall be installed in the center of the rear wall.

The cabinet shall be enclosed by a R.O.M. or AMDOR rollup door on the front surface and have heavy duty netting in place on the side to secure contents, with two (2) shelves and adjustable shelf tracking installed. The shelves shall be fabricated of smooth aluminum and shall have 1" formed lips to retain its contents and provide rigidity. The exterior and interior of the cabinet; and each shelf shall be Rhino liner type finish in black pebble grain texture or red. To be determined in preconstruction.

Shoreline Connected Duplex Receptacles

Two (2) NEMA 5-15 120V/15A shoreline powered duplex receptacle with weather resistant cover shall be located inside EMS cabinet. The receptacles shall be located at the top and bottom of the cabinet. The receptacles may be used to charge flashlights, radios, and other miscellaneous 120 volt components.

Custom Map Console

There will be a custom designed map book holder in the cab.

Drink Holder

Each seating position shall have a drink holder installed nearby

PUMP COMPARTMENT

The complete apparatus pump compartment shall be constructed of a combination of structural tubing and formed sheet metal. The same type materials used in the body shall be utilized in the construction of the pump compartment. The structure shall be welded utilizing the same A.W.S. Certified welding procedure as used on the structural body module. These processes shall ensure the quality of structural stability of the pump compartment module.

The pump compartment module shall be separated from the apparatus body.

Pump Module Mounting System

The entire pump module assembly shall be mounted so that it “floats” above the chassis frame rails with vibration and torsion isolator assemblies. The body substructure shall be mounted above the frame to allow independent flexing to occur between the body and the chassis. Each assembly shall be mounted to the chassis frame rails with steel, gusseted mounting brackets. Each bracket shall be painted or powder coated for corrosion resistance.

The rubber type isolators shall be of a specific durometer to carry the necessary loads of the apparatus body, equipment, tank, water, and hose. The quantity of mounts utilized shall correspond directly to the anticipated weight being supported.

There shall be no welding to the chassis frame rail sides, web or flanges, or drilling of holes in the top or bottom frame flanges between axles. All body to chassis connections shall be bolted.

Side Operators Panel

The pump operator's panel shall be located on the left, upper side of the apparatus pump compartment. The panel shall be split into an upper and lower section. The upper panel shall house all gauges and controls and be hinged to allow easy access to those components. The door shall have a stainless steel hinge, dual point chrome push button latches and a rubber seal provided to prevent excessive moisture from entering or leaving the pump house. The lower panel shall be a removable panel attached with mechanical fasteners.

Valve controls shall be immediately adjacent to its respective gauge. The valve controls shall be properly labeled and color coded for ease of use. All markings shall be permanent in nature.

There shall be a cut out in the front of the pump box on the right and left side to accommodate a

25' section of 5" hose rolled up.

Panel Lights

Adequate illumination shall be provided for all gauges and controls by means of a reinforced embossed diamond plate light shield with four (4) 9" OnScene LED "Night Stik" lights on the left side above the gauge panel or an adequate amount of lights space permitting.

The right side pump compartment shall have a reinforced embossed aluminum diamond plate light shield installed with four (4) 9" OnScene LED "Night Stik" lights to illuminate the plumbing components.

There shall be a switch located on the operators pump panel to turn three (3) of the pump panel lights and the right side lights on or off. This switch shall also activate any area step lighting. The fourth light on the pump panel shall illuminate when the pump is engaged and it is "OK TO PUMP".

Pump Compartment Service Access

The front portion of the pump compartment structure (directly behind the chassis cab) shall not be overlaid to provide an opening for access to the midship fire pump.

Pump Compartment Structure

The structural framework of the pump compartment shall be self-supportive and independent of the apparatus body. The pump module shall be approximately seventy-five (75) inches in width as measured laterally across the apparatus. The width of the apparatus as measured longitudinally (measured within the wheelbase dimension of the apparatus) shall be specified in the remainder of the specifications.

The width of the pump compartment (front to back) shall not exceed sixty (60) inches

Apparatus Labeling

The apparatus shall be descriptively tagged with color coded metal labels. The labels shall be applied near the apparatus features that require a user function description. Wherever necessary,

the labels shall be color coded to differentiate controls and their respective functions to simplify and clarify complex configurations.

Bezels for Discharge Gauges

Deluxe metal bezels powder coated and color coordinated with discharge control handles shall be supplied on all discharge pressure gauges.

Bezels for Valve Control Handles

Mirrored stainless steel bezels shall be supplied around the openings in the pump panels for all valve control handles. All valve handles shall be color coordinated with respective discharges.

Bezels for Discharges and Inlets

Mirrored stainless steel bezels shall be supplied around the openings in the pump panels for all discharge and suction inlet fittings. All discharges shall be color coordinated with respective discharges.

Pump Panels

Each side pump panel shall be a black coated aluminum. Both openings shall be hinged and accessible by quick-release type latches closing against a door seal. The panels, when opened, shall provide a large access opening to the pump for service.

All panels shall be made from heavy duty black covered aluminum capable of withstanding the effects of extreme weather and temperature.

Running Boards

The running boards shall be made of a structural tubular framework. The tubular frame support all loads by transmitting the loads through the pump compartment structure directly to the chassis frame rails.

The running boards shall be independent of the apparatus body and shall be integrated to the pump compartment structure only, eliminating any pump compartment to body interference. This is essential in keeping a truly 'modular' configuration. Slip-resistant abrasive adhesive materials

shall be applied to the top surface of the running board framework to provide a suitable stepping surface. Each running board shall have an embossed aluminum diamond plate overlay installed. The stepping area shall be as large as possible, overlapping the perimeter of the structural running board framework

Slide Out Platform

On each side there shall be a slide out platform provided and installed under the pump compartment running board. The platform shall incorporate an OnScene slide assembly and shall be as wide as possible to fit the pump compartment and shall be approximately 16" deep.

The platform surface shall be embossed aluminum diamond plate aluminum material to provide a slip resistant stepping surface. The platform shall lock into place while in the extended or stowed positions.

If the platforms are not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the "Door Open" indicator light in the cab to warn the crew.

Testing Ports

Test port connections for pressure and vacuum shall be provided at the pump operator's panel. One shall be connected to the intake side of the pump, and the other to the discharge manifold side of the pump. They shall have 0.25 in. standard pipe thread connections and be manufactured of non-corrosive polished stainless steel or brass plugs.

Pressure Governor

A Fire Research Corp. TotalControl™ Pressure Governor (j1939) shall be supplied with the chassis and installed on the pump panel. The PSG allows for pump pressure control and throttle control.

The PSG installation shall be wired specifically for the Cummins electronic engine.

Suction Relief Valve

An Elkhart suction relief valve with a range of pressure adjustment from 75 to 250 PSI shall be installed inside pump compartment piped to the suction side of the pump.

The valve shall be preset at 125 PSI suction inlet pressure. The valve shall be installed inside the pump compartment where it will be easily accessible for future adjustment. The excess water shall be plumbed to the atmosphere via the unloader pipe and shall dump on the opposite side of the pump operator.

The valve shall come with 2 1/2" male NST threads that can be capped if the relief valve fails in the open position. For normal pumping operations, the relief valve shall not be capped and there shall be a placard stating "DO NOT CAP" installed.

Heat Exchanger

The supplementary heat exchanger cooling system provided on the chassis, it shall be complete to the discharge side of the fire pump through to the engine compartment, without intermixing, for absorption of excess heat.

The heat exchanger shall be adequate in size to maintain safe operating temperature of the coolant in the pump drive engine and not in excess of the engine manufacturer's temperature rating, under all pumping conditions. Appropriate drains shall be provided to allow draining the heat exchanger to prevent damage from freezing.

A manual shut-off, Class One 1/4" Ball Valve (#14BV) shall be supplied at the pump operator's position.

Pump Compartment Top Overlay

The top of the pump compartment shall be overlaid with 3/16" embossed aluminum diamond plate, meeting the minimum NFPA standard requirements for slip resistance.

MIDSHIP PUMP

The pump shall have the capacity of 1500 gallons per minute, measured in U.S. Gallons, the

pump shall be D rated to 1500 gpm. The pump preference is a Hale Fire Pump, QMax-1500, single stage with sacrificial anodes. Vendors that choose to propose alternate pump solutions should quote the Hale fire pump and list an alternative. (See Appendix A).

The entire pump shall be manufactured at the pump manufacturer's factory. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA Pamphlet No. 1901. All moving parts in contact with water shall be of high quality bronze or stainless steel. The pump shall be free from objectionable pulsation and vibration.

The pump drive unit shall be of sufficient size to withstand up to 16,000 lbs/ft of torque of the engine in both road and pump operating conditions. The drive unit shall be completely manufactured and tested at the pump manufacturer factory.

The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

The pump must deliver the percentages of rated capacity at these pressures:

- 100% of rated capacity at 150 pounds net pressure,
- 100% of rated capacity at 165 pounds net pressure,
- 70% of rated capacity at 200 pounds net pressure,
- 50% of rated capacity at 250 pounds net pressure.

Master Drain Valve

There shall be a manifold type drain valve installed in the pump compartment. All pump drains shall be connected to the master drain valve. The drain valve shall be controlled on the left side lower pump house sill. The control shall be a hand wheel knob marked “open” and “closed”.

The drain shall be located such that it shall not interfere with pumping operations or function such as soft suction hoses, etc. nor shall it protrude past the outer edge of the apparatus, to prevent damage to the valve.

In some cases, it is necessary to locate the master drain in a secondary location to ensure proper function, such as draining, or if no lower or vertical sill exists. In this event, the drain shall be located below the bottom outside edge of the hose body near the forward most corner on the driver's side hose body. The drain shall not protrude past the outer edge of the body, thus preventing damage to the valve.

Pump Seal

A mechanical seal shall be supplied on the inboard side of the pump. The mechanical seal must be two (2) inches in diameter and shall be spring-loaded, maintenance-free and self-adjusting. Mechanical seal construction shall be a carbon sealing ring, stainless steel coil spring, Viton rubber cup, and a tungsten carbide seat.

Pump Shift

The drive unit shall be provided with an air pump shift system. The control valve shall be a spring loaded guard lever that locks in "Road" or "Pump" mode.

To the left of the pump shift control, there shall be two indicator lights to show the position of the pump when the control is moved to "Pump" position. A green light shall be energized when the pump shift has been completed and shall be labeled "PUMP ENGAGED"; a second green light shall be labeled "OK TO PUMP" energized when both the pump shift has been completed and the chassis automatic transmission is engaged.

A third green indicator light shall be installed adjacent to the throttle on the pump operator's panel. This light shall be labeled "Throttle Ready".

In addition to this indicator light, an additional indication shall be provided to the pump operator at the panel when the pump is ready to pump. This additional indication shall be that one (1) of the operator's panel illumination lights will only activate when the "OK TO PUMP" indicator is lit. The remaining panel lights shall be controlled via push button switch.

Primer System

The priming pump shall be a Trident Emergency Products compressed air powered, high efficiency, multi-stage, venturi based Air Prime System. All wetted metallic parts of the priming system are to be of brass and stainless steel construction. A single panel mounted control will activate the priming pump and open the priming valve to the pump. The system shall employ an 80 psi pressure protection valve to prevent loss of air brakes to the chassis.

Steamer Inlets

There shall be two (2) 6" inlets installed, one on either side of the pump. The inlets shall each have short suction tubes so the inlets will protrude 1-2" away from the side panels. This will allow for an external valve to be connected while keeping the valve from protruding past the running board. Each inlet shall have 6" NST threads and a removable strainer.

Electronic Intake Waterway Valves

There shall be two (2) full flowing Master Intake Valves (MIV-E) installed with the apparatus. The valve shall be electrically controlled and installed between the main pump body casting and the steamer inlet casting.

The control shall include status lights that indicate valve positioning; open, closed, or traversing from one position to another. The valve shall have a manual override control provided and installed in an easily accessible location.

The valve shall be rated at 1500 PSI and be capable of withstanding the same pressures as the pump.

The MIV-E shall have a built-in adjustable pressure relief valve, with a quarter turn air bleeder valve. The bleeder valve shall be plumbed to the water supply side of the intake valve (by a 3/4" NPT port), to help evacuate air from the system and avoid cavitation of the pump.

6" Caps

There shall be two (2) 6" long handled caps installed on the apparatus. The caps shall be National Standard Thread.

Pump Cooling Line

There shall be a 3/8" line run from the pump to the water tank to assist in keeping the pump water from overheating. There shall be a 1/4 turn on/off valve installed on the operator's panel.

Stainless Steel Plumbing

All auxiliary suction and discharge plumbing related fittings, and manifolds shall be fabricated

with stainless steel pipe, brass or high pressure flexible piping with stainless steel couplings. **Galvanized components and/or iron pipe shall NOT be accepted.** Where waterway transitions are critical (elbows, tees, etc.), no threaded fittings shall be allowed to promote the smooth transition of water flow to minimize friction loss and turbulence. All piping components and valves shall be non-painted, unless otherwise specified. All piping welds shall be wire brushed and cleaned for inspection and appearance.

The high pressure flexible piping shall be black SBR synthetic rubber hose with 300 PSI working pressure and 1200 PSI burst pressure for flexible piping sizes 1.5" through 4". Sizes 3/4", 1" and 5" are rated at 250 PSI working pressure and 1000 PSI burst pressure. All sizes are rated at 30 in HG vacuum. Reinforcement consists of two plies of high tensile strength tire cord for all sizes and helix wire installed in sizes 1" through 5" for maximum performance in tight bend applications. The material has a temperature rating of -40° F to +210° F.

The stainless steel full flow couplings are precision machined from high tensile strength stainless steel. All female couplings are brass. Mechanical grooved and male 3/4" and 1" couplings are brass. A high tensile strength stainless steel ferrule with serrations on the I. D. is utilized to assure maximum holding power when fastening couplings to hose.

Pump House Line Protection

All drain lines for the discharges, suctions, ABS discharge gauge lines and any other connections in the pump house area shall have a protective cover provided on the lines in the required areas of the lines to prevent the lines from rubbing on any other components in the pump house area.

All drain lines, ABS lines, high pressure discharge lines and electrical wiring in the pump house area shall be properly and neatly routed, wire tied and rubber coated "P" clamped, to keep the items secured.

All manual drains shall be lift handle ball valve type.

2 1/2" Left Side Inlet

There shall be a gated suction inlet with 3/4" bleeder installed on the left side of the apparatus. A total quantity of one (1) shall be provided with the following specified components:

- 2 1/2" Akron Brass 8000 series swing-out valve with stainless steel ball.

- The control valve shall be a 'swing out type' direct operation manual lever actuator.
- The plumbing shall consist of 2 1/2" piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The suction termination shall include the following components:

- One (1) 2 1/2" NST swivel female adapter with screen
- One (1) 2 1/2" male self-venting plug, secured by a chain

Left Side Discharge

There shall be a gated discharge installed on the left side of the apparatus. A total quantity of two (2) shall be provided with the following specified components:

- 2 1/2" Akron Brass 8000 series swing-out valve with a stainless steel ball.
- The control valve shall be a 'swing out type' direct operation manual lever actuator.
- The plumbing shall consist of 2 1/2" piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 2 1/2" Male NST adapter.
- One (1) 2 1/2" NST female by male swivel w/45 degree elbow.
- One (1) 2 1/2" female by 1 1/2" male reducer.
- One (1) 1 1/2" female self-venting cap, secured by a chain.
- A Fire Research Insight Ultimate gauge shall be supplied for the discharge pressure reading of 0-400 psi.

Left Rear Discharge

There shall be a gated discharge installed on the left rear of the apparatus. A total quantity of one (1) shall be provided with the following specified components:

- 2 1/2" Akron Brass 8000 series swing-out valve with a stainless steel ball.
- The discharge shall be controlled from the side operator's panel.
- The plumbing shall consist of 2 1/2" piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 2 ½” Male NST adapter.
- One (1) 2 ½” NST female by male swivel w/45 degree elbow
- One (1) 2 ½” female self-venting cap, secured by a chain
- A Fire Research Insight Ultimate gauge shall be supplied for the discharge pressure reading of 0-400 psi.

Discharge Outlet (Front Bumper)

One (1) front bumper discharge outlet shall be provided and installed in the location specified with the following specified components:

- A 2" Akron Brass 8000 series swing-out valve with a stainless steel ball.
- The discharge shall be controlled from the side operator's panel.
- The plumbing shall consist of 2” piping, and incorporate a manual drain control installed below the pump area for ease of access. Auto-drain(s) shall be installed in the discharge piping at lowest point of the plumbed system.

The discharge termination shall include the following components:

- One (1) 2” NPT x 1 ½” NST, polished SST chicksan swivel
- A Fire Research Insight Ultimate gauge shall be supplied for the discharge pressure reading of 0-400 psi.

The front bumper discharge shall be mounted on top of the gravel shield of the front bumper extension. The discharge shall be placed to the right of the hose well. The discharge shall terminate with a chicksan swivel to accommodate deployment of hose in different directions.

Right Side Discharge

There shall be a gated discharge installed on the right side of the apparatus. A total quantity of one (1) shall be provided with the following specified components:

- 2 1/2" Akron Brass 8000 series swing-out valve with a stainless steel ball.
- The discharge shall be controlled from the side operator's panel.
- The plumbing shall consist of 2 1/2” piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 2 ½” Male NST adapter.
- One (1) 2 ½” NST female by male swivel w/45 degree elbow.
- One (1) 2 ½” female by 1 ½” male reducer.
- One (1) 1 ½” female self-venting cap, secured by a chain.
- A Fire Research Insight Ultimate gauge shall be supplied for the discharge pressure reading of 0-400 psi.

Master Discharge

There shall be a master discharge installed on the right side of the apparatus. A total quantity of one (1) shall be provided with the following specified components:

- 4”Akron Brass valve with handwheel control and mechanically driven dial type position indicator.
- The plumbing shall consist of 3” piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 3” NST adapter.
- One (1) 3” NST female swivel by 5” Storz cast aluminum 30 degree elbow.
- One (1) 5” female Storz self-venting cap, secured by a chain.
- A Fire Research Insight Ultimate gauge shall be supplied for the discharge pressure reading of 0-400 psi.

Right Rear Discharge

There shall be a gated discharge installed on the right rear of the apparatus. A total quantity of one (1) shall be provided with the following specified components:

- 2 1/2”Akron Brass 8000 series swing-out valve with a stainless steel ball.
- The discharge shall be controlled from the side operator's panel.
- The plumbing shall consist of 2 1/2” piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 2 ½” Male NST adapter.
- One (1) 2 ½” NST female by male swivel w/45 degree elbow
- One (1) 2 ½” female self-venting cap, secured by a chain
- A Fire Research Insight Ultimate gauge shall be supplied for the discharge pressure

reading of 0-400 psi.

Double Stack Crosslays

The crosslay hose beds shall be located in the upper portion of the pump compartment. The crosslay shall be constructed to allow for the hose loads listed below. Intent is to have hose double stacked with depth of stack as low as possible. The final configuration is to be established at pre-construction. The crosslay area shall be located at the front of side control module apparatus and at the rear of top control module apparatus. The crosslay area shall span the entire width of the pump module apparatus. Removable slotted aluminum flooring shall be provided for hose area.

Chicksan swivels shall be installed just below the floor of each crosslay bed just high enough for hose couplings to be accessed and tightened on to Chicksans. Chicksan swivels shall swing from left to right to allow attached hose to be deployed from either side.

Two (2) crosslays shall be provided for up to 200 feet of 1 3/4" hose.

A 2" Akron Brass 8000 series swing-out valve with a stainless steel ball.

The discharge shall be controlled from the side operator's panel.

The plumbing shall consist of 2" piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 2" NPT x 1 1/2" NST brass chicksan swivel
- A Fire Research Insight Ultimate gauge shall be supplied for the discharge pressure reading of 0-400 psi.

One (1) crosslay shall be provided for up to 200 feet of 2.5" hose.

A 2 1/2" Akron Brass 8000 series swing-out valve with a stainless steel ball.

The discharge shall be controlled from the side operator's panel.

The plumbing shall consist of 2 1/2" piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

The discharge termination shall include the following components:

- One (1) 2 1/2" NPT x 2 1/2" NST brass chicksan swivel
- A Fire Research Insight Ultimate gauge shall be supplied for the discharge pressure reading of 0-400 psi.

Crosslay Trim

Brushed stainless steel trim shall be installed at the openings on each side of the crosslay hose bed area. The trim shall reduce the chaffing of the hose jacket on the edges of the storage area.

An NFPA compliant restraining device shall be included to secure the hose stored in the crosslays to prevent inadvertent deployment of hose during transit.

Crosslay Hose Bed Light

There shall be one 12' LED strip light mounted on the rear of the cab compartment to illuminate the crosslay hose bed.

Deck Gun Monitor Waterway

There shall be one (1) deck gun monitor waterway installed on the apparatus.

A 3" Akron Brass 8000 series slo-cloz swing-out valve with a stainless steel ball.

The discharge shall be controlled from the side operator's panel.

The waterway shall be plumbed with 3" piping that terminates 3" above the top of the pump compartment unless otherwise specified or required by a specific deck gun selection as noted.

The plumbing shall be drained with an auto-drain located at the lowest point of the waterway plumbing if required.

A Fire Research Insight Ultimate gauge shall be supplied for the discharge pressure reading of 0-400 psi.

The deluge pipe shall be located up through the pump compartment, centered from left to right.

Deck Gun TFT Hurricane Combination Package

There will be one (1) Task Force Tips Pumper Hurricane Combination Package (XFC-63) provided and installed. The package shall include a manual 18" Extend-A-Gun installed on the deluge pipe, stack tips and Hurricane monitor. The Extend-A-Gun will be wired to the cab "Door Open" indicator light that will notify occupants the gun is not in the stowed position.

Booster Hose Reel

There shall be one (1) Hannay Model EF electric rewind booster reel with automatic brake installed on the apparatus. The reel shall have a capacity of 200' of 800 psi booster hose. The reel shall be plumbed to the pump with a 1" quarter turn Akron 8810 ball valve and 1" high pressure hose and coupling. The valve shall be controlled from the operator's panel.

There shall be a manual rewind device provided. A manual crank shall be mounted adjacent to booster reel.

The reel will be mounted off to the left side of the rear compartment leaving maximum space to the right side. It is intended to utilize the right side space for storage of cones or Propaq.

The hose reel shall be steel and painted the standard silver utilized by Hannay.

The hose reel shall be mounted in the rear compartment on the back wall off to the left side.

An electric rewind switch shall be located adjacent to the booster reel. The switch shall have a weather resistant rubber cover and label denoting its function.

Hose Reel Blow Out

There shall be an air "blowout" system furnished for reel drainage. The air blow out system shall

be connected to the chassis air brake system. There shall be a check valve furnished between the chassis system and the reel blow out system. There shall be a ¼ turn manual control valve furnished on the pump operators panel for the air blow out system.

The valve shall be labeled “REEL BLOW OUT”.

A matching gauge shall be supplied for the discharge pressure reading of 0-400 psi.

Booster Hose

The reel shall come equipped with 200 feet of 1" diameter booster hose, 800 psi. The hose shall be provided in two (2) 100 foot lengths with hardcoat aluminum couplings.

Foam Proportioning System

There shall be a fully automatic electronic direct injection foam proportioning system furnished and installed on the apparatus. The system shall be a FoamPro 2001, or Pierce Manufacturing Husky 12.

The system shall be equipped with a digital electronic control display. It shall be installed on the pump operators panel and enable the pump operator to perform the following functions:

- Activate the foam system
- Change foam concentrate proportioning rates from .1% to 3% in .1% increments
- Display current flow in GPM
- Display total flow in GPM
- Display total amounts of foam concentrates used
- Provide simulated flow for manual operation
- Perform setup and diagnostic functions

The system shall supply a total quantity of five (5) discharges.

Foam System Testing

The apparatus foam system shall be tested and certified.

The system shall be supplied by a single foam tank that shall be monitored by the control display. The display shall flash a "low concentrate" warning for two minutes when the foam tank runs low. In the event that no additional concentrate is added to the tank, the foam concentrate pump shall be deactivated.

Foam Tank

A 30 gallon foam tank with square hinged lid, equipped with a hold down device shall be installed and plumbed with non-corrosive piping to the foam system. The fill tower shall be approximately 10" x 10".

A label shall be affixed to the foam tank fill indicating: "WARNING" Class A foam tank fill, do not mix brands or types of foam.

The foam tank shall be integral with the booster water tank provided.

There shall be a 1" quarter turn drain valve installed to drain the foam tank.

The valve shall be installed in the pump house with a drain line extended to the side running board.

The drain line shall be labeled "FOAM DRAIN".

Foam Tank Level Gauge

There shall be one (1) Fire Research TankVision LED electronic foam level gauge located on the operator's control panel. This level gauge utilizes ultra bright LEDs for sunlight readability, and two wide-viewing lenses for 180 degrees of clear viewing.

Foam Power Fill

The apparatus shall be equipped with one (1) foam fill system. The foam fill system shall be an electronic, automatic, concentrate refill system. The system shall operate independently of the foam proportioner allowing simultaneous use. Refill operation shall not require apparatus or fire pump to be running. The system shall be capable of handling Class A or Class B foam concentrates, emulsifiers, gels and decontamination concentrates. The apparatus shall be plumbed from the externally accessed intake/flush ports to the concentrate cell. External fill and

flush connections shall be quick-connect cam-lock type. Internal piping shall incorporate check valves to prevent back flow. Concentrate tank inlet shall be positioned to minimize agitation. The refill operation shall be based on direct measurement of concentrate level in tank. The system must be capable of automatically stopping when cell is full and include a manual override feature. The system shall be equipped with an electronic control suitable for installation on the pump panel. Incorporated within the control shall be a microprocessor that receives input from the system while controlling foam concentrate pump output. An all-bronze three-way valve shall be included to allow the operator to flush system after use. Valve control, intake and flush ports shall be located within corresponding panel plate.

The system shall enable the operator to perform the following control/operation functions and status indicators for the refill operation:

- Provide push-button start/stop control of foam refill
- Solid green light advises operator concentrate cell is full
- Flashing green indicates system is running
- Green light off, system off
- Allow override of “full tank” condition
- Provide a means to flush the pump and intake piping

Pump body and other wetted components and piping to be constructed of non-corrosive materials. The system shall receive readings when the concentrate tank is full and stop operation to prevent overflow.

Components of the complete refill system shall include:

- Operator control and display with Weather-Pac connectors
- Refill/flush quick-connect cam-lock fittings and cap
- Check valves
- Pump/motor assembly and solenoid
- Strainer
- Tank level switch
- Three-way fill/flush valve
- Stainless steel pickup wand and 6 feet of reinforced suction hose, 1 inch in diameter to allow maximum flow
- Panel placards

Tank to Pump Line

The connection between the tank and the pump shall be capable of the flow recommendations as set forth in NFPA Pamphlet 1901, latest revision and shall be tested to those standards when the

pump is being certified. One (1) non-collapsible flexible hose and valve shall be incorporated into the tank to pump plumbing to allow movement in the line as the chassis flexes to avoid damage during normal road operation. Four (4) inch stainless steel schedule 10 or Poly-Vinyl Chloride schedule 40 piping may be used to complete the connection from the tank to pump valve to the water tank.

A 3" Akron Brass 8000 series swing-out valve with a stainless steel ball.

The valve shall be controlled from the side operator's panel.

Tank to Pump Check Valve

There shall be a tank to pump check valve, conforming to NFPA standard requirements, which shall be of bronze construction. The check valve shall be mounted as an integral part of the pump suction extension.

Tank Fill Line

One (1) 2" tank fill/recirculating line shall be installed from the pump directly to the booster tank.

A 2" Akron Brass 8000 series swing-out valve with a stainless steel ball.

The valve shall be controlled from the side operator's panel.

ALUMINUM BODY

The apparatus body shall be constructed of aluminum and be welded together utilizing an A.W.S. Certified welding procedure. The apparatus body shall be the manufacturer's standard design and construction for a premium custom apparatus body.

The body shall be designed for maximum strength to weight ratio, therefore the gauge of sheet metal and structural members shall vary, dependent on the design requirement.

Aluminum alloys are required for optimum all-around performance for strength, manufacturing properties, and corrosion resistance.

Absolutely no dissimilar metals shall be used in the body and its supporting substructure without being separated by a sufficient corrosion and electrolysis inhibitor.

Front Body Compartment Walls

The front compartment walls of both forward most compartments shall be sheet finished. No overlay material shall be visible from the interior of the compartments.

Rear Body Compartment Walls

The rear compartment walls of both rearward most compartments shall be sheet finished. No overlay material shall be visible from the interior of the compartments. Access panels from the rear walls shall be strategically placed to ensure access to the rear taillight clusters for any servicing that may be completed.

Compartment Top

The top of the compartments shall be an integral portion of the body. No overlay material shall be visible from the interior of the compartments.

Compartment Floors

The body compartments shall be enclosed with aluminum sheet metal as specified above. The compartment floors shall have a 1” lip downward at the door opening side of the compartment. This lip shall integrate with a structural member on the bottom edge and form a “sweep-out” compartment. This design shall also allow for a structural flush fitting door frame and a complete door/weather seal.

Compartment Load Capacity

Each compartment shall have a minimum weight rating of 800 pounds.

Exterior Hose Bed Walls

The exterior hose bed walls shall be an integral portion of the body. The wall shall give a smooth exterior look and finish with no vertical support tubing visible from the exterior of the truck.

Side Rub Rails

The lower edge of the apparatus shall be trimmed with rub rails to absorb minor damage while protecting the body. The rub rails shall be fabricated of brightly anodized aluminum channel material.

The rub rails shall be secured with stainless steel hardware and shall be spaced away from the apparatus body with ½” nylon spacers, to help prevent the collection of water and debris. The rub rail sections shall be easily removable.

Rear Rub Rails

The rearward edge of the rear step shall be trimmed with rub rails to absorb minor damage while protecting the body. The rub rails shall be fabricated of brightly anodized aluminum channel material.

The rub rails shall be secured with stainless steel hardware and shall be spaced away from the apparatus body with ½” nylon spacers, to help prevent the collection of water and debris. The rub rail sections shall be easily removable.

Rub Rails Reflective Striping

One inch reflective 3M Diamond Grade striping shall be applied to the length of each rub rail section making the perimeter of the apparatus more readily visible.

The reflective striping shall be red in color.

Rear Tailboard

The rear tailboard shall be fabricated of the same tubular materials as used in the apparatus body. The tailboard shall be two (2) independent assemblies welded to the rear body structural framing to provide body protection and a solid rear stepping platform. The center section shall be framed for a slide out platform.

The rear step shall be designed to incorporate "crush zone" technology. This idea incorporates lighter materials in the tailboard than the body structure so the step will "crush" in a collision before the body structure.

The rear of the apparatus body shall be vertical in design - otherwise known as a 'flat-back'. On

the rear body surface, a sign shall be attached that states: "DO NOT RIDE ON REAR STEP, DEATH OR SERIOUS INJURY MAY RESULT."

The rear tailboard and body shall be constructed such that the angle of departure shall be no less than 8 degrees at the rear of the apparatus when fully loaded (Per NFPA 1901).

The rear tailboard shall be approximately thirteen and one-half (13.5) inches deep and shall incorporate a 3/16" embossed aluminum diamond plate overlay.

The stepping area shall span the width of the apparatus, overlapping the perimeter of the structural tailboard framework. The embossed aluminum diamond plate material shall meet the latest NFPA minimum requirements for "slip resistance" on stepping, standing and walking areas.

Slide Out Platform

One (1) slide out platform, utilizing an OnScene Solutions slide, approximately forty-one (41) inches in width shall be installed in the center of the rear tailboard, approximately 1" below the split outward tailboard sections.

The platform shall slide out approximately twelve (12) inches and lock in place when fully extended and when in the stowed positions.

The platform stepping surface shall be constructed of a minimum 1/8" embossed aluminum diamond plate materials to meet minimum NFPA standard requirements for slip resistance.

If the platform is not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the "Door Open" indicator light in the cab to warn the crew.

Fuel Fill

There shall be a fuel fill assembly located on the apparatus body accessing the chassis supplied fuel tank. The assembly shall be located in the left rear module behind the rear axle.

There shall be a drain in the fuel fill assembly to allow over flow to drain on the back side of the apparatus body. The fuel fill cap shall be manufactured of plastic materials, green in color and equipped with a tether.

The fuel fill cap shall be labeled "DIESEL FUEL". The stainless steel fuel fill neck shall have a 3/8" inside diameter vent line installed from the top of the fuel tank to the fill tube.

Mud Flaps

Heavy-duty rubber mud flaps shall be provided behind the rear wheels. The mud flaps shall be black rubber type and be bolted in place.

BODY PAINT SPECIFICATIONS

All bright metal fittings, if unavailable in stainless steel, shall be heavily chrome plated.

Critical body and sub-frame area which cannot be primed after assembly shall be pre-painted.

All welded metal surfaces shall be ground to a smooth surface prior to a degreasing and high pressure, high temperature phosphatizing process. The entire surface shall be sprayed with a non-chromate sealing compound to prevent formulation of stains or flash rust on previously phosphatized parts.

The body paint process shall be the manufacturer's standard process and similar in nature to the cab paint process.

Body Paint Color

The apparatus body shall be painted American LaFrance Red, 7678UM (PPG FBCH 71528 Red) to match the cab paint color. A color sample of ample size (12" X 12") for comparison to other trucks in North Richland Hills shall be provided by the manufacturer prior to painting for approval.

Compartment Finish

The compartment interiors shall be coated with an ultra-hard Industrial polymer coating with a good resistance to U.V. and common chemical solvents including fuels and corrosive materials. The color shall be medium gray.

General Body Details

All compartmentation shall be constructed in a sweep out design to be water and dust resistant, and manufactured to the maximum possible storage capacity.

Fasteners

All bolts and nuts used in the finish construction of the apparatus shall be coated stainless steel which helps prevent dissimilar metal electrolytic reaction and corrosion. The Manufacturer may be requested to supply evidence of fastener coating and results of salt spray testing when dissimilar metals are used. Any bolt extending into a compartment or into the hose bed area shall have an acorn nut attached or be protected in such manner where sharp edges are avoided.

BODY MOUNTING SYSTEM

The entire body module assembly shall be mounted so that it “floats” above the chassis frame rails with vibration and torsion isolator assemblies. The body substructure shall be mounted above the frame to allow independent flexing to occur between the body and the chassis. Each assembly shall be mounted to the chassis frame rails with steel, gusseted mounting brackets. Each bracket shall be painted or powder coated for corrosion resistance.

Each assembly shall have a rubber type vibration isolator. The isolator shall be of a specific durometer to carry the necessary loads of the apparatus body, equipment, tank, water, and hose. The quantity of mounts utilized shall correspond directly to the anticipated weight being supported.

There shall be no welding to the chassis frame rail sides, web or flanges, or drilling of holes in the top or bottom frame flanges between axles. All body to chassis connections shall be bolted so that in the event of an accident, the body shall be easily removable from the truck chassis for repair or replacement.

Body Structure Width

The width of the apparatus body from the outside of the left compartments to the outside of the right compartments shall be approximately 99" excluding any attached peripherals such as rub rails, fenderettes, grab handles, etc.

COMPARTMENTATION

Compartment Ventilation

To allow for proper air circulation & flow, each compartment shall have a venting route. The venting locations shall be determined by best-fit for each body configuration. The vents will be chrome louvered plate and installed appropriately on the compartment interior walls.

Side Compartment Unistrut

Vertically mounted Unistrut shall be installed in all apparatus body "SIDE" compartments, to accommodate the installation of shelves, trays, tool boards and or other miscellaneous equipment.

Compartments

Finish

All compartment lips shall have a matte black durable protective coating to protect from damage.

Compartment "L1":

There shall be one (1) full height compartment ahead of the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 39" wide by 74" high with a lower depth of approximately 25.5" and an upper depth of approximately 12.5". The framed opening shall measure 36.5" wide by 70" high. The compartment will have approximately 38 cubic feet of space. L1 shall have a Lista tool box installed in lower portion. This compartment will be completely customizable in order to meet purchaser's needs.

Compartment "L2":

There shall be one (1) compartment located directly over the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 62" wide by 44.5" high with a depth of 12.5". The framed opening shall measure approximately 62" wide by 40.5" high. The compartment will have approximately 19.9 cubic feet of space.

Compartment "R3":

There shall be one (1) full height compartment located behind the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 43" wide by 74" high with an upper depth of 12.5". The framed opening shall measure approximately 40.5" wide by 70" high. The compartment will have approximately 38 cubic feet of space.

The full depth area of this compartment shall extend approximately 47" up from the compartment floor.

Compartment "R3" Custom Power Saw Tray

There will be a custom designed welded plastic saw holder installed in the L3 compartment.

Compartment "R1":

There shall be one (1) full height compartment located ahead of the rear wheels on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 39" wide by 74" high with a lower depth of 25.5" and an upper depth of 12.5". The framed opening shall measure approximately 36.5" wide by 70" high. The compartment shall have approximately 38 cubic feet of space.

Compartment "R2":

There shall be one (1) compartment located directly over the rear wheels on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 62" wide by 44.5" high with a depth of 12.5". The framed opening shall measure approximately (62") 26" wide by 40.5" high. The compartment will have approximately 19.9 cubic feet of space. R2 shall be equipped with a swing out tool board of maximum height and width.

Compartment "L3":

There shall be one (1) full height compartment located behind the rear wheels on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 43" wide by 74" high with an upper depth of 12.5". The framed opening shall measure approximately 40.5" wide by 70" high. The compartment shall have approximately 38 cubic feet of space.

Compartment “L3” Custom Rescue Tool Tray

There will be a custom designed rescue tool tray in the R3 compartment.

Shelving

The shelf shall be fabricated of aluminum sheet material adequately thick enough to withstand and support equipment, with the outside and inside edges flanged up to prevent equipment from sliding off. The shelf shall be as wide as possible to allow proper attachment to uni-strut channels. The shelf shall be adjustable up and down.

A 12.5” deep shelf shall be supplied and installed in the compartment. The shelf shall be as wide as possible and there shall be a total quantity of seven (7).

- Two (2) located in the L-3 compartment.
- Two (2) located in the R-1 compartment.
- One (1) located in the L-2 compartment
- Two (2) located in the R-3 compartment.

A 25.5” deep shelf shall be supplied and installed in the compartment. The shelf shall be as wide as possible and there shall be a total quantity of (3).

- One (1) located in the L-1 compartment.
- One (1) located in the L-3 compartment.
- One (1) located in the R-3 compartment.

Roll Out Tray/Slidemaster

The tray shall be fabricated of 3/16" thick aluminum with four 3” side flanges; corner welded for maximum strength. The tray shall be as wide and deep as the door allows and secured to a Slide Master roll-out system constructed of “heavy duty steel” with structural tube and channels. The slide assemblies shall incorporate cadmium plated ball bearing roller slides and a latching device to hold the tray in the stored position.

The following shall be provided:

- A 600# capacity tray with 100% extension shall be supplied and installed to the compartment floor. There shall be a total quantity of two (2).
- The slide shall be held in locked position by a spring lock.

The Slide Master slides shall be powder coated {black} in color.

- One (1) located in the L-3 compartment.
- One (1) located in the R-3 compartment.

Fire Extinguisher Storage Compartment

There shall be a compartment located in the wheel well for storage of one (1) 2.5 gallon water extinguisher and one (1) 20 lb. ABC fire extinguisher.

The compartment shall be located in front of the axle on the left side.

SCBA Compartment

There shall be a compartment located in the wheel well to hold three (3) 6.75" Diameter x 24" long SCBA bottles with 1" nylon safety loops installed.

The compartment shall be located in front of the axle on the right side.

SCBA Compartment

There shall be a compartment located in the wheel well to hold three (3) 6.75" Diameter x 24" long SCBA bottles with 1" nylon safety loops installed.

The compartment shall be located behind the axle on the right side.

Rear Center Compartment

There shall be one (1) compartment provided and installed at the rear of the apparatus, directly below the hose bed access area.

The approximate dimensions of this compartment shall be 43" wide and as high as possible determined by the hose bed height with a depth of 31" dependent on suspension. The compartment will have approximately 29 cubic feet of usable storage space.

No door will be provided for this compartment. It will contain a 200 foot reel line.

Interior of compartment will be painted to match the exterior body.

SIDE COMPARTMENT DOORS

Roll-Up Door Construction and Finish

All horizontal and vertical side compartment doors shall be roll-up style doors. The side compartment roll up doors shall be painted to match the cab body.

Roll-Up Doors

Roll up doors shall be R.O.M. or AMDOR brand designed for fire apparatus. The track shall be of a one piece aluminum design with an attaching flange and finishing flange incorporated into its design to facilitate installation and provide a pleasing finished look without additional trim or caulking. The track shall have a replaceable side seal to resist water and dust intrusion into the compartment.

The drip rail shall be fabricated of aluminum and have a built in replaceable wiper seal. The Roll-up door shall have a counterbalance, to assist in lifting while eliminating the risk of accidental closing. The door shall be secured by a full width lift bar, operational by one hand with heavy gloves. The securing method will be of a positive latch device design.

Door Open Indicator

Each roll up door shall have an integral door open indicator magnet in the lift bar.

If the bar is not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the “Door Open” indicator light in the cab to warn the crew.

Sill Plates

Brushed stainless steel sill plates shall be installed at the bottom of each body compartment door opening.

HOSE STORAGE

A hose bed shall be provided and installed with a minimum of thirty (30) cubic feet of storage space available. The hose bed shall have a slotted 1/4" aluminum flooring installed to allow drainage through the tank cavity to the ground below.

The aluminum flooring shall be manufactured in discrete sections to allow for ease of removal and stability. The area shall be free of sharp edges to protect the hose when loading and unloading.

The hose bed floor shall extend off the back of the hose bed and be finished with aluminum treadbright to create a shelf.

There shall be a "Chicago Tray" in the hose bed.

The walls of the hose bed shall be the same height as the highest portion of the cab.

'A' Frame Hose Bed Cover

There shall be a double door cover furnished and installed which overlays a tubular structure for the hose bed.

Each cover shall be capable of supporting 600 lbs while standing on the cover. Each cover shall be capable of being opened independently and rest on a tubular structure which runs down the middle of the hose bed with a truss support at the rear of the apparatus. The covers in the closed position shall be higher in the center of the hose bed than they are at the hinged end to create an 'A' frame appearance and to aid in water runoff.

The front and rear of hose bed covers shall have vertical end caps that extend down to create a level line of diamond plate the width of the covers. The rear of the hose bed shall have a folding vinyl flap that is held in place by an elastic shock cord.

The doors shall be fabricated of .125" embossed aluminum diamond plate with full length two-piece stainless steel piano hinges. There shall be a gas strut hold open device on each cover to hold in the open position.

The hose bed cover shall be wired to the open door warning light in the chassis cab with sensors at the hinges to warn the crew when the cover is open when the transmission is placed into drive

or reverse movement mode.

To aid in opening and closing the cover, there shall be two (2) grab handles, one (1) for each cover, installed on the rear facing vertical end cap.

The rear flap shall be black. The following lettering shall be on the surface of this flap “KEEP BACK” The letters shall be red in color.

The hose bed covers shall be fabricated of embossed aluminum diamond plate to comply with the NFPA standards for a “slip resistance” surface.

On Scene "Access" Hose Bed Cover Lighting

Two (2) "Access" LED strip light shall be mounted to the underside of each hose bed cover. The lights shall be on a circuit and turning on only when the covers are opened. The light shall be manufactured by On Scene Solutions.

Hose Bed Area Trimmed W/ Brushed Stainless Steel

The vertical corners at the back hose bed shall be trimmed with brushed stainless steel. The trim shall extend from the hose floor level up to the top edge of the body side.

The top rail on the hose bed side walls shall have a trim cap fabricated of 16 gauge brushed 304L stainless steel. The cap shall run the entire length of the hose bed side wall and shall provide a smooth surface with a highly finished appearance. It shall extend down at least 1” on each side of the hose bed side wall.

Hose Bed Area

The hose bed area of the apparatus shall be overlaid with brushed stainless steel material.

The hose bed shall accommodate the following hose loads:

- | <u>Qty</u> | <u>Size</u> |
|------------|-------------|
| • 1000' | 5" |

- 300' 2.5"
- 300' 2.5"

Hose Bed Divider with Hand Cutout

There shall be a hose bed divider provided and installed in the hose bed area of the apparatus body.

The divider shall be fabricated of 1/4" thick aluminum plate with a double sided reinforcement and attached to the adjustable slide rails. The rear of the divider shall have a radius to provide a smooth corner and a hand cut out to aid in access to the hose bed area. Hose payout shall be unobstructed by the divider.

There shall be a total quantity of two (2) dividers installed in the hose bed.

Hose Bed Dunnage Area

A vertical bulkhead shall be provided and installed at the front of the hose bed area, just behind the water tank fill tower, forming a storage area that is separated from the hose bed.

The rear face of the bulkhead shall serve as a mounting surface for the hose bed dividers, resulting in the ability to move any hose bed divider across the entire width of the hose bed.

WATER TANK

Polypropylene Tank

The tank shall be 500 gallons in capacity. The water tank shall be designed to utilize cavities that have commonly been wasted space. The water tank shall extend up and over the rear center compartment to just behind the rear body wall. The water tank shall fill the void between the main hose bed floor and the top of the rear center compartment. This tank design shall provide for a lower overall tank height, resulting in a lower overall main hose bed height. In addition, this design shall create a lower center of gravity of the vehicle, for improved vehicle handling.

Tank Construction

The booster tank shall be constructed of 1/2" thick polypropylene sheet stock which is a non-

corrosive stress relieved thermoplastic. It shall be designed to be completely independent of the body and compartments. All joints and seams are extrusion welded and/or contain the "Bent Edge" and tested for maximum strength and integrity. The top of the booster tank is fitted with lifting eyes designed with a 3 to 1 safety factor to facilitate tank removal.

Cover

The tank cover shall be constructed of 1/2" thick polypropylene and shall be recessed. A minimum of two lifting dowels shall be drilled and tapped 1/2" x 2" to accommodate the lifting eyes.

Baffles

The swash partitions shall be manufactured from 1/2" polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments to provide to provide maximum water flow. All swash partitions interlock and are welded to one another as well as to the walls of the tank.

Mounting

The tank shall have a reinforced 3/4" floor for added strength and durability. The tank shall be isolated from the body substructure cross members with rubber strips. The tank shall sit nested inside the center body substructure and shall be completely removable without disturbing the body side panels. Tank stops on all four sides will keep the tank from shifting front to back or side to side.

Fill Tower

The fill tower opening shall be approximately 13" x 12". The tower will have a 1/4" thick removable polypropylene screen and a polypropylene hinged type cover that will open if the tank is filled at an excess rate. There shall be a removable 1/4" thick polypropylene screen to prevent debris from falling into the tank. The fill tower shall have a 4" overflow that will discharge underneath the tank, behind the rear wheels. The overflow shall terminate above the tank water level when filled to the rated capacity.

The fill tower shall be located in the left front hose bed.

Sump

The sump will be constructed in an 8.0" wide x 8.0" long x 3.0" deep area. The construction material shall utilize 1/2" polypropylene and be located inline with the tank suction valve. There shall be a 4" schedule 40 polypropylene tube installed that will run from the suction outlet to the sump location. The tank will have an anti-swirl plate located approximately 2" above the sump.

The sump shall have a 3" plug for use in draining and cleaning out the tank.

Outlets

In addition to the tank suction valve outlet located in the sump, there shall be an outlet provided for the tank fill valve. If there are any additional options selected (such as an extra tank suction or direct tank inlets), there shall be additional outlets provided to accommodate these items.

Tank Level Gauge

Two Fire Research Tank Vision model WLA200-A00 tank indicator kits shall be installed on the apparatus (One on each side of the apparatus). The kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of aluminum, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

BODY ELECTRICAL AND LIGHTING

Low-Voltage Electrical System

The apparatus shall be equipped with a Low-Voltage 12-volt Electrical System, compliant with the latest revision of the NFPA 1901 standard guidelines.

The system shall be capable of performing total load management, load management sequencing, and load shedding via continuous monitoring of the low-voltage electrical system. In addition, the system shall be capable of switching loads (similar to operating as an emergency warning lamp flasher) eliminating the dependency on many archaic electrical components such as conventional flasher modules. The system shall also incorporate provisions for future expansion or system modification.

The low-voltage electrical system shall be designed to distribute the placement of electrical system hardware throughout the apparatus thereby enabling a smaller, optimized wire harness. The programmable, logic controlled system shall eliminate redundant electrical hardware such as extra harnesses, circuit boards, relays, circuit breakers, and separate electrical or interlock subsystems and associated electronics for controlling various electrical loads and inputs.

As-built electrical system drawings and an apparatus-specific reference of I/O shall be furnished in the final delivery manuals. These drawings shall illustrate the electrical system broken down into separate functions, or small groups of related functions. Drawings shall depict circuit numbers, electrical components and connectors from beginning to end. **A single drawing for all electrical circuits installed by the apparatus manufacturer shall not be accepted.**

Electrical Nodes

An electrical distribution node or relay shall be located as high as possible on the interior of the rearward most rear compartments on each side of the apparatus body.

Full depth body compartmentation designs shall have the node mounted to the rear frame wall that is perpendicular to the chassis frame rails.

Half depth compartmentation designs shall have the node mounted to the rear frame wall that is perpendicular to the chassis frame rails.

A protective cover shall be installed to prevent damage to the node or electrical system during equipment installation and or removal. Node covers shall be approximately 16 to 22” in length

and shall match the compartments interior finish. Node covers will not include any type of shelve mounting structure and will limit the height of uni-strut or shelf height within the compartments.

LED DOT Lighting

There shall be a total of eleven (11) red clearance lights and two (2) amber clearance lights on the apparatus.

- There shall be seven (7) red clearance lights located on the rear of the apparatus, five (5) lights shall be in the rear rub rail and two (2) lights shall be as high and wide as possible.
- On the sides of the apparatus there shall be four (4) red clearance lights, two (2) located on each side of the apparatus in the rub rails at the front and rear portion of the rear compartments.
- On the sides of the apparatus there shall be two (2) amber clearance lights, one (1) located on each side of the apparatus in the rub rail at the rear portion of front compartments.

There shall be four (4) amber intermediate turn signals located on the sides of the apparatus. They shall be located two (2) on each side of the apparatus in the rub rail, one (1) at the front of front compartments and one (1) at the front of the pump compartment. The LED lights shall be DOT approved from a brand name manufacturer.

LED Rear Tail Light Warning Cluster

There shall be a Whelen M9-Series Super LED and rear tail lights provided and installed in individual polished bezels on the rear of the apparatus, one each side. The lights shall consist of the following specified components:

- 1 - Whelen #M9BTT LED red brake/tail light
- 1 - Whelen #M9T LED series amber turn signal light
- 1 - Whelen #M9 BUW LED clear backup light
- 1 - M9 spot for the warning lamp (See Lower Zone C below)

Backup Lights

The backup lights shall illuminate when the apparatus is placed in reverse.

Pump/Transverse Compartment Lighting

There shall be one (1) LED light flush mounted in individual bezel and switched at the light with a weather resistant toggle switch.

Compartment Strip Lighting

OnScene "Access" LED strip lighting shall be installed in the compartments as specified. The lighting in each compartment shall be on a separate circuit, and only illuminate when the compartment doors are open unless otherwise noted.

- Two (2) "Access" LED strip lights shall be installed in two (2) over wheel compartment(s).
- Two (2) "Access" LED strip lights shall be installed in four (4) full height compartment(s).
- One (1) "Access" LED strip lights shall be installed in the top of the rear compartment. This light shall be controlled by a simple toggle switch located near the control for the hose rewind switch.

Perimeter Lights

There shall be four (4) LED underbody perimeter lights provided and installed in addition to the chassis provided lights. One (1) under each side of the front of the body, and two (2) under the rear step to illuminate the ground around the truck.

Lighting designed to provide illumination under the cab step areas shall be of a switch-able design although, activate automatically when the exit doors are opened. All other ground area lighting shall be of the standard switch-able design.

The lights shall be from a brand name manufacturer and provide adequate lighting.

Upper Lighting Package

The following NFPA lighting package, manufactured by Whelen, shall be provided and installed in the upper areas of the vehicle.

ZONE C: There shall be two (2) Whelen beacons with 360 degree super LED lights, provided and installed at the rear upper outboard corners of the apparatus.

The beacons shall be model B6MM**P with red lights and clear lenses and two (2) 700 series LED amber flashing lights with clear lenses surface mounted below the beacons.

There shall also be two (2) Whelen M9 series LED light red/amber split with clear lenses installed on the top of the compartment tops.

The upper ZONE C specified lights shall be mounted directly to the horizontal body surface as far rearward as possible.

Lower LED Warning Lighting

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the lower areas of the vehicle.

ZONE A: Warning lights shall be provided per the cab/chassis lighting.

ZONES B&D: There shall be a total of four (4) Whelen model M6RC 4"x6" flashing red LED lights with clear lenses and chrome bezels, installed two (2) on each side of the apparatus.

ZONE C: There shall be two (2) Whelen model M9RC flashing red LED lights with clear lenses and chrome bezels, provided and installed on the rear of the body.

Lower Zones B&D Cast Aluminum Light Housing

A cast aluminum light housing shall be used for the rearmost warning light in zones B&D to ensure the light is mounted as far rearward as possible.

Additional Warning Lights

In addition to the NFPA warning light package, there shall be four (4) Whelen Ion model #WIONSMC red LED lights with clear lenses installed two (2) each side. One (1) shall be installed in front and one (1) behind the rear axle on the upper body sides. These four (4) lights

shall be installed in the upper section of the side compartment header centered above the compartments.

In addition to the NFPA warning light package, there shall be four (4) Whelen Ion model #WIONSMC red LED lights with clear lenses installed two (2) each side. One (1) shall be installed in front and one (1) behind the rear axle on the lower body sides. These four (4) lights shall be installed in the rear fender (wheel well) area of the body.

Roto-Ray Warning Light

A Roto-Rays® warning light shall be provided on the cab. The Roto-Rays light shall consist of three (3) round chrome heads, each equipped with an LED light. The lights shall be two (2) red and one (1) clear. The Roto-Rays light shall be installed on the center of the cab grille using a custom bracket.

When activated, the entire light head assembly shall rotate at 200 RPM. When the parking brake is engaged the light shall stop rotating. The Roto-Rays light shall have individual circuits for rotation and illumination so the lamps can remain illuminated when not rotating. When activated the Roto-Rays lights shall be steady burn while rotating and flashing while not rotating.

The Roto-Rays® front warning light(s) shall be separately controlled through the display and control screen.

Rear Directional Light Bar

There shall be eight (8) rear directional lights provided and installed on the rear of the apparatus integrated to the rear face of hosebed cover vertical end cap. The lights shall be Whelen Ion WIONSMC amber lights with clear lenses and chrome bezels and mounted equally spaced, four (4) lights on each end cap.

In addition to the eight light assembly, there shall be six (6) Whelen Ion #WIONSMC Amber LED lights with clear lenses installed three (3) each side. These lights shall be installed in the upper section of the side compartment header centered above the compartments and shall act as a continuation of the rear directional arrow when activated to the left or right.

The back of the hose bed cap shall be boxed in to provide protection and strength for the lights. The back of the protection panel shall be angled to provide protection when hose is deployed in case of contact. This protection panel shall be constructed of embossed aluminum diamond plate.

The lights shall be controlled by a Whelen TACTLD1 control head.

12 Volt Scene Lights

There shall be two (2) Whelen model #M9LZC 12 volt gradient scene lights with chrome bezel provided and installed on the rear of the body, one (1) each side.

The scene lights shall be activated through the multiplexing LCD touch displays.

BODY MISCELLANEOUS

Ladder Storage

The ladders shall be stored within a compartment located beside the booster tank.

All items shall be stored in their own independent section to allow one item to be removed without disturbing another. There shall be polypropylene slide angles installed in each section where applicable to support the ladders and allow ease of removal. There shall be a stop in the front of each section to prevent the items from sliding forward.

There shall be a vertically hinged door, matching the rear overlay material, on the rear of the compartment with two push button type latches and a chrome handle centered between the push button latches.

If the door is not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the “Door Open” indicator light in the cab to warn the crew.

The inner side wall of the ladder compartment shall be extended vertically to the same height as the body side sheet to create a dunnage area above the compartment. The sheet shall be overlaid with the matching material of the hose bed interior side sheets.

There shall be slotted hose bed flooring installed with approximately 1 inch clearance above the ladder box allowing for drainage.

The compartment shall be fully enclosed. The compartment shall be located on the left side of

the tank, with the ladders lying on their side.

The compartment shall be large enough for one (1) 10' aluminum folding ladder, one (1) 14 foot aluminum roof ladder, one (1) 24 foot two section Duo-Safety aluminum extension ladder, two (2) pike poles, one (1) 8' rubbish hook and one (1) 8' Boston hook. Each item is to be stored individually so one item may be removed without disturbing another.

There shall be a stop in the front of each compartment to prevent the items from sliding forward.

Overlays

The entire front face of the apparatus body shall have aluminum diamond plate overlay installed.

The entire rear face of the apparatus body shall have raw aluminum overlays installed for the installation of chevron striping.

All overlay materials shall be coated with 3M adhesive sealant on the back portion to provide an insulating barrier between dissimilar metals.

The front of the apparatus body, vertical wall overlay shall be integrated with a 1/8" aluminum diamond plate corner trim pieces for edge protection. The vertical edge trim piece shall extend from the top to bottom and shall be fastened at a minimum of three locations, top, middle, and bottom.

The rear face of the apparatus body, vertical wall overlays shall be installed with a 1/8" aluminum diamond plate 1.0" x 1.0" corner trim piece, for edge protection. The vertical edge trim piece shall extend from the top to bottom and shall be fastened at a minimum of three locations, top, middle, and bottom.

The vertical edge trim piece that is protecting the chevron striping surface or that is utilized for the purpose of striping, shall be secured utilizing fasteners only.

Knurled SST Insert Hand Rails

All handrails shall be 1 1/4" in diameter, constructed of knurled #3 polished stainless steel tubing. There shall be a 2" minimum clearance between the bracket and the body.

There shall be three (3) hand rails installed on the rear of the apparatus. Each hand rail shall

provide approximately 42 inches of gripping area for personnel. Each hand rail shall be constructed of a knurled #3 polished stainless steel tubing to provide a positive grip. The handrails shall be spaced away from the body using chrome plated ends. Two (2) vertical hand rails shall be installed, one on each side, just below the hose bed sides. The remaining hand rail shall be installed horizontally, just below the hose bed area.

Rear View Camera System

A camera shall be surface mounted on the center rear of the apparatus body for maximum viewing capability. A protective shroud shall be installed over the system to protect against damage.

Reflective Striping

There will be an 8" wide Black Scotchlite stripe. An additional 1" wide Avery Florentine GOLD leaf stripe shall be overlaid at the top and bottom edges of the black stripe. The stripes will cover a minimum of eighty percent (80%) of each side of the apparatus and forty percent (40%) of the front and rear of the apparatus. The stripe will angle upward approximately halfway from the front of the apparatus.

The apparatus shall have reflective striping installed in accordance with NFPA. The design of the striping will be determined at a later date.

Conspicuity Striping

NFPA 2009 Compliant striping shall be supplied to the rear of the vehicle. The front bumper shall have red/black striping and rhino type liner applied to the top edge of the front bumper. The striping shall be applied prior to mounting any equipment or lighting to the surface.

The striping shall be 3M Diamond Grade™ Reflective 983-72NL Red and 983-23 Fluorescent Yellow-Green.

Lettering

There shall be a maximum of sixty (60) 5" tall Scotchlite letters applied to the apparatus. There shall be a maximum of thirty (30) 3" Scotchlite letters applied to the apparatus. There shall be a maximum of sixteen (16) 11" Scotchlite letters applied to the apparatus. All lettering shall have a one color Scotchlite shade applied.

License Plate Mounting

A Cast Products, model LP0004-1-A, cast aluminum fully enclosed license plate bracket shall be installed. The bracket shall incorporate proper LED lighting to illuminate the license plate to meet DOT requirements.

Rear Tow Eyes

There shall be a rear tow eye installed on the left side frame rail. The location of the tow eye shall be below the rear center compartment. The tow eye shall be manufactured utilizing a steel plate that is bolted to the chassis frame rail.

MISCELLANEOUS EQUIPMENT

The following equipment shall be provided with the completed apparatus. All equipment purchased from or provided by the dealer shall be installed on the apparatus prior to the delivery.

Zico Wheel Chocks

One (1) set of NFPA compliant Ziamatic folding wheel chocks model # SAC-44-E shall be supplied with the apparatus.

Zico Wheel Chock Mounting Brackets

One (1) set Ziamatic folding wheel chock underbody horizontal mounts model #SQCH-44-H shall be installed on the apparatus under the body in front of the rear wheels.

Ground Ladders

One (1) Duo-Safety 24' two (2) section aluminum extension ladder, model 900A.

One (1) Duo-Safety 14' aluminum roof ladder with folding hooks, model 775A.

One (1) Duo-Safety 10' aluminum attic ladder, model 585A

Pak Trac

Performance Advantage tool boards will be supplied in compartments as dictated in pre-construction.

Tool Box

There shall be one (1) Lista MP0600-0302 tool box in compartment L1.

WARRANTY

General

To insure single point service support, the manufacturer will certify that they are the single source contact for warranty on the entire apparatus. All required warranty periods are to be considered a minimum and by no means are intending to replace longer warranty periods offered by any manufacturer. All warranties to include parts, labor, and supplies for the full term of the warranty period. The warranty period shall commence from the date the vehicle is accepted by the City of North Richland Hills. No prorated warranties or warranties with deductibles are acceptable. In the event the warranty repair cannot be performed at the City of North Richland Hills, the City of North Richland Hills will be responsible for transportation to the dealer's, vendor's, or manufacturer's repair facility within a sixty (50) mile radius of the City of North Richland Hills. Any transportation or cost for transportation for warranty service or repairs outside the sixty (50) mile radius will be the responsibility of the selling vendor/manufacturer.

Two Year Bumper to Bumper

The apparatus manufacturer shall provide a complete bumper to bumper parts and labor warranty (not to include normal wear items) to the City of North Richland Hills for a period of Two (2) years or the first 36,000 miles, whichever occurs first. The warranty period shall commence from the date the vehicle is accepted by the City. The warranty shall include the complete apparatus including any equipment provided by the manufacturer or vendor. Equipment provided by the City would be excluded from the manufacturer's warranty.

Structural

The aluminum body/structure provided by the apparatus manufacturer for products of its manufacture to be free from defects in material and workmanship, under normal use and service, shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first.

Frame

The frame and cross members shall carry a limited lifetime warranty to the original purchaser.

Engine

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

Transmission

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage.

Paint

A ten (10) year Prorated Paint Warranty shall be included with the apparatus.

Plumbing

Stainless Steel Plumbing/Piping shall be warranty for a period of ten (10) years.

Water Tank

A lifetime tank warranty shall be provided by the tank manufacturer.

Multiplex Electrical

A four (4) year multiplex system warranty shall be provided by the apparatus manufacture for parts and labor, while under normal use and service; against mechanical, electrical and physical defects from the date of installation.

The warranty shall exclude; sensors, shunt interface modules, serial or USB kits, transceivers, cameras, GPS, and electrical display screens, which shall be limited to a period of a two (2) years.

Hale Pump

Hale Products, Inc shall provide a limited manufacturer's pump warranty to be free from defects in material and workmanship, under normal use and service, for a period of two (2) years parts and labor and parts only for years three (3) through five (5).

SERVICE AGREEMENT

Two Year Service Agreement

The following service shall be provided and be included in each vendor's proposal. The service shall be scheduled by the vendor and performed at the City of North Richland Hills.

Prior to the end of the first year and the second year, for the first two years the apparatus has been in service, a factory-trained service and warranty technician shall schedule and perform a thorough check of the entire apparatus including, but not limited to, the following components.

- Engine
- Transmission
- Suspension System
- 12-Volt Electrical System and Components
- 110-Volt Electrical System & Components
- Paint System
- Roll-Up Door System
- Foam Systems
- Pump Systems
- Water Tank
- All Other Components Provided with the Apparatus

Any deficiencies found (that is not due to neglect or abuse) shall be repaired under warranty at no additional cost to the City of North Richland Hills. It is the responsibility of the City of North Richland Hills to notify the vendor/manufacturer within sixty (60) days of any outstanding warranty repairs after the service calls have been made.

Manuals

Two (2) complete operation and maintenance manuals shall be provided with the completed apparatus. One manual will be printed and the other will be delivered on a CD-ROM. Manuals shall include instruction in the operation and maintenance of the overall compressed air foam system and each major component.

Appendix A (Engine Options)

Appendix A includes alternate components being considered for the engine. Pricing for each of these options should be included in the bid. The price quoted should reflect any and all associated equipment needed for installation.

Option #1 Diesel Generator & Light tower

The generator shall be a 7.5KW diesel generator and all associated components.

Generator Installation Location

Shall be located as discussed in the preconstruction meeting and have 200 feet of power chord available on an electric reel.

Electric Cord Reel

One (1) Hannay model #ECR-1618-17-18 series electric rewind cord reel shall be installed on the apparatus as specified.

A weather resistant push button switch to activate the rewind shall be located next to the reel. The switch shall be labeled "CORD REEL".

The cord shall be hardwired to a Circle D remote power distribution box with (4) four NEMA

L5-20 single receptacles. The distribution box shall be stored in a mounting bracket when not in use. The box shall be equipped with a light to indicate when distribution box is energized.

The distribution box shall be equipped with the following receptacles:

Position 1: NEMA L5-20 R

Position 2: NEMA L5-20 R

Position 3: NEMA L5-20 R

Position 4: NEMA L5-20 R

Option #2 Command Light

A Command Light model KL 450 with backlighting option may be considered. Light heads shall be fire research Optimum light heads utilizing LED lighting.

Option #3 Howler Siren

Howler siren and associated components shall be included.

Option#4 Multiplex Electrical System Second display/control panel

An option for a second display/control panel that is mounted on the right hand side of the dash for officer usage

Option #5 Fire pump other than Hale.

Vendors that choose to offer a different style or type pump configuration shall quote the Hale QMAX pump as the specifications request and add an upgrade option #6 for a different pump. All options affected by the pump change shall be included in this price.

Option #6 Independent Front Suspension

Manufacturers offering an upgrade to independent front suspension should list a specific pricing option to upgrade the standard vehicle to IFS.

AERIAL SPECIFICATIONS

The intent of incorporating the aerial specifications at the end of the engine specifications is to provide identical design and construction for all three apparatus. Additional components will be considered as directed by the manufacturer. Appendix A1 reflects additional pricing options that we would like to consider if the manufacturer chooses to itemize for those options.

The below sections will directly pertain to the aerial apparatus capabilities:

Aerial Length-100 foot vertical reach

Aerial tip load- Minimum 500 lbs uncharged/dry (An option to upgrade to 750 pound (Dry) tip load can be added to the bid for consideration). See Appendix A1.

Aerial mount- Rear mount

Aerial materials- Steel

Pump-Same type as engine specifications.

Paint and striping-Same design as the above fire engine specifications.

Hose beds must accommodate a minimum of 700 feet of 5' supply hose and 300 feet of 2.5'.

Hose layouts: **Vendor to ensure that adequate room for the hose and nozzle are incorporated into the design.**

- 1- Bumper line 150 foot of 1 ¾ hose
- 2- Attack line 200 foot 1 ¾ hose
- 3- Attack line 200 foot 1 ¾ hose
- 4- Attack line 200 foot of 2.5' hose

PUMP & APPARATUS TRAINING

The successful bidder shall provide a factory-trained technician to provide the following training: A minimum 4 hour structured training course for the fire apparatus mechanics of the department, covering the repair and maintenance of all components of the apparatus called for in the specifications.

The successful bidder shall provide a minimum 8 hour structured training course to be repeated three times to cover each of the 3 shifts of personnel assigned to operate the apparatus, covering nomenclature of components, proper operation of the apparatus, daily operational maintenance checks, and other information necessary for a firefighter/driver/engineer to properly operate and maintain the apparatus.

It is intended that this training be organized in such a manner that both the mechanics and fire personnel receive full benefit of the aforementioned structured training. The firefighter/operator training shall be conducted within one week after the vehicle is fully accepted and readied for service by the "Purchaser" or at a time mutually agreed upon by the "Purchaser" and "Supplier

MAXIMUM OVERALL LENGTH REQUIREMENT

The apparatus specified shall be constructed with no restrictions to the maximum overall length. However, attention to keeping the wheel base short is desired.

MAXIMUM OVERALL HEIGHT REQUIREMENT

Apparatus taller than 14 feet will not be considered.

OVERALL WIDTH

The apparatus specified shall be constructed to provide as much usable passenger room for the driver and officer respectively. In an effort to ensure adequate room is provided and allow for needed engine compartmentalization, the cab shall have a minimum width of 99 inches yet not exceed 102 inches in overall width.

This dimension shall include the primary construction of the apparatus body and chassis cab. Any peripherals that are 'removable' shall not be incorporated into this measurement.

Items that are considered 'removable' are: Rub Rails, Fenderettes, Mirrors, Lights, Handrails, Front Bumpers, Etc.

CAB AND CHASSIS

APPARATUS TYPE

The apparatus shall be a Quint vehicle designed for emergency service use. The apparatus shall include a permanently mounted fire pump which has a minimum rated capacity of 1500 gallons per minute, a water tank (500), a hose storage area, a compliment of ground ladders, and an

aerial ladder with a permanently mounted waterway that shall be rear mounted thus providing the following vehicle benefits:

- Improved mobility vs. mid-ship mounted units, due to shorter overall travel length and wheelbase.
- Increased compartment space, hose load, and water capacity in the body, resulting from ladder being raised to clear the cab.
- Shorter vehicle wheelbase.

AXLE CONFIGURATION

The manufacturer shall ensure that the apparatus has the appropriate axle configuration to support a fully equipped and in service apparatus.

GROSS AXLE WEIGHT RATINGS FRONT

This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be determined by the manufacturer and capable of supporting the weight of the completed apparatus including all equipment and personnel.

This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

PUMP PROVISION

The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the midship location.

CAB SPECIFICS INCLUDING LIGHTING

See engine cab specifications listed above. This includes all safety features, wiring, mounting and climate control items listed in the engine specifications.

Aerial apparatus will require a slightly different emergency lighting package specific to the design. The engine specification should be used as an example for the aerial lighting package.

CAB SEATING & INTERIOR COMPONENTS

See engine cab specifications listed above. This includes all safety features, wiring, mounting and climate control items listed in the engine specifications.

EMS Storage Cabinet

There shall be a single cabinet fabricated out of smooth aluminum installed in the chassis cab. The cabinet shall be constructed allowing for an opening of approximately 34" wide x 18" deep and as tall as possible while allowing for installation of auxiliary A/C. The compartment shall be installed in the center of the rear wall.

The cabinet shall be enclosed by a R.O.M. or AMDOR rollup door on the front surface and have heavy duty netting in place on the side to secure contents, with two (2) shelves and adjustable shelf tracking installed. The shelves shall be fabricated of smooth aluminum and shall have 1" formed lips to retain its contents and provide rigidity. The exterior and interior of the cabinet; and each shelf shall be Rhino liner type finish in black pebble grain texture or red. To be determined in preconstruction.

Shoreline Connected Duplex Receptacles

Two (2) NEMA 5-15 120V/15A shoreline powered duplex receptacle with weather resistant cover shall be located inside EMS cabinet. The receptacles shall be located at the top and bottom of the cabinet. The receptacles may be used to charge flashlights, radios, and other miscellaneous 120 volt components.

Custom Map Console

There will be a custom designed map book holder in the cab.

Drink Holder

Each seating position shall have a drink holder installed nearby.

Cab Electrical & Auxiliary AC

See engine cab specifications listed above.

ENGINE

The chassis engine shall be a Cummins ISX15 engine. The ISX15 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 550 horse power at 1800 RPM and shall be governed at 2100 RPM. The torque rating shall feature 1850 foot pounds of torque at 1200 RPM with 912 cubic inches (14.9 liter) of displacement.

The ISX15 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2013 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CJ4 low ash engine oil which shall be utilized for proper engine lubrication.

A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

ENGINE COOLING SYSTEM

Manufacturer shall provide engine cooling as outlined in the fire engine specification above.

TRANSMISSION

The drive train shall include an Allison model EVS 4000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters which shall offer Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission gear ratios shall be:

1st	3.51:1
2nd	1.91:1
3rd	1.43:1
4th	1.00:1
5th	0.74:1
6th	0.64:1 (if applicable)
Rev	4.80:1

TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will automatically select a five (5) speed operation. The fifth speed over drive shall be available without using the mode button.

TRANSMISSION FEATURE PROGRAMMING

The Allison Gen V-E transmission EVS group package number 127 shall contain the 198 vocational package in consideration of the duty of this apparatus as a pumper. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

Function ID	Description	Wire assignment
Inputs		
C	PTO Request	142
J	Fire Truck Pump Mode (4th Lockup)	122 / 123
Outputs		

C	Range Indicator	145 (4th)
G	PTO Enable Output	130
	Signal Return	103

SUSPENSION AND STEERING

The suspension shall be similar to the fire engine specifications and appropriate for the apparatus, as determined suitable by the manufacturer. Please list an option for independent front suspension for the aerial apparatus. (See Appendix A1.)

Tires and Wheels

Shall be similar to the fire engine specifications and appropriate for the apparatus as determined by the manufacturer.

Brake and Air System

Shall be similar to the fire engine specifications and appropriate for the apparatus as determined by the manufacturer.

FRONT BUMPER/FRAME

Shall be similar to the fire engine specifications and appropriate for the apparatus as determined by the manufacturer.

BUMPER EXTENSION ADDITIONS

There shall be a hose well provided on the front bumper extension. The hose well shall be made of smooth aluminum and shall have the edges flush with the gravel shield. There shall be modular floor tiles located in the bottom and drain holes provided in the corners.

An embossed aluminum diamond plate cover shall be installed on the front bumper compartment. The cover shall also be notched in the front corner adjacent to the front discharge to allow the cover to be closed while the hose is connected to the front discharge outlet.

The rear edge of the cover shall be attached with a stainless steel hinge. The cover shall be equipped with a D-ring style handle with mechanical latch mechanism to secure the cover in the

closed position. A hold open device shall be installed on the opposite side of the notch to hold the cover in the "Open" position.

The hose well shall be located in the center of the front bumper of the apparatus and shall be designed to hold 150' of 1.75" hose with nozzle.

SIREN AND HORN CONTROLS

Shall be similar to the fire engine specifications.

WIRELESS INTERCOM SYSTEM

Similar to the fire engine specification with one exception:

- Locate a headset in a water tight box near the fly section of the aerial. This headset should be able to continuously charge. An aerial antenna for better reception should be installed on the roof of the apparatus.

MIDSHIP PUMP

The pump shall have the capacity of 1500 gallons per minute, measured in U.S. Gallons. The pump preference is a Hale Fire Pump, QMax, single stage with sacrificial anodes. Vendors that choose to propose alternate pump solutions should quote the Hale fire pump and list an alternative. (See Appendix A).

The entire pump shall be manufactured at the pump manufacturer's factory. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA Pamphlet No. 1901. All moving parts in contact with water shall be of high quality bronze or stainless steel. The pump shall be free from objectionable pulsation and vibration.

The pump drive unit shall be of sufficient size to withstand up to 16,000 lbs/ft of torque of the engine in both road and pump operating conditions. The drive unit shall be completely manufactured and tested at the pump manufacturer factory.

The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

The pump must deliver the percentages of rated capacity at these pressures:

- 100% of rated capacity at 150 pounds net pressure,

- 100% of rated capacity at 165 pounds net pressure,
- 70% of rated capacity at 200 pounds net pressure,
- 50% of rated capacity at 250 pounds net pressure.

The manufacturer shall provide enough discharges and pump piping to provide a functional apparatus. The layout will be similar to the fire engine specifications. Specific locations for each discharge will be discussed in the preconstruction meeting.

PUMP PANELS

Shall be configured and constructed similar to the fire engine specifications. All discharges and additional appliances as listed in the fire engine specifications shall be included on this apparatus.

FOAM

Capabilities identical to the fire engine specifications are required.

BOOSTER HOSE REEL

There shall be one (1) Hannay Model EF series electric rewind booster reel(s) with automatic brake installed on the apparatus. The reel(s) shall have a capacity of 200' of 800 psi booster hose. The reel(s) shall be plumbed to the pump with a 1" quarter turn Akron 8810 ball valve(s) and 1" high pressure hose and couplings. The valve(s) shall be controlled from the operator's panel.

There shall be a manual rewind device provided. A manual crank shall be mounted adjacent to booster reel(s).

Each hose reel specified shall be steel and painted the standard silver utilized by Hannay.

The hose reel shall be mounted above the pump house, centered in the space available.

There will be two (2) set of stainless steel hose rollers guides installed on the left and right side upper pump house to allow hose payout to the both sides of the apparatus.

An electric rewind switch shall be located on the right and left operator's panel.

BOOSTER HOSE

The reel shall come equipped with 200 feet of 1" diameter booster hose, 800 psi. The hose shall be provided in 100 foot lengths with hardcoat aluminum couplings.

COMPARTMENTATION

Should be designed to mirror the fire engine specifications. Vendor shall be prepared to customize the design at prebuild.

Three rollout trays shall be figured into the price of the build. Location to be determined at preconstruction.

Two shelves shall be available for all compartments that will accommodate shelving.

LADDER BOX STORAGE:

The storage shall be large enough for the following ladder compliment and pulling tools.

- (1) 35' 3 Section Ladder
- (2) 28' 2 Section Ladders
- (2) 16' Roof Ladders
- (2) 10' Attic Ladders

PIKE POLES

- (2) 6' NY hook
- (2) 8' NY hook
- (1) 10' NY hook
- (1) 12' NY hook

GENERATOR

10KW Hydraulic Generator with HOT shift PTO as suggested by the manufacturer. All associated components should be included. This is not an optional item on the aerial.

ELECTRIC REWIND CORD REEL

Two (2) Hannay model #ECR-1616-17-18 series electric rewind cord reel(s) shall be installed on the apparatus as specified.

There shall be a four way roller assembly provided and installed to guide the cord on and off of the spool to prevent chafing on the body or opening. There shall also be a cord stop supplied. The reel shall come equipped with 200 feet of yellow 10-3 electrical cord.

A weather resistant push button switch to activate the rewind shall be located next to the reel. The switch shall be labeled "CORD REEL".

The cord shall be hardwired to a Circle D remote power distribution box with (4) four NEMA L5-20 single receptacles. The distribution box shall be stored in a mounting bracket when not in use. The box shall be equipped with a light to indicate when distribution box is energized.

The distribution box shall be equipped with the following receptacles:

Position 1: NEMA L5-20 R

Position 2: NEMA L5-20 R

Position 3: NEMA L5-20 R

Position 4: NEMA L5-20 R

- One (1) located in L1 Compartment.

- One (1) located in R1 Compartment.

AERIAL COMPONENTS

INTENT OF AERIAL SPECIFICATIONS

The intent of these specifications is to obtain a telescoping elevating ladder of the true ladder type. It shall consist of enough outriggers and ladder sections to safely operate the aerial device. The rated vertical height of the unit shall be a minimum of 100'. Any vendor who submits a bid shall disclose any and all restrictions to their 100' vertical or horizontal reach capabilities.

It is the intent of the purchaser that the device must meet all the requirements of the National Fire Protection Association's (NFPA) 1901 standard, 2009 edition. It is also the intent of the purchaser to secure a fire service proven piece of apparatus that shall be manufactured in the U.S.A.

It is not the intent of the purchaser to deviate from this requirement; therefore, ladders attached to booms, whether solid or lattice, or articulating arms shall not be considered as meeting these specifications or the intent of these specifications.

Vendor shall disclose their weight ratings flowing and not flowing water. Wind and ice ratings shall also be identified.

MATERIAL STANDARD

All structural materials used in the aerial shall be certified by the mill of the manufactured material. Materials that are not certified shall not be acceptable.

GENERAL APPARATUS DESCRIPTION

The unit shall be designed to conform fully to the "Aerial or Quint Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2009 Revision), shall include the general requirements as stated in Chapter 4 for Aerial or Quint Apparatus.

The manufacturer shall describe in detail the components of the proposed hydraulic system and torque box.

OUTRIGGERS

The manufacturer will specify the proper number and length of all out and down riggers. Outrigger pads will be provided with the apparatus.

TURNTABLE

A full size turntable deck shall be provided to maximize the safe work area around the control console and to allow unimpeded access to and from the aerial ladder and the ground. Operator safety should be considered in the construction of a solid operating platform.

360 DEGREE ROTATION

The aerial shall be designed to rotate 360 degrees and be able accomplish what is commonly referred to as a store front blitz.

LADDER EGRESS

The fly ladder tip shall be equipped with a bolt-on section to make the transition to and from the ladder easier. The egress shall have an angled section which includes ladder rungs and an extended radius handrail to provide additional safety when climbing to and from the ladder. The bolt-on section shall be easily replaced if damaged during firefighting operations.

REMOVABLE RUNG ASSEMBLY

For ease of service, the first rung of each section shall be integrated with the rear ladder side guides and vertical load transfer mechanism. The assembly shall be removable from the rear of the section by removing four bolts to allow for easy service access to slide pads and rollers.

FLY TIP STEPS

One (1) folding step shall be conveniently located at the end portion of the fly section. This shall be used for one person to place his feet so that he is positioned parallel to the ladder. The step shall fold into proper position for usage and fold toward the side of the ladder when not in use to provide adequate clearance when the ladder is being climbed. A gas strut shall be provided to secure the step in the stored and deployed positions.

AERIAL WATER SYSTEM

The aerial waterway system shall be capable of being supplied by both the pump and an external water source with the auxiliary inlet on the right side of the apparatus.

All piping from the pump and the auxiliary aerial inlet to the riser pipe below the turntable swivel shall be 4" Schedule 40 aluminum 6061 T6 pipe. A 5" water swivel shall be located in the riser pipe permitting 360-degree continuous rotation of the ladder.

A 5" heel pin swivel connection between the ladder waterway and the turntable swivel permitting water tower operations from -10 to +75 degrees shall be provided.

A 1-1/2" adjustable relief valve shall be located beneath the turntable to protect the water system from excessive pressures.

AERIAL WATERWAY FLOWMETER

The apparatus shall be equipped with a Class 1 Flowminder, model #FMS at the aerial discharge waterway to give the aerial operator an indication of actual volume of water (in gallons per minute) being discharged through the line. Display shall be located at the turntable control console.

The flowmeter shall be checked and calibrated prior to delivery of the apparatus.

TELESCOPIC WATERWAY

An anodized aluminum telescopic waterway shall be mounted beneath the center of the aerial ladder.

PINABLE WATERWAY FEATURE

The aerial ladder waterway monitor shall be capable of being positioned at either the fly section for water tower operation or at the next lower ladder section for rescue. The monitor will be able to direct water above ground when the aerial is setting near ground level.

The monitor will be a Task Force Tips Monsoon and will be controlled electronically on the fly section of the ladder and the turn table.

The monitor will come with and accommodate stack tips as well as a fog nozzle.

AERIAL AUXILIARY TIP DISCHARGE

A 2 ½ discharge outlet shall be provided at the tip of the aerial device to be used for connecting and flowing fire hose. This shall be connected to the waterway.

AERIAL DEVICE PAINT

The finished paint color shall be red, white or black. Price should be reflected in the bid. This color will be decided in the preconstruction meeting along with all of the other aerial components.

COMMUNICATION SYSTEM

A communication system shall be provided and installed between the pump panel, ladder tip and the turntable operator's position. The communication speaker at the ladder tip shall require no operator attention to transmit or receive. The transmitting receiving volume controls shall be located at the turntable operator's position and the pump panel.

AERIAL LIGHTS

The manufacturer shall equip the aerial with an adequate light package. This will include LED Spot/Flood lights on the tip along with flood lights and walkway illumination.

OUTLETS AT THE AERIAL TIP

One (1) 110-volt weatherproof outlet, NEMA L5-20R, twist lock type and an environmental cover shall be provided and installed.

APPARATUS LEVEL INDICATOR

Appropriate bubble type level indicators shall be provided as per the manufacturers requirements.

"Green" **Safe Operating Zone.**
"Yellow" **Caution Operating Zone.**
"Red" **Do Not Operate Zone – Reposition Apparatus.**

FORE/AFT LEVEL

An additional backlit leveling indicator shall be provided and installed to measure fore and aft level of the vehicle. The indicator shall be mounted near the left main outrigger control panel.

AXE MOUNTING

There shall be a mount provided and installed for a pick head axe in the fly section of the ladder. The axe mount shall include a receptacle that will cover the entire axe head and a mechanical pin to secure the axe handle.

PIKE POLE MOUNTING

There shall be a mount provided and installed in the fly section of the ladder for a pike pole. The mounts shall include restraints for both ends of the pike pole.

ROOF LADDER MOUNT

There shall be a mount provided and installed in the fly section of the ladder for a 16' roof ladder. The mounts shall include restraints for both ends of the ladder.

STOKES BASKET STORAGE BOX (PAINTED)

A stokes basket storage box shall be provided and installed on the outside of the aerial ladder base section.

The storage box shall be totally enclosed and shall include a hinged lid with latches. The storage box shall be fabricated from 1/8" smooth aluminum sheet and shall be approximately 12" D x 27" H x 90" L and painted to match the aerial sign panel on the opposite side of the base section.

The storage box shall be located on the side of the aerial ladder opposite from the turntable control console in order to provide maximum visibility for the operator.

The storage box shall be easily accessible from the ladder or body.

The side facing, outside painted surface of the storage box shall serve as the aerial sign panel on that side of the apparatus.

The storage box shall be designed to be water proof.

LIFTING ANCHORS

Two tip anchors shall be provided at the end of the fly section with a total capacity of 500 lbs.

AERIAL TESTING & CERTIFICATION

General

The following Apparatus shall comply with all NFPA 1911 applicable regulations in effect as of the contract signing date. There shall be multiple tests performed by the contractor and Underwriter's Laboratories when the apparatus has been completed. The manufacturer shall furnish the completed Test Certificate(s) to the purchaser at time of delivery.

The apparatus upon completion will be tested and certified by Underwriters Laboratories, Inc. The certification tests will follow the guide lines outlined in NFPA 1911 "Standard for Fire Apparatus".

There shall be multiple tests performed by the contractor and Underwriter's Laboratories when the apparatus has been completed. The manufacturer shall provide the completed Test Certificate(s) to the purchaser at time of delivery. The inspection services of Underwriters Laboratories are available to all bidders on an equal basis; therefore, no third party testing service shall be acceptable.

Performance Testing

All work outlined in NFPA 1911, current Edition, including nondestructive testing, shall be conducted at the manufacturer's facility. In addition, the following test work, Certification Test sections of NFPA 1901, 2009 Edition shall be conducted.

a). 1-1/2 Times Rated Capacity on Level Ground Stability Test: A load of 1-1/2 times rated capacity (as specified by the manufacturer) shall be suspended from the tip of the aerial ladder, or the platform of the elevating platform, when it is in the position of least stability. If the manufacturer specifies a rated capacity while flowing water, then one times the water load and the worst case nozzle reaction shall be added to the stability test weights. The apparatus shall show no signs of instability. For a water tower, the stability test includes 1-1/2 times the weight of the water in the system and 1-1/2 times the maximum nozzle reaction force when it is in the position of least stability.

b). 1-1/3 Times Rated Capacity on a 5 degree Slope Stability Test. A load of 1-1/3 times rated capacity shall be suspended from the tip of the aerial ladder, the platform of the elevating platform, or the tip of the water tower when it is in the position of least stability. The apparatus shall show no signs of instability.

c). A friction loss test shall be conducted for an aerial device equipped with a permanent water system and has a rated vertical height of 110 ft. or less. A flow test shall be conducted to determine that the friction loss in the water system between the base of the swivel and the monitor outlet does not exceed 100 psi with 1000 GPM flowing and the water system at full extension.

d). A maximum vertical height flow test shall be conducted to determine that the water system is capable of flowing 1000 GPM at 100 psi nozzle pressure with the aerial device at full elevation and extension. If the apparatus is equipped with a fire pump designed to supply the water system, the test shall be conducted using the onboard fire pump. The intake pressure to the fire pump shall not exceed 20 psi.

Written Examination and Test Report

A complete written Examination and Test Report for each aerial device inspection performed at the manufacturer's facility. The test report, as required by NFPA 1911, shall include the following test results.

a). Torque verification of all mounting bolts including bolt size, grade, and torque specification.

b). The following NDT methods and results shall be recorded. All ferrous welds shall be magnetic particle inspected for defects. All nonferrous welds shall be visually inspected, and if questionable defect are identified, a penetrating dye shall be used to further evaluate the quality of the weld. All bolts and pins shall be ultrasonically inspected for internal flaws. A waterway pressure test shall be performed and a hydraulic oil sample taken.

c). The following measurements shall be taken and recorded in the examination and test record: bearing clearance and backlash, elevation cylinder drift, engine speed operating rpm, relief pressure, stabilizer extension cylinder drift, ladder section twist, hardness readings, base rail thickness, winch drift, extension brake drift, and extension cylinder drift.

Personnel

The inspectors performing the test work on the units are certified to Level II in the required NDT methods, under the requirements outlined in ASNT document CP-189.

Aerial Apparatus Certification

When the unit successfully meets all the requirements outlined in NFPA 1901, 2009 Edition, UL shall issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit's compliance with NFPA 1911.

MANUALS

The aerial manufacturer shall provide the following manuals pertaining to the aerial device:

Two (2): Operators' manuals.

Two (2): Parts manuals in a CD format.

Two (2): Complete Electrical and Hydraulic Diagrams in a CD format.

SERVICE

Due to the importance of keeping this vital piece of firefighting apparatus in service with a minimum of downtime, the manufacturer of the aerial device shall maintain a network of service centers with factory-trained personnel.

The service facility shall carry an inventory of parts, separate from production parts.

WARNING DECALS

Warning decals shall be provided in appropriate locations to alert the operator of potential hazards and operating instructions. All warning labels shall be in general compliance with A.N.S.I. Z534.1 recommendations.

ON-SITE PREVENTATIVE MAINTENANCE & OPERATIONAL TRAINING

PROGRAM OUTLINE

An on-site program for demonstration and instruction of the Fire Department personnel shall be provided. This program shall be designed to assure complete understanding of all aspects of the aerial device in the operating environment.

After the unit has been accepted, a factory trained, qualified Field Service Technician shall be provided for a minimum of three (3) consecutive days of instruction.

The program shall be designed to instruct an individual who has never utilized an aerial device of this type before. The individual shall be thoroughly taught the operating systems of the aerial device, including emergency operation. Introductory service skills utilizing the vehicle shall also be taught.

OPERATION & MAINTENANCE PROGRAM

To instruct Fire Department personnel in the operation, preventative maintenance and care of the aerial device, this instruction program shall be oriented towards a hands-on approach utilizing the new apparatus.

1. Explain operations of the entire aerial device. Each participant shall actually use the aerial and be instructed in the necessary steps of safe operation.
2. Troubleshooting shall be emphasized and reinforced continually throughout the instruction period.
3. Preventative maintenance procedures shall be setup and definite schedules developed to assure proper maintenance of the aerial device.
4. Instruction in the use of tools and how to replace minor assemblies, as applicable. Equally important in this instruction shall be when to call appropriate personnel for assistance.

5. How to order parts through the local service center by utilizing parts manual.

AERIAL APPARATUS CERTIFICATIONS (TYPE 1)

The aerial device shall be tested in compliance with the National Fire Protection Association's Standard #1911 (latest edition). Ongoing structural and physical property testing during construction will also be done.

The following tests shall be conducted by personnel holding a Level II certification to detect defects and improperly secured components:

1. Magnetic particle inspection shall be conducted on all ferrous welds to assure the integrity of the weldments and also detect any flaws or weaknesses. These tests shall be performed prior to paint or assembly.
2. Ultrasonic inspection shall be used to detect any flaws in pins, bolts and other critical mounting components. The bolts shall be tested after they have been torqued to ensure the bolt was not damaged.
3. All extension/retraction cables shall be tested and certified by the cable vendor.
4. All extension/retraction shall be tested and certified by the cable vendor.
5. Functional tests, load tests, stability tests and visual structural examination shall be performed. These tests will determine any unusual deflection, vibration, or instability characteristic of the unit.
6. Hydraulic oil shall be sample tested prior to delivery.
7. A waterway system pressure test shall be performed.

Upon completion of the preceding inspections, the independent testing company shall issue a Certificate of Inspection indicating that all specified standards have been satisfied. The Type I certification shall be provided by Underwriters Laboratories Inc. (UL). Aerial manufacturers not utilizing third party, independent testing companies shall not be acceptable.

TESTS

The following test shall be conducted to the aerial device prior to delivery; all listed tests shall be

witnessed and certified by Underwriters Laboratories Inc. (UL) to ensure the device meets all current requirements of NFPA-1901.

The manufacturer of the aerial device shall to provide a written statement signed by a Registered Professional Engineer certifying the aerial's ability to perform the following tests:

1. 1-1/2:1 DYNAMIC STABILITY AND LIFT TEST - A test of the apparatus shall be performed that the ladder sections are so designed and powered to support a load representing 150% of the manufacturer's rated tip load capacity at maximum horizontal reach on level ground. Since this is a dynamic test, the load must be raised, lowered and rotated without evidence of instability. Specifically, 1125 pounds at the ladder tip with the ladder fully extended at zero degrees shall be rotated 360 degrees.

2. 1-1/3:1 DYNAMIC STABILITY AND LIFT TEST - A test of the apparatus shall be performed that the tip and ladder sections are so designed and powered to support a load representing 133% of the manufacturer's rated tip load capacity at maximum horizontal reach on a five (5) degree slope. Since this is a dynamic test, the load must be raised, lowered and rotated without evidence of instability. Specifically, 998 pounds at the ladder tip with the ladder fully extended at zero degrees shall be rotated 360 degrees.

3. TIME TEST - A test of the apparatus shall be performed to raise the ladder from a bedded position extended to full height and rotated through a 90 degree turn smoothly and without undue vibration in not over 120 seconds.

4. WATER TOWER TEST #1 - A test of the apparatus shall be performed to test its ability to discharge 1000 gallons per minute parallel to the ladder with the unit at full extension and zero degree elevation. The unit shall be capable of performing this test with a rated tip load of 500 pounds at the ladder tip.

5. WATER TOWER TEST #2 - A test of the apparatus shall be performed to test the ability to discharge 1000 gallons per minute, 90 to the ladder with the ladder at full extension, zero degree elevation. The unit shall be capable of performing this test with a rated tip load of 500 pounds at the ladder tip.

6. HORIZONTAL LOAD TEST-With the aerial device out of the cradle at zero degree elevation, a horizontal load of 500 lbs shall be applied to the tip of the ladder, unless a 750 pound tip load is purchased.

Bidders must state their ability to comply with all of the above tests. Failure to do so shall be grounds for rejection of their bid.

WARRANTY –

Vendor shall provide specific warranty information with their respective bid.

REFLECTIVE STRIPING

The reflective striping shall be supplied and installed by the dealer.

REAR RETRO-REFLECTIVE CHEVRON STRIPING

A minimum of 50 percent of the rear-facing vertical surface, visible from the rear of the apparatus, shall be equipped with Diamond Grade, retro-reflective striping in a chevron pattern, sloping downward and away from the centerline of the vehicle at an angle of 45-degrees. The stripe shall be 6” wide alternating in colors in compliance with the current edition of NFPA 1901.

The retro-reflective chevron striping shall be red and fluorescent yellow-green in color.

DEALER SUPPLIED BODY LETTERING

The body lettering shall be provided and installed by the servicing dealership before final delivery of the completed apparatus. See Engine portion of specifications.

DEALER SUPPLIED AERIAL LETTERING

The aerial lettering shall be provided and installed by the servicing dealership before final delivery of the completed apparatus.

LICENSE PLATE MOUNTING

A Cast Products, model LP0004-1-B, cast aluminum fully enclosed license plate bracket shall be installed. The bracket shall incorporate a clear LED light (WL0501) to illuminate the license plate and meet DOT requirements.

MISCELLANEOUS EQUIPMENT

The following equipment list shall be provided with the completed apparatus.

All NFPA required wheel chocks will be supplied and installed by the Dealership before the

truck is placed into service.

GROUND LADDERS

- (1) 35' 3 Section Ladder
- (2) 28' 2 Section Ladder
- (3) 16' Roof Ladder
- (2) 10' Attic Ladders

PIKE POLES

- (2) 6' NY hook
- (2) 8' NY hook
- (1) 10' NY hook
- (1) 12' NY hook

DEALER SUPPLIED SERVICES/EQUIPMENT

SERVICE AGREEMENT

The vendor shall provide a two year service agreement. The service shall be scheduled by the vendor and performed at the City of North Richland Hills.

Prior to the end of the first year and the second year, for the first two years the apparatus has been in service, a factory-trained service and warranty technician shall schedule and perform a thorough check of the entire apparatus including, but not limited to, the following components.

- Engine
- Transmission
- Suspension System
- 12-Volt Electrical System and Components
- 110-Volt Electrical System & Components
- Paint System
- Roll-Up Door System
- Foam Systems
- Pump Systems
- Water Tank
- All Other Components Provided with the Apparatus

Any deficiencies found (that is not due to neglect or abuse) shall be repaired under warranty at

no additional cost to the City of North Richland Hills. It is the responsibility of the City of North Richland Hills to notify the vendor/manufacturee within sixty (60) days of any outstanding warranty repairs after the service calls have been made.

INSTALLATION OF CUSTOMER SUPPLIED KEY SECURE

A Knox System KeySecure 1 with Blue Strobe (Model 2611) shall be provided by the City of North Richland Hills and installed in the cab in a location determined during the pre-construction conference.

INSTALLATION OF FD SUPPLIED RADIOS

The Fire Department radios/antennas will be installed by the dealer

HOSE BED DRAPE

There will be a hose bed drape provided and installed on the apparatus.

PAK TRAC

Should be included in the bid for compartments. Specification should reflect every compartment where the bidder intends on providing said boards.

CUSTOM POWER SAW TRAY

There will be a custom designed welded plastic saw holder installed in a compartment

CUSTOM MAP CONSOLE

There will be a custom designed map book holder in the cab.

CUSTOM DRINK HOLDERS

There shall be four (4) custom black poly drink holders provided and installed on the apparatus.

LISTA TOOL BOX

There shall be one (1) Lista tool box in compartment L1.

APPENDIX A1 (AERIAL OPTIONS)

Appendix A1 includes alternate information being considered. Pricing for each of these options should be included in the quote proposal. The price quoted should reflect any and all associated equipment needed for installation.

Option #1 Special 4X8 Compartment

Manufacturer shall design and allow for a single compartment that will facilitate carrying two $\frac{3}{4}$ inch thick 4x8 sheets of plywood. Location to be determined based off of unique apparatus limitations.

Option #2 Howler Siren

Howler siren and associated components shall be included.

Option#3 Multiplex Electrical System Second display/control panel

An option for a second display/control panel that is mounted on the right hand side of the dash for officer usage

Option #4 Fire pump other than Hale.

Vendors that choose to offer a different style or type pump configuration shall quote the Hale QMAX pump as the specifications request and add an upgrade option #7 for a different pump. All options affected by the pump change shall be included in this price.

Option #5 750 pound tip load

Apparatus with aerials that do not have a 750 pound tip load (dry) should add the option to upgrade to a 750 pound tip load (dry).

Option #6 Independent Front Suspension

Manufacturers offering a upgrade to independent front suspension should list a specific pricing option to upgrade the standard vehicle to IFS.

Option #7 2000gpm rated pump

Manufacturers may recommend a 2000 gpm rated pump. The price on this option shall include all additional cost to accommodate the additional plumbing and discharges required with the increased pump size.

APPENDIX B (TRADE IN)

The below information is provided with the intent of trading all three fire apparatus in on the purchase of three new fire apparatus. The vehicles listed below are still in service. The mileage, hours and general condition are continuously changing and should be considered approximate.

Unit#	945 Reserve 75 Ft Quint
Year	1997
Make	E-One
Engine	Detroit 500 HP
Pump	1500 GPM
Aerial	75 Aluminum
Miles	120,199
Foam	NA
Inside	Clean
Generator	Hydraulic Yes
Condition	Good
Engine hrs	11,723 hrs

Unit#	981 Ferrara 77 Ft
Year	2009
Make	Ferrara
Engine	500
Pump	Hale 1500GPM 153 Hrs
Aerial	141.4
Miles	45,677
Foam	Yes 30gal
Inside	Excellent
Generator	Yes
Condition	Excellent
Engine Hrs	4856 hrs

Unit#	974 ALF Platform
Year	2007
Make	ALF
Engine	Detroit 500
Pump	Hale 2,000 GPM
Aerial hrs	731
Miles	49,329
Foam	NA
Inside	Clean
Generator	Yes
Condition	Excellent
Engine Hrs	5552 hrs

PRICING SHEET FOR NORTH RICHLAND HILLS FIRE APPARATUS

Vendors should quote apparatus as a complete package. Any options quoted should be reflected as an additional price (or discount) if applicable.

As a representative of _____, I will attest the manufacturer has an approved service center within 50 miles of North Richland Hills.

Yes No Please circle one.

Fire Engine/Pumper

- Option 1 Diesel Generator _____
- Option 2 Command Light _____

- Option 3 Howler Siren _____
- Option 4 Control panel Second Display _____
- Option 5 Fire Pump Other than Hale _____
- Anticipated Delivery Date _____

Two (2) -100' minimum Aerial apparatus

- Option 1 Special 4' X 8' compartment _____
- Option 2 Howler Siren _____
- Option 3 Control panel Second Display _____
- Option 4 Fire Pump other than Hale _____
- Option 5 750 pound tip load _____
- Option 6 Independent front suspension _____
- Option 7 2000 GPM rated Fire Pump _____
- Anticipated Delivery Date _____

Trade-in Values Listed individually

- 1997 E-One 75' Aluminum Ladder _____
- 2007 American LaFrance 100' Platform _____
- 2009 Ferrara 77' Steel Ladder _____