CITY OF PAWTUCKET

REQUEST FOR PROPOSALS

12-069
Fire Apparatus

Contents:

1.0 - Bid/Solicitation Information

Schedule

Pre-Bid/Proposal Conference: ☒ No ☐ Yes

Requests for Further Information:
December 20, 2012 at 10:00 AM

Requests for information or clarification must be made electronically to the attention of:
David Clemente - Purchasing Agent
E-mail: dclemente@pawtucketri.com

Please reference the RFP / LOI number on all correspondence. Answers to questions received, if any, will be posted on the internet as an addendum to this bid solicitation.

RFP Submission Deadline:
January 8th 2012 at 3:00 PM
Late submittals will not be considered.

Proposals must be mailed or hand-delivered in a sealed envelope **marked with the RFP/Bid # and Project Name** to:

Pawtucket City Hall - Purchasing Office
137 Roosevelt Avenue
Pawtucket, RI 02860

Bonds/Surety Required

Bid Bond: ☐ No ☒ Yes

Surety Bond: ☒ No ☐ Yes
Bidder is required to provide a bid surety in the form of a bid bond or certified check payable to the City of Pawtucket in an amount not less than five percent (5%) of the bid price.

Fidelity Bond: ☒ No ☐ Yes

Performance Bond: ☐ No ☒ Yes

The successful bidder will be required to furnish all insurance documentation as outlined in the attached Purchasing Rules & Regulations and General Terms & Conditions of Purchase.

Miscellaneous

The bid process and resulting contract are subject to the Rules and Regulations and General Terms and Conditions of Purchase. Submission of a bid in response to this solicitation is acknowledgement and acceptance of these Rules and Regulations and General Terms and Conditions of Purchase.

The City of Pawtucket reserves the right to award on the basis of cost alone, accept or reject any or all bids, and to act in its best interest including, but not limited to, directly negotiating with any vendor who submits a proposal in response to this RFP and to award a contract based upon the results of those negotiations alone. Proposals found to be technically or substantially non-responsive at any point in the evaluation process will be rejected and not considered further. The City of Pawtucket may, at its sole option, elect to require presentations(s) by bidders clearly in consideration for award.

2.0 - Instructions and Notifications to Bidders

- It is the vendor's responsibility to examine all specifications and conditions thoroughly, and comply fully with specifications and all attached terms and conditions. Vendors must comply with all Federal, State, and City laws, ordinances and regulations, and meet any and all registration requirements where required for contractors as set forth by the State of Rhode Island. Failure to make a complete submission as described herein may result in a rejection of the proposal.

- All costs associated with developing or submitting a proposal in response to this Request, or to provide oral or written clarification of its content shall be borne by the bidder. The City of Pawtucket assumes no responsibility for these costs.

- A submittal may be withdrawn by written request to the Purchasing Agent by the proposer prior to the stated RFP deadline.

- Prior to the proposal deadline established for this RFP, changes may be made to a proposal already received by the City if that vendor makes a request to the Purchasing Agent, in writing, to do so. No changes to a proposal shall be made after the RFP deadline.

- Proposals are considered to be irrevocable for a period of not less than ninety (90) days following the opening date, and may not be withdrawn, except with the express written permission of the Purchasing Agent. Should any vendor object to this condition, the vendor must provide objection through a question and/or complaint to the Purchasing Agent prior to the proposal deadline.

- All pricing submitted will be considered to be firm and fixed unless otherwise indicated herein.

- The vendor has full responsibility to ensure that the proposal arrives at the Purchasing Division Office prior to the deadline set out herein. The City assumes no responsibility for delays caused by the U.S. Postal Service or any other delivery service. Postmarking by the due date will not substitute for actual receipt of response by the due date. Proposals arriving after the deadline may be returned, unopened, to the vendor, or may simply be declared non-responsive and not subject to evaluation, at the sole discretion of the Purchasing Agent. **For the purposes of this requirement, the official time and date shall be that of the time clock in the City of Pawtucket's Purchasing Office.**

- It is intended that an award pursuant to this Request will be made to a prime contractor, who will assume responsibility for all aspects of the work. Joint venture and cooperative proposals will not be considered, but subcontracts are permitted, provided that their use is clearly indicated in the bidder's proposal, and the subcontractor(s) proposed to be used are identified in the proposal.

- Bidders are advised that all materials submitted to the City of Pawtucket for consideration in response to this Request for Proposals shall be considered to be public records as defined in Title 38 Chapter 2 of the Rhode Island General Laws, without exception, and may be released for inspection immediately upon request once an award has been made.

- Vendors are responsible for errors and omissions in their proposals. No such error or omission shall diminish the vendor's obligations to the City.

- The City reserves the right to reject any or all proposals, or portions thereof, at any time, with no penalty. The City also has the right to waive immaterial defects and minor irregularities in any submitted proposal at its sole discretion. All material submitted in response to this RFP shall become the property of the City of Pawtucket upon delivery to the Purchasing Agent.

- There is no official, public opening of proposals. The City asks that companies refrain from requesting proposal information concerning other respondents until an intention to award is determined, as a measure to best protect the solicitation process, particularly in the event of a cancellation or re-solicitation. Proposal materials become public information only after a contract is awarded.

3.0 - Overview

The City of Pawtucket is interested in seeking proposals from reputable manufacturers of fire apparatus per the specifications found within this document. The equipment is as follows:

One (1) each of a pumper fire truck.

One (1) each of a ladder fire truck.

4.0 - Scope of Work

FIRE APPARATUS SPECIFICATIONS FOR ONE (1) CLASS I PUMPER

Information for Contractors

Sealed proposals are desired from reputable makers of automobile fire apparatus in accordance with these specifications and with the advertisement, a copy of which is attached, for the piece of apparatus listed as follows:

Fire Truck, triple combination pumper, midship mounted fire pump, extruded aluminum apparatus body, 750 gallon booster tank, Idle Reduction Technology, and all other equipment in accordance with the following:

GENERAL REQUIREMENTS

Each bid must be accompanied by bidders accurate written specifications covering the apparatus and equipment, which it is proposing to furnish and to which the apparatus furnished under the Contract must conform.

It is the intent of these specifications to cover the furnishing and delivery to the city, complete apparatus equipped as specified. All specifications herein contained are considered as minimum. Some items have been specified by brand name or model number. These have been carefully selected because of their reliability, compatibility with present equipment, and local availability of parts.

NO EXCEPTIONS will be allowed relating to the make and model of fire pump, valves and plumbing, gauge and types of materials, size of compartments, methods of construction, and overall design features of the apparatus.

Exceptions taken in areas other than listed above must be listed on a separate page and marked "Exceptions To Specifications". Every exception taken shall be listed as to page number and paragraph. Failure to provide the required exception list with the bid proposal will be cause for rejection of that proposal.

Such details and other construction features not specifically covered herein shall conform with all State and Federal requirements, and the NFPA Pamphlet No. 1901 "Standard for Automotive Fire Apparatus" in effect at the time the contract is signed.

Any test equipment required or expense incurred for the ULI pump test shall be borne by the contractor supplying this equipment.

RELIABILITY OF CONTRACTOR

Contractor shall furnish satisfactory evidence that he has the ability to construct the apparatus specified, and shall state in the bid proposal the location of the factory where the apparatus is to be built, and also where future service work will be performed.

Proposals will only be considered which are submitted by full time fire apparatus manufacturers who are current members of the Fire Apparatus Manufacturers Association (FAMA). FAMA is a non-profit organization designed to keep fire truck manufacturers abreast with latest technologies and governing standards, and to act as a liaison to the IAFC and NFPA. Bidder must have the ability to show evidence of their affiliation to the FAMA in the bid proposal.

All bidders shall provide with their proposal, pictures of similar apparatus as that being specified, and the names of ten cities where similar apparatus have been furnished. Bidders shall provide the name and telephone number of a contact person for each City listed. Failure to provide a users list with the bid proposal shall be cause for rejection of that proposal.

SUBMISSION OF PROPOSALS

Proposals are to be submitted as follows:

- Each proposal shall be submitted in duplicate unless otherwise indicated in the specifications.
- Each proposal shall be submitted in sequence with the attached specifications for ease of checking compliance of bids with bidders specifications.
- All proposals shall be submitted on company letterhead.
- Each bid proposal shall be signed by an authorized representative of the manufacturing company being bid.
- Any proposal which is not signed by a representative of the manufacturing company being bid or not submitted on company letterhead will be immediately rejected.

PROPOSAL GUARANTEE

Each proposal must be accompanied by a Bidder's Bond or Cash in the amount of 10% of the bid submitted a proposal guarantee, which it is agreed by the contractor will be forfeited in the event this proposal is accepted and the contract is not executed.

Bid bond shall be signed by an Officer of the manufacturing company being bid.

Personal or Company checks are not acceptable as a Bonding medium.

All bidders must have the ability to provide the requested Bidder's Bond and Performance Bonds when called for in these specifications. Companies who are only able to provide Supply Bonds in lieu of Performance Bonds will not be considered.

INSURANCE REQUIREMENTS

Each bidder must submit with their bid proposal a Certificate of Insurance listing the proposed manufacturer's product liability insurance coverage. General Liability Insurance limits shall have a minimum limit of $1,000,000 per occurrence and $2,000,000 General Aggregate limit. Umbrellas coverage shall have a minimum $15,000,000 limit. Submitted Certificate shall name the apparatus manufacturer, insurance company, policy number, and effective dates of the insurance policy. Bids submitted without the required Certificate, or for Certificates listing less than two (2) million dollars of general coverage, plus the ten (10) million dollar umbrella coverage, will be considered non responsive and automatically rejected. No exceptions are allowed to the minimum insurance coverage requirement.

The manufacturer shall maintain full insurance coverage on the purchaser's cab and chassis from time of first possession by the manufacturer until the apparatus is delivered and accepted by the purchaser. No exceptions. Purchaser reserves the right to require proof of insurance from the manufacturer's insurance carrier prior to entering into a contract for the apparatus.

DELIVERY AND OPENING OF PROPOSAL

Each proposal and all papers bound and attached thereto, together with the proposal guarantee, shall be placed in an envelope and securely sealed therein. The envelope shall be marked "Bid On Fire Equipment" with the bidders name and address on the upper left hand corner.

Proposals will be received at or prior to the time set for the opening of bids. Proposals received after the "Bid Opening" will be returned unopened.

The bids will be opened publicly and read aloud at the time and date stated on the advertisement for bids.

DRAWINGS

A CAD produced line drawing of the exact apparatus being proposed must be furnished with the bid. Since the blueprint drawing is required of all bidders, any bid submitted without a drawing as specified will be considered non-responsive and automatically rejected. Drawing must include the left side with chassis cab, right, and rear views of the vehicle. Drawing

must be a large size "D", and shall be a drawing of the exact apparatus as proposed, not a drawing of another similar unit. All submitted drawings will become a part of the bid proposal.

REJECTION OF PROPOSALS

The right is reserved to reject any or all proposals or to accept such proposal as is in the best interest of the city.

All bid requirements and specifications as written are considered minimum.

Bids will be rejected which substitute less substantial materials and/or methods of body construction than those specified. Since all manufacturers have the ability to purchase the materials described as well as to shear, fabricate and assemble body panels as specified, these areas are considered a strict requirement of the specification.

Purchaser does not, in any way, obligate itself to accept the lowest Bid.

Proposals may be rejected for any alteration, erasures, or penciled entries. No bidder may withdraw his proposal for at least 30 days after the scheduled closing time for the receipt of bids.

Bidders taking "total exception" to these specifications are hereby advised that any such statement will result in immediate rejection of the bid proposal.

COMPLETION DATE

Bidders shall indicate in their proposals the number of working days for delivery of the completed apparatus, from the date of bid acceptance by the Manufacturer.

CARRYING CAPACITY

The GAWR and GCWR or GVWR of the chassis shall be adequate to carry the fully equipped apparatus including full water and other tanks, the specified hose load, unequipped personnel weight, ground ladders, and a miscellaneous equipment allowance of 2000 pounds.

A permanent placard shall be affixed and visible to the driver, which states the maximum number of personnel the vehicle is designed to carry.

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

WARRANTY

As a condition of the acceptance of the apparatus, the contractor shall furnish the following warranty:

We the manufacturing company, warrant each new piece of fire apparatus manufactured by us to be free from defects in material and workmanship under normal use and service. Our obligation under this warranty is limited to repair or replacing, as the Company may elect, any part or parts thereof which shall be returned to us with transportation charges prepaid and as to which examination shall disclose to the company's satisfaction to have been defective, provided that such part or parts thereof shall be returned to us not later than one year after delivery of said vehicle. Such defective part or parts will be returned or replaced free of charge and without charge for reinstallation, to the original purchaser.

This warranty will not apply:

To normal maintenance, service or adjustments.

- To any vehicle which has been repaired or altered outside of the factory in any way so as in our judgment, to affect its stability, which has been subject to misuse, negligence, or accident, which has been operated at a speed exceeding the factory rated speed, or which has been loaded beyond the factory rated load capacity.

- To the truck chassis and associated equipment furnished with the chassis, including, but not limited to; engine transmission, axles, frame rails, alternator, batteries, or other trade accessories in as much as they are warranted separately by their respective manufacturers.

This Warranty is in lieu of all other warranties expressed or implied and of all other obligations or liabilities on our part and

we neither assume nor authorize any other person to assume for us any liability in connection with the sale of our apparatus.

BUMPER TO BUMPER WARRANTY

The manufacturer shall provide a three (3) year bumper-to-bumper warranty covering the cab and chassis The manufacturer shall supply details of their warranty information with their bid submission. **NO EXCEPTIONS**

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, which ever comes first, with the complete detail of the warranty outlined in a document provided upon request.

TRANSMISSION WARRANTY

The Allison EVS transmission shall be warranted for a period of five (5) years with the complete detail of the warranty outlined in a document provided upon request.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application.

CAB STRUCTURE WARRANTY

The cab structure shall be warranted for a period of ten (10) years with the complete detail of the warranty outlined in a document provided upon request.

PUMP WARRANTY

The fire pump manufacturer shall provide a five (5) year warranty. The manufacturer shall supply details of their warranty information with their bid submission.

STAINLESS STEEL PLUMBING WARRANTY

The manufacturer shall provide a ten (10) year warranty on the stainless steel plumbing components and installation. The manufacturer shall supply details of their warranty information with their bid submission.

FRAME WARRANTY

The frame and cross members shall carry a lifetime warranty with the complete detail of the warranty outlined in a document provided upon request.

MODULAR BODY TRANSFERABLE WARRANTY - LIFE-TIME

The manufacturer shall provide a life-time structural and transferable warranty for the fabricated aluminum body. The manufacturer shall supply details of their warranty information with their bid submission.

ALUMINUM SUBFRAME TRANSFERABLE WARRANTY

The manufacturer shall provide a lifetime transferable warranty for the aluminum subframe of the apparatus body. The manufacturer shall supply details of their warranty information with their bid submission.

PAINT WARRANTY TEN YEAR

The manufacturer shall provide a ten (10) year paint warranty for all portions of the apparatus that they have painted. The manufacturer shall supply details of their warranty information with their bid submission.

LETTERING WARRANTY

The manufacturer shall provide a one (1) year warranty for the lettering and striping applied to the apparatus. The manufacturer shall supply details of their warranty information with their bid submission.

DESIGN REQUIREMENTS

Specified design features of the apparatus have been carefully selected because of their safety, integrity and consistency with existing apparatus. It is expected that all bidders will adhere to the compartmentation layout, etc., since these features can be produced by all fire apparatus manufacturers.

All aspects of the vehicle shall be properly engineered with priority given to firefighter safety, as well as ease of operation and maintenance of the apparatus. The vehicle shall be free from hazardous protrusions, angles or sharp corners that might bring injury to a firefighter or equipment. Previously delivered units will be judged for compliance to these factors.

All water, air, fuel, hydraulic and/or oil lines on the chassis and apparatus shall be properly located, and securely tie wrapped to prevent scuffing or abrasion. Durable type grommets or loom material shall be used to protect the lines wherever a line passes through the apparatus body or frame rail sections.

All grease fittings, bleeders, filler plugs, drains and check points shall be located so as to be easily accessible. No special tools shall be required to access these components for normal service or maintenance of the vehicle.

All parts and components on the vehicle shall be positioned for ease of inspection, and recognition of wear or failure. Easily removable access or cover plates shall be provided for all items requiring periodic service or adjustment. Access panels shall be of the hinged or quick disconnect design-allowing ease of access.

Design of the apparatus shall be such that no disassembly of the body or any of its parts is required for normal maintenance.

All components of the chassis and apparatus shall be protected against rain, snow or other adverse weather conditions.

CONTRACT AWARD

Contract will be awarded to the most "responsible bidder", provided that bid is in the best interest of the city.

When analyzing the bid proposals, and in recommending a successful bidder, superior design, workmanship, materials, operating costs, location of service facility, past experience, length of incorporation and compliance to specifications will be taken into consideration.

The City reserves the right to waive any formality in the bids received once such waiver is in the best interest of the purchaser and, also, to accept any item in the Bid found to be of superior quality or otherwise preferred by the City of Pawtucket.

ACCEPTANCE TESTS AND REQUIREMENTS

Acceptance tests on behalf of the purchaser shall be prescribed and conducted prior to delivery or within 10 days after delivery, by the manufacturer's representative in the presence of such person or persons as the purchaser may designate in the requirements for delivery.

The apparatus, loaded with a full complement of hose and men, a full water tank, and equipment as specified in "Carrying Capacity" on this page, shall meet the tests on paved roads, dry and in good condition. Tests shall be on the basis of two runs, in opposite directions over the same route, the engine not operating in excess of the manufacturer's maximum rpm.

From a standing start, through the gears, the vehicle shall attain a true speed of 35-mph within 25 seconds. From a steady speed of 15-mph the vehicle shall accelerate to a true speed of 35-mph within 30 seconds.

The vehicle shall attain a minimum top speed of 50-mph on a level road.

The apparatus shall be able to maintain a speed of at least 20-mph on any grade up to and including 6 percent.

Manufacturers pump test and Certification tests shall be conducted by the manufacturer in accordance with requirements of NFPA #1901. Certificate of testing shall be furnished to the purchaser.

FAILURE TO MEET TESTS

In the event the apparatus fails to meet the test requirements on first trial, a second trial may be made at the option of the

Contractor within thirty days of the date of the first trial. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to make such changes as the Chief of the Fire Department and/or the purchaser may consider necessary to conform to any clause of the specifications within thirty days after notice is given to the Contractor to make such changes shall also be cause for rejection of the apparatus.

DOCUMENTATION

The manufacturer must supply at time of delivery, at least one copy of:

1. Engine manufacturer's certified brake horsepower curve showing the maximum no load governed speed.

2. Manufacturer's record of pumper construction details.

3. Pump manufacturer's certification of suction capability.

4. Pump manufacturer's certification of hydrostatic test.

5. If specified certification of inspection and testing by the Underwriter's Laboratories Incorporated.

6. A copy of the apparatus manufacturer's approval for stationary pumping applications.

7. Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle

   (with water tank full but without personnel, equipment, or hose).

8. At least two copies of the complete operation and maintenance manual covering the completed apparatus as delivered, including the pump and fire fighting equipment delivered with the apparatus.

NO EXCEPTIONS WILL BE ALLOWED TO ANY OF THE DOCUMENTATION REQUIREMENTS.

DATA PLATES

A test data plate shall be provided at the pump operator's position that gives the rated discharges and pressures together with the speed of the engine as determined by the manufacturer's test for this unit. Plate must comply with requirements of NFPA #1901.

A permanent data plate shall be affixed in the drivers compartment specifying and quantity and type of the following fluids used in the vehicle.

1. Engine Oil
2. Engine Coolant
3. Chassis Transmission Fluid
4. Pump Transmission Lubrication Fluid
5. Pump Primer Fluid
6. Drive Axle Lubrication Fluid
7. Air Conditioning refrigerant
8. Air Conditioning lubrication oil
9. Power steering fluid
10. Cab tilt mechanism fluid
11. Transfer case fluid

12. Equipment rack fluid

13. Air compressor system lubricant

14. Generator system lubricant

Permanent placards shall be affixed and visible to all seated occupants instructing the occupants to wear their seat belts.

A permanent placard shall be affixed to the rear step area to instruct that riding on the rear step is prohibited.

PAYMENT

Final payment for the apparatus shall be made at time of delivery of the completed vehicle. Due to insurance liability, the apparatus will not be left at the purchaser's location without full acceptance and payment or prior agreement between the Purchaser and Bidder.

Final delivery price shall not include any Local, State or Federal taxes. The Bidder shall not be liable for any State or Federal mandated tax or program after sale or delivery of the apparatus.

DELIVERY

Final delivery of the completed apparatus shall be made at Fire Department Headquarters.

DEMONSTRATION - NO EXCEPTIONS

Fire Department personnel shall be properly instructed as to the proper use of the entire apparatus including, but not limited to, chassis, fire pump system, the apparatus and all equipment. The demonstration shall be made by a trained and certified factory trained delivery specialist (s) who have the following certifications: NFPA 1041 Instructor, NFPA 1002 Fire Apparatus Operator, EVT F-1 Fire Apparatus Preventive Maintenance, F-2 Fire Apparatus Design and Performance, F-3 Fire Pumps, and F-7 Fire Apparatus Foam systems. The Delivery Specialist (s) must have at least 20 years experience of fire fighting and fire ground operations and shall be responsible for complete instruction as to operation and maintenance of the chassis, and the completed vehicle**. Safe operation is of the upmost importance to the department. Under qualified instructors shall will not be acceptable.**

The demonstration specialist(s) shall remain at the Fire Department for a sufficient amount of time to provide thorough instructions to all personnel on all duty shifts (4), or as instructed by Chief of the Department. All meals, motel and travel costs shall be the responsibility of the successful bidder.

DELIVERY

The apparatus shall be delivered complete and ready for operation. The apparatus, to insure proper break-in of all components, shall be delivered under its own power - rail or truck freight is not acceptable.

MAX HEIGHT

The maximum height of the apparatus shall not exceed: 10' 3"

MAX LENGTH

The maximum length of the apparatus shall not exceed: 360"

MAX WHEELBASE

The maximum wheelbase of the apparatus shall not exceed: 166"

ANGLE OF APPROACH

The angle of approach for the apparatus shall not be less than eight (8) degrees as specified by the current edition of NFPA 1901.

ANGLE OF DEPARTURE

The angle of departure for the apparatus shall not be less than eight (8) degrees as specified by the current edition of NFPA 1901.

FINANCIAL STABILITY SPECIFICATIONS

Ensuring the financial stability of the proposed body builder is a paramount consideration to this department. Financial strength directly relates to the body builders ability to successfully produce an apparatus without jeopardizing fire department funds. In addition, financial strength is vital to this department to insure a body builder will be able to provide warranty service along with replacement parts and service for the life of the apparatus. Failure to be able to provide these lifelong services may cause future increases in maintenance expenses and create undue burden on the department's budget and tax base. This is a situation that this department is unwilling to risk. The body builder, therefore, shall meet certain minimum financial ratios in order to qualify for a bid award. The financial ratios presented shall be that of the consolidated entity; not the consolidated entity's parent company; for the body builder.

The financial ratios required to be met shall be derived from the most recent audited financial statements of the body builder proposed.

ANY EXCEPTION taken to this requirement shall immediately render the bid non-responsive and the bidder dismissed from further consideration. Under no circumstance shall a bid be considered where the bidder submits a letter of explanation taking exception to this requirement in lieu of providing the required documentation, nor shall consideration be given to bidders that refuse to submit the required information on the basis that the body builder proposed is a private company.

The three (3) critical financial indicators to be met are as follows:

Debt-to-Equity Ratio: The debt-to-equity ratio of the entity must not exceed a 2.0 rating. A debt-to-equity ratio is defined as that of total liabilities divided by total owner's equity. In layman's terms, a low debt-to-equity ratio means the company itself owns a greater share of its assets, as opposed to banks, creditors and other financial institutions. Conversely, companies with high debt-to-equity ratios are those that are generally financing their growth by carrying additional debt. The cost of this debt-financing may outweigh the return that the company generates on the debt through business activities and become too much for the company to manage. This can lead to bankruptcy, which is of grave concern to this purchaser.

Debt Coverage Ratio: The debt coverage ratio of the entity must exceed a 100.0 rating. A debt coverage ratio is defined as annual net income divided by the current portion of long-term debt. A high debt coverage ratio means the company can easily meet its payment obligations with its banks and other creditors. A low debt coverage ratio clearly infers the company may struggle to meet these obligations, which could ultimately delay or cancel production of apparatus.

Equity Ratio: The equity ratio of the body builder must exceed a .30 rating. An equity ratio is defined as total owners' equity divided by total assets. The equity ratio is another good indicator of the level of leverage (or financing) used by a company. The equity ratio measures the proportion of the total assets that are financed by owners and not creditors. A high equity ratio provides the company with flexibility in financing growth and other needs.

All financial indicators required by this section must be verified by Dun and Bradstreet, the nationally-recognized, independent financial analysis company. Bids furnished without the required financial information shall render the bid non-responsive and the bidder dismissed from further consideration. **NO EXCEPTIONS.**

CENTER OF GRAVITY

The apparatus, prior to acceptance, will be required to meet the vehicle stability of the applicable NFPA Automotive Fire Apparatus Standard.

A calculated center of gravity shall be provided. The calculated or measured center of gravity (CG) shall be no higher that 80-percent of the rear axle track width.

COMPLETE COMPACT DISC MANUAL

The manufacturer shall provide with the vehicle upon delivery, one (1) complete delivery manual. These manuals shall be on a computer generated compact disc (CD), with reference guide for each section of the vehicle. Within each section shall be:

- Individual component manufacturer instruction and parts manual
- Warranty forms for body
- Warranty forms for all major components
- Warranty instructions and format to be used in compliance with warranty obligations
- Wiring diagrams
- Installation instructions and drawings of major parts
- Visual graphics and electronic photos of the installations of major parts
- Necessary normal routine service forms, publications and components of body portion of apparatus
- Technical publications on training and instructions for major body components
- Warning and safety related notices for personnel protection

Cab and chassis manuals on parts, service and maintenance shall be provided

ELECTRICAL SYSTEM COMPACT DISC MANUAL

The manufacturer shall provide with the vehicle upon delivery, one (1) delivery manual for the electrical system. These manuals shall be on a computer generated compact disc (CD), with reference guide for each section of the vehicle. Within each section shall be:

Individual component manufacturer instruction and parts manuals

- Warranty forms for the components
- Warranty instructions and format to be used in compliance with warranty obligations
- Wiring diagrams
- Installation instruction and drawings for major parts
- Visual graphics and electronic photos for the installation of major parts
- Necessary normal routine service forms, publications and components for the installed electrical components
- Technical publications for training and instruction on major components
- Warning and safety related notices for personnel protection
- Cab and chassis manuals on parts, service and maintenance shall be provided

ENGINE AND TRANSMISSION MANUALS

One (1) paper copy of the specific engine and transmission manuals shall accompany each cab and chassis.

OPERATION AND PARTS LIST MANUALS

Each cab and chassis shall include two (2) electronic copies of the operation manuals and parts listings. The manuals shall include information specific to the components included on the apparatus.

AS BUILT WIRING DIAGRAMS

Each cab and chassis shall include one (1) digital copy of the wiring schematics and component wiring.

CAB TEST INFORMATION

The cab as built shall have successfully completed the pre-load side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests shall have been witnessed by and attested to by an independent third party. The test results shall have been recorded using cameras, high speed imagers, accelerometers and strain gauges.

Documentation of the testing shall be provided upon request.

CAB INTEGRITY CERTIFICATION

The manufacturer shall provide a cab crash test certification with this proposal including SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading for Heavy Trucks and SAE J2420 COE Frontal Strength Evaluation - Dynamic Load for Heavy Trucks.

CAB TEST INFORMATION

Roof Crush

The cab shall be subjected to a roof crush test of 120,000 pounds exceeding the requirements of ECE 29 criteria. The 120,000 requirement is important to ensure to most structurally sound and safe cab in the event of a crash or roll over.

Side Impact

The cab shall be subjected to dynamic moving barrier slammed into the side of the cab at 7.5 mph, striking with an impact of 15,157 foot pounds of energy. This test will closely represent the forces a cab would incur in a rollover incident.

Frontal Impact

The cab shall withstand a frontal force produced from a moving barrier slammed into the front of the cab traveling at 10.5 mph, striking with an impact of 42,587 foot pounds of energy.

The same cab shall withstand all tests without any measurable intrusion into the survival space of the occupant area.

An official of the company shall designate, in writing, which is qualified to witness and certify test results.

CAB CUSTOM STYLE

The cab shall be a custom, cab over engine style, with the driver and officer positions ahead of the engine and front axle. The cab shall be specifically designed and manufactured for the fire service industry.

The cab shall be designed and assembled by the apparatus manufacturer in a facility located on the manufacturer's premises.

NO EXCEPTIONS.

The cab shall be of a totally enclosed full tilt design, with the interior area completely open to improve visibility and verbal communication between the occupants. The cab shall be capable of tilting 45-degrees, allowing the chassis engine to be removed, if required, without tilting the cab beyond 45-degrees. **NO EXCEPTIONS**.

The cab shall include a four (4)-point rubber isolated cab pivot and mounting system. The rear histic mounts shall be isolated from the chassis frame to reduce the transfer of road vibrations and frame torque into the cab, while providing superior handling characteristics. No solid mounted rear lock downs shall be acceptable.

The front cab pivot assemblies shall be 1/2" A36 steel plate with a .31" thick 2-1/2" diameter tube cross member mechanically attached to the cab and frame. There shall be two (2) greaseable rubber isolated engineered bushings to reduce the transfer of road vibrations into the cab.

The cab shall be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.

The cab super-structure shall be designed with high strength 6061-T6 aluminum extrusions and 3/16" 5052-H32 aluminum plate. This shall include the “A”, “B”, “C” and “D” extruded pillars, triple wall front end reinforced by 3/16" thick x 2"x3" extrusion tubes, 3/16" side walls, roof and 3/16" rear wall. This shall offer superior occupant protection in the event of vehicle impact.

The extrusions shall provide adequate space for routing of wiring and hoses which will provide service accessibility. Routing of harnessing which requires pulling of wires through tubes will not be allowed. **NO EXCEPTIONS.**

The "A" pillar shall be of a closed section, one-piece extrusion extending from the cab header to the bottom of the cab. This design shall ensure strength and superior resistance to buckling in the event of a frontal impact.

The cabs front corners shall be constructed of 5052-H32 stamped aluminum to provide a consistent material composition. The stamping process alleviates the high tendency of fractures through the fusing of dissimilar metal composition as appears with a casting process.

Cast cab components, including cab corners, "A" pillars and front fascia components shall not be acceptable due to the high tendency of fractures**. NO EXCEPTIONS**.

Additional cab strength shall be obtained through closed section, dual extrusions in the construction of the "D" pillars.

The front façade shall be constructed with dual wall .19” thick 5052-H32 aluminum plates which make up the front bulkhead, reinforced by .19” thick 6061-T6 aluminum extrusion (box-sections), though-out the inner and outer perimeter of the front end / façade. The reinforcing the third wall / barrier is .13” thick 5052-H32 work hardened aluminum façade panels. All welded no adhesive.

The cab side wall of the cab shall be 3/16” thick 5052-H32 aluminum plate. The cab side plate shall wrap the corner of the cab b pillar and slam post. The cab rear wall plates shall be reinforced with a minimum of two (2) 3/16 x 3” aluminum sections; the cab side reinforcements shall be a minimum of 28” apart and span from the cab B pillar and cab C pillar.

The rear wall of the cab shall be 3/16” thick 5052-H32 aluminum plate. The rear cab plate shall wrap the corner of the cab and attach to the cab D pillar and slam post. The cab rear wall plates shall be reinforced with four horizontal and dual vertical support sections; the dual vertical support structure shall consist of 1/8” thick x 2” 6061-T6 aluminum tubes and the horizontal hat sections shall consist of 1/8” thick x 4” 5052-H32 aluminum. The dual vertical support sections shall be 40” a-part, and the cab shall contain a minimum of four (4) 4” hat section horizontal supports.

Additionally, the rear edge of the floor shall include a 3/16” 6061-T6 aluminum tube extrusion (under the floor) and a 7” 5052-H32 aluminum cab floor support section (above the floor)

The outside cab width shall measure 99” across. The interior cab shall have a width of 93".

The cab length shall measure 77.3” from the center of the front axle to the front cab skin and 60” from center of the front axle to the back of the cab, for a total cab length of 137.3”.

The cab shall also feature ample driver and officer foot room, a total of 3.7 square feet for the driver and 3.6 square feet of floor space at the officer’s feet.

The engine tunnel shall be a tapered design, featuring 24" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 25.5" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 33" in the driver's position.

The engine tunnel shall be a tapered design, featuring 22-1/2" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 24" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 31-1/2" in the officer's position.

The crew floor shall feature a complete flat floor design, including provisions for a one o'clock PTO inclusion, while still offering an uninterrupted 25 total square feet of space. The distance from the back of the tunnel to the interior wall shall be 46" measured at floor level and 52" at top of engine tunnel.

The leading edge of the cab floor from the steps shall meet NFPA 13-7.3 slip resistance requirements, by using bi-directional, knurled trim piece on both the front and rear cab doors. **NO EXCEPTIONS**.

The cab shall incorporate a two-step design at each door, with a first step height of approximately 22” from the ground. The leading edge of the first step shall be 5" further outboard than the second step to provide a staircase design for safer egress.

The front cab first step shall measure a minimum of 32" wide x 9-1/2" deep. The front cab intermediate step shall measure a minimum 33" wide x 8-1/2" deep.

The crew cab first step shall measure a minimum of 26-1/2" wide x 9-1/2" deep. The crew cab intermediate step shall measure a minimum 28" wide x 9-1/2" deep.

The cab steps shall meet NFPA 13-7.3 in size and slip resistance requirements.

The cab shall meet or exceed cab impact test (SAE J-2420, cab rollover test (SAE J2422), and cab seating requirements (FMVSS 210, and FMVSS 208).

ROOF STYLE - 11" RAISED

The cab roof design shall incorporate an angled front roof, transitioning into a rolled extrusion for a swept back design.

The roof height shall feature an 11" raise starting over the driver and officer positions and continuing back to the roof and rear wall joint. Raised roof designs that do not include a raised portion over the driver and officer positions will not be acceptable.

NO EXCEPTIONS.

The roof of the cab shall feature dual .25" thick interlocked structural member extrusions running the entire width of the cab defending against buckling in the event of a rollover.

The cab header shall feature dual 6061-T6 aluminum extrusions which shall offer superior rigidity and strength.

The raised roof shall offer a crew head height area of 66-1/2” from the floor to the ceiling in the crew areas for optimum headroom.

The crew roof super structure shall include a reinforcement hat-section structure 1/8” thick 5052-H32 aluminum bracing. The for-aft support braces will be 24” on center apart, the side to side support braces will stretch from cab side to cab side and centered between the dual 3/16” extruded and plate reinforced roll-cage section.

The forward cab roof section shall include a combination of 1/8” 6061-T6 extruded tube reinforcements and a hat-section structure 1/8” thick 5052-H32 aluminum bracing. The bracing shall wrap the entire perimeter of the cab forward roof, and the condenser support structure.

The condenser support structure shall include 1/8” triple sections, supporting the outer perimeter and center of the condenser mounting pad.

Additionally, the entire roof super structure is reinforced by a .25” thick roof edge corner extrusion around the entire cab perimeter

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

CAB STEP TRIM

The lower cab steps at all doors shall be finished with a grip strut material. The intermediate cab steps shall be finished with an embossed aluminum tread plate.

CAB STEP TRIM KICKPLATE

The cab step risers at all doors, the vertical section of all steps, shall include an aluminum tread plate finish. The kickplate shall be flared at the bottom.

CAB DOORS

The cab shall include a total of four (4) doors, two (2) forward and two (2) rear crew doors.

The forward cab doors shall be a minimum of 45" wide and the rear crew doors shall be a minimum of 41" wide to provide enhanced entry and egress of the cab.

The two (2) forward doors shall offer a clear door opening measurement of 42" wide and two (2) rear crew clear door opening measurement of 38" wide, measured from door seal to door seal. **NO EXCEPTIONS**.

Each cab door shall feature:

- Superior strength and rigidity from 3/16" closed section extruded door frames
- Insulation and damping inside each door for a solid feel and minimized reverberation when closed
- A minimum of 1" rolled rubber bulb seal style gasket and an "L" foam seal around the door ensuring a weather tight fit
- Integrated, mechanical door stop
- A full length, hidden piano style 10 gauge stainless steel door hinge with a 1/4" pin, which shall be mounted inside the panel of the door prohibiting dirt and debris from becoming trapped in the hinge
- An integrated one-piece inner door assembly that includes a glass track, mounting provisions for window regulator, door handle and door panel shall be utilized. The inner door assembly shall be easily removed with nut inserts. Self tapping screws shall not be acceptable.

BARRIER FREE DOORS

The cab doors shall be "barrier free" style, meaning the door shall be constructed to cover the entry down to the intermediate step, leaving the bottom step open. Each door shall provide approximately 33" of clearance from the ground to the bottom of the door so the door may be opened without stopping due to guard rails along highways.

DOOR HANDLES

The exterior door handles shall be constructed of die-cast steel. They shall feature heavy duty pull style handles which are extended out and suitable for easy grasping with a gloved hand.

The handles shall be complimentary to the cab exterior and shall be black in color.

The interior door handle shall be a paddle style which shall be black in color. The paddle shall be hinged towards the front of the cab and shall include a manual door lock unless otherwise specified.

CAB DOOR LOCKS

All cab doors shall include manual door locks with keys. The door lock shall include a toggle and shall be an integral part of the interior door handle which is red in color. The exterior door lock is integral with the door latch. The cab doors may be unlocked from the exterior with a key or through a thumb turn from inside the cab.

INTERIOR CAB DOORS

All cab doors shall consist of a one-piece formed and stamped aluminum interior panel. The panel shall include a formed collar around the interior door latch. ABS material shall not be acceptable. No Exceptions.

INTERIOR CAB DOOR FINISH

All cab doors shall be finished in an ARMA coating for durability. The finish shall be black in color.

CAB DOOR REFLECTIVE TRIM

Cab door reflective trim NFPA compliant red/yellow in accordance with NFPA 14.1.6.

WINDSHIELD

A one (1)-piece, safety glass full width windshield with more than 3,228 square inches of clear viewing area will be provided.

NO EXCEPTIONS.

The windshield shall feature:

- A completely uninterrupted view from both the driver and officer positions
- The windshield will consist of three (3) layers; the outer light, the middle safety laminate, and the inner light. The .114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer.
- Economical replacement readily available from auto glass supplier
- Easily removable for replacement using standard automotive techniques
- A frit band will be provided along with an outer trim seal on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPER SYSTEM

A single windshield wiper system shall be incorporated in conformance with FMVSS and SAE requirements. Two (2) 22" windshield wiper arms shall be mounted below the windshield. Each arm shall include a 26" long wiper to provide optimum windshield clearing.

The windshield wiper fluid reservoir can be filled without raising the cab.

WINDOW -DRIVER'S DOOR

The driver's door shall include a window which measures 27" wide x 24" high with a clear viewing area of 687 square inches. The glass shall include a standard automotive tint and through the use of a manual crank style handle shall roll completely into the door housing.

The window shall be trimmed in a black anodized aluminum ring and rubber seal to keep water from entering the cab when closed.

WINDOW- OFFICER'S DOOR

The officer's door shall include a window which measures 27" wide x 24" high with a clear viewing area of 687 square inches. The glass shall include a standard automotive tint and through the use of a manual crank style handle shall roll completely into the door housing.

The window shall be trimmed in a black anodized aluminum ring and rubber seal to keep water from entering the cab when closed.

REAR DRIVER SIDE CREW WINDOW

The rear driver's side crew door shall include a window measuring 26.5" wide x 21.75" high with a clear viewable area of 577 square inches. The glass shall include a standard automotive tint and through the use of a manual crank style handle shall roll completely into the door housing.

REAR OFFICER SIDE CREW WINDOW

The rear officer's side crew door shall include a window measuring 26.5" wide x 21.75" high with a clear viewable area of 577 square inches. The glass shall include standard automotive tint and through the use of a crank style handle shall roll completely into the door housing.

DRIVER CANOPY SIDE WINDOW

The cab shall include a fixed driver's side window glass which shall be located between the cab front and rear doors. The glass shall be 18" wide x 24" high and shall include a standard automotive tint and shall be trimmed in a black anodized rubber ring for a tight seal when closed.

OFFICER CANOPY SIDE WINDOW

The cab shall include a fixed officer's side window glass which shall be located between the cab front and rear doors. The glass shall be 18" wide x 24" high and shall include a standard automotive tint and shall be trimmed in a black anodized rubber ring for a tight seal when closed.

SEAT AND SEAT BELT COLOR

Seats in the cab shall be black in color with a red seat belt.

SEAT BACK

The seat back shall incorporate a standard style headrest.

SEAT BACK

An SCBA locking system which shall be one bracket model and store all U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

- The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically

- A center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions

The system shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

DRIVER SEAT

The driver's seat shall be a H. O. Bostrom Sierra high back reclining ABTS bucket seat. The seat shall have contoured, high-density cushions with lumbar support. The back recline shall include a locking mechanism on both sides of the seat and shall have a release handle located at the retractor side of the seat assembly. The seat cushion shall be supported with a serpentine spring suspension. The seat shall have a double-locking five-inch fore and aft adjustment and occupancy sensor in the seat cushion.

The seat shall be equipped with a red, integrated 3-point shoulder harness and lap belt and an emergency locking retractor. The seat belt shall include a buckle latched switch. The seat belt shall include a rotating bezel guide at the upper shoulder point and shall be routed through the seat frame and covering to protect webbing.

OFFICER SEAT

The officer's seat shall be a H. O. Bostrom Tanker 450 ABTS (All Belts To Seat/Integrated Seat Belts) series high back

seat with fixed base. The seat shall have contoured, high-density cushions with lumbar support and Occupancy sensor in the seat cushion. The seat cushion shall be supported with a serpentine spring suspension. The seat shall include an SCBA storage area with one piece flip- up headrest with spring return. The seat shall include two part bolster padding with removable insert to accommodate SCBAs with rigid waist belts.

The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt and an emergency locking retractor. The seat belt shall include a buckle latched switch. The seat belt shall include a rotating bezel guide at the upper shoulder point and shall be routed through the seat frame and covering to protect webbing.

SEAT BACK

An SCBA locking system which shall be one bracket model and store all U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

- The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically

- A center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions

The system shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

REAR FACING OUTER SEAT

Two (2) rearward facing outer crew seat shall be a H. O. Bostrom Tanker 400CT ABTS (All Belts To Seat/Integrated Seat Belts) series with Flip/Up cushion. The seat shall have contoured, high-density cushions with lumbar support and occupancy sensor in the seat cushion. The seat cushion shall be spring biased to fold to vertical position when occupant weight is removed. The seat shall include a SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt and an emergency locking retractor. The seat belt shall include a buckle latched switch. The seat belt shall include a rotating bezel guide at the upper shoulder point and shall be routed through the seat frame and covering to protect webbing.

REAR FACING OUTER SEAT MOUNTING

Each rear facing outer seat shall be mounted facing the rear of the cab.

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.

ENGINE TUNNEL INSULATION

The engine tunnel shall include an insulated barrier from noise on the underside of each tunnel surface. This barrier shall be engineered for surrounding engines.

The insulation barrier shall provide an acceptable decibel level within the cab meeting or exceeding the recommendations of NFPA 1901.

The thickness of the engine tunnel insulation shall be 1" thick. The insulating material shall be open cell polyether based foam with a textured surface, specifically designed for acoustic absorption.

Use of aluminized faced material on the engine tunnel shall not be acceptable. **NO EXCEPTIONS.**

The engine tunnel insulation shall be precisely cut and sealed to fit each segment on the underside of the tunnel surface. The insulation shall then be affixed by a pressure sensitive adhesive.

The insulation shall meet or exceed FMVSS 302 flammability testing.

DAMPING INSULATION

The entire cab, including the ceiling and walls shall include additional insulation reducing structure borne noise from vibration, impact and resonance within the cab.

INTERIOR TRIM MATERIAL

The interior trim shall feature a 31 oz. marine grade vinyl which features a tensile strength of ASTM D751 of excellent, tear strength meeting the Federal standard 191-5134 of excellent and shall be oil resistant passing the CID-A-A-2950A requirement for no permeation.

Due to the excellent qualities of the marine grade vinyl material, no other type of interior trim shall be acceptable.

NO EXCEPTIONS.

The soft trim vinyl shall feature mildew resistance passing ASTM G21-90 and shall be rated to -25 degrees Fahrenheit.

The vinyl shall be flame retardant meeting California Fire Code 117, UFAC Class 1, and BIFMA Class 1 and shall have a high resistance to abrasion.

The interior of the cab including the side walls and ceiling panels shall feature this soft trim and shall be black in color.

INTERIOR CAB INSULATION

The cab shall be completely insulated from road and vehicle resonance, exterior sound and thermal intrusion.

The cab insulation system shall be comprised of three separate components each designed to assure optimal thermal and acoustic properties are achieved. Two layers of insulation material shall be utilized in conjunction with a .2” air barrier.

The cab shall utilize at a minimum 10 mils of flexible extensional visco elastic vibration damping insulation offering excellent acoustic reduction properties.

A minimum of .8” of SCbond Polyurethane Foam insulation shall be applied as an additional insulation between the cab skin and all interior ceiling and wall surfaces. The insulation shall have a density of 10 lb/ft3 +/-.5 providing better thermal properties and acoustic reduction properties.

The interior cab insulation system shall ensure that no seated position within the cab exceeds 72dB as certified by the manufacture.

This decibel rating shall be measured with the apparatus traveling 45 mph with climate control settings off.

All insulation used in the construction of the cab shall be marine grade featuring longevity and resistance to degradation.

Use of open cell material as the primary insulation will not be acceptable.

The interior of the cab including the side walls, rear wall and ceiling panels shall be insulated.

CAB HEADER

The cab header shall offer heavy duty, durable construction using resin transfer molding (RTM) technology formed composite material. The composite material shall be .28" thick for improved resistance and military type strength.

RTM is a low pressure, closed molding process which offers a dimensionally accurate and high quality surface finish composite molding, using liquid thermoset polymers reinforced with various forms of fiber reinforcements. The matrix selection of polymer and reinforcement dictates molding mechanical and surface finish performance.

ABS polymer construction shall not be acceptable**.** **NO EXCEPTIONS**.

The cab header shall offer a finish of ARMA advanced urethane coating for a rugged design and finish. **NO EXCEPTIONS.**

ARMA is a polyurethane/polyurea elastomer providing a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured, skid-resistant surface.

The ARMA coating shall offer durability, scratch resistance, chemical and abrasion resistance even against today's advanced firefighting turnout materials with consistent, even coverage and a uniform texture. The ARMA 952 coating is extremely flexible, stretching to 280% of its original size without any adhesion loss, eliminating the "shearing effect" and loss of adhesion that plagues other coatings due to substrate expansion, contraction and elevation shifts.

REAR WALL INTERIOR MATERIAL

The rear wall of the cab shall be covered in black 31 oz. marine grade vinyl for a more pleasing appearance.

FLOOR MAT

The interior flooring of the cab shall be covered with an advanced black multi-layer acoustic dampening mat. The floor matting shall be an open/closed cell, flexible polyurethane polyamide material with frictional dampening and dissipation properties. The mat shall be a fire and skid resistant non-wicking material.

SUN VISORS

The driver and officer seats shall feature a sun visor mounted in the header over each seating position. The sun visors shall be padded and trimmed in vinyl.

CAB DASH

The cab dash shall offer heavy duty, durable construction using resin transfer molding (RTM) technology formed composite material. The composite material shall be .28" thick for improved resistance and military type strength.

RTM is a low pressure, closed molding process which offers a dimensionally accurate and high quality surface finish composite molding, using liquid thermoset polymers reinforced with various forms of fiber reinforcements. The matrix selection of polymer and reinforcement dictates molding mechanical and surface finish performance.

ABS polymer construction shall not be acceptable. **NO EXCEPTIONS.**

ARMA is a polyurethane/polyurea elastomer providing a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured, skid-resistant surface.

The ARMA advanced urethane coating finish shall resist fading from UV light.

The cab dash shall be constructed of a single contoured piece of RTM composite material with ARMA coating. No Exceptions.

This construction shall allow for a clean, seamless dash area that shall reduce unnecessary joining of cab dash components. This design allows for the following features:

- Optimal heating and cooling of cab occupants, HVAC louvers shall be integrated into the gauge panel with a total of six (6) louvers; three louvers pointing at the driver and three louvers pointing at the officer.

The cab dash instrument cluster shall be installed on a painted fire service grade RTM composite fiberglass panel. This panel shall provide for easy removal to increase serviceability and provide ease of maintenance.

- For improved safety cab switches and controls shall be ergonomically located within easy reach of the driver when in the seated position with seatbelts fastened. This design will reduce driver distraction and increase safety by putting frequently accessed driver controls within easy reach to allow the driver more time to focus on the road.

- The officer side cab dash shall have a painted fire service grade RTM composite fiberglass panel that shall house the three HVAC louvers on the officer side. This panel will also provide ergonomically located switches and controls for the officer. All controls shall be within easy reach while in the seated position with seatbelts fastened.

- Access panels on the top of the dash for both the driver and officer sides easing maintenance access to controls, components and gauge assemblies

- The driver side dash shall include gauges for primary air pressure, secondary air pressure, a Pacific Insight instrumentation gauge panel and the DEF gauge as standard

- The driver side dash shall also include two (2) lower panels to the left and right of the steering column for FMVSS switches such as the Off/Ignition and start switches and the park brake assembly

- The driver dash shall include a panel for inclusion of an optional Weldon Vista screen and seven (7) additional switches or the maximum of 24 switches to the right of the Driver

- The officer dash shall include a recessed area for optional mounting cradles or brackets for a laptop computer, mobile data terminal, map compartment or clip board

- The officer dash shall include a panel for inclusion of an optional Weldon Vista screen and seven (7) additional switches or the maximum of 24 switches to the left of the Officer

ENGINE TUNNEL

The engine tunnel shall be constructed of aluminum offering superior durability in addition to thermal and acoustic resistance. Covering the engine tunnel shall be a layer of formed composite material for a contoured transition into the dash and offering a pleasing appearance.

The tunnel shall feature an ARMA coating which shall match the dash and header in texture and color for a consistent appearance and robust finish with a thickness of approximately .28".

The engine tunnel shall feature:

- A low profile design measuring approximately 46.5" wide and 23-1/2" in height from the crew floor shall offer optimum visibility of the windshield and cab interior from any seated position. **NO EXCEPTION.**

- The engine tunnel at the driver's position shall be a tapered design, featuring 24" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 25.5" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 33".

- The engine tunnel at the officer's position shall be a tapered design, featuring 22-1/2" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 24" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 31-1/2".

- The design shall offer a minimum of 26" for the driver and 24" for the officer as measured from the inside door pan to the top edge of the tunnel. The dimension measured at the "H" (hip) point, with the seat in the lowest position, shall be a minimum of 28-1/2" for the driver and 27" for the officer. **NO EXCEPTION.**

- There shall be no components such as HVAC systems mounted to or above the tunnel as this would reduce visibility and inhibit communications within the cab

- Recessed sections for ease of mounting equipment at the rear of the tunnel or for compartments and bases which can be used for installing Fire/EMS equipment and components such as flashlights and light boxes

- A finish of ARMA advanced urethane coating offering durability, scratch, UV, chemical and abrasion resistance

CAB DASH & ENGINE TUNNEL

The cab dash and the engine tunnel of the cab shall be coated with ARMA Coating for a durable finish. The color shall be black.

MODULAR CENTER DASH CONSOLE

The dash and front portion of the tunnel shall include an angled modular console centered between the driver and officer positions.

The console shall feature:

- A heavy duty housing constructed from 14 gauge steel which is powder coated with a durable semi-gloss textured black finish to provide glare and corrosion resistance
- The console top constructed of black anodized aluminum extruded rails which allow for mounting brackets, plates, and other console options
- Integral nut tracks which allow mounting of equipment to the sides of the console by way of sliding 1/4"-20 hex nuts
- A hinged lid constructed from 16 gauge steel also powder coated for corrosion resistance
- The availability of pre wiring for specific components
- A modular design for ease of changes and future additions such as changing out brands of radio, types of sirens or adding accessory space

The console shall offer an available eight (8) zones configured with mounting plates for optional components as shown below:

BLACK MOUNTING PLATE

One (1) black mounting plate(s) containing blank plates shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 1

BLACK MOUNTING PLATE FOR RADIO

One (1) black mounting plate(s) containing radio mounting shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 6

BLACK MOUNTING PLATE FOR POWER POINTS

One (1) black mounting plate(s) containing two (2) 12 volt power points shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 2

CONSOLE MOUNTED MAP LIGHTS

One (1) black mounting plate(s) containing a map light shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 5

CONSOLE MOUNTED LOCKING ACCESSORY BOX

One (1) black mounting plate(s) containing a locking accessory box shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 7

CONSOLE MOUNTED ACCESSORY BOX

One (1) black mounting plate(s) containing an open accessory box shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 3

CONSOLE MOUNTED CUP HOLDER

Four (4) black mounting plate(s) containing a cup holder shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 4 and Zone 8

INTERIOR FRONT AND REAR DOOR PULLS

The interior driver and officer cab doors shall include one (1) customized cast aluminum single piece door grab pulls designed specifically for the fire service.

The single piece door pull shall have a curved designed in a “L” formation to provide multiple points for grasping with a gloved hand. The horizontal dimension shall be a minimum of 28" and the vertical dimension shall be a minimum of 20". The door pulls shall have an ergonomic curve making them easier to grasp when entering and exiting the cab. **NO EXCEPTIONS.**

The door pull shall feature secure mounting in three separate locations of the pull utilizing stainless steel fasteners with nut inserts in each location. Self-taping screws or other mounting techniques shall not be allowed for interior door pulls or grab handles.

Each handle shall be constructed of A356 aluminum casting and shall feature a black powder coated finish.

INTERIOR GRAB HANDLE REAR DOOR

A black powder coated cast aluminum grab handle shall be provided on the inside of each rear crew door. The handle shall extend horizontally the width of the window just above the windowsill. The handle shall assist with entry and egress from the crew area of the vehicle.

The interior driver and officer rear cab crew doors shall include one (1) customized cast aluminum single piece door grab pulls designed specifically for the fire service.

The door pulls shall have an ergonomic curve making them easier to grasp when entering and exiting the cab. **NO EXCEPTIONS.**

The door pull shall feature secure mounting with stainless steel fasteners with nut inserts in each location. Self-taping screws or other mounting techniques shall not be allowed for interior door pulls or grab handles.

Each handle shall be constructed of A356 aluminum casting and shall feature a black powder coated finish.

EXTERIOR GRAB HANDLES

One (1) 18” anti-slip exterior assist handle shall be mounted behind each of the cab doors. The grab handle shall be constructed of aluminum and be 1.25” diameter with a knurled finish enabling non-slip assistance with a gloved hand and mounted on stanchions.

CAB FASCIA

The cab fascia shall offer a traditional, yet aggressive appearance, in its design and shall be constructed of work-hardened 5052-H32 aluminum. This design shall feature:

- A super structure which is fully welded to the cab, for a seamless and robust integration
- Thermoformed headlamp bezels, constructed of impact resistant, polycarbonate composite which is vacuum metalized to eliminate pealing and bubbling of a chrome type film or plating

- Traditional style headlight bezels with 4 x 6 high intensity headlights which shall add a classic look to the fascia while improving visibility

- The turn signal lights shall be located in the lower outboard portion of the head lamp bezel and a warning light in the lower inboard position

LIGHT BEZEL

The front grille shall include wing light bezels. The bezels shall be constructed of ABS chrome material.

FRONT GRILLE

A prominent front grille shall punctuate the aggressive design of the cab with its outboard wing style warning light bezels and heavy framework. The front grille shall feature:

- amped steel construction for superior strength and durability

- Chrome plated for an aesthetically pleasing appearance

- Tiltable and/or removable mesh panel for fluid fill and fluid check access

- Two (2) 4” x 6” warning light locations in the upper wings

- Up to six (6) warning light locations along the mid bar for a variety of warning light combinations

FRONT GRILLE INLAY

The front grille shall include a honeycomb inlay of stainless steel, painted black, which shall provide air flow to through the grille and provide a sporty, muscular appearance to the front of the apparatus.

CAB FENDERS

The cab wheel wells shall include full width, 14 gauge 304 polished, stainless steel cab fenders to resist corrosion and enable easier cleaning maintenance. The inner liner, measuring 18" wide shall be constructed of plastic with an outer fenderette measuring 2.5" wide.

CAB TILT SYSTEM

The cab shall be a full tilt style. A hydraulic cab lift system shall be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

The dual lift cylinders shall lift the cab 45 degrees from a horizontal plane facilitating easy engine maintenance. The chassis engine shall be able to be removed if required without tilting the cab beyond 45-degrees.

The center line of the chassis cab tilt shall be a minimum of 76" from the center line of the front axle, providing a 27" corridor between the cab and front tire for maximum work space and accessibility to fan, fan belt, fan drive, air compressor, power steering pump, alternator and air filter.

The tilt angle shall allow access to the engine and area under the cab without contacting any components mounted to the gravel shield.

The cylinder shall be a Trunion style for improved stability in the tilted position and shall have an integral accumulator so as to not interfere with the cab mounting system creating a smoother and quieter ride.

The cab shall include a four (4)-point rubber isolated cab pivot and mounting system. The rear histic mounts shall be isolated from the chassis frame to reduce the transfer of road vibrations and frame torque into the cab, while providing superior handling characteristics. No spring loaded rear lock downs shall be acceptable,

The front cab pivot assemblies shall be a 1/2" A36 steel plate with a .31" thick 2-1/2" diameter tube cross member mechanically attached to the cab and frame. There shall be two (2) greaseable rubber isolated engineered bushings to reduce the transfer of road vibrations into the cab.

The cab shall be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.

The cylinders shall include blocking valves (velocity fuses) which prevent motion when no control buttons are pushed. In the event of a hydraulic system failure, the valves shall retain the fluid in the cylinders.

A redundant mechanical stay arm shall automatically be engaged once the cab has been fully raised. Before lowering the cab, this device must be disengaged using the stay arm control located on the driver's side rear of the cab, providing the operator protection from high engine exhaust temperatures.

All mounting points shall be bolted directly to the frame rail.

The cab lift safety system shall be interlocked with the parking brake. The cab tilt mechanism shall be active only when the parking brake is set and the ignition is in the on position. If the parking brake is release, the cab tilt mechanism shall be disabled.

CAB TILT MANUAL PUMP

There shall be a manual pump incorporated in the event of a system failure to the cab tilt system.

CAB TILT LOCK DOWN INDICATOR

The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.

In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar and the parking brake is released.

CAB LIFT CONTROL LOCATION

The cab lift controls for tilting the cab shall be recess mounted in the forward wall inside the right front compartment. Proper operation and warning labels shall be installed adjacent to the controls.

REARVIEW MIRRORS

Retrac Aerodynamic West Coast style single vision mirror heads model 613790 shall be provided and installed on each of the front cab doors.

The mirrors shall measure 8" wide X 19" high and shall include an 8" convex mirrors with a stainless steel back, model 980-4, installed below the flat glass to provide a wider field of vision. The flat mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The convex mirrors shall be manually adjustable. The flat mirror glass shall be heated for defrosting in severe cold weather conditions.

The mirror backs shall be constructed of vacuum formed chrome plated ABS plastic housings that are corrosion resistant and shall include an amber marker light. The mirrors shall be manufactured with the finest quality non-glare glass.

INTERIOR CAB FINISH

The interior cab shall be finished in a high performance polyurethane coating coating including the interior A, B, C and D pillars, all occupant seat frames and any surrounding surfaces extending to the ball seal around each door. This type of coating shall feature:

- Durability, scratch, chemical and abrasion resistance
- Consistent, even coverage and a uniform texture

- Resistance from fading from exposure to UV light
- Black in color

CAB TWO TONE PAINT

The cab surface shall be thoroughly washed with grease cutting solvent (PPG DX330) prior to any sanding. The cab surface shall then be sanded and minor imperfections filled and sanded. The prepared surface shall then be washed again with (PPG DX330) to remove any contaminants from all surfaces to be painted.

The first coating to be applied shall be a pre-treat self-etching primer (PPG DX1787) (.5 to 1.0 dry film build) for maximum adhesion to the body material. The next two to four coats shall be an acrylic urethane primer resurfacing agent (PPG K38). The film build shall be 4-6 mils when dry. The primer coat, after appropriate dry time, shall be sanded with 320-600 grit sandpaper to ensure a maximum gloss finish. The last step shall be an application of at least three coats of PPG Concept acrylic urethane two-component color (single stage). The film build shall be 2-3 mils when dry. The single stage acrylic urethane, when mixed with component (PPG DCX61) catalyst shall provide a UV barrier to prevent fading and chalking.

The cab shall be painted two colors, which shall be determined prior to the cab assembly.

CAB PAINT UPPER

The upper cab color shall be PPG Black in color

CAB PAINT LOWER

The lower or primary cab color shall be PPG Red color

CAB PAINT EXTERIOR BREAKLINE

The upper and lower paint shall meet on the cab which shall start at the grille under the wings and travel 6" below the cab windshield and approximately 5" under the driver and passenger and crew door windows.

CAB PAINT AIR CONDITIONING CONDENSER

The air conditioning condenser shall be painted to match the roof color.

HEATING AND COOLING SYSTEMS

The interior cab climate control shall be comprised of a triple system which shall include a defroster, a cab and crew heater and air conditioner for a complete HVAC system. The air conditioning system shall be comprised of compressor, condenser, and a minimum of three (3) evaporators to provide consistent temperature control throughout the entire cab. The front system shall be controlled through the VMUX screen and the rear overhead system shall be controlled through a conventional rotary knob control in the rear crew area. No Exceptions.

The system shall be rated as an Emergency Vehicle grade for the use in Fire and Rescue style vehicles and shall provide environmental air treatment in accordance with published SAE standards.

The HVAC system shall be tested and certified by the component manufacturer, including all three systems. Documentation of test results shall be provided with the bid. **NO EXCEPTIONS**.

The HVAC system shall be a total and complete system, not incorporating the use of auxiliary heating and cooling systems. The HVAC system shall provide sufficient defrosting, heating and cooling to the entire cab without the need for any auxiliary systems.

The lines for the system shall be mounted in the extrusion of the “B” and “C” pillars on each side of the cab allowing for the space between the front and rear crew doors to be used for lighting and other components.

DEFROSTING SYSTEM

The defrosting system shall feature:

- To provide maximum defrost and heating performance, a 55,000 BTU heater-defroster unit with 558 CFM of air flow will be provided inside the cab.

- The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable cover will be installed over the defroster unit.

- Mounting under the dash with fresh air intake providing excellent defrost and demist capabilities. Systems not utilizing fresh intake shall not be acceptable. **NO EXCEPTIONS.**

- Six (6) vents shall be located in the top forward portion of the dash for superior defrosting properties across the entire windshield.

- The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the one (1) piece windshield.

HEATING SYSTEM

The heating system shall feature:

- Delivery of a minimum of 82,000 BTU/hour of heat to the entire cab.

- Heat and air circulation shall be provided to the driver and officer foot area of the cab as standard through ducting in the foot well area of both positions.

- Substantial air movement and heating provided to the driver and officer's position, with six (6) adjustable louvers, located in the dash, three (3) adjustable louvers directed at the driver and three (3) adjustable louvers directed at the officer

- Dual overhead units, with five (5) adjustable louvers shall be mounted above the rear facing seat positions on the driver and officer side of the cab

- A minimum of 530 CFM of air flow measured at the front seated positions and 240 CFM per side in the rear seated positions.

AIR CONDITIONING

The air conditioning system shall feature:

- A minimum of 67,000 BTU/hour of cooling capacity to the entire cab.

- Two (2) crew overhead evaporators located near the B-pillar on each side of the cab allowing for greater frontal visibility for the forward facing crew seating and allowing for more interior mounting of accessories.

- A gravity condensation drain system shall be utilized. These drains shall remove all condensation from the evaporator units and direct it to the exterior of the chassis cab for optimal performance. Systems utilizing pumps to remove condensation, or gravity systems with poles or other obstructions located within the cab to route drains through shall not be acceptable.

NO EXCEPTIONS.

- Substantial air movement for optimum cooling shall be provided to the driver and officer positions, with six (6) adjustable louvers, located in the dash, three (3) adjustable louvers shall be directed at the driver and three (3) adjustable louvers shall be directed at the officer

- The air conditioning system is capable of cooling the cab to a minimum of 70-degrees within 30-minutes from a temperature of 100-degrees and 60-percent relative humidity. Documentation for this test shall be provided with the bid. **No Exceptions.**

Proposals offering ceiling mounted evaporator units in the center of the cab above or on the engine tunnel shall not be accepted as this is a safety consideration due to the lack of visibility and communication within the cab.

A/C COMPRESSOR

A refrigerant compressor shall be provided to power the air conditioning evaporators.

A belt driven, model TM-31, 19.1 cubic inch compressor shall be installed on the engine.

CONDENSOR

The cab air conditioning system shall include one (1) low profile HE-condenser which shall be centered forward on the roof of the cab.

AIR COMPRESSOR FOR IDLE REDUCTION SYSTEM

The air conditioning system shall include an additional air compressor for the Idle Reduction system.

ENGINE PLACEMENT

The engine shall be a maximum of 36" from the center line of the front axle to the front face of the engine block. The engine valve cover shall be a maximum of 23" from the top of the frame.

The engine placement shall provide optimal weight distribution to the front axle to enhance vehicle handling. More weight out in front of the front axle can cause a “fulcrum effect” and cause unsafe “bump steer” conditions.

The engine shall be mounted in a position that provides for the lowest possible height of the interior engine tunnel. An engine tunnel height from the floor of the chassis cab shall be no more then 21” high inside the cab.
Engine placement shall provide a minimum of 11” between the engine fan and radiator to maximize the airflow and cooling of the engine.

ENGINE

A Cummins ISL 9.0 liter, four-cycle diesel fueled, turbo charged engine shall feature the following:

- One of the highest power to weight ratios in its class
- Heavy-duty replaceable wet liners, roller followers, by-pass oil filtration with replaceable spin on cartridge and targeted piston cooling for longer service in tough work environments
- Improved cooled EGR system
- 543 Cubic inches of displacement
- High pressure common rail fuel system producing a precise quantity of fuel at ultra high pressures
- Fully integrated, robust electronic engine controls

The engine shall be coupled with a Holset VGT™ (Variable Geometry Turbocharger).

The engine shall filled with Citgo brand Citgard 500 (or equivalent) SAE 15W40 CJ4 low ash engine oil for proper engine lubrication.

The engine shall be EPA certified to meet the 2010 emissions standards without compromising performance, reliability or durability using cooled exhaust gas recirculation and selective catalytic reduction technology.

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

The engine shall include programming which will govern the top speed of the vehicle.

HORSEPOWER

The engine shall have 450 horsepower at 2100 RPM, with a governed speed of 2200 RPM.

The engine shall have 1250 foot pounds of torque at 1400 RPM.

AUXILIARY ENGINE BRAKE

A Cummins engine compression brake, for the six (6) cylinder engine, shall be provided. The engine compression brake shall:

- Activate upon 0% accelerator when in operation mode and activate the vehicle's brake lights.

A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs.

TRANSMISSION PRE-SELECT

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

ENGINE PROGRAMMING HIGH IDLE SPEED

A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation.

The high idle will be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle.

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 and optimize output of the HVAC system.

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.

FLUID FILLS & CHECK

For ease of maintenance and access, the following fluid checks shall be located behind the tiltable and/or removeable mesh panel:

- Engine Oil dipstick
- Engine Coolant Sight Glass
- Power Steering Fluid dipstick
- Windshield Washer Fluid

The following fluid fill shall be located behind the tiltable and/or removable mesh panel:

- Engine Oil
- Power Steering
- Windshield Washer

Proposals including access to fluid checks and fills through the tunnel or by raising the cab shall not be considered.

ENGINE COOLING SYSTEM

The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system requirements.

The system shall include and feature the following:

- A vertically stacked charge air cooler providing the maximum cooling capacity for the engine. Proposals offering horizontally stacked charge air cooler shall not be acceptable**. NO EXCEPTIONS**
- The charge air cooler and radiator shall measure not less than 1382 square inches
- A one (1) piece nine (9) blade fan and shroud
- A surge tank with a low coolant probe and capable of removing entrained air from the cooling system
- Radiator re-circulation shields to prevent heated air from re-entering the cooling system and affecting performance
- Mounts allowing the entire radiator to drop through the frame for service when needed - **NO EXCEPTIONS**
- Engine placement shall provide a minimum of 8" between the engine fan and radiator to maximize the airflow and cooling of the engine.
- A Spin on Element water filter with corrosion inhibitor shall be provided for the cooling system. **NO EXCEPTION.**

COOLANT HOSES

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include stainless steel constant torque band clamps.

ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. 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 F.

Supplemental coolant additives (SCA) are not required as this is part of the extended life coolant makeup.

ENGINE PUMP HEAT EXCHANGER

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. This pump heat exchanger shall circulate water from the fire pump to the heat exchanger thereby reducing the temperature of the coolant for the engine. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant.

ENGINE AIR INTAKE

The engine air intake system shall include an ember separator air intake filter which shall be located behind the fascia.

The filter shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a corrosion resistant steel frame.

This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack, while creating only minimal air flow restriction through the system. Periodic cleaning or replacement of the screen shall be all that is required after installation.

The intake shall also feature a cyclone style water separator to remove unwanted moisture from incoming air.

The engine shall include an air intake filter which shall be bolted to the frame and located under the front of the cab. This dry type filter shall ensure dust and debris is safely contained inside the disposable housing, eliminating the chance of contaminating the air intake system during air filter service via a leak-tight seal.

The filter must have a capacity of no less than 1350 cubic feet of air per minute. The filter paper media must be of a flame retardant treated material. An electric air filter restriction indicator shall also be included with the system.

ENGINE EXHAUST SYSTEM

The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction catalyst (SCR) to meet current EPA standards.

The selective catalytic reduction catalyst shall utilize a diesel exhaust fluid solution consisting of urea and purified water to convert nitrogen oxide into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be injected into the system through the decomposition tube between the DPF and SCR.

The system shall utilize 0.065 inch thick stainless steel exhaust tubing between the engine turbo and the DPF.

The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall all be connected with zero leak gasketed clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires with an exhaust gas diffuser.

DIESEL EXHAUST FLUID TANK

There shall be a molded cross linked polyethylene tank for the Diesel Exhaust Fluid (DEF). The tank shall have a capacity of not less than five (5) usable gallons and shall be mounted on the left hand side of the chassis frame in front of the batteries below the frame.

The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.

DIESEL EXHAUST FLUID TANK

There shall be an access door provided in the top rear step of left side crew area for access to the DEF 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 Allison approved 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 Gen IV-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

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

6th 0.65:1 (if applicable)

Rev 5.03:1

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.

TRANSMISSION DRAIN PLUG

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

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located on the tunnel to the right of the driver.

The shift selector shall provide an indicator on the digital display and shall alert the driver/operator when a specific maintenance function is required.

TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will automatically select a five (5) speed operation.

TRANSMISSION PROGRAMMING

The EVS group package number 127 shall contain the 198 vocational package for the fire service for 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 which requires re-selecting the 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.

An eight (8) pin diagnostic connector will be provided next to the steering column.

The trans module shall contain the following circuits:

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

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1710 series universal joints.

The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®.

FUEL FILTER/WATER SEPARATOR

The fuel system shall incorporate a Racor 3150R-1210, 10 micron fuel filter/water separator as a primary filter. The fuel filter shall have a sight bowl to allow visual inspection of fuel and a drain valve to remove visible contaminants. The instrument panel shall signal when water is present in the fuel/water separator through an audible alarm and lamp.

A water-in-fuel sensor probe shall be installed in the filter bowl and wired to the water in fuel (WIF) indicator lamp on the cab dash.

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

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black aramid braided lines with a fiber outer braid. The fuel lines shall connected with reusable steel fittings. Fuel line is compatible with bio-fuel blends.

FUEL SHUTOFF VALVE

Two (2) fuel shutoff valves shall be installed at the fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

FUEL COOLER

The cross flow air to fuel cooler shall be all aluminum and shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the battery box, under the frame.

The fuel cooler shall incorporate a fan for improved heat transfer.

FUEL SYSTEM

The fuel tank shall have a capacity of sixty-eight (68) gallons/two hundred fifty-seven (257) liters.

The tank shall offer:

- A vent port which will facilitate venting to the top of the fill neck for rapid filling without any “blow-back”
- One (1) 2” NPT fill port for left hand fill with a .5” NPT drain plug centered side to side, 9" from the front of the tank
- A roll over ball check vent for temperature related fuel expansion and draw
- A design including dual draw tubes and sender flanges
- A baffled design which shall be constructed of steel
- An exterior painted with a PRP Corsol™ black anti-corrosive exterior metal treatment finish which offers superior external corrosion resistance

The fuel tank shall be mounted below the frame, behind the rear axle. There shall be two (2) three-piece strap hanger assemblies with “U” straps bolted midway on the fuel tank, allowing the tank to be easily lowered and removed for service purposes.

The strap hanger material shall be stainless steel. **NO EXCEPTIONS**.

For isolation of vibration and movement, rubber isolating pads shall be provided between the tank and the hanger strap assemblies. The tank straps shall be attached to rubber coated cross members which help isolate the tank from frame flex.

Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

All fuel lines shall be connected with steel fittings with all fittings pointed towards the right side (curbside) of the chassis.

The chassis fuel lines shall feature an additional 4’ of length provided so the tank can be easily lowered and removed for service purposes which shall be coiled and secured at the top of the tank.

FRONT AXLE

A Meritor MFS Easy Steer non-drive axle shall be incorporated as the front axle for the chassis. The axle shall feature:

- A capacity of 20,000 pounds
- A 3.74” drop and a 71” king pin intersection (KPI)
- A conventional style hub with a standard knuckle

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 SUSPENSION

The front suspension shall include a Hendrickson leaf spring suspension. The suspension shall feature:

- Capacity rating of 20,000 pounds
- 9 Leafs
- Case hardened threaded bushings
- A Grease fitting
- Double wrapped front eye

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 shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.

STEERING WHEEL AND COLUMN

The vehicle shall include a Douglass Autotech 18" tilt/telescopic steering column which shall offer up to seven (7) tilt positions. The steering column shall include a self-canceling turn signal lever, a four-way hazard switch and headlamp dimmer switch. The steering column shall also incorporate a steer angle sensor.

The steering wheel shall be a four (4) spoke VIP SmartWheel and shall be finished with vinyl covering foam padding and shall include a horn button. The smart wheel shall include controls on each side of the wheel. The left side switches shall control fog lights, wiper variable, wiper off, wash and wiper high and low. The right side switches shall control the air horn, engine brake off, low, medium and high functions.

POWER STEERING GEAR WITH ASSIST

The power steering gear shall be a TRW model TAS 85 and shall include the following:

- A balanced, hydraulic, positive displacement, sliding vane power steering pump which is gear driven from the engine

- One-piece, 2" diameter drag link for maintaining consistent wheel alignment resulting in less maintenance.

- The steering gear shall be mounted on a plane that is at a 9-degree angle in relationship to the center plane of the chassis. This mounting technique is designed to reduce the operating angle of input steering shafts. A more direct, responsive, and smoother handling vehicle will result from these unique design characteristics.

A certified torque and geometry study by TRW shall be available upon request.

REAR AXLE

A single Meritor RS-25-160 driving axle shall be incorporated as the rear axle for the chassis. The axle shall feature:

- Rated capacity of 27,000 pounds

- Heavy duty Hypoid gearing for longer life, increased strength and quieter operation

- Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage

- Rigid differential case for high axle strength and reduced maintenance

- Rugged Dependability

- Rectangular shaped, hot formed housing with a standard wall thickness at spring seat of .63” for extra strength and rigidity

- Precision forged, single differential gearing

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR SUSPENSION

The single rear axle shall feature a Reyco 79KB vari-rate, self-leveling captive slipper type conventional multi-leaf spring suspension, with 57.50 inch X 3.00 inch springs. One (1) adjustable and one (1) fixed torque rod shall be provided.

The rear suspension capacity shall be rated at 27,000 pounds based on the capacity of the brakes and rear tires.

REAR SHOCK ABSORBERS

Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.

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.

Alignment documentation shall be delivered with chassis.

FRONT TIRES

The front tires shall be Michelin 385/65R22.5 “L” tubeless radial XFE regional tread.

The front tires shall feature:

- A stamped load capacity of 19,840 pounds per axle with a speed capacity of 65 miles per hour when properly inflated to 130 pounds per square inch

REAR TIRES

The rear tires shall be Michelin 12R 22.5 16PR “H” tubeless radial XZE regional tread.

The rear tires shall feature:

- A stamped load capacity of 27,120 pounds per axle with a speed capacity of 75 miles per hour when properly inflated to 120 pounds per square inch

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.5" x 12.25" 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 WHEEL

The rear wheels shall be Accuride hub piloted, heavy duty, 22.50 inch x 8.25 inch LvL One™ aluminum wheels. Each outer wheel shall have a polished aluminum finish on the exterior surface and each inner wheel shall have a machine finish. The wheels shall be forged from a single piece of aluminum which shall be corrosion resistant, engineered to be lightweight and provide exceptional performance. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

VEHICLE TOP SPEED

The top speed of the vehicle shall be programmed at approximately 65 MPH +/-2 MPH at governed engine RPM.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system with a minimum of 4152 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. A spring brake release valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss. The system shall include an anti-compounding feature. 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 four (4) sensor, four (4) modulator anti-lock braking system (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. 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 loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

A momentary rocker style switch 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 and the light on the rocker switch 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.

FRONT BRAKES

The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17" vented rotors.

The front brakes shall include brake chambers supplied by Meritor and shall be approved per application.

REAR BRAKES

The rear brakes shall be Meritor 16.50 inch X 7.00 inch S-cam drum type.

The rear brakes shall include brake chambers supplied by Meritor and shall be approved per application.

REAR BRAKE DUST SHIELDS

The rear brakes shall be equipped with brake dust shields.

REAR BRAKE SLACK ADJUSTERS

The rear brakes shall include Meritor automatic slack adjusters installed on the axle which features a simple, durable design offering reduced weight. The automatic slack adjusters shall feature a manual adjusting nut which cannot inadvertently be backed off and threaded grease fittings for easy serviceability.

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 dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

Park brake system shall include an anti-compounding feature.

AIR DRYER

The brake system shall include a Wabco System Saver 1200 Plus air dryer with an integral 100 watt heater with a Metri-Pack sealed connector. The system shall have an integrated purge volume and integrated governor.

The system shall have the following features:

- Premium desiccant provides greater water adsorption
- Replaceable spin on cartridge for simple maintenance
- Compact light weight design
- Pressure relief safety valve
- Turbo cut-off valve for boosted compressor applications
- Service components are external for easy replacement

- Common service components proven for reliability and quality

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 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. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

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 integrated in the air dryer assembly.

MOISTURE EJECTORS

Heated, automatic moisture ejectors with a manual drain provision shall be installed on all reservoirs of the air supply system. The manual drain provision shall include an actuation pull cable coiled and tied at each drain valve. The supplied cables when extended shall be sufficient in length to allow each drain to be activated from the side of the apparatus.

AIR SUPPLY LINES

A dual air system plumbed with color coded reinforced nylon tubing air lines shall be installed on the chassis. 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 chassis frame shall consist of single “C” style parallel rails, constructed of high strength low alloy and shall feature the following:

- A Domex **MODEL110XF** 10.19” high by 3.63” deep cold rolled steel frame.
- The 10.19” frame height shall be maintained throughout the entire length of the frame to allow for maximum storage capacity for the entire apparatus.
- If frame rails that are larger than those specified are to be utilized, the maximum height of each frame rail shall not exceed 10.25” at any point on the frame rail. This will ensure the lowest possible vehicle center of gravity allowing maximum stability as well as providing the lowest body height possible.
- Frame rail shall have a consistent frame web throughout the entire length.
- The entire frame rail design shall be manufactured in the United States of America and readily available on the aftermarket.
- Grade 8 Yellow zinc coated fasteners, huck bolts shall not be acceptable
- Manufacturer's lifetime warranty

The frame ratings shall be as follows:

- 110,000 PSI minimum yield strength high strength low alloy steel

- Minimum Resisting Bending Moment (RBM) of 1,860,000 inch pounds per rail

To avoid frame cracking and failure over time, the top flange of the frame adjacent to the engine installation shall have a tapered design. Notches for engine components shall not be accepted due to fatigue and the potential for cracking.

UNDER FRAME REINFORCEMENT

An under slung frame reinforcement shall be installed below the frame rails in the transmission area to increase the vertical rigidity of the frame.

The under frame reinforcement provides:

- Enhanced handling
- Improved ride quality
- Increase resistance to frame and cross member fatigue
- Enhanced vehicle stability providing improved safety to occupants

CROSS MEMBERS

There shall be a minimum of seven (7) steel plate cross members installed on the apparatus.

- 50,000 psi minimum yield strength steel plate cross members
- Manufacturer's lifetime warranty to match frame warranty. No Exceptions.
- Installed with one-piece cross member gusset to maximize vertical strength and minimize cross member flex
- Crossmembers can be inverted when required to allow for PTO drive line installation without the need for notching or modifying the cross members in anyway. **No Exceptions.**

FRONT FRAME EXTENSION

A single piece 80,000 PSI steel extension shall be installed on the front of the frame rails.

- Reduces frame flex which translates into improved vehicle handling and ride quality
- Designs using multiple piece, bolted together extensions will not be acceptable since they are prone to more flexing, possible frame failure and cab cracking
- Allows radiator to be removed through the bottom of the frame extension without tilting the chassis cab
- Minimizes damage to the chassis cab in the event of frontal impact accident
- Maintains structural integrity of the chassis frame rails while attaching bumper extensions of varying lengths
- Splayed or notched frame rails and/or extensions shall not be accepted
- Provides foundational strength and stability of the cab tilt system which provides superior access to engine and cooling components

FRAME FINISH

The frame shall be **hot dipped galvanized** to resist weather, dirt and other corrosive material.

NO EXCEPTIONS

FRONT BUMPER

The chassis shall be equipped with a Maximum Force front bumper featuring:

- 12” high with a 3” flange and 102” wide
- ASTM A572 Grade 50 steel offering superior strength and rigidity with less weight
- A flange thickness of .5”
- Web face thickness of .282”

BUMPER EXTENSION

The bumper shall extend 18” from the cab fascia to the edge of the bumper face.

FRONT BUMPER PAINT

The front bumper shall be painted the same color as the lower color of the apparatus.

TOW HOOKS

Two (2) tow hooks shall be mounted to the bumper extension under the bumper towards the rearward section of the extension. The tow hooks shall be steel and shall be powder coated black.

ELECTRICAL SYSTEM

There shall be a 12 volt direct current single starting electrical system providing power to all components for the cab and chassis. The system shall feature:

- A Weldon Multiplexed system
- 300 degree Fahrenheit high temperature, flame retardant loom
- All SAE wiring color coded and labeled as to its function
- Wiring which is cross link with 311 degree Fahrenheit insulation
- A suppressed system in accordance with SAE J551

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload.

General protection circuit breakers will be a combination of automatic and manual reset breakers. This will provide a durability and capacity maximization of the electrical system. When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

EMI/RFI PROTECTION

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself.

EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL HARNESSING INSTALLATION

To ensure rugged dependability, all wiring harnesses installed by the apparatus manufacturer will conform to the following specifications:

SAE J1128 - Low tension primary cable

SAE J1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring

SAE J163 - Low tension wiring and cable terminals and splice clips

SAE J2202 - Heavy duty wiring systems for on-highway trucks

NFPA 1901 - Standard for automotive fire apparatus

FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses

SAE J1939 - Serial communications protocol
SAE J2030 - Heavy-duty electrical connector performance standard
SAE J2223 - Connections for on board vehicle electrical wiring harnesses NEC - National Electrical Code
SAE J561 - Electrical terminals - Eyelet and spade type
SAE J928 - Electrical terminals - Pin and receptacle type A

For increased reliability and harness integrity, harnesses will be routed throughout the cab and chassis in a manner which allows the harnessing to be laid into its mounting location. Routing of harnessing which requires pulling of wires through tubes will not be allowed.

Wiring will be run in loom or conduit where exposed, and have grommets or other edge protection where wires pass through metal. Wiring will be color, function and number coded. Wire colors will be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires and uses a single wire color for all wires will not be allowed. Function and number codes will be continuously imprinted on all wiring harness conductors at 3.00" intervals. All wiring installed between the cab and into doors will be protected by an expandable rubber boot to protect the wiring. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

- All wire ends not placed into connectors will be sealed with a heat shrink end cap. Wires without a terminating connector or sealed end cap will not be allowed.

- All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.

- Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.

- For low cost of ownership, electrical components designed to be removed for maintenance will be quickly accessible. For ease of use, a coil of wire will be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.

- Corrosion preventative compound will be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation of the plug.

- Any lights containing non-waterproof sockets in a weather-exposed area will have corrosion preventative compound added to the socket terminal area.

- All electrical terminals in exposed areas will have protective Coating applied completely over the metal portion of the terminal.

- Rubber coated metal clamps will be used to support wire harnessing and battery cables routed along the chassis frame rails.

- Heat shields will be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust will be protected by a heat shield.

- Cab and crew cab harnessing will not be routed through enclosed metal tubing. Dedicated wire routing channels will be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab will allow for easy routing of additional wiring and easy access to existing wiring.

- All braided wire harnesses will have a permanent label attached for easy identification of the harness part number and fabrication date.

- All standard wiring entering or exiting the cab will be routed through sealed bulkhead connectors to protect against water intrusion into the cab.

BATTERY CABLE INSTALLATION

All 12-volt battery cables and battery cable harnessing installed by the apparatus manufacturer will conform to the following requirements:

SAE J1127 - Battery Cable
SAE J561 - Electrical terminals, eyelets and spade type
SAE J562 - Nonmetallic loom
SAE J836A - Automotive metallurgical joining
SAE J1292 - Automotive truck, truck-tractor, trailer and motor coach wiring
NFPA 1901 - Standard for automotive fire apparatus

Battery cables and battery cable harnessing will be installed utilizing the following guidelines:

- All battery cables and battery harnesses will have a permanent label attached for easy identification of the harness part number.

- Splices will not be allowed on battery cables or battery cable harnesses.

- For ease of identification and simplified use, battery cables will be color coded. All positive battery cables will be red in color or wrapped in red loom the entire length of the cable. All negative battery cables will be black in color.

- For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus will be coated to prevent corrosion.

ELECTRICAL COMPONENT INSTALLATION

All lighting used on the apparatus will be, at a minimum, a two (2) wire light grounded through a wired connection to the battery system. Lights using an apparatus metal structure for grounding will not be allowed.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests will be recorded and provided to the purchaser at time of delivery.

BATTERY COMPARTMENTS

A well ventilated battery storage compartment shall house the batteries on the officer and driver side of the chassis and shall be located so as to offer easy access to the batteries when the cab is tilted.

The each battery compartment shall feature:

- 3/16" steel construction with powder coated finish
- A complete floor of heavy duty, industrial grade, recycled Turtle Tile brand interlocking matting
- A double hinged powder coated steel cover with two (2) push button latches shall be utilized providing easy access to the When in the open position, the double hinged door shall be flush with the bottom of the battery compartment, allowing for a sweep out style floor and removal of the batteries when necessary, without the inference of a lower lip. **No Exceptions.**

BATTERY CABLES

The starting system shall include cables which shall be protected by a 275 degree F, minimum high temperature flame retardant loom.

The loom shall be sealed to keep out dirt, dust and debris

BATTERY JUMP START LUGS

A method for quickly connecting jumper cables shall be installed on the apparatus. The system shall be internally wired to the 12 volt chassis batteries and terminate with positive and negative lugs located near the driver's door. The lugs shall be covered with color-coded rubber plugs, red for positive and black for negative. An identification label shall be applied.

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.

BATTERIES

The single start electrical system shall include six (6) AC-Delco BCI 31 950 CCA batteries. The batteries shall feature:

- A 210 minute reserve capacity
- 4/0 welding type dual path starter cables per SAE J541
- Heat shrink and sealant encapsulated ends on the cables

ALTERNATOR

The charging system shall include a 320 amp Leece Neville 12 volt alternator. The alternator shall include a self-excited integral regulator.

HEADLIGHTS

A quadruple headlight assembly shall be provided in the fascia to enhance the look. The top two (2) bezels shall include head lamps while the lower bezels shall house a turn signal in the outboard position and a warning light in the inboard position.

The daytime running light feature shall include the headlights on low beam and the marker lights shall be illuminated.

FRONT TURN SIGNALS

Two (2) Whelen Series 600 LED square, front turn signal assemblies shall be included on the front fascia directly below the headlights, one each side of the cab grille. Each turn signal shall be mounted in an attractive façade style bezel which is an integral part of the fascia.

SIDE MARKER LIGHTS

Two (2) Weldon amber LED round, side marker light assemblies shall be mounted on the side of the cab ahead of the driver door, adjacent to the front head lamp bezel.

FRONT MARKER LAMPS

The cab front shall include five (5) LED amber marker lamps above the windshield in accordance with the Department of Transportation requirements.

CORNERING LIGHTS

There shall be two (2) Whelen #600 halogen cornering lights which shall be mounted, one (1) on each of the driver and officer bumper tails for additional lighting when turning a corner. Each lamp shall illuminate when the respective turn signal is activated.

GROUND LIGHTS

Each door shall include a Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the cab step below each door.

Each light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.

CAB STEP LIGHTING

One (1) LED light shall be mounted to the riser of the middle cab step, a total of four (4) step lights for the cab, in accordance with NFPA.

Each light shall include a polycarbonate lens and shall be contained in a housing which is vibration welded with a bulb which shall be shock mounted. Each step light shall not be any larger than 3" in diameter.

ENGINE COMPARTMENT LIGHTING

One (1) LED light shall be mounted to the engine compartment in such a fashion as to provide as much light as possible to the engine compartment area. The engine compartment lighting shall activate with the tilting of the cab.

INTERIOR OVERHEAD CAB LED LIGHTING

Each cab door shall include an LED lamp with a red and a clear lens.

The clear lamp shall illuminate with the opening of each respective door with both the red and clear portions of the lamp activated by individual switches on each lamp.

CAB INSTRUMENTATION

The instrumentation panel within the cab shall feature a gauge panel which shall include three (3) 5"diameter information centers, telltale indicator lamps, control switches, alarms, and a LCD diagnostic panel.

The gauges shall be easy to read including red backlighting.

The instrument panel shall contain the following gauges and indictors:

The middle information center shall include:

- A programmable speedometer to read either 0 to 140 MPH or 0 to 140 KM/H
- An amber telltale lamp indicating the Check Engine
- An amber telltale lamp indicating MIL Engine Emissions System Malfunction
- A red telltale lamp indicating Stop Engine
- A tachometer gauge with 0-3,000 RPM

The right hand side information center shall include:

- A gauge to display the engine oil pressure with high and low level indicators and stop engine alarm
- A fuel level gauge with a low fuel indicator and alarm
- An LED bar displaying 4 stages of the level for the Diesel Exhaust Fluid (DEF) with a refill indicator
- A voltage gauge with low voltage indicator
- A water temperature gauge with high water temp indicator and alarm

The left hand side information center shall include:

- A primary air PSI gauge including low air and high air warning displays
- A secondary air PSI gauge with low and high air warning indication

An LCD diagnostic display, located in the left hand side information center shall include digital readouts for the following:

- Odometer
- Transmission oil temp
- Engine oil temp
- Speedometer
- Engine hours
- Engine and transmission code
- Exhaust temp
- Engine coolant temp
- Engine oil PSI
- Turbo boost PSI
- Primary air pressure
- Secondary air pressure
- Engine load %
- Engine torque
- Battery volts
- Fuel level %
- Vehicle speed
- RPM
- DEF level
- Instant fuel economy

- Average fuel economy
- Engine hours
- Capable to record four trips, each shall be include: Trip distance, Fuel economy,Fuel used, Idle fuel used.
- The LCD screen shall also provide diagnostic capability

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located below the middle information center. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols. The following indicator lamps shall be located on the Telltale panel:

BLUE Indicator Lights

- High Beam Headlight

GREEN Indicator Lights

- Right Turn Indicator - Left Turn Indicator - Battery On (Always On)

YELLOW Indicator Lights

- Particle Filter Regeneration (DPF) - Regeneration Inhibit (Switch Engaged) - Check Transmission
- Air Intake Restriction - High Exhaust System Temperature (HEST) - Wait to Start
- ATC (Automatic Traction Control) (when applicable) - Water in Fuel

RED Indicator Lights

- Low Engine Coolant Level - Air Bag Warning (when applicable)
- High Transmission Temperature - ABS
- Parking Brake

ALARMS

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Alarm silence: Any active audible alarm will be able to be silenced with a button on the right side of the LCD screen.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

DIAGNOSTIC PANEL

A diagnostic panel shall be accessible while standing on the ground and located inside the driver's side door, left of the steering column. The diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved trouble shooting providing a lower cost of ownership. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist.

The diagnostic panel shall include the following:

- Engine diagnostic port
- Transmission diagnostic port
- ABS diagnostic port

- V-Mux USB diagnostic port
- Engine diagnostic switch (blink codes flashed on check engine telltale indicator)
- Diesel particulate filter regeneration switch
- Diesel particulate filter regeneration inhibit switch

ELECTRONIC WINDSHIELD WASHER INDICATION

The windshield washer level shall be electronically available to the Driver through the Vista screen.

ELECTRONIC POWER STEERING FLUID INDICATION

The level of the power steering fluid shall be electronically available to the Driver through the Vista screen.

IGNITION

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a Land & Sea brand two position switch, of which shall be mounted on the left side Driver kick Panel.

A push button type starter button shall be provided on the driver dash to the left of the steering wheel.

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

POWER & GROUND STUD

An electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud.

MULTIPLEX DISPLAYS

Two (2) Weldon Vista IV displays shall be located one (1) on the driver's side dash and one (1) on the officer's side of the dash.

The Vista IV displays shall feature:

- A full color LCD display screens
- A message bar displaying the time of day, and important messages requiring acknowledgement by the user
- Four (4) push button style controls on either side of the screen for the on-board diagnostics
- Seven (7) push button style controls located below the screen for the on-board diagnostics
- Video ready display screens for back- up cameras, thermal cameras, and DVD
- A DIN type input connector ready for GPS interfacing shall be incorporated into the back of the display

The Vista IV displays shall measure approximately 10.38" wide x 7.5" in height. Each shall offer varying fonts and background colors, shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

BACKLIGHTING COLOR

The instrumentation gauges and the switch panel legends shall be backlit using amber LED backlighting.

INSTRUMENTATION PANEL

The instrumentation panel inlay shall be painted a gloss black.

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 through an on/off switch and individual low/medium/high selector switches on the right side of the steering wheel. The engine brake status shall be displayed through indicator lights on the dash panel in view of the driver.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The head light shall be activated through a button on the left side of the steering wheel. The marker lights shall be activated through the Vista.

GROUND LIGHT ACTIVATION

The ground lights shall activate when the park brake is engaged and when either the front or rear side doors is open, the respective ground light shall activate.

The step lighting shall activate by opening any of the cab doors.

REARVIEW MIRROR REMOTE ACTIVATION

The driver's panel shall include activation for the rearview mirrors remote function. The activation for the mirror heat shall be through the Weldon Vista screen.

HEATING AND COOLING CONTROLS

The HVAC system shall be controlled through all available vistas, and the HVAC system for the crew area shall be controlled through a manual panel located in the crew area

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 driver's side dash to the right of the steering column within easy reach of the driver.

WINDSHIELD WIPER ACTIVATION

The windshield wipers shall be activated through a switch on the smart wheel.

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. Each switch shall be located in a covered location.

DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder system installed. The system shall be designed to meet NFPA 1901. 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
- Service Brake
- Engine Hours
- 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. The laptop connection shall be a panel mounted female type A USB connection point, remotely mounted in the left side foot well of the cab. The latest software shall be available for download from the Weldon website.

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 activate an indicator light in the instrument panel, a digital seat position indicator with a seat position legend in the switch 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.

REARVIEW CAMERAS

A heavy duty rearview style camera system shall be supplied including one (1) teardrop style cameras mounted to the officer's side of the apparatus below the windshield ahead of the front door and one (1) box style at the rear of the apparatus.

The cameras shall feature:

- Views of side and rear available through the multiplex screen on the driver dash
- Activation of the rear camera when the transmission is placed in reverse
- Activation of the right side camera with the activation of the right indicator
- Additional activation through the multiplex system

LOW VOLTAGE ELECTRICAL SYSTEM SPECIFICATIONS

The electrical system shall include all panels, electrical components, switches and relays, wiring harnesses and other electrical components. The electrical equipment installed by the apparatus manufacturer shall conform to current

automotive electrical system standards, the latest Federal DOT standards, and the requirements of the applicable NFPA standards.

The apparatus shall use an integrated CAN-bus technology. The system shall utilize multiplexed, CAN-Bus technology and integrate with the Weldon V-Mux multiplex system providing complete apparatus control. The system shall be modular and configurable to accommodate the necessary control functions for the emergency apparatus being specified. The system shall provide operator relief with optimized sequences and a central control point(s) for all functions. Operator interface(s) shall have key buttons with tactile feedback (even when wearing gloves) to control apparatus functions. The key buttons shall allow the operator to engage or disengage functions by touch (pressed button feedback). Key buttons shall be identified with color-coded pictographs and/or labels combined with LED control lamps indicating function status. Operator interface(s) shall be ergonomic in placement and design, intuitive to use, with functions arranged in a top-down order configuration. The operator interface(s) shall be internally backlit for operation at night and low light conditions. The system shall provide maximum control integration of the various component systems installed on the specified apparatus. The system shall be pre-wired for computer accessibility to allow service personnel to easily connect to perform diagnostics, troubleshooting, or program additions.

The system shall have the following functions or features available:

1. Power management
2. Load shedding
3. Solid-state circuitry
4. Switch input
5. Lighting device activation
6. Self-contained diagnostic indicators
7. Power distribution
8. Diagnostic display capability
9. High Idle
10. Throttle Control
11. Multiple Operator Interfaces

All wiring shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for the protected circuit. Voltage drops in all wiring from the power source to the using device shall not exceed 10 percent. The wiring and wiring harness and insulation shall be in conformance to applicable SAE and NFPA standards. The wiring harness shall conform to SAE J-1128 with GXL temperature properties. All exposed wiring shall be protected in a loom with a minimum 289 degree Fahrenheit rating. All wiring looms shall be properly supported and attached to body members. The electrical conductors shall be constructed in accordance with applicable SAE standards, except when good engineering practice requires special construction.

The wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection and shall be installed in accordance with the device manufacturer's instructions. Electrical connections shall be with mechanical type fasteners and large rubber grommets where wiring passes through metal panels.

The wiring between the cab and body shall be joined using Deutsche type connectors or an enclosed in a terminal junction panel area. This system will permit body removal with minimal impact on the apparatus electrical system. All connections shall be crimp-type with insulated shanks to resist moisture and foreign debris such as grease and road grime. Weather-resistant connectors shall be provided throughout to ensure the integrity of the electrical system.

Any electrical junction or terminal boxes shall be weather resistant and located away from water spray conditions. In addition, the main body junction panel shall house the automatic reset breakers and relays where required.

There shall be no exposed electrical cabling, harnesses, or terminal connections located in compartments, unless they are enclosed in a junction box or covered with a removable electrical panel. The wiring shall be secured in place and protected against heat, liquid contaminants and damage. Wiring shall be uniquely identified every three-inches (3") by color coding or permanent marking with a circuit function code and identified on a reference chart or electrical wiring schematic per requirements of applicable NFPA #1901 standards.

The electrical circuits shall be provided with low voltage overcurrent protective devices. Such devices shall be accessible and located in required terminal connection locations or weather resistant enclosures. The overcurrent protection shall be suitable for electrical equipment and shall be automatic reset type and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of maximum current for which the circuit is protected. The system shall have electro-magnetic interference suppression provided as required in

applicable SAE standards.

The electrical system shall include the following:

1. Electrical terminals in weather exposed areas shall have a non-conductive grease or spray applied. A corrosion preventative compound shall be applicable to all terminal plugs located outside of the cab or body.

2. The electrical wiring shall be harnessed or be placed in a protective loom.

3. Holes made in the roof shall be caulked with silicone. Large fender washers shall be used when fastening equipment to the underside of the cab roof.

4. Any electrical component that is installed in an exposed area shall be mounted in a manner that will not allow moisture to accumulate in it.

5. A coil of wire must be provided behind an electrical appliance to allow them to be pulled away from mounting area for inspection and service work.

6. All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area.

The warning lights shall be switched in the chassis cab with labeled switches in an accessible location. All electrical equipment switches shall be mounted on a switch panel mounted in the cab convenient to the operator. For easy nighttime operation, an integral indicator shall be provided to signal when the circuit is energized. All switches shall be appropriately identified as to their function.

A single warning light switch shall activate all required warning lights. This switch will allow the vehicle to respond to an emergency and "call for the right of way". When the parking brake is applied, a "blocking right of way" system shall automatically activate per requirements of the applicable NFPA standards. All "clear" warning lights shall be automatically turned off upon application of the parking brake.

NFPA REQUIRED TESTING OF ELECTRICAL SYSTEM

The apparatus shall be electrically tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with delivery documentation per requirements of the applicable NFPA standards. The following minimum testing shall be completed by the apparatus manufacturer:

1. Reserve capacity test:

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes. All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a failed test.

2. Alternator performance test at idle:

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

3. Alternator performance test at full load:

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system is permitted during this test. However, if an alarm sounds due to excessive battery discharge, as detected by the system requirements in the NFPA standards, or a system voltage of less than 11.7 volts dc for more than 120 seconds is present, the test has failed.

4. Low voltage alarm test:

Following the completion of the above tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts dc for a 12 volt system shall be considered a test failure. The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

NFPA REQUIRED DOCUMENTATION

The following documentation shall be provided on delivery of the apparatus:

a. Documentation of the electrical system performance tests required above.

b. A written load analysis, including:

1. The nameplate rating of the alternator.
2. The alternator rating under the conditions.
3. Each specified component load.
4. Individual intermittent loads.

MASTER ELECTRIC SWITCH

One (1) battery disconnect switch shall be located conveniently to the driver of the apparatus. The switch shall disconnect the 12 volt power supply from the battery system.

KEYLESS IGNITION SWITCH

One (1) non-removable, keyless style ignition switch shall be provided with the chassis.

PUMP ENCLOSURE LIGHTS

One (1) incandescent work light shall be provided in the pump enclosure. The control switch shall mounted on the light head.

HEADLIGHT FLASHER

One (1) Code 3 model 700 wig-wag flasher shall be provided. This shall flash two loads of up to 8 amps (100 watts) each.

PORTABLE LANTERN

Four (4) Streamlight “Vulcan” LED portable handlight shall be provided and installed. The lantern shall include a mounting bracket, with 12 volt charger wired to the battery system to allow the light to recharge when not in use.

HANDLIGHT INSTALLATION

The location of the handlight installation shall be in the chassis cab. All components shall be installed as directed by the fire department.

MARKER LIGHTS

Two (2) United Group Model VS-L31RW flex rubber arm style LED Clearance lights shall be mounted on the rear of the body, one each side. These lights are in addition to the lights required by the DOT.

LICENSE PLATE BRACKET

One (1) Cast Products license plate bracket shall be provided at the rear bumper. The bracket shall have a polished finish and LED light.

TAIL LIGHTS

Two (2) Weldon tail/brake lights shall be provided. The rectangular light shall be 7" x 8" incandescent with a red lens.

TURN SIGNALS

Two (2) Weldon turn signals shall be provided. The rectangular incandescent light shall be 7" x 8" in dimension.

MID BODY TURN SIGNALS

Two (2) mid body turn signals shall be provided. The rectangular incandescent lights shall be approximately 1-1/4" x 4" in dimension. The location of the turn lights shall be at mid-body near the rear wheel axle.

BACKUP LIGHTS

Two (2) Weldon incandescent backup lights shall be installed on the rear of the apparatus body. The dimensions shall be 7" x 8" and the lens color shall be clear.

THREE LIGHT BEZEL

Two (2) tail light cluster bezels shall be supplied. Each bezel shall be designed to hold the specified rear lights located at the lower rear corners of the body.

FRONT BUMPER GROUND LIGHTS

Two (2) ground lights LED lights shall be installed under the front bumper.

PUMP PANEL GROUND LIGHTS

Two (2) LED ground lights shall be installed under the pump panel running boards. One (1) light shall be located on the driver's side and one (1) light located on the officer's side of the apparatus.

REAR STEP GROUND LIGHTS

Two (2) LED ground lights shall be installed under rear step of the apparatus.

The ground lights shall automatically activate when the parking brake is applied.

STEP LIGHT

Two (2) LED step light(s) with clear lens shall be installed.

REAR TAILBOARD LIGHTS

Two (2) LED step lights with clear lens shall be installed to illuminate the step surfaces at the rear of the apparatus body.

STEP LIGHT

Two (2) LED step light with clear lens shall be installed to illuminate the side running boards.

The step/walkway light switch shall be installed and wired to the parking brake.

SCENE LIGHT

Four (4) Fire Research model SPA900-Q65 surface mount light shall be installed. The light shall be mounted with four (4) screws to a flat surface. It shall be 6 3/4" high by 9" wide and have a profile of less than 1 3/4" beyond the mounting surface. Wiring shall extend from a weatherproof strain relief at the rear of the light.

The light shall have twenty-four (24) white LEDs that generate a rated 4600 lumens at 12 or 24 volts DC. The lens shall redirect the light along the vehicle and out onto the working area. The light housing shall be aluminum with a chrome colored bezel.

One (1) scene light shall be located on the left side of the cab.

One (1) scene light shall be located on the right side of the cab.

Two (2) scene light shall be located on the rear of the apparatus body.

One (1) scene light switch with indicator shall be installed on the cab main switch panel to control the left side scene light(s).

The switch shall be labeled "LEFT SCENE".

One (1) scene light switch with indicator shall be installed on the cab main switch panel to control the right side scene light(s).

The switch shall be labeled "RIGHT SCENE".

One (1) scene light switch with indicator shall be installed on the cab main switch panel to control the rear scene light(s).

The switch shall be labeled "REAR SCENE".

The rear scene lights shall activate automatically upon placing the transmission into reverse.

ELECTRIC SIREN

One (1) Code 3 Model #3692 V-Con electronic siren shall be mounted in the cab. The unit shall feature an electronic air horn, wail, yelp, hi-lo siren and shall have a hard wired microphone.

SPEAKER

One (1) Federal Signal DynaMax Model #ES100 100-watt speaker shall be installed. The black aluminum speaker shall include a polished trim #ESFMT.

SPEAKER LOCATION

The siren speaker shall be installed on the apparatus bumper extension, as determined by the body manufacturer.

FEDERAL MECHANICAL SIREN

One (1) Federal Signal Q2B mechanical siren shall be pedestal mounted onto the front bumper. The "Q" siren shall feature a highly polished chrome body and grille. The siren's distinctive mechanical wail sound shall produce 123 db at 10'. The siren control switch(es) shall be installed in the cab.

SIREN BRAKE

One (1) push button siren brake to silence the Federal Signal Q2B siren shall be provided on the officer's side dash.

SIREN CONTROL

One (1) foot switch shall be provided on the driver's side of the cab floor to activate the Federal Signal Q2B siren.

SIREN CONTROL

One (1) foot switch shall be provided on the officer's side of the cab floor to activate the Federal Signal Q2B siren.

LIGHTBAR

One (1) Whelen Justice Series Model #01-0686119-02 light bar shall be installed. The LED lightbar shall be 56" in length. The lightbar shall have four (4) red corner linear LED's and four (4) front red LED's. The light bar shall have a five (5) year warranty on the LED modules. The light bar shall be installed on the apparatus cab roof.

UPPER WING FRONT WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side one the front of the chassis cab upper grille area. The dimensions of the lights shall be 4-5/16" x 6-3/4".

OUTER GRILLE WARNING LIGHTS

One (1) pair of Whelen model M7 LED warning lights shall be installed, one each side on the front of the chassis grille, outboard position. The dimensions of the lights shall be 3-3/8" x 7-5/8".

INTERSECTION WARNING LIGHTS

One (1) pair of Whelen model #600 red Super LED warning lights shall be installed one each side of the chassis cab. The dimensions of the lights shall be 4" x 6".

LOWER MID-CHASSIS WARNING LIGHTS

Two (2) Whelen model #600 red Super LED warning lights shall be installed on the lower side of the mid-chassis. The dimensions of the lights shall be 4" x 6".

LOWER MID-BODY WARNING LIGHTS

One (1) pair of Whelen model #600 red Super LED warning lights shall be installed , one each side of the apparatus, mid-body. The dimensions of the lights shall be 4" x 6".

UPPER REAR WARNING LIGHTS

One (1) pair of Whelen model #L31H Super LED beacons shall be installed, one each side on the upper rear of the apparatus body. The unit shall have dimensions of 4" high x 7-9/16" deep and shall have one red lens and one amber lens.

REAR WARNING LIGHT MOUNTING

The upper rear lights shall be mounted on cast aluminum stanchions attached to the apparatus body, one on each side.

LOWER REAR WARNING LIGHTS

One (1) pair of Whelen model #600 red Super LED warning lights shall be installed, one each side on the lower rear of the apparatus body. The dimensions of the lights shall be 4" x 6".

Chrome Bezels

There shall be chrome bezels supplied and installed on the warning lights.

AIR HORNS

Two (2) 24.5" Stuttertone chrome plated air horns shall be recess mounted into the front bumper with one positioned on each side. An air protection valve shall be provided in the air horn piping that will not allow the chassis air brake system to drop below 90 PSI..

DATA LABEL

HEIGHT LENGTH & WEIGHT

A highly visible label indicating the overall height, length, and weight of the vehicle shall be installed in the cab dash area.

CAB SEATING POSITION LIMITS

The label shall also include the seating positions for firefighters. A weight allowance of 250 pounds for each shall be factored into the gross vehicle weight rating of the chassis.

NO RIDE LABEL

One (1) "NO RIDERS" label shall be applied on the vehicle at the rear step area or other applicable areas. The label shall warn personnel that riding in or on these areas, while the vehicle is in motion is prohibited.

HELMET WARNING TAG

One (1) label shall be installed in the cab, visible from each seating position. The label shall read "CAUTION: DO NOT WEAR HELMET WHILE SEATED." Helmets must be properly stowed while the vehicle is in motion according to the current edition of NFPA 1901.

REAR TOWING PROVISIONS

There shall be two tow eyes furnished under the rear of the body and attached directly to each chassis frame rail. There shall be a reinforcement spreader bar connecting the two tow eyes. Tow eyes are to be constructed of 3/4" plate steel with a 3" I.D. hole, large enough for passing through a tow chain end hook.

BUMPER EXTENSION

The chassis frame shall be extended 18" with reinforced steel angle and structural channel by the body builder. The extension shall be designed to support the bumper and other equipment to be installed.

FRONT BUMPER GRAVELSHIELD

A 18" front to rear filler panel constructed from NFPA compliant, slip resistant aluminum tread plate shall be provided on the front chassis frame extension. The extension shall be covered on the top and sides, up to the level of front bumper and shall be reinforced to support one (1) firefighter (approximately 250 pounds) and the equipment specified to be installed.

FRONT BUMPER COMPARTMENT

One (1) recessed fire hose compartment constructed from smooth aluminum shall be installed in the center of the front bumper extension. Water drain holes shall be drilled in the bottom. The compartment shall hold 150' of 1 ¾ fire hose.

COMPARTMENT MATTING

One (1) bumper compartment floor shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking units, 12 x 12 square by 3/4" thick. This material shall be resistant to temperature, ultra-violet radiation, mechanical impacts, chemical actions and corrosion free.

BUMPER COMPARTMENT DOOR

One (1) aluminum tread plate door for the front bumper compartment shall be supplied. The flat door shall have a stainless steel hinge at the rear, a latch to secure the compartment, and a notch in the cover to allow for hose access to the bumper discharge.

HUB AND LUG NUT COVERS

The apparatus shall have chrome or stainless steel hub and lug nut covers on the front and single rear axles.

TIRE PRESSURE INDICATOR

There shall be a tire pressure indicator at each tire's valve stem on the vehicle that shall indicate if there is insufficient pressure in the specific tire.

EXHAUST HEAT SHIELD

A heat shield shall be installed under the body in the areas where the exhaust system is routed.

FRONT MUD FLAPS

One (1) pair of black mud flaps shall be installed behind the front wheels.

REAR MUD FLAPS

One (1) pair of black mud flaps shall be installed behind the rear wheels.

INTERIOR CABINET

There shall be one (1) full height storage cabinet installed on the back wall of the interior cab. The cabinet shall be constructed of smooth aluminum plate. The cabinet shall have approximate interior dimensions of 36" Wide x 18" Deep x Full Height.

Three (3) vertically adjustable shelves shall be installed in the cabinet. The shelves shall be constructed of smooth aluminum plate. Each shelf shall have a 1" front bend for added strength.

The shelves shall be mounted with extruded aluminum adjustable shelf track attached to the walls and secured with aluminum brackets to the tracks to allow for vertical height adjustment.

The cabinet shall be equipped with a roll-up door constructed of anodized aluminum.

The cabinet's interior shall have an unpainted D/A orbital sander finish.

The cabinet's exterior finish shall match the interior finish of the chassis cab.

Two (2) 18" long Whelen Fluorent™ Plus Model F18PC LED lights shall be installed, one each side of the door opening. Each light shall contain two (2) LEDs per inch producing approximately 120 lumens. The lights shall have a 5/8" clear polycarbonate tube enclosure for sever duty applications and silicone rubber end caps for a superior sealed fit around light tube and wires. The lights shall be provided with a 5 year HDP® Heavy Duty Professional warranty.

The lights shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

1500 GPM FIRE PUMP SPECIFICATIONS

The centrifugal type fire pump shall be a Hale model QMAX midship mounted with a rated capacity of 1500 GPM. The pump shall meet NFPA 1901 requirements.

The pump shall be certified to meet the following deliveries:

1500 GPM @ 150 PSI

1500 GPM @ 165 PSI

1050 GPM @ 200 PSI

750 GPM @ 250 PSI

HALE QMAX SINGLE STAGE PUMP

A Hale model Q-MAX single stage pump shall be designed to mount within a pump enclosure and shall be split-drive shaft driven. The pump shall be driven by a driveline from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance.

The entire pump, suction and discharge passages shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be tested at the pump manufacturer's factory to the performance specs as outlined by the applicable sections of the NFPA 1901 standard. The pump shall be free from objectionable pulsation and vibration.

Pump Body

The pump body and related parts shall be fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI. All metal moving parts in contact with water shall be of high quality bronze or stainless steel. The pump body shall be horizontally split, on a single plane in two sections for easy removal of entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in chassis.

Impellers

The pump shall have one double suction impeller. The pump body shall have two opposed discharge outlet volute cutwaters to eliminate radial unbalance. Pump impeller shall be hard, fine grain bronze of the mixed flow design;

accurately machined and individually balanced. The vanes of the impeller intake eyes shall be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower.

Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and shall be of wrap-around double labyrinth design for maximum efficiency.

Pump Shaft

Pump shaft shall be rigidly supported by three bearings for minimum deflection. One (1) high lead bronze sleeve bearing shall be located immediately adjacent to the impeller (on side opposite the gearbox). The sleeve bearing shall be lubricated by a force fed, automatic oil lubricated design, pressure balanced to exclude foreign material. The remaining bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.

The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel to be super-finished with galvanic corrosion protection for longer shaft life. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of the gearbox.

Pump Transmission

Pump transmission shall be of sufficient size to withstand 16,000 lb./ft. of torque of the engine. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

The gearbox drive shafts shall be of heat-treated chrome nickel steel and be at least 2-3/4" in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine.

All gears both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened, to give an extremely accurate gear for long life. An accurately cut spur design shall be provided to eliminate all possible end thrust.

Pump Mounting

The pump shall be bolted to steel angles in the pump module, using grade 8 bolts.

Drivelines

Hollow-tube drivelines and universals shall be properly matched to the engine and transmission output torque ratings.

FIRE PUMP MECHANICAL WATER SEAL

The Hale fire pump shall have a high quality, self-adjusting, maintenance free mechanical seal.

ELECTRIC/PNEUMATIC PUMP SHIFT

The pump shift shall be an air operated and shall incorporate an air cylinder with an electric actuating switch to shift from road to pump and back. The power shift control valve shall be mounted in the cab. The fire pump-shift system shall be equipped with a means to prevent unintentional movement of the control device from its set position.

The system shall include a nameplate indicating the chassis transmission shift selector position to be used for pumping and located so that it can be easily read from the driver's position.

The system shall include applicable the NFPA interlocks, pump shift and OK TO PUMP indicator lights in the cab and pump panel. The fire pump system shall be equipped with an interlock system shall be provided to ensure that the pump drive system components are properly engaged in the pumping mode of operation so that the pumping system can be safely operated from the pump operator's position.

If applicable, the secondary braking device shall be automatically disengaged for pumping operations.

FIRE PUMP PRIMER

The fire pump shall be equipped with a Hale ESP oil-less electrically driven priming pump. The unit shall be a positive displacement vane type. A Hale PV priming control shall be located at the pump operator's panel and when pulled it shall

open the priming valve and start the priming motor.

The pump shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds with the pump dry, through 20 feet of suction hose of appropriate size. The priming system shall comply to applicable sections of NFPA standards.

FIRE PUMP SPLIT SHAFT DRIVESHAFTS AND INSTALLATION

The mid-ship split shaft fire pump shall be installed and shall include installation of the fire pump, modification and/or fabrication of new drivelines and all pump-mounting brackets. The drive shaft(s) shall be spin balanced prior to final installation.

UNDERWRITERS LABORATORIES FIRE PUMP TEST

The pump shall undergo an Underwriters Laboratories Incorporated test per applicable sections of NFPA standards, prior to delivery of the completed apparatus.

The UL acceptance certificate shall be furnished with the apparatus on delivery.

FIRE PUMP TEST LABEL

A fire pump performance and rating label shall be installed on the fire apparatus pump panel. The label shall denote levels of pump performance and testing completed at factory. These shall include GPM at net pump pressure, RPM at such level, and other pertinent data as required by applicable NFPA standards. In addition, the pressure control device, tank to pump flow tests, and other required testing shall be completed.

In addition, the entire pump, suction and discharge passages shall be hydrostatically tested to a pressure as required by applicable NFPA standards. The pump shall be fully tested at the pump manufacturer's factory to the performance specifications as outlined by applicable NFPA standards. Pump shall be free from objectionable pulsation and vibration.

If applicable, the fire pump shall be tested and rated as follows:

100% of rated capacity at 150 pounds net pressure.

70% of rated capacity at 200 pounds net pressure.

50% of rated capacity at 250 pounds net pressure.

100% or rated capacity at 165 pounds net pressure.

INTAKE RELIEF/DUMP VALVE

One (1) Elkhart Model 40, 2-1/2" intake relief/dump valve preset at 125 psi shall be permanently installed on the suction side of the fire pump. The valve shall have an adjustment range of 75 psi to 250 psi, and shall be designed to automatically self-restore to a non-relieving position when excessive pressure is no longer present.

Discharge side of the intake relief valve shall be plumbed to the side the apparatus, away from the pump operator, and shall terminate with a 2-1/2" NST male thread. The outlet shall be marked with an engraved tag "Intake pressure relief outlet - Do Not Cap".

FIRE PUMP COOLING

The fire pump shall be equipped with 3/8" cooling line from the pump to the water tank. This re-circulation line shall be controlled by a pump panel control valve with nameplate label noting it as the "fire pump bypass cooler". There shall be a check valve installed in the pump cooler line to prevent tank water from back flowing into the pump when it is not in use.

FIRE PUMP COOLING

The fire pump shall be equipped Hale Model TRV-L, thermal bypass cooling system. The system shall automatically dump water through a .375" discharge line to the ground when pump water temperature exceeds 120 degrees. A warning light shall be installed on the pump panel with proper label installed. The valve shall be equipped with an integral strainer and

shall reset automatically.

CHASSIS ENGINE HEAT EXCHANGER COOLING SYSTEM

The apparatus shall be equipped with a heat exchanger for supplementary chassis engine cooling during fire pump operations. A manually opened valve, mounted at the operator's panel, shall direct water from the fire pump to the heat exchanger that is mounted in the engine radiator cooling hose. The system shall provide cooling water from the fire pump to circulate around the engine radiator coolant without mixing or coming in direct contact with the engine coolant. The unit shall be installed by the chassis manufacturer and connected to the plumbing system by the fire apparatus manufacturer.

A nameplate label shall be installed on the pump panel noting "engine cooling system" with "on-off" opening directions noted.

PUMP ANODES

There shall be sacrificial, zinc anodes in the pump steamer ports which shall protect the pump and piping from electrolyis. These anodes shall also act as screens.

PUMP PLUMBING SYSTEM

The fire pump plumbing system shall be of rigid stainless steel pipe or flexible piping with stainless steel fittings. Mechanical grooved couplings shall be installed to permit flexing of the plumbing system and allow for quick removal of piping or valves for service. Flexible hose couplings shall be threaded stainless steel or mechanical grooved coupling connections.

The fire pump and plumbing shall be hydrostatically tested in compliance to applicable sections of NFPA standards. The test results shall be included in the delivery documentation.

FIRE PUMP MASTER DRAIN

The fire pump plumbing system and fire pump shall be piped to a single pump panel mounted 'handwheel' type master pump drain assembly. The master drain valve shall be a bronze master drain with a rubber disc seal, a universal joint and a handwheel control on the pump panel. The master drain shall also provide for low point drainage of the fire pump and auxiliary devices.

ADDITIONAL LOW POINT DRAINS

The plumbing system shall be equipped with additional low point manually operated 3/4" quarter turn bleeder drain valves to allow total draining of the fire pump plumbing system. These valves shall be accessible from the side of the vehicle and labeled for exact location.

FIRE PUMP & PLUMBING SYSTEM PAINTING

The fire pump and plumbing system shall be painted by the fire apparatus manufacturer. The fire pump and the plumbing shall be painted metallic silver.

HOSE THREADS

The hose threads shall be National Standard Thread (NST) on all base threads on the apparatus intakes and discharges.

LEFT SIDE -- 6" UNGATED INTAKE

One (1) 6" ungated suction intake shall be installed on the left side pump panel to supply the fire pump from an external water supply. The threads shall be 6" NST. The intake shall be provided with a removable screen.

One (1) 6" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped long handles.

RIGHT SIDE -- 6" UNGATED INTAKE

One (1) 6" ungated suction intake shall be installed on the right side pump panel to supply the fire pump from an external

water supply. The intake shall be provided with a removable screen.

One (1) 6" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped long handles.

LEFT SIDE -- 2-1/2" GATED INTAKE

One (1) 2-1/2" gated suction intake shall be installed on left side pump panel to supply the fire pump from an external water supply. The control valve shall be a quarter turn ball valve and shall have 2-1/2" NST female thread of chrome plated brass.

The intake shall be equipped with a ¾" drain and bleeder valve. A nameplate label and removable screen shall be installed.

One (1) 2-1/2" chrome plated plug shall be provided. The threads shall be NST and the plug shall be equipped rocker lugs and chain or cable securement.

WATER TANK TO PUMP LINE

One (1) 3" water tank to fire pump line shall be provided with a full flow quarter turn ball valve, 3" piping, and with flex hose and stainless steel hose clamps. The tank to pump line shall be equipped with a check valve to prevent pressurization of the water tank.

The line shall be flow tested during the fire pump testing and shall meet applicable requirements of NFPA standards.

One (1) Akron valve equipped with a manually operated pull rod, with quarter turn locking feature shall be provided on the specified intake. The handle shall be equipped with color coded engraved type name plate.

The specified intake valve shall be equipped with one (1) manually operated swing type manual control located adjacent the intake. The valve shall be equipped with a color coded engraved type name plate.

FIRE PUMP TO WATER TANK FILL LINE

One (1) 2" fire pump to water tank refill and pump bypass cooler line shall be provided. The valve shall be a full flow quarter turn ball valve with 2" piping and flex hose to tank. The valve control handle shall have a nameplate located near the valve control.

2" DISCHARGE FRONT RIGHT SIDE BUMPER

One (1) 2" discharge shall be installed at front right side bumper area with brass swivel outlet with 1-1/2" NST male threads. The valve control shall be on pump panel and a nameplate label provided at valve control area.

The specified valve shall be an Akron 8000 Series two-inch (2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

The plumbing shall be flexible hose with abrasion resistant support mountings. Auxiliary low point drains shall be provided on the discharge line.

Note: the hose connection for the front discharge shall be swivel type located above the front bumper deck level.

One (1) 2-1/2" Noshok discharge pressure gauges (30"-0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

TWO (2) 1-3/4" CROSSLAY DISCHARGES

Two (2) pre-connect 1-3/4" hose crosslays shall be installed over pump enclosure, with quarter turn 2" diameter ball valves. The outlets shall be a 2" NPT female swivel x 1-1/2" male NST hose threads.

The specified valves shall be an Akron 8000 Series two-inch (2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

Two (2) 2-1/2" Noshok discharge pressure gauges (30"-0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

The crosslay hosebeds shall have smooth aluminum sides. The hosebed decking shall be constructed with slots integrated into the hosebed floor.

Each hosebed shall provide for a minimum capacity of 200 feet of 1-3/4" diameter double jacket hose with nozzle, for hose provided by the fire department.

2-1/2" CROSSLAY DISCHARGE

One (1) pre-connect 2-1/2" hose crosslay shall be installed over the pump enclosure with a quarter turn 2-1/2" diameter ball valve. The outlet shall be a 2-1/2" NPT female swivel x 2-1/2" male NST hose threads.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

One (1) 2-1/2" Noshok discharge pressure gauges (30"-0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

The hosebed decking shall be constructed with slots integrated into the hosebed floor.

The hose bed shall provide for a minimum capacity of 150 feet of 2-1/2" diameter double jacket hose with the hose and nozzle provided by the fire department.

CROSSLAY HINGED COVER WITH END FLAPS

The crosslay hosebed shall be equipped with a single aluminum diamond plate hinged cover with vinyl end flaps with hook & loop fasteners. The cover shall have rubber bumpers, latching devices, and lift up handle on each end of the cover.

ROLLERS FOR CROSSLAY HOSE BED

The crosslay hosebed shall be equipped stainless steel "U" shaped roller system, one on each end of the hosebed.

CROSSLAY HOSEBEDS

Crosslay hosebed(s) shall be mounted over the upper pump panel or gauge panel in the upper portion of the pump enclosure. The crosslay hosebed shall be approximately 12" from the top of the pump enclosure.

LEFT SIDE PUMP PANEL -- 2-1/2" DISCHARGE

Two (2) 2-1/2" discharge shall be installed on the left side pump panel area and shall be controlled by a quarter turn ball valve. The discharge shall have 2-1/2" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.

The specified valves shall be Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless balls.

Two (2) chrome plated elbows with rocker lugs shall be provided with 2-1/2" NST swivel female x 2-1/2" NST male hose threads.

Two (2) 2-1/2" NST rocker lug chrome plated vented cap and cable or chain securement shall be provided.

Two (2) 2-1/2" Noshok discharge pressure gauges (30"-0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

RIGHT SIDE PUMP PANEL -- 2-1/2" DISCHARGE

One (1) 2-1/2" discharge shall be installed on the right side pump panel area and shall be controlled by a quarter turn ball valve. The discharge shall have 2-1/2" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

One (1) chrome plated elbow with rocker lugs shall be provided with 2-1/2" NST swivel female x 2-1/2" NST male hose threads.

One (1) 2-1/2" NST rocker lug chrome plated vented cap and cable or chain securement shall be provided.

One (1) 2-1/2" Noshok discharge pressure gauges (30"-0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

RIGHT SIDE PUMP PANEL -- 4" DISCHARGE

One (1) 4" discharge shall be installed on the right side pump panel area. The 4" discharge installed on the right side pump panel area. The discharge shall have 4" NST male hose threads.

The specified valve shall be an Akron 8000 Series four-inch (4") valve with a stainless ball.

One (1) Akron valve equipped with an Akron manually operated hand wheel control with dial type position indicator shall be provided on the specified 4" discharge. A color-coded name plate installed over the valve control.

One (1) lightweight aluminum elbow with 30 degree slant shall be provided. Threads shall be 4" Storz with lugs and manual locks x 4" female swivel NST with rocker lugs.

One (1) 4" lightweight aluminum Storz cap with cable or chain securement shall be provided

One (1) 2-1/2" Noshok discharge pressure gauges (30"-0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

REAR RIGHT SIDE -- 2-1/2" DISCHARGE

One (1) 2-1/2" discharge shall be installed on the right side rear panel of the apparatus body and shall be controlled by a quarter turn ball valve on the pump panel. The discharge shall have 2-1/2" NPT x 2-1/2" NST male hose threads. The outlet shall be equipped with an engraved nameplate label shall be installed adjacent the valve control handle.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

One (1) 2-1/2" NST rocker lug chrome plated vented cap and cable or chain securement shall be provided.

One (1) 2-1/2" Noshok discharge pressure gauges (30"-0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

3" MONITOR DISCHARGE

One (1) 3" discharge shall be piped to the area over the pump enclosure with 3" NPT male threads provided. The pipe shall be equipped with Victaulic couplings (if necessary) and shall be properly secured to prevent movement when a monitor or deck gun is attached.

One (1) Akron valve equipped with an Akron manually operated hand wheel control with dial type position indicator shall be provided on the specified 3" discharge. A color coded engraved type name plate installed over the valve control.

The specified valve shall be an Akron 8000 Series three-inch (3") valve with a stainless ball.

One (1) 2-1/2" Noshok discharge pressure gauges (30"-0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

ELKHART BUILT-IN FOAM EDUCTOR

One (1) Elkhart Model #240-125P complete built-in foam eductor shall be provided. This eductor shall be installed permanently within the pump panel compartment. The foam solution shall flow through the eductor at 125 GPM while operating at an inlet pressure of 200 PSI and discharge through the front jumpline.

The foam eductor shall have a 2" NPT female inlet and a 2" NPT female outlet. The construction of the eductor and valves shall be cast brass. The tee handles and rod guides shall be chrome plated.

FOAM SYSTEM DESIGN AND PERFORMANCE REQUIREMENTS

The proportioning system shall be capable of proportioning foam concentrate in accordance with the foam concentrate manufacturer's recommendations for the type of foam concentrate used in the system over the system's design range of flow and pressures. The foam proportioning system water flow characteristics and the range of proportioning ratio shall be specified as noted herein. The latest foam system shall be in compliance with applicable NFPA standards as it relates to this specified system

Plumbing and Strainer

The foam concentrate supply line shall be non-collapsible. A means shall be provided to prevent water back flow into the foam proportioning system and the foam concentrate storage tank.

A strainer or filter shall be provided on the foam concentrate supply side of the foam proportioner to prevent any debris that might affect the operation of the foam proportioning system from entering the system. The strainer assembly shall consist of a removable straining element, housing, and retainer. The strainer assembly shall allow full flow capacity of the foam supply line.

Flushing

A foam concentrate system flush line shall be provided as required by the foam system manufacturer. A means shall be provided in the flush line to prevent water backflow into the foam concentrate tank or water tank during the flushing operation.

Foam System Controls

The foam proportioning system operating controls shall be located at or near the pump operator's position and shall be clearly identified. Foam proportioning system shall be provided with accessible controls to completely flush the system with water according to the manufacturer's instructions.

Labels and Instructions

An instruction plate shall be provided for the foam proportioning system that include, at a minimum, piping schematic of the system and basic operating instructions. Labels that are marked clearly with the identification and function shall be provided for each control, gauge, and indicator related to the foam proportioning system.

A label shall be provided on the pump operator's panel that identifies the type of foam concentrate that the foam proportioning system is designed to use. It shall also state the minimum/maximum foam proportioning rate at the minimum/maximum foam proportioning rated system flow and pressure.

Two (2) copies of an operations and maintenance manual shall be provided. They shall include a complete diagram of the system together with operating instructions and details outlining all recommended maintenance procedures.

Foam System Testing

The accuracy of the foam proportioning system shall be certified by the foam equipment manufacturer and also tested by the installer prior to delivery of the apparatus in compliance to NFPA standards.

1" FOAM TANK CONTROL -- CLASS B

One (1) Class B foam tank shall be plumbed with 1" valve and corrosion resistant hose from the foam tank to the foam inlet of the foam system. The manually opened valve shall be provided behind the pump panel with a label.

EXTERNAL FOAM SUPPLY PUMP PANEL CONNECTION

One (1) Elkhart Model 81231001 off-truck foam tank access system furnished and installed on the apparatus. The off-truck access kit shall include a quick disconnect pickup tube with quick disconnect fitting and cap on side pump panel. The system shall be plumbed to the inlet side of the foam system and have in line check valve and an on/off selector valve.

INTEGRAL CLASS B FOAM TANK -- 30 GALLON

One (1) thirty (30) gallon Class B foam tank shall be installed within the water tank. The non-corrosive foam tank shall meet applicable sections of NFPA standards. The foam concentrate tank shall be provided with sufficient wash partitions so that the maximum dimension perpendicular to the plane of any partition shall not exceed 36 inches. The swash partition(s) shall extend from wall to wall and cover at least 75 percent of the area of the plane of the partition.

The foam concentrate tank shall be provided with a fill tower or expansion compartment having a minimum area of 12 square inches and having a volume of not less than 2 percent of the total tank volume. The fill tower opening shall be protected by a completely sealed air-tight cover. The cover shall be attached to the fill tower by mechanical means. The fill opening shall be designed to incorporate a 1/4 inch removable screen and shall be located so that foam concentrate from a five (5) gallon container can be dumped directly to the bottom of the tank to minimize aeration without the use of funnels or other special devices.

The foam tank fill tower shall be equipped with a pressure/vacuum vent that enables the tank to compensate for changes in pressure or vacuum when filling or withdrawing foam concentrate from the tank. The pressure/vacuum vent shall not allow atmospheric air to enter the foam tank except during operation or to compensate for thermal fluctuations. The vent shall be protected to prevent foam concentrate from escaping or directly contacting the vent at any time. The vent shall be of sufficient size to prevent tank damage during filling or foam withdrawal.

A color coded label or visible permanent marking that reads "FOAM TANK FILL" shall be placed at or near any foam concentrate tank fills opening. A label shall be placed at or near any foam concentrate tank fill opening that specifies the type of foam concentrate the system is designed to use. Any restrictions on the types of foam concentrate that can be used with the system shall also be stated, and a warning message that reads "WARNING: DO NOT MIX BRANDS AND TYPES OF FOAM."

The foam concentrate tank outlet connection shall be designed and located to prevent aeration of the foam concentrate and shall allow withdrawal of 80 percent of the foam concentrate tank storage capacity under all operating conditions with the vehicle level.

The foam tank(s) shall be fabricated by United Plastic Fabricating.

FOAM TANK DRAIN -- UNDER TANK

The foam tank shall have one (1) 1" gate valve drain provision installed.

PRESSURE GOVERNOR AND MONITORING DISPLAY

One (1) Fire Research PumpBoss model PBA400-A00 pressure governor and monitoring display kit shall be provided on the pump panel. The kit shall include a control module, pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8" wide by 1 3/4" deep. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

The following continuous displays shall be provided:

- CHECK ENGINE and STOP ENGINE warning LEDs
- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Engine OIL PRESSURE; shown on an LED bar graph display in 10 psi increments
- Engine TEMPERATURE; shown on an LED bar graph display in 10 degree increments
- BATTERY VOLTAGE; shown on an LED bar graph display in 0.5 volt increments
- PSI / RPM setting; shown on a dot matrix message display
- PSI and RPM mode LEDs
- THROTTLE READY LED.

A dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. The brightness of the displays shall be automatically adjusted for day or night viewing.

The program shall store the accumulated operating hours for the pump and engine, previous incident hours, and current incident hours in a non-volatile memory. Stored elapsed hours shall be displayed at the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Engine RPM
- Pump Overheat
- High Transmission Temperature
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Battery Voltage
- Low Engine Oil Pressure
- High Engine Coolant Temperature

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A control knob that uses optical technology shall adjust pressure or RPM settings. It shall be 2" in diameter with no mechanical stops, a serrated grip, and have a red idle push button in the center.

A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set

by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

FOAM TANK GAUGE

The apparatus shall be equipped with one (1) Class1 “Intelli-Tank” foam tank level gauge and shall be installed on the pump panel. The tank level gauge shall indicate the liquid level on an easy to read LED display and show increments of 1/8 of a tank.

Each tank level gauge system shall include:

- A pressure transducer mounted on the outside of the tank in an easily accessible area. Sealed foam tanks will require zero pressure vacuum vents.
- Super bright LED 4-light display with a visual indication at nine accurate levels.

Weather resistant connectors to connect to the digital display, to the pressure transducer and to the apparatus power.

FRONT BUMPER DISCHARGE AIR BLOWOUT

One (1) air blow out shall be provided for the front bumper discharge. The air supply must be supplied from the chassis air system and be connected to a quarter turn valve located on the pump operators panel.

SIDE MOUNT PUMP ENCLOSURE

The side mount pump enclosure shall be removable and supported from the chassis frame rails. This enclosure will allow independent flexing of the pump enclosure from the body and allow for quick removal. The support structure shall be constructed of extruded aluminum tubing and angle.

All pump suction and discharge controls are to be mounted on the driver side pump operator's panel so as to permit operation of the pump from a central location. The fire pump, valves and controls shall be accessible for service and maintenance as required by applicable sections of NFPA standards.

The "master" gauges shall be suitably enclosed and mounted on a full pump compartment width "hinged" gauge panel constructed of the same material as the pump operators control panel, allowing access to the backside of all gauges and gauge lines. The individual gauges shall be mounted inline with the control handle or adjacent to the control handle. Panel is to include a stainless steel piano hinge, flush mounted chrome plated trigger latch, and stainless steel cable end stops. Electrical wiring and all gauge lines shall be properly tie wrapped to prevent kinking or cutting of the lines when the panel is opened.

The following controls and equipment as specified in the specifications, shall be provided on the pump panel or within the pump enclosure:

- Primer.
- Pump and plumbing area service lights.
- Pressure control device and throttle control.
- Fire pump and engine instruments.
- Pump intakes and discharge controls.
- Master intake and discharge gauges.
- Tank fill control.
- Tank suction control.
- Water tank level gauge.
- Pump panel lights.

Crosslay Installation

The area atop the pump enclosure shall be notched for the installation of a crosslay hose bed. The hosebed shall have smooth sides and a perforated floor to allow for drainage. Provisions shall be provided to secure hose and equipment per requirements of applicable NFPA standards.

OPEN DUNNAGE COMPARTMENT -- OVER PUMP ENCLOSURE

One (1) open compartment shall be located on the top of the pump module. The compartment will be constructed as large as space permits with removable slip resistance floor material or decking in the base of the compartment.

RIGHT SIDE RUNNING BOARD -- SIDE MOUNT PANEL

The right side mount pump panel shall be equipped with side running board. The running board will extend along the width of the pump enclosure from the forward end of the body module to behind the chassis cab.

The running board shall be constructed of aluminum tread plate, bolted in place with stainless steel fasteners. The step surfaces shall be in compliance to applicable sections of NFPA requirements.

PUMP PANEL INTEGRAL SLIDE OUT STEP -- LEFT AND RIGHT SIDES

A slide out step assembly shall be constructed as an integral part of the side running board on both the left and right sides of the pump panel. The step and running board shall be integral with 12" of the step sliding in and under the pump enclosure.

The sliding step assembly shall use roller bearing slide tracks and with a step surface of slip resistant NFPA compliant grating. The step shall extend out approximately 24" and lock in both the in and out positions.

GAUGE PANEL -- LEFT SIDE UPPER

A gauge panel shall be provided on the upper left side of the side mount pump enclosure. The gauge panel shall be approximately 18" high and as wide as possible. The gauge panel shall be constructed of 14 gauge #304 brushed stainless steel and hinged. The gauge panel shall be held in the closed position with push button type latches.

PUMP ENCLOSURE ACCESS DOOR -- RIGHT SIDE UPPER

A pump panel access door shall be provided on the upper right side of the side mount pump enclosure. The access door shall be approximately 18" high and as wide as possible. The door shall be constructed of 14 gauge #304 brushed stainless steel with push button type latches.

FRONT ACCESS PUMP PANEL

A removable front access panel shall be installed on the front of the pump enclosure of the apparatus. The panel shall be constructed of aluminum tread plate and be fastened to the pump enclosure with push button or D-ring type latches.

LEFT SIDE PUMP PANEL -- BOLTED

The pump panel installed on the left hand side of the pump enclosure shall be fastened to the pump enclosure with 1/4" stainless steel bolts.

HINGED PUMP PANEL -- RIGHT SIDE

The pump panel installed on the on the right hand side of the pump enclosure shall be hinged with push-button latches.

PUMP PANELS -- SIDE MOUNT

The pump operator's panel, along with the lower left hand and right hand pump panels shall be constructed of 14 gauge #304 brushed stainless steel.

LABELS

Safety, information, data, and instruction labels for apparatus shall be provided and installed at the operator's instrument panel.

The labels shall include rated capacities, pressure ratings, and engine speeds as determined by the certification tests. The no-load governed speed of the engine, as stated by the engine manufacturer, shall also be included.

The labels shall be provided with all information and be attached to the apparatus prior to delivery.

COLOR CODED PUMP PANEL LABELING AND NAMEPLATES

Discharge and intake valve controls shall be color coded in compliance to guidelines of applicable sections of NFPA standards.

All labels, instruction panels and warnings shall be installed on the pump panel for safe operation of the pumping equipment and controls using Innovative Controls labels and bezel assemblies. These bezel assemblies will be used to identify intake and discharge controls with color and verbiage. The label and bezel assemblies are designed and manufactured to withstand the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The specified assemblies feature a chrome-plated panel-mount bezel with durable UV resistant polycarbonate inserts. These UV resistant polycarbonate graphic inserts shall be sub-surface screen printed to eliminate the possibility of wear and protect the inks from fading. All insert labels shall be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards

MIDSHIP PUMP PANEL LIGHTS -- LEFT SIDE

Three (3) Weldon #2631 or equal LED lights with clear lenses shall be installed under an instrument panel light hood on the left side pump panel. The lights shall be controlled by a switch located on the operators instrument panel.

MIDSHIP PUMP PANEL LIGHTS -- RIGHT SIDE

Two (2) Weldon #2631 or equal LED lights with clear lenses shall be installed under an instrument panel light hood on the right side pump panel. The lights shall be controlled by a switch located on the operator's instrument panel.

PUMP PANEL LIGHTS

One (1) pump panel light shall be illuminated at the time the fire pump is engaged into operation. The remaining lights shall be controlled by a switch located on the operator's instrument panel.

MASTER DISCHARGE AND INTAKE GAUGES

Two (2) 4" diameter Noshok discharge pressure and intake gauges (30"-0-600 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel. A polished chrome-plated brass bezel shall be provided to prevent corrosion and protect the lens and gauge case.

TEST TAPS

Test taps for pump intake and pump pressure shall be provided on the pump instrument panel and be properly labeled.

WATER TANK GAUGE

One (1) Fire Research TankVision model WLA200-A00 tank indicator kit shall be installed on the pump panel. 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 place on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

WATER TANK LEVEL LIGHTS

Two (2) Whelen PS-TANK vertically mounted LED lights shall be installed one each side of the apparatus to allow for monitoring the water tank level from a distance.

They shall be configured as follows:

- GREEN - Position 1 indicates FULL
- BLUE - Position 2 indicates 3/4
- AMBER - Position 3 indicates 1/2
- RED - Position 4 indicates 1/4

Each light shall remain illuminated until the water level drops below full 3/4, 1/2, or 1/4 levels. When the level drops below 1/4 the RED light will flash to indicate an empty tank. The Whelen PS-TANK water tank level lights shall be controlled with a Fire Research Corporation TankVision remote driver.

AIR HORN PUSH-BUTTON

One (1) push button with a label shall be installed on the pump instrument panel to operate the air horns.

SPEAKER GRILL

The pump panel shall be equipped with one (1) stainless steel or chrome plated perforated speaker grill.

HANDRAIL SIDE PUMP PANEL

Two (2) extruded aluminum non-slip handrails, approximately 12" in length, shall be provided and vertically mounted, one (1) each side on the side pump panel.

WATER TANK - 750 GALLON

The apparatus shall be equipped with a seven-hundred-fifty (750) gallon polypropylene water tank. The tank shall be equipped with a four-inch (4") overflow pipe.

The tank body and end bulkheads shall be constructed of .5" thick, polypropylene, nitrogen-welded and tested inside and out. Tank construction shall conform to applicable NFPA standards. The tank shall carry a lifetime warranty.

The transverse and longitudinal .375" thick swash partitions shall be interlocked and welded to each other as well as to the walls of the tank. The partitions shall be designed and equipped with vent holes to permit air and liquid movement between compartments.

The .5" thick cover shall be recessed .375" from the top of the side walls. Hold down dowels shall extend through and be welded to both the covers and the transverse partitions, providing rigidity during fast fill operations. Drilled and tapped holes for lifting eyes shall be provided in the top area of the booster tank.

A combination vent/water fill tower shall be provided at front of the tank. The 0.5" thick polypropylene fill and overflow tower shall be equipped with a hinged lid and a removable polypropylene screen. The overflow tube shall be installed in fill tower and piped with a minimum schedule 40 PVC pipe through the tank.

The water tank sump shall be located in the forward area of the tank. There will be a schedule 40 polypropylene tank suction pipe from the front of the tank to the tank sump. The tank drain and clean out shall be located in the bottom of the tank sump. The sump shall have a minimum 3" threaded outlet on the bottom to be used for a combination clean out and drain.

The pump to tank refill connection shall be a sized to mate with tank fill discharge line. A deflector shield inside the tank will also be provided.

The tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area.

The tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4” x 1” and a hardness of approximately 60 durometer. The rubber must be installed so it will not become dislodged during normal operation of the vehicle. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both in the front and rear as well as side to side to prevent tank from shifting during vehicle operation.

A picture frame type cradle mount with a minimum of 2" x 2" x 1/4” mild steel, stainless steel, or aluminum angle shall be provided or the use of corner angles having a minimum dimension of 4" x 4" x 1/4” by 6” high are permitted for the purpose of capturing the tank.

Although the tank is designed on a free floating suspension principle, it is required that the tank have adequate vertical hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on top of the tank, half way between the front and the rear on each side of the tank. These stops can be constructed of steel, stainless steel or aluminum angle having minimum dimensions of 3" x 3" x 1/4” and shall be approximately 6” to 12” long. These brackets must incorporate rubber isolating pads with a minimum thickness of 1/4” inch and a hardness of 60 durometer affixed on the underside of the angle. The angle should then be bolted to the body side walls of the vehicle while extending down to rest on the top outside edge of the upper side wall of the tank.

Hose beds floors must be so designed that the floor slat supports extend full width from side wall to side wall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur. Tank top must be capable of supporting loads up to 200 lbs per sq. foot when evenly distributed. Other equipment such as generators, portable pumps, etc. must not be mounted directly to the tank top unless provisions have been designed into the tank for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

The tank construction shall include PolyProSeal™ technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method shall provide a liquid barrier, offering leak protection in the event of a weld compromise.

The tank shall be equipped with Polychromatic fill towers. The water fill tower shall be blue in color. The foam tank fill towers, if applicable, shall be yellow for foam A and green for foam B and black for any additional foam fill towers.

The water tank shall be certified for the capacity of the water tank prior to delivery of the apparatus. This capacity shall be recorded on the manufacturer's record of construction and the certification shall be provided to the purchaser when the apparatus is delivered.

The tank shall be manufactured by United Plastic Fabricating (UPF).

WATER TANK FILL TOWER

A fill tower measuring approximately 10” x 10” square shall be provided on the water tank.

Tank suction shall be located in a sump assembly located below the bottom of the tank, properly baffled to prevent surging of water. A 3" cleanout plug shall be provided in the bottom of the tank sump.

HOSEBED WIDTH

The width of the pumper body hosebed shall be 71".

ALUMINUM HOSEBED GRATING

The hose bed compartment deck shall be constructed entirely from maintenance-free, extruded aluminum slats. The slats shall have an anodized, radiused ribbed top surface. The slats shall be of widths approximately 3/4" high x 6" wide, space 1/2" apart and shall be welded into a one-piece grid system to prevent the accumulation of water and allow ventilation to assist in drying hose.

HOSE BED STORAGE CAPACITY

The hose bed shall be designed to have a storage capacity for a minimum of 30 cubic feet of fire department supplied fire hose.

The hose bed shall be designed to have storage capacity for 5, 50-ft lengths of 1.75” Double Jacket fire hose.

The hose bed shall be designed to have storage capacity for 12, 100-ft lengths of 4” LDH Single Jacket rubber fire hose.

ALUMINUM HOSEBED DIVIDER

2 adjustable hosebed dividers constructed of .250" aluminum shall be installed on the apparatus.

One divider shall be stationary and center mounted to support the hose bed cover

The divider shall be fully adjustable, mounted using extruded aluminum track at the rear and aluminum "C" channel tracks at the front of the divider for full side to side adjustment.

Each hosebed divider installed on the apparatus shall be provided with a hand hole cut-out approximately 3" wide x 8" long.

ALUMINUM HOSEBED COVER

Polished aluminum treadplate hosebed covers shall be furnished, extending the full length and width of the main hosebed.

Covers shall be fabricated of .125" polished aluminum treadplate with cross bracing for maximum strength, and to support the weight of a firefighter standing on the covers when closed. The covers shall be of the sloped design for proper water runoff. Each cover to be equipped with a full length stainless steel piano hinge. Hosebed covers shall include heavy duty stops to support them when in the opened position.

MANUALLY OPERATED ALUMINUM HOSEBED COVER

The polished aluminum treadplate hosebed covers extending the full-length and width of the main hosebed shall have lift up handles installed on each hose cover to manually open the hosebed covers.

REAR VINYL FLAPS FOR ALUMINUM COVER

There shall be a vinyl flaps attached to each aluminum hosebed cover. The vinyl flaps shall cover the area on the rear of the hosebed from top to bottom. The flaps shall be independent of each other but attachable with velcro in the center. The bottom edge of the flap shall be shall be secured utilizing a hook and loop fastening system.

HEAVY DUTY EXTRUDED ALUMINUM BODY

To prevent possible interaction of dissimilar metals and to reduce the weight of the completed apparatus, the body and ALL STRUCTURAL SUPPORTS shall be constructed entirely of aluminum sheet and aluminum extrusions.

Aluminum extrusions or sheet aluminum of smaller thicknesses or lesser grades to those specified herein are not acceptable.

All extrusions utilized in the body superstructure, substructure and framing shall be 6061-T6 alloy aluminum. For strength and rigidity, all aluminum sheets utilized in the apparatus body for structural support shall be a minimum of **3/16"** 5052-H32 alloy aluminum sheet. All extrusions shall be beveled at each joint and all seams shall be electrically seam welded using #5356 alloy aluminum wire.

FASTENERS

All fasteners use in the apparatus body shall be attached with Ny-Lok type fasteners.

All aluminum and stainless steel components shall be attached using stainless steel fasteners. Zinc or cadmium plated fasteners are not acceptable for use with any aluminum or stainless steel components on the vehicle.

Compartment door hinges, handrails and running boards shall be attached using a minimum of 1/4" diameter machine bolt fasteners. Fasteners used in nonstructural areas such as; door handles, trim moldings, gauge mounting, etc shall be 3/16" in diameter.

BODY SUPERSTRUCTURE CONSTRUCTION

All vertical and horizontal structural members of the outer apparatus body shall be constructed of no less than 4.00" by 12.00", 6061-T6 aluminum extrusions with a minimum .200" wall thickness fully welded together forming a unitized support system for the body and compartments. In order to provide a complete internal and integrated body super-structure, full height extruded structural members shall be provided at each corner of the apparatus and between each exterior equipment compartment.

EXTERIOR COMPARTMENT CONSTRUCTION

Compartment sides and walls shall be welded to the super-structure. Seams shall be sealed using an engineered grade polyurethane adhesive-sealant.

The compartments shall be designed to provide protected raceways for vertically hinged door fastener retention elements. This requirement shall eliminate the possibility of door hinge hardware from being damaged by or damaging equipment stored in the compartments.

The compartment door openings are to be full width of the compartment with no loss of space. The raceways shall be designed to allow door hardware removal by a single person with simple hand tools.

Full height access panels fastened with stainless steel fasteners shall be provided to access all wiring routed through vertical super-structure extrusions. There shall be no exposed wiring allowed within the compartment interiors.

Compartment flooring shall be constructed of a combination aluminum extrusion and aluminum treadplate welded in place to the extruded aluminum framework creating a double compartment floor for added strength. Due to the high usage and wear and tear caused by removal of equipment, only treadplate aluminum with a raised pattern will be acceptable for compartment flooring. Bolted or welded in smooth raw aluminum or painted aluminum does not meet the intent nor technical requirement of raised pattern treadplate.

There shall be no floor welds visible from the interior of the equipment compartments.

The tops of the side exterior compartments shall be constructed of NFPA #1901 Standards compliant non-slip polished aluminum treadplate fastened to the body with stainless steel fasteners. Compartment tops that are welded in place do not meet the serviceability intent of this requirement.

SHELVING TRACKS

The vertical extrusions forming the framework of the side exterior compartmentation shall be designed to incorporate FULLY RECESSED adjustable shelving standards. Shelving tracks shall run full height of **ALL** side exterior equipment compartment.

The intent of this requirement is to allow full use of the available storage areas without the interference of shelving tracks extending into and reducing the interior widths of the compartments which will allow equipment to be stored within the full width of the compartment interiors.

Shelving, when specified, shall have a width of no less than .50" of the overall compartment width.

Adjustable shelving tracks welded or bolted onto interior walls of the compartments do not meet the intent of these specifications.

HOSE BODY CONSTRUCTION

To maintain strength and rigidity, the main hose body shall be completely framed with a minimum of 2.00" X 3.00" 6061-T6 alloy aluminum extrusions with a .281 nominal wall thickness. The hose body extrusions shall be welded to the super-structure framework, becoming an integral portion of a complete unitized support system. Sheet metal or sheet aluminum with double or triple formed breaks, does not meet the technical requirement of the specification in providing a complete hosebody framework and are not acceptable.

Sides shall be constructed of aluminum sheet welded to the framework. There shall be no visible welds on the exterior of the hose bed side sheets.

ELECTROLYSIS CORROSION CONTROL

The apparatus shall be assembled using ECK or electrolysis corrosion control, on all high corrosion potential areas, such as door latches, door hinges, trim plates, fenderettes, etc. This coating is a high zinc compound that shall act as a sacrificial barrier to prevent electrolysis and corrosion between dissimilar metals. This shall be in addition to any other barrier material that may be used.

All 1/4" diameter and smaller screws and bolts shall be stainless steel with a powdered aluminum coating. This coating shall be bonded metallurgically to the stainless screws to prevent peeling and flaking. This coating is designed to reduce the potential for electrolysis and corrosion to occur where items are assembled and attached.

Due to the expected life of the vehicle, proposals will only be acceptable from manufacturers that include these corrosion features.

HINGED COMPARTMENT DOOR CONSTRUCTION

Any compartment calling for a hinged door shall be supplied with a flush style door, so that all hinged compartment doors shall be of the overlapping style so that the entire door fits flush against the apparatus body sides. Doors shall be designed, in the closed position, to have the painted edges protected from damage on the tops by forming the treadplate compartment tops into a extended drip edge, on the bottoms by the rub rail and on the front and rear by extending the front and rear vertical scuff plates into protective edges. There shall be no visible painted door edge surfaces when the doors are in the closed position. Doors shall not extend into the compartments thereby reducing the usable compartment depths.

Doors shall be a minimum 2" thick, fabricated of a minimum of 1/8" smooth aluminum. Full panel inner compartment door liners shall be provided and constructed from smooth aluminum. Exterior door panels shall be smooth with no welds visible on the exterior skin. Double door compartments shall not require nor be equipped with a secondary latch to hold the same in position.

All compartment door hinges shall be full length piano type constructed of a minimum 14 gauge type 304 polished stainless steel with 1/4" stainless steel hinge pin with dual directional bolt holes for ease of adjustment. Door hinges shall be fully recessed and protected from the environment by the door gasket. The door hinges shall not be visible from the outside of the body when the doors are in the closed position.

Striker plates shall be a minimum of 12 gauge stainless steel and posts shall be positioned so they do not interfere with the clear door openings by pointing down. Door retention studs or posts on striker plates that extend into the clear door frame opening do not meet the technical intent of these specifications and are not acceptable. Door hinges and striker plates shall be attached with minimum 5/16" stainless steel nuts and bolts.

On vertically hinged double door compartments, the secondary door shall have a nylon door holders, top and bottom of the interior of the door to hold the door in place when closed. When specified, horizontally hinged lift-up doors shall be equipped with heavy-duty gas filled dampeners to hold the doors in the open position. All other hinged doors shall be equipped with spring loaded hold open devices specifically designed for use on vertically hinged doors. Door holders shall be bolted in position. The door ajar switches shall be fully enclosed within structural members and shall not extend into the clear door opening.

All hinged compartment doors shall be provided with hollow core weather stripping to provide a weather tight seal at the door opening and to prevent road spray and debris from entering the compartment.

Hinge door openings shall match the compartment sizes. No exception.

EXTERIOR DOOR HANDLES

All compartment doors shall be furnished with a large, keyed, locking Hanson Model #102 solid STAINLESS STEEL spring loaded D-handle with slam type latches. D-handles shall have the large style "bent" D-ring for ease of grabbing the handle even when wearing mitts or gloves. Chrome plated standard steel D-handles are not acceptable.

Door handles shall be held in place with four stainless steel stud fasteners secured on the interior of the door skin to eliminate bolt heads on the exterior latch ring. To prevent possible interaction between dissimilar metals, the studs shall not break any painted surface. A non-moisture absorbing gasket shall be installed between the door latch and the door skin panel.

Handles which are held in place with visible fasteners, two sided tape or glue do not meet the intent of this requirement.

SIDE BODY HEADER

All high side compartment tops shall be NFPA approved non-slip treadplate with the side body header area above the compartment doors finished with polished aluminum tread plate.

The aluminum overlays on the compartmentation tops on each side of the body shall be extended out and downward a minimum of .50" over the compartment doors forming a drip rail. Corners shall be TIG welded.

Lower or rear face compartments, if specified shall be provided with polished aluminum drip rails.

ALUMINUM SUB-FRAME

The surface of the chassis frame rails shall be isolated from the apparatus substructure by an elastomeric isolator.

The main body sub-frame shall be fully welded to the longitudinal chassis extrusions. Two (2) 6061-T6 aluminum longitudinal extrusions shall be provided, one (1) on each chassis frame rail running full length beneath the apparatus body. A minimum .50" extruded wall thickness shall be provided on the top flange of the chassis frame rail. Each extrusion shall be designed to cover the complete top flange and outside radius of the chassis frame rail extending down the outside web of the frame rail a minimum of 1.25" to prevent side to side shifting of the apparatus body.

The main body sub-frame shall be constructed of not less than four (4) 4.00" by 2.50" tubular, 6061-T6 aluminum, "I" beams with a .375" vertical main body crossmembers. A minimum of four (4) crossmembers shall be provided two ahead of and two behind the rear axle forming the main body support crossmembers.

The main cross tubes shall be routed through and fully welded to the vertical and horizontal extrusions forming the body super-structure.

For added strength and rigidity, no less than six (6) intermediate body crossmembers shall be provided constructed of solid aluminum structural "I" beams 4.00" high by 3.00" wide with a minimum .29" flange thickness. If necessary, additional crossmembers shall be provided, to meet the minimum booster tank mounting requirements, as published by the manufacturer of the booster tank provided.

The intermediate structural "I" beam crossmembers shall be interconnected and welded to the main body tubular crossmembers forming a fully welded support grid for the body super-structure compartments and booster tank.

A minimum of six (6) U-bolts shall be provided to secure the body sub-structure to the chassis frame. The forward two (2) U-bolts shall be shock absorbing spring tension type to allow for flexing without placing stress on the apparatus body or chassis frame rails.

BODY WIDTH

The overall width of the pumper body shall not exceed 100". The overall width across the rub rails shall be 101".

COMPARTMENT DEPTH - NO EXCEPTIONS

All left side upper compartments shall have an interior usable depth of not less than 12" in the upper portion with the specified doors in the closed position.

The lower portion of the front and rear side compartments of the body are to be notched in and under the water tank to a useable depth of 26" with the specified doors in the closed position in order to provide the maximum amount of storage area.

All right side upper compartments shall have an interior usable depth of not less than 12" in the upper portion with the specified doors in the closed position.

The right side lower portion of the forward and rear side compartments of the body are to be notched in and under the water tank to a useable depth of 26" with the specified doors in the closed position in order to provide the maximum amount of storage area.

COMPARTMENT HEIGHT

The left side full height body compartments shall be 63" high and equipped with a 63" high clear door opening.

The left side upper level compartment(s) shall be 32" high and equipped with a 32" high clear door opening.

COMPARTMENT VENTS

Removable louvered vents shall be provided in each compartment.

LEFT FRONT COMPARTMENT L-1

There shall be one (1) 24" wide full height compartment located ahead of the rear wheels. The compartment shall be equipped with a full height double hinged doors.

The compartment shall be equipped with the following: Single shelf constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve shall be fully adjustable within the compartment. Lighter gauge shelf materials are not acceptable.

Shelf shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf track

LEFT OVERWHEEL COMPARTMENT L-2

There shall be one (1) 52" wide compartment above the rear wheels. The compartment shall be equipped with a single hinged lift up door.

The compartment shall be equipped with the following: A 250 lb. rated capacity fire apparatus swing-out tool board shall be provided. The swing-out tool board shall be provided with 3/16" cadmium plated mounted brackets securely mounted to reinforced mounting points on the apparatus body. Two (2) mounting points shall be on a vertical surface, (1) at the top of the bracket and (1) at the bottom extending approximately 5" from the vertical mounting point. The upper and lower pivot points of the swing-out tool board shall include heavy duty bronze bearings for extended life. Due to the weight of the equipment intended to be carried on the tool board, the mounting points on the apparatus body shall be suitably designed to support the intended weight.

A single latch mechanism shall be provided to lock the tool board in the stored position and in the opened position. The handle shall be an inverted "U" shape for easy access with a gloved hand, painted yellow in color.

The frame of the tool board shall be fabricated of steel tubing welded into a module. Attached to this module shall be a .125" aluminum tool board panel for mounting equipment. Special brackets attached to this tool board shall be provided as listed elsewhere in these specifications.

LEFT REAR COMPARTMENT L-3

There shall be one (1) 42" wide full height compartment located behind the rear wheels. The compartment shall be equipped with a full height double hinged doors.

The compartment shall be equipped with the following: A single rollout equipment tray shall be installed in a standard depth compartment. The 500# rated tracks shall have roller bearings. The tray shall be constructed of .188" smooth aluminum plate, fabricated with four 3" sides.

The unit shall roll fully out of the compartment, with a gas operator to hold tray in both the "in and out" positions.

Two (2) compartment shelves shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelves shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelves shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

COMPARTMENT HEIGHT

The right side full height body compartments shall be 63" high and equipped with a 63" high clear door opening.

The right side upper level compartment(s) shall be 32" high and equipped with a 32" high clear door opening.

RIGHT FRONT COMPARTMENT R-1

There shall be one (1) 24" wide full height compartment located ahead of the rear wheels. The compartment shall be equipped with a full height double hinged doors.

The compartment shall be equipped with the following: Two (2) compartment shelves shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelves shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelves shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

RIGHT OVERWHEEL COMPARTMENT R-2

There shall be one (1) 32" wide compartment above the rear wheels to the rear of the hydraulic equipment rack. The compartment shall be equipped with vertically hinged double doors.

The compartment shall be equipped with the following: A single shelf shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelf shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral

RIGHT REAR COMPARTMENT R-3

There shall be one (1) 42" wide full height compartment located behind the rear wheels. The compartment shall be equipped with a full height double hinged doors.

The compartment shall be equipped with the following: A single shelf shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelf shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

REAR CENTER COMPARTMENT

There shall be one (1) 42” wide, 24”high, and 26” deep compartment located at the rear of the apparatus. The compartment shall be equipped with a full height natural finish roll up door. The compartment shall be open to the rear side compartments, providing a transverse compartment at the rear of the truck.

The compartment shall be equipped with the following: A rollout equipment tray shall be installed in the rear compartment. The 500# rated tracks shall have roller bearings. The tray shall be constructed of .188" smooth aluminum plate, fabricated with four 3" sides.

The unit shall roll fully out of the compartment, with a gas operator to hold tray in both the "in and out" positions.

REAR BODY CONFIGURATION

The rear of the apparatus body shall be of the flat back design.

REAR STEP - 18” BOLT-ON

An 18" deep step surface shall be provided at the rear of the apparatus body, bolted in place and easily removable for replacement or repair. The tailboard shall be constructed of .188" aluminum diamond plate or equal non-slip surface in compliance with NFPA #1901 standards.

The maximum height of the step assembly shall be no more than 24" from the ground when the apparatus is in the loaded condition. A label shall be provided warning personnel that riding on the rear step while the apparatus is in motion is

prohibited.

ACCESS LADDER LEFT REAR

There shall be a swing out and down access ladder supplied and installed on the apparatus, for accessing the top of the apparatus. It shall be of an all aluminum design and shall incorporate treads six (6") inches deep and no more than eighteen (18") inches apart. The ground to the first step dimension, on level ground, shall be no more than eighteen (18") inches. When in the deployed position the ladder shall have an angle of approximately 75-degrees to facilitate ascending and descending the ladder. The ladder shall be retained in the stowed and deployed position by two (2) gas cylinders and shall not require the use of lathes to hold it in position.

WHEEL WELL LINER

For ease of accessibility and maintenance, wheel well panels shall be double break formed polished aluminum treadplate that is fully gasketed and bolted in place with stainless fasteners. Wheel wells shall be of the removable design so as to provide replacement in the event of damage. There shall be no visible bolt heads, retention nuts or fasteners on the exterior surface of the panel. Wheelwell panel shall be isolated from the apparatus body utilizing .25" nylon spacer blocks.

To fully protect the wheel well area from road debris and to aid in cleaning, a full depth (minimum of 24.00") radius wheel well liner constructed of exterior grade .25" black polyethylene sheet shall be provided. For ease of removal, the liner shall be held in place by a self-captive retention design. Due to possible corrosion and contamination by road debris in the wheel well area a minimal number of mechanical fasteners shall be used to secure the wheel well liner at the front and rear edges.

FENDERETTES

The rear wheel wells shall be radius cut for a streamlined appearance. A polished type 304 stainless steel radius fenderette shall be furnished at each rear wheel well opening, held in place with concealed stainless steel fasteners with nylon isolators to prevent contact of the fastener with the wheelwell housing panel. A black rubber gasket shall be installed between the stainless fenderette and the apparatus body sides. Silicone caulking does not meet the intent nor the technical requirement of a solid gasket material in this area and is not acceptable.

FUEL FILL DOOR

A fuel fill access assembly shall be provided on the left side rear, rear wheel well area. The assembly shall include a brushed stainless steel fuel fill enclosure door and a black polymer fuel assembly. A label indicating DIESEL FUEL ONLY shall be applied.

WHEEL WELL COMPARTMENTS

One (1) breathing air cylinder storage compartment shall be provided and located forward in the left rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

One (1) breathing air cylinder storage compartment shall be provided and located in the right front rear wheel well of the apparatus body.

The cylinder storage compartmenst shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

One (1) breathing air cylinder storage compartment shall be provided and located in the right rear, rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

One (1) one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

LEFT SIDE ROOF COMPARTMENTS

One (1) upper body compartment shall be provided top of body with useable dimensions of approximately 8" wide by 16" deep by half the available upper body length.

The compartment shall have a lift-up door installed and constructed of 3/16" NFPA approved non-slip aluminum tread plate flanged downward to overlap the door opening. The door shall have a stainless steel hinge and dual gas openers. The door opening shall be flanged upward to prevent water from running into compartments when the door is closed. The gas openers shall be installed in a dual purpose over-center arrangement to hold the door in either the open or closed position. Two (2) heavy duty socket and plunger latches shall be installed to secure the door. A heavy duty chrome grab handle shall be provided to lift the door.

The compartment shall be located on the left side of the body.

COMPARTMENT MATTING

All shelves/trays shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

COMPARTMENT LIGHTING

All compartment lights will be controlled by an automatic "On-Off" switch located on each compartment door.

The compartment lights shall be controlled by a heavy duty roller switches, located on each compartment lower door jam area. The switches shall be constructed with a die cast zinc housing. The cable connections and switch terminals will be encapsulated in an epoxy compound, offering superior resistance to harsh conditions.

Rear Compartment, Two (2) 18" long Fire Research Sun Strip LED Work Lights model LED200-A18 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have eighteen (18) white LEDs that generate a rated 300 lumens of light at 12 vdc/0.35 amps and have a life span of over 50,000 hours. Each light shall fit in a 20" space and be secured with two (2) molded nylon mounting clips.

Compartment L-2, Two (2) 27" long Fire Research Sun Strip LED Work Lights model LED200-A27 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have twenty-seven (27) white LEDs that generate a rated 450 lumens of light at 12 vdc/0.52 amps and have a life span of over 50,000 hours. Each light shall fit in a 29" space and be secured with three (3) molded nylon mounting clips.

Compartment R-2, Two (2) 27" long Fire Research Sun Strip LED Work Lights model LED200-A27 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have twenty-seven (27) white LEDs that generate a rated 450 lumens of light at 12 vdc/0.52 amps and have a life span of over 50,000 hours. Each light shall fit in a 29" space and be secured with three (3) molded nylon mounting clips.

Compartment L-1, Two (2) 54" long Fire Research Sun Strip LED Work Lights model LED200-A54 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have fifty-four (54) white LEDs that generate a rated 900 lumens of light at 12 vdc/1.05 amps and have a life span of over 50,000 hours. Each light shall fit in a 56" space and be secured with four (4) molded nylon mounting clips.

Compartment R-1, Two (2) 54" long Fire Research Sun Strip LED Work Lights model LED200-A54 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have fifty-four (54) white LEDs that generate a rated 900 lumens of light at 12 vdc/1.05 amps and have a life span of over 50,000 hours. Each light shall fit in a 56" space and be secured with four (4) molded nylon mounting clips.

Compartment L-3, Two (2) 54" long Fire Research Sun Strip LED Work Lights model LED200-A54 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have fifty-four (54) white LEDs that generate a rated 900 lumens of light at 12 vdc/1.05 amps and have a life span of over 50,000 hours. Each light shall fit in a 56" space and be secured with four (4) molded nylon mounting clips.

Compartment R-3, Two (2) 54" long Fire Research Sun Strip LED Work Lights model LED200-A54 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have fifty-four (54) white LEDs that generate a rated 900 lumens of light at 12 vdc/1.05 amps and have a life span of over 50,000 hours. Each light shall fit in a 56" space and be secured with four (4) molded nylon mounting clips.

MOUNTING – LADDER RACK CONTROLS

The controls for the ladder rack shall be mounted on the pump panel, on the same side as the ladder rack.

The power ladder rack support arms shall be covered with a polished aluminum treadplate panel.

EQUIPMENT RACK

One (1) electric over hydraulic ladder rack shall be installed on the right side of the apparatus body, to carry the ladders in a horizontal position above the side compartments. Power to the hydraulic cylinder shall be supplied by means of a 12 volt electric motor power pack, and shall be installed in an area that provides proper protection of the electric and hydraulic components.

Ladder rack shall be a modular unit and of the single pivot arm design with no stabilizing arms at the front or rear that hinder access to the side compartments with the rack in the lowered position. Ladder rack assembly shall be located in the center of the body, above the rear wheel area, with a weatherproof control switch provided on the body for operator in full view of the rack. Rack shall be designed so that it will clear the compartment doors with the doors in the open position when ladders are being raised or lowered.

The vertical pivoting supports shall be constructed of 2" x 3" stainless steel tube for a more stable and stronger support system.

NO EXCEPTIONS.

NO EXCEPTIONS are allowed to the single pivot design, or the requirement of the rack being able to be raised or lowered with the compartment doors open.

A hinged-down panel shall be provided to cover the ladder rack hydraulic lift cylinder and pivot arm when rack is in the stowed position.

Flashing lights facing front and rear shall be installed on the rack and shall be illuminated whenever the rack is in operation.

Cast aluminum ladder brackets with chrome plated quick release type mounting clamps shall be provided which hold the ladders to the pivot arm assembly.

A red warning light shall be provided and mounted in the cab to warn the driver when ladder rack is not in the stowed position.

The ladder rack shall be locked in the stored position when the ladder is in the upright position by the hydraulic system. This safety feature must be integral in the design of the hydraulic system.

When in the lowered position, the rack shall automatically compensate and tilt back three degrees towards the body to allow the ladders to be individually removed from the rack one at a time while maintaining all other ladders in there stored position.

A dimension of approximately 40" shall be maintained when the ladder rack is in the lowered position from the ground to the bottom of the ladders. NO EXCEPTIONS

LADDER MOUNT LOCATION

The location of the ladder mounting assembly shall be located on the right hand side of the apparatus body.

FOLDING ATTIC LADDER MOUNTING

A mounting on the hydraulic ladder rack shall be provided for the specified folding attic ladder.

FOLDING ATTIC LADDER SOURCE

New folding attic ladder shall be provided the apparatus.

LADDER SOURCE

New ground ladders shall be provided for the apparatus.

ROOF LADDER

One (1) Alco-Lite Model PRL-14, 14 foot aluminum roof ladder with folding steel roof hooks on one end and rubber safety shoes on the other end shall be provided for the apparatus. The ladder shall meet or exceed all latest NFPA Standards.

EXTENSION LADDER

One (1) Alco-Lite PEL-24, 24 foot two (2) section aluminum extension ladder shall be provided for the apparatus. The ladder shall meet or exceed all latest NFPA Standards.

PIKE POLE MOUNTING BRACKET

Two (2) aluminum tube shall be provided for pike pole mounting. The tube shall have a 2-1/4" interior diameter and shall be mounted on the hydraulic ladder rack.

FOLDING STEP LEFT SIDE FRONT

Three (3) 8" square folding steps of chrome plated die cast aluminum shall be provided. The steps shall comply to NFPA

#1901 non-slip standards and shall be installed on the left side front compartment face.

FOLDING STEP RIGHT SIDE FRONT

Three (3) 8" square folding steps of chrome plated die cast aluminum shall be provided. The steps shall comply to NFPA #1901 non-slip standards and shall be installed on the right side front compartment face.

HANDRAIL REAR STEP

Two (2) extruded aluminum non-slip handrails, approximately 60” in length, shall be provided and vertically mounted on the rear of the apparatus, one (1) on each side of the body.

HANDRAIL BELOW HOSEBED

One (1) extruded aluminum non-slip handrail, approximately 60” in length, shall be provided and horizontally mounted below the hosebed on the rear of the apparatus.

HANDRAIL TOP OF BODY SIDES

Two (2) extruded aluminum non-slip handrails, approximately 12" in length, shall be provided and mounted, one (1) each side at the top of the body sides, at the front of the apparatus body.

HANDRAIL TOP OF HOSE BED SIDES

Two (2) extruded aluminum non-slip handrails, approximately 12" in length, shall be provided and mounted, one (1) each side on the top of the hose bed sides, at the rear of the apparatus body.

FRONT BODY PROTECTION PANELS

Aluminum tread plate overlays and panels shall be installed on the front of the body from the lower edge to the top of the compartment doors. The material shall be bolted in place and sealed to prevent any moisture entry between the overlay and the body structure.

REAR BODY PROTECTION PANELS

Smooth aluminum shall be installed on the rear of the body, to allow for the installation of a "Chevron" stripe on the rear.

EXTRUDED ALUMINUM RUB RAILS

Full body length polished aluminum rub rails shall be bolted in place on the lower right and left body sides. The side rub rails shall be a heavy extruded aluminum "C" channel. Red and white reflective material shall be applied to the vertical surface of the "C" channel. There shall also be a bolt on aluminum corner casting on each rear corner to blend the rear tail board assembly with the side rub rails.

FUEL TANK ACCESS PANEL

There shall be a removable panel in the rear compartment, used to gain access to the fuel tank and fuel gauge-sending unit.

SHORE POWER PLUG

The shore power plug shall be located at the left front cab door.

AUTO-EJECT

A Kussmaul "Auto-Eject" automatic disconnect device shall be provided and installed on the 110-volt shoreline connection complete with weatherproof cover and matching plug. The Auto-Eject shall be activated by the chassis starter switch to disconnect the plug.

GENERATOR PROTECTIVE COVER

One (1) cover constructed from aluminum tread plate shall be installed to protect the generator. The cover shall be installed so that it is easily removed to perform fluid checks and service on the unit. Cooling requirements from the manufacturer shall be designed into the cover to avoid overheating conditions.

GENERATOR MOUNTING LOCATION

The generator shall be installed in the front section of the hosebed.

CIRCUIT BREAKER BOX

One (1) circuit breaker box for single phase voltage equipment shall be provided capable of holding twelve (12) breakers.

CIRCUIT BREAKER BOX LOCATION

The circuit breaker box shall be installed on the wall towards the front of the apparatus in the left front body compartment.

The instrument panel for the generator shall be installed next to the breaker panel.

120V ELECTRIC RECEPTACLE -- TWIST LOCK

Two (2) 120-volt 20 amp twist lock (NEMA L5-20) receptacle with spring loaded weatherproof cover shall be provided.

The electric receptacle shall be located near the left side wheel well.

The electric receptacle shall be located near the right side wheel well.

IDLE REDUCTION TECHNOLOGY (IRT)

Idle reduction technology system shall be supplied with the apparatus that will significantly reduce the amount of diesel exhaust soot, NOx and CO2 emissions into the atmosphere. Diesel engines contain pollutants that negatively impact human health and the environment. Diesel engines emit large amounts of nitrogen oxides, particulate matter and air toxics, which contribute to serious public health problems. Idle reduction technology has been verified by the U.S. EPA to reduce diesel emissions from diesel powered vehicles and engines.

Idle Reduction Technology will reduce idle time through the use of an auxiliary power unit (APU) in conjunction with automatic diesel engine controls that will shut down the main chassis diesel engine during operations not requiring the use of the pump assembly. This system will be automated and will not require intervention from the vehicle operator. There will be a time delay engine shut down feature that will automatically shut down the chassis main diesel engine and engage the diesel driven APU. This feature will be available when the chassis air brake is set and when the pump assembly is not engaged.

All features below are available with the main chassis diesel engine off.

The chassis voltage system is protected against extreme drain of the battery bank. If the vehicles voltage drops to 12 VDC, the automatic engine controls will start the chassis diesel engine to provide a charge.

Reducing the amount of idle time for the chassis diesel engine will substantially reduce the fuel consumption.

NO EXCEPTIONS

AUXILIARY POWER UNIT (APU)

A MeccAlte 7.9 KW, 120/240 volt, diesel driven generator shall be provided. The generator shall be controlled electronically by the IRT system. The APU engine shall be a Kubota D1105-E3B diesel powered. The engine must comply with Tier 4 emissions regulations. **NO EXCEPTIONS**

ALTERNATOR

A 160-amp alternator shall be supplied with the APU. The alternator shall be tied to the chassis batteries. **No Execptions**

BATTERY CHARGER

A Newmar PT-40W 110 volt battery charger will be supplied with the apparatus that will have a three phase battery conditioning procedure.

ELECTRIC CABLE REEL

One (1) Hannay ECR-1600 series electric cable reel with an electric rewind shall be installed on the vehicle. The reel shall be designed for use with 120 volt, three (3) wire cable. The duty rating of the cable reel shall be for continuous usage. The reel shall be installed so that it is easily accessible for cord access and maintenance. A 12-volt motor controlled by a push button switch located in a convenient position and properly labeled shall perform the electric rewind function.

The installation of the cable reel shall meet applicable sections of the NFPA standards.

Reel Capacity

The reel shall be sized to hold 110 percent of the capacity needed for the specified cable length. The wire size shall be in accordance with the National Electric Code.

Labeling

An information label shall be installed in a location visible adjacent to any permanently connected reel with the following data:

- Voltage
- Phase
- Current type
- Current rating
- Total cable length

Electrical Supply Wiring To Reel

The wiring shall end in a sealed conduit box at the reel with mechanical connectors to allow removal of the reel. Appropriately, sized wire and circuit breakers shall be utilized.

The electric cable reel shall be installed in the lower left side body compartment ahead of the rear wheels.

A one hundred fifty foot (150') length of 10/3 yellow electric cable shall be installed with specified plugs. The cable shall be type SEO-WA with a 20 amp, 120 volt rating.

The electric cable shall be configured with a 120-volt 20 amp NEMA L5-20C three prong, twist lock female receptacle.

One (1) four-sided nylon roller unit for the electric cable shall be installed on specified reels. The roller unit shall be mounted in the specified location to permit the cable to feed directly off the reel.

One (1) ball stop shall be attached to the electric cable to prevent total re-wind and to allow the cable to remain at a reachable position. The ball shall positively attach to the cable and be bright orange in color for high visibility.

JUNCTION BOX

One (1) Circle-D model PF51G-5 yellow electrical junction box shall have a 12" pigtail with a NEMA L5-20 twist-lock plug for connection to the cord reel. The unit shall have an integral pilot light to indicate electrical current.

The unit shall be equipped with four (4) 120 volt 20 amp NEMA L5-20 twist-lock receptacles, each with a hinged, weatherproof cover.

One (1) aluminum storage bracket designed to hold an electric junction box shall be supplied. The holder shall be mounted in the same compartment as the specified cable reel.

BROW MOUNT 750 WATT FLOODLIGHT

Two (2) Fire Research Optimum model OPA800-S75 contour roof mount light shall be installed. The mounting brackets shall attach to the bottom of the lamphead and be machined to conform to the roof radius. Wiring shall extend from a weatherproof strain relief at the rear of the lamphead.

The lamphead shall have one (1) quartz halogen 750 watt 120 volt bulb. The bulb will draw 6.3 amps and generate 19,600 lumens. The bulb shall be accessible through the front. The lamphead shall incorporate a vacuum deposit polished reflector and two optimizing mirrors to produce a uniform beam that lights up an area 100° vertically by 150° horizontally. The lamphead shall have a heat dissipating curved front lens. The curve of the lens shall have a radius of 5.16 inches to optimize light emission. The lamphead shall be no more than 4 3/4" deep by 5 1/8" high by 8 3/4" wide. Lamphead and brackets shall be powder coated white.

The floodlights shall be installed one (1) each side at the front edge of the cab roof.

The brow quartz floodlight(s) shall be circuit breaker protected. The circuit breaker(s) shall be used as an ON/OFF switch(es) for the floodlight(s). The circuit breaker(s) shall be labelled "BROW LIGHTS".

BODY PAINT PROCESS

While constructing the truck body, all aluminum parts that are to be finish painted shall be properly fitted on the body and then removed to be painted individually. The back side of all aluminum parts shall be sanded smooth of any burrs and sharp edges.

During reassembly of the apparatus, care shall be exercised in fitting and fastening the parts back in their respective position on the vehicle.

All aluminum parts shall be bolted to the body using stainless steel fasteners. Zinc or Cadmium plated fasteners are not acceptable. All bright metal fittings, if unavailable in stainless steel shall be heavily chrome plated. Iron fittings shall be copper plated prior to chrome plating.

All seam shall be caulked both inside and along the exterior edges with a urethane automotive sealant to prevent moisture

from entering between any body panels.

The body and all parts shall be thoroughly washed with a grease cutting solvent (PPG DX330) prior to any sanding. After the body has been sanded and the weld marks and minor imperfections are filled and sanded, the body shall be washed again with (PPG DX330) to remove any contaminants on the surface.

The first coating to be applied is a pre-treat self etching primer (PPG DX1787) (.5 to 1.0 dry film build) for maximum adhesion to the body material. The next two to four coats (depending on need) shall be an acrylic urethane primer surfacer (PPG K38). The film build shall be 4-6 mils when dry. The primer surfacer coat, after appropriate dry time, shall be sanded with 320-600 grit sandpaper to ensure maximum gloss of the paint. The last step is the application of at least three coats of PPG Concept acrylic urethane two-component color (single stage). The film build being 2-3 mils dry. The single stage acrylic urethane, when mixed with component (PPG DCX61) catalyst shall provide a UV barrier to prevent fading and chalking.

All products and technicians are certified by PPG every two (2) years.

INTERIOR COMPARTMENT FINISH

The interior of all compartments shall be unpainted and have a D/A orbital sander finish.

TOUCH-UP PAINT

One (1) two (2) ounce bottle of touch-up paint shall be furnished with the completed truck at final delivery.

LETTERING

Apparatus lettering shall match the Pawtucket Fire Department Fleet.

REFLECTIVE STRIPING

Reflective striping shall be supplied for the apparatus in compliance to applicable NFPA standards.

CHEVRON STRIPING

The front bumper shall have 3M reflective red and amber striping installed. The chevron style striping shall be applied at a 45-degree upward angle.

CHEVRON STRIPING

The entire rear portion of the body shall have 3M reflective red and amber striping installed. The chevron style striping shall be applied at a 45-degree upward angle pointing towards the center upper portion of the rear panel.

EQUIPMENT PAYLOAD WEIGHT ALLOWANCE

In compliance with NFPA #1901 standards, the apparatus shall be engineered to provide an allowance of 2000 pounds of fire department provided loose equipment.

EQUIPMENT MOUNTING ALOWANCE

A four thousand dollar ($4,000) equipment mounting allowance shall be included for equipment mounting.

WHEEL CHOCKS WITH MOUNTS

A pair of Zico Model SAC-44 Quic-Chok folding wheel chocks shall be provided and mounted under the apparatus body with model SQCH-44H horizontal mounting brackets.

EMERGENCY ROAD KIT

One (1) DOT emergency kit shall be provided with the completed apparatus and shall include a 2.5 BC fire extinguisher and three reflective triangles.

ON-SPOT TIRE CHAINS

"On-Spot" automatic tire chains shall be installed on the rear axle of the apparatus. A switch installed on the cab dash shall allow the operator to "Engage" and "Disengage" the tire chains without stopping to enhance traction and braking while in forward or reverse motion. The system shall include protective switch guard, continuous duty solenoid, arm bearings and replaceable chainplates.

SERVICE REQUIREMENTS

It is the intent of the purchaser to assure that parts and service are readily available for the apparatus specified. Service capabilities will be a major criteria for the award of this bid. To insure proper service, no bid will be accepted unless the bidder owns or offers facilities within 30 miles where complete parts and service are available and where such facility has been in business for a minimum of twenty five (25) years. The facility must be staffed by full time personnel who are factory trained and EVT certified in the operation and repair of fire apparatus, including the pump, with full authorization of the manufacturer. The facility shall maintain a complete parts inventory in excess of $700,000 including major pump parts, body components, electrical items, fire apparatus hardware, etc. and shall offer on-site services including pump overhaul, body fabrication, collision repair, and a paint shop complete with a cross flow booth with air makeup and bake options to ensure the highest quality paint finish available. The bidder must also operate an on-site pump test facility and must be an “Authorized Parts and Service Center” for Hale Pumps and provide proof thereof.

Due to the highly specialized nature of fire apparatus repair, emergency vehicle technicians shall be in conformance with NFPA standards 1915 and 1071. There shall be a minimum of twelve (12) E.V.T. certified technicians including one (1) technician certified as a “Master Mechanic” (having amassed every EVT certification) on staff at the authorized service facility. Proof of current certifications shall be supplied along with required service center information with the bid. Bids that do not meet these requirements shall not be considered. **NO EXECPTIONS**

FIRE APPARATUS SPECIFICATIONS FOR ONE (1) REAR MOUNT AERIAL LADDER TRUCK

Information for Contractors

Sealed proposals are desired from reputable makers of automobile fire apparatus in accordance with these specifications and with the advertisement, a copy of which is attached, for the piece of apparatus listed as follows:

Fire Ladder Truck, 109’ “Low Profile” aerial, extruded aluminum apparatus body, Idle Reduction Technology, prepiped waterway, and all other equipment in accordance with the following:

GENERAL REQUIREMENTS

Each bid must be accompanied by bidders accurate written specifications covering the apparatus and equipment, which it is proposing to furnish and to which the apparatus furnished under the Contract must conform.

It is the intent of these specifications to cover the furnishing and delivery to the city, complete apparatus equipped as specified. All specifications herein contained are considered as minimum. Some items have been specified by brand name or model number. These have been carefully selected because of their reliability, compatibility with present equipment, and local availability of parts.

No exceptions will be allowed relating to the make and model of fire pump, valves and plumbing, gauge and types of materials, size of compartments, methods of construction, and overall design features of the apparatus.

Exceptions taken in areas other than listed above must be listed on a separate page and marked "Exceptions To Specifications". Every exception taken shall be listed as to page number and paragraph. Failure to provide the required exception list with the bid proposal will be cause for rejection of that proposal.

Such details and other construction features not specifically covered herein shall conform with all State and Federal requirements, and the NFPA Pamphlet No. 1901 "Standard for Automotive Fire Apparatus" in effect at the time the contract is signed.

Any test equipment required or expense incurred for the ULI pump test shall be borne by the contractor supplying this equipment.

RELIABILITY OF CONTRACTOR

Contractor shall furnish satisfactory evidence that he has the ability to construct the apparatus specified, and shall state in the bid proposal the location of the factory where the apparatus is to be built, and also where future service work will be performed.

Proposals will only be considered which are submitted by full time fire apparatus manufacturers who are current members of the Fire Apparatus Manufacturers Association (FAMA). FAMA is a non profit organization designed to keep fire truck manufacturers abreast with latest technologies and governing standards, and to act as a liaison to the IAFC and NFPA. Bidder must have the ability to show evidence of their affiliation to the FAMA in the bid proposal.

All bidders shall provide with their proposal, pictures of similar apparatus as that being specified, and the names of ten cities where similar apparatus have been furnished. Bidders shall provide the name and telephone number of a contact person for each City listed. Failure to provide a users list with the bid proposal shall be cause for rejection of that proposal.

SUBMISSION OF PROPOSALS

Proposals are to be submitted as follows:

- Each proposal shall be submitted in duplicate unless otherwise indicated in the specifications.
- Each proposal shall be submitted in sequence with the attached specifications for ease of checking compliance of bids with bidders specifications.
- All proposals shall be submitted on company letterhead.
- Each bid proposal shall be signed by an authorized representative of the manufacturing company being bid.
- Any proposal which is not signed by a representative of the manufacturing company being bid or not submitted on company letterhead will be immediately rejected.

PROPOSAL GUARANTEE

Each proposal must be accompanied by a Bidder's Bond or Cash in the amount of 10% of the bid submitted a proposal guarantee, which it is agreed by the contractor will be forfeited in the event this proposal is accepted and the contract is not executed.

Bid bond shall be signed by an Officer of the manufacturing company being bid.

Personal or Company checks are not acceptable as a Bonding medium.

All bidders must have the ability to provide the requested Bidder's Bond and Performance Bonds when called for in these specifications. Companies who are only able to provide Supply Bonds in lieu of Performance Bonds will not be considered.

INSURANCE REQUIREMENTS

Each bidder must submit with their bid proposal a Certificate of Insurance listing the proposed manufacturer's product liability insurance coverage. General Liability Insurance limits shall have a minimum limit of $1,000,000 per occurrence and $2,000,000 General Aggregate limit. Umbrellas coverage shall have a minimum $15,000,000 limit. Submitted Certificate shall name the apparatus manufacturer, insurance company, policy number, and effective dates of the insurance policy. Bids submitted without the required Certificate, or for Certificates listing less than two (2) million dollars of general coverage, plus the ten (10) million dollar umbrella coverage, will be considered non responsive and automatically rejected. No exceptions are allowed to the minimum insurance coverage requirement.

The manufacturer shall maintain full insurance coverage on the purchaser's cab and chassis from time of first possession by the manufacturer until the apparatus is delivered and accepted by the purchaser. No exceptions. Purchaser reserves the right to require proof of insurance from the manufacturer's insurance carrier prior to entering into a contract for the apparatus.

DELIVERY AND OPENING OF PROPOSAL

Each proposal and all papers bound and attached thereto, together with the proposal guarantee, shall be placed in an envelope and securely sealed therein. The envelope shall be marked "Bid On Fire Equipment" with the bidders name and address on the upper left hand corner.

Proposals will be received at or prior to the time set for the opening of bids. Proposals received after the "Bid Opening" will be returned unopened.

The bids will be opened publicly and read aloud at the time and date stated on the advertisement for bids.

DRAWINGS

A CAD produced line drawing of the exact apparatus being proposed must be furnished with the bid. Since the blueprint drawing is required of all bidders, any bid submitted without a drawing as specified will be considered non-responsive and automatically rejected. Drawing must include the left side with chassis cab, right, and rear views of the vehicle. Drawing must be a large size "D", and shall be a drawing of the exact apparatus as proposed, not a drawing of another similar unit. All submitted drawings will become a part of the bid proposal.

REJECTION OF PROPOSALS

The right is reserved to reject any or all proposals or to accept such proposal as is in the best interest of the city.

All bid requirements and specifications as written are considered minimum.

Bids will be rejected which substitute less substantial materials and/or methods of body construction than those specified. Since all manufacturers have the ability to purchase the materials described as well as to shear, fabricate and assemble body panels as specified, these areas are considered a strict requirement of the specification.

Purchaser does not, in any way, obligate itself to accept the lowest Bid.

Proposals may be rejected for any alteration, erasures, or penciled entries. No bidder may withdraw his proposal for at least 30 days after the scheduled closing time for the receipt of bids.

Bidders taking "total exception" to these specifications are hereby advised that any such statement will result in immediate rejection of the bid proposal.

COMPLETION DATE

Bidders shall indicate in their proposals the number of working days for delivery of the completed apparatus, from the date of bid acceptance by the Manufacturer.

CARRYING CAPACITY

The GAWR and GCWR or GVWR of the chassis shall be adequate to carry the fully equipped apparatus including full water and other tanks, the specified hose load, unequipped personnel weight, ground ladders, and a miscellaneous equipment allowance of 2000 pounds.

A permanent placard shall be affixed and visible to the driver, which states the maximum number of personnel the vehicle is designed to carry.

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

WARRANTY

As a condition of the acceptance of the apparatus, the contractor shall furnish the following warranty:

We the manufacturing company, warrant each new piece of fire apparatus manufactured by us to be free from defects in material and workmanship under normal use and service. Our obligation under this warranty is limited to repair or replacing, as the Company may elect, any part or parts thereof which shall be returned to us with transportation charges prepaid and as to which examination shall disclose to the company's satisfaction to have been defective, provided that such part or parts thereof shall be returned to us not later than one year after delivery of said vehicle. Such defective part or parts will be returned or replaced free of charge and without charge for reinstallation, to the original purchaser.

This warranty will not apply:

- To normal maintenance, service or adjustments.
- To any vehicle which has been repaired or altered outside of the factory in any way so as in our judgment, to affect its stability, which has been subject to misuse, negligence, or accident, which has been operated at a speed exceeding the factory rated speed, or which has been loaded beyond the factory rated load capacity.
- To the truck chassis and associated equipment furnished with the chassis, including, but not limited to; engine transmission, axles, frame rails, alternator, batteries, or other trade accessories in as much as they are warranted separately by their respective manufacturers.

This Warranty is in lieu of all other warranties expressed or implied and of all other obligations or liabilities on our part and we neither assume nor authorize any other person to assume for us any liability in connection with the sale of our apparatus.

BUMPER TO BUMPER WARRANTY

The manufacturer shall provide a three (3) year bumper-to-bumper warranty covering the cab and chassis The manufacturer shall supply details of their warranty information with their bid submission. **NO EXCEPTIONS**

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, which ever comes first, with the complete detail of the warranty outlined in a document provided upon request.

TRANSMISSION WARRANTY

The Allison EVS transmission shall be warranted for a period of five (5) years with the complete detail of the warranty outlined in a document provided upon request.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application.

CAB STRUCTURE WARRANTY

The cab structure shall be warranted for a period of ten (10) years with the complete detail of the warranty outlined in a document provided upon request.

STAINLESS STEEL PLUMBING WARRANTY

The manufacturer shall provide a ten (10) year warranty on the stainless steel plumbing components and installation. The manufacturer shall supply details of their warranty information with their bid submission.

AERIAL CORROSION WARRANTY

The manufacturer shall provide a twenty five (25) year corrosion warranty on the aerial ladder sections . The manufacturer shall supply details of their warranty information with their bid submission.

TORQUE BOX CORROSION WARRANTY

The manufacturer shall provide a twenty five (25) year corrosion warranty on the aerial torque box. The manufacturer shall supply details of their warranty information with their bid submission.

AERIAL OUTRIGGERS AND STABILIZERS CORROSION WARRANTY

The manufacturer shall provide a twenty five (25) year corrosion warranty on the aerial outriggers and stabilizers. The manufacturer shall supply details of their warranty information with their bid submission.

FRAME WARRANTY

The frame and cross members shall carry a lifetime warranty with the complete detail of the warranty outlined in a document provided upon request.

MODULAR BODY TRANSFERABLE WARRANTY - LIFE-TIME

The manufacturer shall provide a life-time structural and transferable warranty for the fabricated aluminum body. The manufacturer shall supply details of their warranty information with their bid submission.

ALUMINUM SUBFRAME TRANSFERABLE WARRANTY

The manufacturer shall provide a lifetime transferable warranty for the aluminum subframe of the apparatus body. The manufacturer shall supply details of their warranty information with their bid submission.

PAINT WARRANTY TEN YEAR

The manufacturer shall provide a ten (10) year paint warranty for all portions of the apparatus that they have painted. The manufacturer shall supply details of their warranty information with their bid submission.

LETTERING WARRANTY

The manufacturer shall provide a one (1) year warranty for the lettering and striping applied to the apparatus. The manufacturer shall supply details of their warranty information with their bid submission.

DESIGN REQUIREMENTS

Specified design features of the apparatus have been carefully selected because of their safety, integrity and consistency with existing apparatus. It is expected that all bidders will adhere to the compartmentation layout, etc., since these features can be produced by all fire apparatus manufacturers.

All aspects of the vehicle shall be properly engineered with priority given to firefighter safety, as well as ease of operation and maintenance of the apparatus. The vehicle shall be free from hazardous protrusions, angles or sharp corners that might bring injury to a firefighter or equipment. Previously delivered units will be judged for compliance to these factors.

All water, air, fuel, hydraulic and/or oil lines on the chassis and apparatus shall be properly located, and securely tie wrapped to prevent scuffing or abrasion. Durable type grommets or loom material shall be used to protect the lines wherever a line passes through the apparatus body or frame rail sections.

All grease fittings, bleeders, filler plugs, drains and check points shall be located so as to be easily accessible. No special tools shall be required to access these components for normal service or maintenance of the vehicle.

All parts and components on the vehicle shall be positioned for ease of inspection, and recognition of wear or failure. Easily removable access or cover plates shall be provided for all items requiring periodic service or adjustment. Access panels shall be of the hinged or quick disconnect design-allowing ease of access.

Design of the apparatus shall be such that no disassembly of the body or any of its parts is required for normal maintenance.

All components of the chassis and apparatus shall be protected against rain, snow or other adverse weather conditions.

CONTRACT AWARD

Contract will be awarded to the most "responsible bidder", provided that bid is in the best interest of the city.

When analyzing the bid proposals, and in recommending a successful bidder, superior design, workmanship, materials, operating costs, location of service facility, past experience, length of incorporation and compliance to specifications will be taken into consideration.

The City reserves the right to waive any formality in the bids received once such waiver is in the best interest of the purchaser and, also, to accept any item in the Bid found to be of superior quality or otherwise preferred by the City of

Pawtucket.

ACCEPTANCE TESTS AND REQUIREMENTS

Acceptance tests on behalf of the purchaser shall be prescribed and conducted prior to delivery or within 10 days after delivery, by the manufacturer's representative in the presence of such person or persons as the purchaser may designate in the requirements for delivery.

The apparatus, loaded with a full complement of hose and men, a full water tank, and equipment as specified in "Carrying Capacity" on this page, shall meet the tests on paved roads, dry and in good condition. Tests shall be on the basis of two runs, in opposite directions over the same route, the engine not operating in excess of the manufacturer's maximum rpm.

From a standing start, through the gears, the vehicle shall attain a true speed of 35-mph within 25 seconds. From a steady speed of 15-mph the vehicle shall accelerate to a true speed of 35-mph within 30 seconds.

The vehicle shall attain a minimum top speed of 50-mph on a level road.

The apparatus shall be able to maintain a speed of at least 20-mph on any grade up to and including 6 percent.

Manufacturers pump test and Certification tests shall be conducted by the manufacturer in accordance with requirements of NFPA #1901. Certificate of testing shall be furnished to the purchaser.

FAILURE TO MEET TESTS

In the event the apparatus fails to meet the test requirements on first trial, a second trial may be made at the option of the Contractor within thirty days of the date of the first trial. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to make such changes as the Chief of the Fire Department and/or the purchaser may consider necessary to conform to any clause of the specifications within thirty days after notice is given to the Contractor to make such changes shall also be cause for rejection of the apparatus.

DOCUMENTATION

The manufacturer must supply at time of delivery, at least one copy of:

1. Engine manufacturer's certified brake horsepower curve showing the maximum no load governed speed.

2. Manufacturer's record of aerial construction details.

3. If specified certification of inspection and testing by the Underwriter's Laboratories Incorporated.

4. A copy of the apparatus manufacturer's approval for stationary pumping applications.

5. Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle

   (with water tank full but without personnel, equipment, or hose).

6. At least two copies of the complete operation and maintenance manual covering the completed apparatus as delivered, including the pump and fire fighting equipment delivered with the apparatus.

NO EXCEPTIONS WILL BE ALLOWED TO ANY OF THE DOCUMENTATION REQUIREMENTS.

DATA PLATE

A permanent data plate shall be affixed in the drivers compartment specifying and quantity and type of the following fluids used in the vehicle.

1. Engine Oil

2. Engine Coolant

3. Chassis Transmission Fluid

4. Drive Axle Lubrication Fluid
5. Air Conditioning refrigerant
6. Air Conditioning lubrication oil
7. Power steering fluid
8. Cab tilt mechanism fluid
9. Transfer case fluid
10. Equipment rack fluid
11. Air compressor system lubricant
12. Generator system lubricant

Permanent placards shall be affixed and visible to all seated occupants instructing the occupants to wear their seat belts.

A permanent placard shall be affixed to the rear step area to instruct that riding on the rear step is prohibited.

PAYMENT

Final payment for the apparatus shall be made at time of delivery of the completed vehicle. Due to insurance liability, the apparatus will not be left at the purchaser's location without full acceptance and payment or prior agreement between the Purchaser and Bidder.

Final delivery price shall not include any Local, State or Federal taxes. The Bidder shall not be liable for any State or Federal mandated tax or program after sale or delivery of the apparatus.

DELIVERY

Final delivery of the completed apparatus shall be made at Fire Department Headquarters.

DEMONSTRATION - NO EXCEPTIONS

Fire Department personnel shall be properly instructed as to the proper use of the entire apparatus including, but not limited to, chassis, aerial system, jacking system, the apparatus and all equipment. The demonstration shall be made by a trained and certified factory trained delivery specialist (s) who has the following certifications: NFPA 1041 Instructor, NFPA 1002 Fire Apparatus Operator, EVT F-1 Fire Apparatus Preventive Maintenance, F-2 Fire Apparatus Design and Performance, and F-5 Aerial Fire Apparatus. The Delivery Specialist(s) must have at least 20 years experience of fire fighting and fire ground operations and shall be responsible for complete instruction as to operation and maintenance of the chassis, and the completed vehicle. **Safe operation is of the upmost importance to the department. Under qualified instructors shall not be acceptable.**

The demonstration specialist (s) shall remain at the Fire Department for a sufficient amount of time to provide thorough instructions to all personnel on all duty shifts (4), or as instructed by Chief of the Department. All meals, motel and travel costs shall be the responsibility of the successful bidder.

DELIVERY

The apparatus shall be delivered complete and ready for operation. The apparatus, to insure proper break-in of all components, shall be delivered under its own power - rail or truck freight is not acceptable.

MAX HEIGHT

The maximum height of the apparatus shall not exceed: 11' 4" **NO EXCEPTIONS**

MAX LENGTH

The maximum length of the apparatus shall not exceed: 41’8” (500”)

MAX WHEELBASE

The maximum wheelbase of the apparatus shall not exceed: 245"

ANGLE OF APPROACH

The angle of approach for the apparatus shall not be less than eight (8) degrees as specified by the current edition of NFPA 1901.

ANGLE OF DEPARTURE

The angle of departure for the apparatus shall not be less than eight (8) degrees as specified by the current edition of NFPA 1901.

FINANCIAL STABILITY SPECIFICATIONS

Ensuring the financial stability of the proposed body builder is a paramount consideration to this department. Financial strength directly relates to the body builders ability to successfully produce an apparatus without jeopardizing fire department funds. In addition, financial strength is vital to this department to insure a body builder will be able to provide warranty service along with replacement parts and service for the life of the apparatus. Failure to be able to provide these lifelong services may cause future increases in maintenance expenses and create undue burden on the department’s budget and tax base. This is a situation that this department is unwilling to risk. The body builder, therefore, shall meet certain minimum financial ratios in order to qualify for a bid award. The financial ratios presented shall be that of the consolidated entity; not the consolidated entity’s parent company; for the body builder.

The financial ratios required to be met shall be derived from the most recent audited financial statements of the body builder proposed.

ANY EXCEPTION taken to this requirement shall immediately render the bid non-responsive and the bidder dismissed from further consideration. Under no circumstance shall a bid be considered where the bidder submits a letter of explanation taking exception to this requirement in lieu of providing the required documentation, nor shall consideration be given to bidders that refuse to submit the required information on the basis that the body builder proposed is a private company.

The three (3) critical financial indicators to be met are as follows:

Debt-to-Equity Ratio: The debt-to-equity ratio of the entity must not exceed a 2.0 rating. A debt-to-equity ratio is defined as that of total liabilities divided by total owner’s equity. In layman’s terms, a low debt-to-equity ratio means the company itself owns a greater share of its assets, as opposed to banks, creditors and other financial institutions. Conversely, companies with high debt-to-equity ratios are those that are generally financing their growth by carrying additional debt. The cost of this debt-financing may outweigh the return that the company generates on the debt through business activities and become too much for the company to manage. This can lead to bankruptcy, which is of grave concern to this purchaser.

Debt Coverage Ratio: The debt coverage ratio of the entity must exceed a 100.0 rating. A debt coverage ratio is defined as annual net income divided by the current portion of long-term debt. A high debt coverage ratio means the company can easily meet its payment obligations with its banks and other creditors. A low debt coverage ratio clearly infers the company may struggle to meet these obligations, which could ultimately delay or cancel production of apparatus.

Equity Ratio: The equity ratio of the body builder must exceed a .30 rating. An equity ratio is defined as total owners’ equity divided by total assets. The equity ratio is another good indicator of the level of leverage (or financing) used by a company. The equity ratio measures the proportion of the total assets that are financed by owners and not creditors. A high equity ratio provides the company with flexibility in financing growth and other needs.

All financial indicators required by this section must be verified by Dun and Bradstreet, the nationally-recognized, independent financial analysis company. Bids furnished without the required financial information shall render the bid non-responsive and the bidder dismissed from further consideration. **NO EXCEPTIONS.**

COMPLETE COMPACT DISC MANUAL

The manufacturer shall provide with the vehicle upon delivery, one (1) complete delivery manual. These manuals shall be on a computer generated compact disc (CD), with reference guide for each section of the vehicle. Within each section shall be:

- Individual component manufacturer instruction and parts manual
- Warranty forms for body
- Warranty forms for all major components
- Warranty instructions and format to be used in compliance with warranty obligations
- Wiring diagrams
- Installation instructions and drawings of major parts
- Visual graphics and electronic photos of the installations of major parts
- Necessary normal routine service forms, publications and components of body portion of apparatus
- Technical publications on training and instructions for major body components
- Warning and safety related notices for personnel protection

Cab and chassis manuals on parts, service and maintenance shall be provided

ELECTRICAL SYSTEM COMPACT DISC MANUAL

The manufacturer shall provide with the vehicle upon delivery, one (1) delivery manual for the electrical system. These manuals shall be on a computer generated compact disc (CD), with reference guide for each section of the vehicle. Within each section shall be:

Individual component manufacturer instruction and parts manuals

- Warranty forms for the components
- Warranty instructions and format to be used in compliance with warranty obligations
- Wiring diagrams
- Installation instruction and drawings for major parts
- Visual graphics and electronic photos for the installation of major parts
- Necessary normal routine service forms, publications and components for the installed electrical components
- Technical publications for training and instruction on major components
- Warning and safety related notices for personnel protection
- Cab and chassis manuals on parts, service and maintenance shall be provided

ENGINE AND TRANSMISSION MANUALS

One (1) paper copy of the specific engine and transmission manuals shall accompany each cab and chassis.

OPERATION AND PARTS LIST MANUALS

Each cab and chassis shall include two (2) electronic copies of the operation manuals and parts listings. The manuals shall include information specific to the components included on the apparatus.

AS BUILT WIRING DIAGRAMS

Each cab and chassis shall include one (1) digital copy of the wiring schematics and component wiring.

CAB TEST INFORMATION

The cab as built shall have successfully completed the pre-load side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests shall have been witnessed by and attested to by an independent third party. The test results shall have been recorded using cameras, high speed imagers, accelerometers and strain gauges.

Documentation of the testing shall be provided upon request.

CAB INTEGRITY CERTIFICATION

The manufacturer shall provide a cab crash test certification with this proposal including SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading for Heavy Trucks and SAE J2420 COE Frontal Strength Evaluation - Dynamic Load for Heavy Trucks.

CAB TEST INFORMATION

Roof Crush

The cab shall be subjected to a roof crush test of 120,000 pounds exceeding the requirements of ECE 29 criteria. The 120,000 requirement is important to ensure to most structurally sound and safe cab in the event of a crash or roll over.

Side Impact

The cab shall be subjected to dynamic moving barrier slammed into the side of the cab at 7.5 mph, striking with an impact of 15,157 foot pounds of energy. This test will closely represent the forces a cab would incur in a rollover incident.

Frontal Impact

The cab shall withstand a frontal force produced from a moving barrier slammed into the front of the cab traveling at 10.5 mph, striking with an impact of 42,587 foot pounds of energy.

The same cab shall withstand all tests without any measurable intrusion into the survival space of the occupant area.

An official of the company shall designate, in writing, which is qualified to witness and certify test results.

CAB CUSTOM STYLE

The cab shall be a custom, cab over engine style, with the driver and officer positions ahead of the engine and front axle. The cab shall be specifically designed and manufactured for the fire service industry.

The cab shall be designed and assembled by the apparatus manufacturer in a facility located on the manufacturer's premises.

NO EXCEPTIONS.

The cab shall be of a totally enclosed full tilt design, with the interior area completely open to improve visibility and verbal communication between the occupants. The cab shall be capable of tilting 45-degrees, allowing the chassis engine to be removed, if required, without tilting the cab beyond 45-degrees. **NO EXCEPTIONS.**

The cab shall include a four (4)-point rubber isolated cab pivot and mounting system. The rear histic mounts shall be isolated from the chassis frame to reduce the transfer of road vibrations and frame torque into the cab, while providing superior handling characteristics. No solid mounted rear lock downs shall be acceptable.

The front cab pivot assemblies shall be 1/2" A36 steel plate with a .31" thick 2-1/2" diameter tube cross member mechanically attached to the cab and frame. There shall be two (2) greaseable rubber isolated engineered bushings to reduce the transfer of road vibrations into the cab.

The cab shall be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.

The cab super-structure shall be designed with high strength 6061-T6 aluminum extrusions and 3/16" 5052-H32 aluminum plate. This shall include the “A”, “B”, “C” and “D” extruded pillars, triple wall front end reinforced by 3/16" thick x 2"x3" extrusion tubes, 3/16" side walls, roof and 3/16" rear wall. This shall offer superior occupant protection in the event of vehicle impact.

The extrusions shall provide adequate space for routing of wiring and hoses which will provide service accessibility. Routing of harnessing which requires pulling of wires through tubes will not be allowed. **NO EXCEPTIONS.**

The "A" pillar shall be of a closed section, one-piece extrusion extending from the cab header to the bottom of the cab. This design shall ensure strength and superior resistance to buckling in the event of a frontal impact.

The cabs front corners shall be constructed of 5052-H32 stamped aluminum to provide a consistent material composition. The stamping process alleviates the high tendency of fractures through the fusing of dissimilar metal composition as appears with a casting process.

Cast cab components, including cab corners, "A" pillars and front fascia components shall not be acceptable due to the high tendency of fractures**. No Exceptions**.

Additional cab strength shall be obtained through closed section, dual extrusions in the construction of the "D" pillars.

The front façade shall be constructed with dual wall .19” thick 5052-H32 aluminum plates which make up the front bulkhead, reinforced by .19” thick 6061-T6 aluminum extrusion (box-sections), though-out the inner and outer perimeter of the front end / façade. The reinforcing the third wall / barrier is .13” thick 5052-H32 work hardened aluminum façade panels. All welded no adhesive.

The cab side wall of the cab shall be 3/16” thick 5052-H32 aluminum plate. The cab side plate shall wrap the corner of the cab b pillar and slam post. The cab rear wall plates shall be reinforced with a minimum of two (2) 3/16 x 3” aluminum sections; the cab side reinforcements shall be a minimum of 28” apart and span from the cab B pillar and cab C pillar.

The rear wall of the cab shall be 3/16” thick 5052-H32 aluminum plate. The rear cab plate shall wrap the corner of the cab and attach to the cab D pillar and slam post. The cab rear wall plates shall be reinforced with four horizontal and dual vertical support sections; the dual vertical support structure shall consist of 1/8” thick x 2” 6061-T6 aluminum tubes and the horizontal hat sections shall consist of 1/8” thick x 4” 5052-H32 aluminum. The dual vertical support sections shall be 40” a-part, and the cab shall contain a minimum of four (4) 4” hat section horizontal supports.

Additionally, the rear edge of the floor shall include a 3/16” 6061-T6 aluminum tube extrusion (under the floor) and a 7” 5052-H32 aluminum cab floor support section (above the floor)

The outside cab width shall measure 99” across. The interior cab shall have a width of 93".

The cab length shall measure 77.3” from the center of the front axle to the front cab skin and 60” from center of the front axle to the back of the cab, for a total cab length of 137.3”.

The cab shall also feature ample driver and officer foot room, a total of 3.7 square feet for the driver and 3.6 square feet of floor space at the officer’s feet.

The engine tunnel shall be a tapered design, featuring 24" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 25.5" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 33" in the driver's position.

The engine tunnel shall be a tapered design, featuring 22-1/2" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 24" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 31-1/2" in the officer's position.

The crew floor shall feature a complete flat floor design, including provisions for a one o'clock PTO inclusion, while still offering an uninterrupted 25 total square feet of space. The distance from the back of the tunnel to the interior wall shall be 46" measured at floor level and 52" at top of engine tunnel.

The leading edge of the cab floor from the steps shall meet NFPA 13-7.3 slip resistance requirements, by using bi-directional, knurled trim piece on both the front and rear cab doors.

The cab shall incorporate a two-step design at each door, with a first step height of approximately 22” from the ground. The leading edge of the first step shall be 5" further outboard than the second step to provide a staircase design for safer egress.

The front cab first step shall measure a minimum of 32" wide x 9-1/2" deep. The front cab intermediate step shall measure a minimum 33" wide x 8-1/2" deep.

The crew cab first step shall measure a minimum of 26-1/2" wide x 9-1/2" deep. The crew cab intermediate step shall measure a minimum 28" wide x 9-1/2" deep.

The cab steps shall meet NFPA 13-7.3 in size and slip resistance requirements.

The cab shall meet or exceed cab impact test (SAE J-2420, cab rollover test (SAE J2422), and cab seating requirements (FMVSS 210, and FMVSS 208).

ROOF STYLE - FLAT

The roof of the cab shall incorporate a flat roof style. The cab roof design shall incorporate an angled front roof, transitioning into a rolled extrusion for a swept back design.

The roof of the cab shall feature dual .25" thick interlocked structural member extrusions running the entire width of the cab defending against buckling in the event of a rollover.

The interior cab height based on the flat roof style shall measure a minimum of 55-1/2”.

The crew roof super structure shall include a reinforcement hat-section structure 1/8” thick 5052-H32 aluminum bracing. The for-aft support braces will be 24” on center apart, the side to side support braces will stretch from cab side to cab side and centered between the dual 3/16” extruded and plate reinforced roll-cage section.

The forward cab roof section shall include a combination of 1/8” 6061-T6 extruded tube reinforcements and a hat-section structure 1/8” thick 5052-H32 aluminum bracing. The bracing shall wrap the entire perimeter of the cab forward roof, and the condenser support structure.

The condenser support structure shall include 1/8” triple sections, supporting the outer perimeter and center of the condenser mounting pad.

Additionally, the entire roof super structure is reinforced by a .25” thick roof edge corner extrusion around the entire cab perimeter.

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

CAB ROOF CHANNEL

The roof of the cab shall feature a channel through the center section of the raised portion. The channel shall measure 53" wide and shall 4" deep. The channel shall allow the aerial device to store below the roof of the cab.

CAB STEP TRIM

The lower cab steps at all doors shall be finished with a grip strut material. The intermediate cab steps shall be finished with an embossed aluminum tread plate.

CAB STEP TRIM KICKPLATE

The cab step risers at all doors, the vertical section of all steps, shall include an aluminum tread plate finish. The kickplate shall be flared at the bottom.

CAB DOORS

The cab shall include a total of four (4) doors, two (2) forward and two (2) rear crew doors.

The forward cab doors shall be a minimum of 45" wide and the rear crew doors shall be a minimum of 41" wide to provide enhanced entry and egress of the cab.

The two (2) forward doors shall offer a clear door opening measurement of 42" wide and two (2) rear crew clear door opening measurement of 38" wide, measured from door seal to door seal. **NO EXCEPTIONS**.

Each cab door shall feature:

- Superior strength and rigidity from 3/16" closed section extruded door frames
- Insulation and damping inside each door for a solid feel and minimized reverberation when closed
- A minimum of 1" rolled rubber bulb seal style gasket and an "L" foam seal around the door ensuring a weather tight fit
- Integrated, mechanical door stop
- A full length, hidden piano style 10 gauge stainless steel door hinge with a 1/4" pin, which shall be mounted inside the panel of the door prohibiting dirt and debris from becoming trapped in the hinge
- An integrated one-piece inner door assembly that includes a glass track, mounting provisions for window regulator, door handle and door panel shall be utilized. The inner door assembly shall be easily removed with nut inserts. Self tapping screws shall not be acceptable.

BARRIER FREE DOORS

The cab doors shall be "barrier free" style, meaning the door shall be constructed to cover the entry down to the intermediate step, leaving the bottom step open. Each door shall provide approximately 33" of clearance from the ground to the bottom of the door so the door may be opened without stopping due to guard rails along highways.

DOOR HANDLES

The exterior door handles shall be constructed of die-cast steel. They shall feature heavy duty pull style handles which are extended out and suitable for easy grasping with a gloved hand.

The handles shall be complimentary to the cab exterior and shall be black in color.

The interior door handle shall be a paddle style which shall be black in color. The paddle shall be hinged towards the front of the cab and shall include a manual door lock unless otherwise specified.

CAB DOOR LOCKS

All cab doors shall include manual door locks with keys. The door lock shall include a toggle and shall be an integral part of the interior door handle which is red in color. The exterior door lock is integral with the door latch. The cab doors may be unlocked from the exterior with a key or through a thumb turn from inside the cab.

INTERIOR CAB DOORS

All cab doors shall consist of a one-piece formed and stamped aluminum interior panel. The panel shall include a formed collar around the interior door latch. ABS material shall not be acceptable. No Exceptions.

INTERIOR CAB DOOR FINISH

All cab doors shall be finished in an ARMA coating for durability. The finish shall be black in color.

CAB DOOR REFLECTIVE TRIM

Cab door reflective trim NFPA compliant red/yellow in accordance with NFPA 14.1.6.

WINDSHIELD

A one (1)-piece, safety glass full width windshield with more than 3,228 square inches of clear viewing area will be provided.

NO EXCEPTIONS.

The windshield shall feature:

- A completely uninterrupted view from both the driver and officer positions
- The windshield will consist of three (3) layers; the outer light, the middle safety laminate, and the inner light. The .114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer.
- Economical replacement readily available from auto glass supplier
- Easily removable for replacement using standard automotive techniques
- A frit band will be provided along with an outer trim seal on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPER SYSTEM

A single windshield wiper system shall be incorporated in conformance with FMVSS and SAE requirements. Two (2) 22" windshield wiper arms shall be mounted below the windshield. Each arm shall include a 26" long wiper to provide optimum windshield clearing.

The windshield wiper fluid reservoir can be filled without raising the cab.

WINDOW -DRIVER'S DOOR

The driver's door shall include a window which measures 27" wide x 24" high with a clear viewing area of 687 square inches. The glass shall include a standard automotive tint and through the use of a manual crank style handle shall roll completely into the door housing.

The window shall be trimmed in a black anodized aluminum ring and rubber seal to keep water from entering the cab when closed.

WINDOW- OFFICER'S DOOR

The officer's door shall include a window which measures 27" wide x 24" high with a clear viewing area of 687 square inches. The glass shall include a standard automotive tint and through the use of a manual crank style handle shall roll completely into the door housing.

The window shall be trimmed in a black anodized aluminum ring and rubber seal to keep water from entering the cab when closed.

REAR DRIVER SIDE CREW WINDOW

The rear driver's side crew door shall include a window measuring 26.5" wide x 21.75" high with a clear viewable area of 577 square inches. The glass shall include a standard automotive tint and through the use of a manual crank style handle shall roll completely into the door housing.

REAR OFFICER SIDE CREW WINDOW

The rear officer's side crew door shall include a window measuring 26.5" wide x 21.75" high with a clear viewable area of 577 square inches. The glass shall include standard automotive tint and through the use of a crank style handle shall roll completely into the door housing.

DRIVER CANOPY SIDE WINDOW

The cab shall include a fixed driver's side window glass which shall be located between the cab front and rear doors. The glass shall be 18" wide x 24" high and shall include a standard automotive tint and shall be trimmed in a black anodized rubber ring for a tight seal when closed.

OFFICER CANOPY SIDE WINDOW

The cab shall include a fixed officer's side window glass which shall be located between the cab front and rear doors. The glass shall be 18" wide x 24" high and shall include a standard automotive tint and shall be trimmed in a black anodized rubber ring for a tight seal when closed.

SEAT AND SEAT BELT COLOR

Seats in the cab shall be black in color with a red seat belt.

SEAT BACK

The seat back shall incorporate a standard style headrest.

SEAT BACK

An SCBA locking system which shall be one bracket model and store all U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

- The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically

- A center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions

The system shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

DRIVER SEAT

The driver's seat shall be a H. O. Bostrom Sierra high back reclining ABTS bucket seat. The seat shall have contoured, high-density cushions with lumbar support. The back recline shall include a locking mechanism on both sides of the seat and shall have a release handle located at the retractor side of the seat assembly. The seat cushion shall be supported

with a serpentine spring suspension. The seat shall have a double-locking five-inch fore and aft adjustment and occupancy sensor in the seat cushion.

The seat shall be equipped with a red, integrated 3-point shoulder harness and lap belt and an emergency locking retractor. The seat belt shall include a buckle latched switch. The seat belt shall include a rotating bezel guide at the upper shoulder point and shall be routed through the seat frame and covering to protect webbing.

OFFICER SEAT

The officer's seat shall be a H. O. Bostrom Tanker 450 ABTS (All Belts To Seat/Integrated Seat Belts) series high back seat with fixed base. The seat shall have contoured, high-density cushions with lumbar support and Occupancy sensor in the seat cushion. The seat cushion shall be supported with a serpentine spring suspension. The seat shall include an SCBA storage area with one piece flip- up headrest with spring return. The seat shall include two part bolster padding with removable insert to accommodate SCBAs with rigid waist belts.

The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt and an emergency locking retractor. The seat belt shall include a buckle latched switch. The seat belt shall include a rotating bezel guide at the upper shoulder point and shall be routed through the seat frame and covering to protect webbing.

SEAT BACK

An SCBA locking system which shall be one bracket model and store all U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

- The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically

- A center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions

The system shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

REAR FACING OUTER SEAT

Two (2) rearward facing outer crew seat shall be a H. O. Bostrom Tanker 400CT ABTS (All Belts To Seat/Integrated Seat Belts) series with Flip/Up cushion. The seat shall have contoured, high-density cushions with lumbar support and occupancy sensor in the seat cushion. The seat cushion shall be spring biased to fold to vertical position when occupant weight is removed. The seat shall include a SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt and an emergency locking retractor. The seat belt shall include a buckle latched switch. The seat belt shall include a rotating bezel guide at the upper shoulder point and shall be routed through the seat frame and covering to protect webbing.

REAR FACING OUTER SEAT MOUNTING

Each rear facing outer seat shall be mounted facing the rear of the cab.

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.

ENGINE TUNNEL INSULATION

The engine tunnel shall include an insulated barrier from noise on the underside of each tunnel surface. This barrier shall be engineered for surrounding engines.

The insulation barrier shall provide an acceptable decibel level within the cab meeting or exceeding the recommendations of NFPA 1901.

The thickness of the engine tunnel insulation shall be 1" thick. The insulating material shall be open cell polyether based foam with a textured surface, specifically designed for acoustic absorption.

Use of aluminized faced material on the engine tunnel shall not be acceptable. **NO EXCEPTIONS.**

The engine tunnel insulation shall be precisely cut and sealed to fit each segment on the underside of the tunnel surface. The insulation shall then be affixed by a pressure sensitive adhesive.

The insulation shall meet or exceed FMVSS 302 flammability testing.

DAMPING INSULATION

The entire cab, including the ceiling and walls shall include additional insulation reducing structure borne noise from vibration, impact and resonance within the cab.

INTERIOR TRIM MATERIAL

The interior trim shall feature a 31 oz. marine grade vinyl which features a tensile strength of ASTM D751 of excellent, tear strength meeting the Federal standard 191-5134 of excellent and shall be oil resistant passing the CID-A-A-2950A requirement for no permeation.

Due to the excellent qualities of the marine grade vinyl material, no other type of interior trim shall be acceptable.

NO EXCEPTIONS.

The soft trim vinyl shall feature mildew resistance passing ASTM G21-90 and shall be rated to -25 degrees Fahrenheit.

The vinyl shall be flame retardant meeting California Fire Code 117, UFAC Class 1, and BIFMA Class 1 and shall have a high resistance to abrasion.

The interior of the cab including the side walls and ceiling panels shall feature this soft trim and shall be black in color.

INTERIOR CAB INSULATION

The cab shall be completely insulated from road and vehicle resonance, exterior sound and thermal intrusion.

The cab insulation system shall be comprised of three separate components each designed to assure optimal thermal and acoustic properties are achieved. Two layers of insulation material shall be utilized in conjunction with a .2” air barrier.

The cab shall utilize at a minimum 10 mils of flexible extensional visco elastic vibration damping insulation offering excellent acoustic reduction properties.

A minimum of .8” of SCbond Polyurethane Foam insulation shall be applied as an additional insulation between the cab skin and all interior ceiling and wall surfaces. The insulation shall have a density of 10 lb/ft3 +/-.5 providing better thermal properties and acoustic reduction properties.

The interior cab insulation system shall ensure that no seated position within the cab exceeds 72dB as certified by the manufacture.

This decibel rating shall be measured with the apparatus traveling 45 mph with climate control settings off.

All insulation used in the construction of the cab shall be marine grade featuring longevity and resistance to degradation.

Use of open cell material as the primary insulation will not be acceptable**. NO EXCEPTIONS.**

The interior of the cab including the side walls, rear wall and ceiling panels shall be insulated.

CAB HEADER

The cab header shall offer heavy duty, durable construction using resin transfer molding (RTM) technology formed composite material. The composite material shall be .28" thick for improved resistance and military type strength.

RTM is a low pressure, closed molding process which offers a dimensionally accurate and high quality surface finish composite molding, using liquid thermoset polymers reinforced with various forms of fiber reinforcements. The matrix selection of polymer and reinforcement dictates molding mechanical and surface finish performance.

ABS polymer construction shall not be acceptable**. NO EXCEPTIONS**.

The cab header shall offer a finish of ARMA advanced urethane coating for a rugged design and finish. **NO EXCEPTIONS.**

ARMA is a polyurethane/polyurea elastomer providing a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured, skid-resistant surface.

The ARMA coating shall offer durability, scratch resistance, chemical and abrasion resistance even against today's advanced firefighting turnout materials with consistent, even coverage and a uniform texture. The ARMA 952 coating is extremely flexible, stretching to 280% of its original size without any adhesion loss, eliminating the "shearing effect" and loss of adhesion that plagues other coatings due to substrate expansion, contraction and elevation shifts.

REAR WALL INTERIOR MATERIAL

The rear wall of the cab shall be covered in black 31 oz. marine grade vinyl for a more pleasing appearance.

FLOOR MAT

The interior flooring of the cab shall be covered with an advanced black multi-layer acoustic dampening mat. The floor matting shall be an open/closed cell, flexible polyurethane polyamide material with frictional dampening and dissipation properties. The mat shall be a fire and skid resistant non-wicking material.

SUN VISORS

The driver and officer seats shall feature a sun visor mounted in the header over each seating position. The sun visors shall be padded and trimmed in vinyl.

CAB DASH

The cab dash shall offer heavy duty, durable construction using resin transfer molding (RTM) technology formed composite material. The composite material shall be .28" thick for improved resistance and military type strength.

RTM is a low pressure, closed molding process which offers a dimensionally accurate and high quality surface finish composite molding, using liquid thermoset polymers reinforced with various forms of fiber reinforcements. The matrix selection of polymer and reinforcement dictates molding mechanical and surface finish performance.

ABS polymer construction shall not be acceptable. **NO EXCEPTIONS.**

ARMA is a polyurethane/polyurea elastomer providing a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured, skid-resistant surface.

The ARMA advanced urethane coating finish shall resist fading from UV light.

The cab dash shall be constructed of a single contoured piece of RTM composite material with ARMA coating. No Exceptions.

This construction shall allow for a clean, seamless dash area that shall reduce unnecessary joining of cab dash components. This design allows for the following features:

- Optimal heating and cooling of cab occupants, HVAC louvers shall be integrated into the gauge panel with a total of six (6) louvers; three louvers pointing at the driver and three louvers pointing at the officer.

The cab dash instrument cluster shall be installed on a painted fire service grade RTM composite fiberglass panel. This panel shall provide for easy removal to increase serviceability and provide ease of maintenance.

- For improved safety cab switches and controls shall be ergonomically located within easy reach of the driver when in the seated position with seatbelts fastened. This design will reduce driver distraction and increase safety by putting frequently accessed driver controls within easy reach to allow the driver more time to focus on the road.

- The officer side cab dash shall have a painted fire service grade RTM composite fiberglass panel that shall house the three HVAC louvers on the officer side. This panel will also provide ergonomically located switches and controls for the officer. All controls shall be within easy reach while in the seated position with seatbelts fastened.

- Access panels on the top of the dash for both the driver and officer sides easing maintenance access to controls, components and gauge assemblies

- The driver side dash shall include gauges for primary air pressure, secondary air pressure, a Pacific Insight instrumentation gauge panel and the DEF gauge as standard

- The driver side dash shall also include two (2) lower panels to the left and right of the steering column for FMVSS switches such as the Off/Ignition and start switches and the park brake assembly

- The driver dash shall include a panel for inclusion of an optional Weldon Vista screen and seven (7) additional switches or the maximum of 24 switches to the right of the Driver

- The officer dash shall include a recessed area for optional mounting cradles or brackets for a laptop computer, mobile data terminal, map compartment or clip board

- The officer dash shall include a panel for inclusion of an optional Weldon Vista screen and seven (7) additional switches or the maximum of 24 switches to the left of the Officer

ENGINE TUNNEL

The engine tunnel shall be constructed of aluminum offering superior durability in addition to thermal and acoustic resistance. Covering the engine tunnel shall be a layer of formed composite material for a contoured transition into the dash and offering a pleasing appearance.

The tunnel shall feature an ARMA coating which shall match the dash and header in texture and color for a consistent appearance and robust finish with a thickness of approximately .28".

The engine tunnel shall feature:

- A low profile design measuring approximately 46.5" wide and 23-1/2" in height from the crew floor shall offer optimum visibility of the windshield and cab interior from any seated position. **NO EXCEPTION.**

- The engine tunnel at the driver's position shall be a tapered design, featuring 24" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 25.5" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 33".

- The engine tunnel at the officer's position shall be a tapered design, featuring 22-1/2" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 24" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 31-1/2".

- The design shall offer a minimum of 26" for the driver and 24" for the officer as measured from the inside door pan to the top edge of the tunnel. The dimension measured at the "H" (hip) point, with the seat in the lowest position, shall be a minimum of 28-1/2" for the driver and 27" for the officer. **NO EXCEPTION.**

- There shall be no components such as HVAC systems mounted to or above the tunnel as this would reduce visibility and inhibit communications within the cab

- Recessed sections for ease of mounting equipment at the rear of the tunnel or for compartments and bases which can be used for installing Fire/EMS equipment and components such as flashlights and light boxes

- A finish of ARMA advanced urethane coating offering durability, scratch, UV, chemical and abrasion resistance

CAB DASH & ENGINE TUNNEL

The cab dash and the engine tunnel of the cab shall be coated with ARMA Coating for a durable finish. The color shall be black.

MODULAR CENTER DASH CONSOLE

The dash and front portion of the tunnel shall include an angled modular console centered between the driver and officer positions.

The console shall feature:

- A heavy duty housing constructed from 14 gauge steel which is powder coated with a durable semi-gloss textured black finish to provide glare and corrosion resistance

- The console top constructed of black anodized aluminum extruded rails which allow for mounting brackets, plates, and other console options

- Integral nut tracks which allow mounting of equipment to the sides of the console by way of sliding 1/4"-20 hex nuts

- A hinged lid constructed from 16 gauge steel also powder coated for corrosion resistance

- The availability of pre wiring for specific components

- A modular design for ease of changes and future additions such as changing out brands of radio, types of sirens or adding accessory space

The console shall offer an available eight (8) zones configured with mounting plates for optional components as shown below:

BLACK MOUNTING PLATE

One (1) black mounting plate(s) containing blank plates shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 1

BLACK MOUNTING PLATE FOR RADIO

One (1) black mounting plate(s) containing radio mounting shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 6

BLACK MOUNTING PLATE FOR POWER POINTS

One (1) black mounting plate(s) containing two (2) 12 volt power points shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 2

CONSOLE MOUNTED MAP LIGHTS

One (1) black mounting plate(s) containing a map light shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 5

CONSOLE MOUNTED LOCKING ACCESSORY BOX

One (1) black mounting plate(s) containing a locking accessory box shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 7

CONSOLE MOUNTED ACCESSORY BOX

One (1) black mounting plate(s) containing an open accessory box shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 3

CONSOLE MOUNTED CUP HOLDER

Four (4) black mounting plate(s) containing a cup holder shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows: Zone 4 and Zone 8

INTERIOR FRONT AND REAR DOOR PULLS

The interior driver and officer cab doors shall include one (1) customized cast aluminum single piece door grab pulls designed specifically for the fire service.

The single piece door pull shall have a curved designed in a “L” formation to provide multiple points for grasping with a gloved hand. The horizontal dimension shall be a minimum of 28" and the vertical dimension shall be a minimum of 20". The door pulls shall have an ergonomic curve making them easier to grasp when entering and exiting the cab. **NO EXCEPTIONS.**

The door pull shall feature secure mounting in three separate locations of the pull utilizing stainless steel fasteners with nut inserts in each location. Self-taping screws or other mounting techniques shall not be allowed for interior door pulls or grab handles.

Each handle shall be constructed of A356 aluminum casting and shall feature a black powder coated finish.

INTERIOR GRAB HANDLE REAR DOOR

A black powder coated cast aluminum grab handle shall be provided on the inside of each rear crew door. The handle shall extend horizontally the width of the window just above the windowsill. The handle shall assist with entry and egress from the crew area of the vehicle.

The interior driver and officer rear cab crew doors shall include one (1) customized cast aluminum single piece door grab pulls designed specifically for the fire service.

The door pulls shall have an ergonomic curve making them easier to grasp when entering and exiting the cab. **NO EXCEPTIONS.**

The door pull shall feature secure mounting with stainless steel fasteners with nut inserts in each location. Self-taping screws or other mounting techniques shall not be allowed for interior door pulls or grab handles.

Each handle shall be constructed of A356 aluminum casting and shall feature a black powder coated finish.

EXTERIOR GRAB HANDLES

One (1) 18” anti-slip exterior assist handle shall be mounted behind each of the cab doors. The grab handle shall be constructed of aluminum and be 1.25” diameter with a knurled finish enabling non-slip assistance with a gloved hand and mounted on stanchions.

CAB FASCIA

The cab fascia shall offer a traditional, yet aggressive appearance, in its design and shall be constructed of work-hardened 5052-H32 aluminum. This design shall feature:

- A super structure which is fully welded to the cab, for a seamless and robust integration
- Thermoformed headlamp bezels, constructed of impact resistant, polycarbonate composite which is vacuum metalized to eliminate pealing and bubbling of a chrome type film or plating
- Traditional style headlight bezels with 4 x 6 high intensity headlights which shall add a classic look to the fascia while improving visibility
- The turn signal lights shall be located in the lower outboard portion of the head lamp bezel and a warning light in the lower inboard position

LIGHT BEZEL

The front grille shall include wing light bezels. The bezels shall be constructed of ABS chrome material.

FRONT GRILLE

A prominent front grille shall punctuate the aggressive design of the cab with its outboard wing style warning light bezels and heavy framework. The front grille shall feature:

- Stamped steel construction for superior strength and durability
- Chrome plated for an aesthetically pleasing appearance
- Tiltable and/or removable mesh panel for fluid fill and fluid check access
- Two (2) 4” x 6” warning light locations in the upper wings
- Up to six (6) warning light locations along the mid bar for a variety of warning light combinations

FRONT GRILLE INLAY

The front grille shall include a honeycomb inlay of stainless steel, painted black, which shall provide air flow to through the grille and provide a sporty, muscular appearance to the front of the apparatus.

CAB FENDERS

The cab wheel wells shall include full width, 14 gauge 304 polished, stainless steel cab fenders to resist corrosion and enable easier cleaning maintenance. The inner liner, measuring 18" wide shall be constructed of plastic with an outer fenderette measuring 2.5" wide.

CAB TILT SYSTEM

The cab lift controls for tilting the cab shall be recess mounted in the forward wall inside the right front compartment. Proper operation and warning labels shall be installed adjacent to the controls.

The cab shall be a full tilt style. A hydraulic cab lift system shall be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

The dual lift cylinders shall lift the cab 45 degrees from a horizontal plane facilitating easy engine maintenance. The chassis engine shall be able to be removed if required without tilting the cab beyond 45-degrees.

The center line of the chassis cab tilt shall be a minimum of 76" from the center line of the front axle, providing a 27" corridor between the cab and front tire for maximum work space and accessibility to fan, fan belt, fan drive, air compressor, power steering pump, alternator and air filter.

The tilt angle shall allow access to the engine and area under the cab without contacting any components mounted to the gravel shield.

The cylinder shall be a Trunion style for improved stability in the tilted position and shall have an integral accumulator so as to not interfere with the cab mounting system creating a smoother and quieter ride.

The cab shall include a four (4)-point rubber isolated cab pivot and mounting system. The rear histic mounts shall be isolated from the chassis frame to reduce the transfer of road vibrations and frame torque into the cab, while providing superior handling characteristics. No spring loaded rear lock downs shall be acceptable.

The front cab pivot assemblies shall be a 1/2" A36 steel plate with a .31" thick 2-1/2" diameter tube cross member mechanically attached to the cab and frame. There shall be two (2) greaseable rubber isolated engineered bushings to reduce the transfer of road vibrations into the cab.

The cab shall be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.

The cylinders shall include blocking valves (velocity fuses) which prevent motion when no control buttons are pushed. In the event of a hydraulic system failure, the valves shall retain the fluid in the cylinders.

A redundant mechanical stay arm shall automatically be engaged once the cab has been fully raised. Before lowering the cab, this device must be disengaged using the stay arm control located on the driver's side rear of the cab, providing the operator protection from high engine exhaust temperatures.

All mounting points shall be bolted directly to the frame rail.

The cab lift safety system shall be interlocked with the parking brake. The cab tilt mechanism shall be active only when the parking brake is set and the ignition is in the on position. If the parking brake is release, the cab tilt mechanism shall be disabled.

CAB TILT MANUAL PUMP

There shall be a manual pump incorporated in the event of a system failure to the cab tilt system.

CAB TILT LOCK DOWN INDICATOR

The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.

In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar and the parking brake is released.

CAB LIFT CONTROL LOCATION

The cab lift controls for tilting the cab shall be recess mounted in the forward wall inside the right front compartment. Proper operation and warning labels shall be installed adjacent to the controls.

REARVIEW MIRRORS

Retrac Aerodynamic West Coast style single vision mirror heads model 613790 shall be provided and installed on each of the front cab doors.

The mirrors shall measure 8" wide X 19" high and shall include an 8" convex mirrors with a stainless steel back, model 980-4, installed below the flat glass to provide a wider field of vision. The flat mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The convex mirrors shall be manually adjustable. The flat mirror glass shall be heated for defrosting in severe cold weather conditions.

The mirror backs shall be constructed of vacuum formed chrome plated ABS plastic housings that are corrosion resistant and shall include an amber marker light. The mirrors shall be manufactured with the finest quality non-glare glass.

INTERIOR CAB FINISH

The interior cab shall be finished in a high performance polyurethane coating coating including the interior A, B, C and D pillars, all occupant seat frames and any surrounding surfaces extending to the ball seal around each door. This type of coating shall feature:

- Durability, scratch, chemical and abrasion resistance
- Consistent, even coverage and a uniform texture
- Resistance from fading from exposure to UV light
- Black in color

CAB TWO TONE PAINT

The cab surface shall be thoroughly washed with grease cutting solvent (PPG DX330) prior to any sanding. The cab surface shall then be sanded and minor imperfections filled and sanded. The prepared surface shall then be washed again with (PPG DX330) to remove any contaminants from all surfaces to be painted.

The first coating to be applied shall be a pre-treat self-etching primer (PPG DX1787) (.5 to 1.0 dry film build) for maximum adhesion to the body material. The next two to four coats shall be an acrylic urethane primer resurfacing agent (PPG K38). The film build shall be 4-6 mils when dry. The primer coat, after appropriate dry time, shall be sanded with 320-600 grit sandpaper to ensure a maximum gloss finish. The last step shall be an application of at least three coats of PPG Concept acrylic urethane two-component color (single stage). The film build shall be 2-3 mils when dry. The single stage acrylic urethane, when mixed with component (PPG DCX61) catalyst shall provide a UV barrier to prevent fading and chalking.

The cab shall be painted two colors, which shall be determined prior to the cab assembly.

CAB PAINT UPPER

The upper cab color shall be PPG Black in color

CAB PAINT LOWER

The lower or primary cab color shall be PPG Red color

CAB PAINT EXTERIOR BREAKLINE

The upper and lower paint shall meet on the cab which shall start at the grille under the wings and travel 6" below the cab windshield and approximately 5" under the driver and passenger and crew door windows.

CAB PAINT AIR CONDITIONING CONDENSER

The air conditioning condenser shall be painted to match the roof color.

HEATING AND COOLING SYSTEMS

The interior cab climate control shall be comprised of a triple system which shall include a defroster, a cab and crew heater and air conditioner for a complete HVAC system. The air conditioning system shall be comprised of compressor, condenser, and a minimum of three (3) evaporators to provide consistent temperature control throughout the entire cab. The front system shall be controlled through the VMUX screen and the rear overhead system shall be controlled through a conventional rotary knob control in the rear crew area**. NO EXCEPTIONS**.

The system shall be rated as an Emergency Vehicle grade for the use in Fire and Rescue style vehicles and shall provide environmental air treatment in accordance with published SAE standards.

The HVAC system shall be tested and certified by the component manufacturer, including all three systems. **Documentation of test results shall be provided with the bid. NO EXCEPTIONS.**

The HVAC system shall be a total and complete system, not incorporating the use of auxiliary heating and cooling systems. The HVAC system shall provide sufficient defrosting, heating and cooling to the entire cab without the need for any auxiliary systems.

The lines for the system shall be mounted in the extrusion of the "B" and "C" pillars on each side of the cab allowing for the space between the front and rear crew doors to be used for lighting and other components.

DEFROSTING SYSTEM

The defrosting system shall feature:

- To provide maximum defrost and heating performance, a 55,000 BTU heater-defroster unit with 558 CFM of air flow will be provided inside the cab.
- The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable cover will be installed over the defroster unit.
- Mounting under the dash with fresh air intake providing excellent defrost and demist capabilities. Systems not utilizing fresh intake shall not be acceptable. **NO EXCEPTIONS.**
- Six (6) vents shall be located in the top forward portion of the dash for superior defrosting properties across the entire windshield.
- The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the one (1) piece windshield.

HEATING SYSTEM

The heating system shall feature:

- Delivery of a minimum of 82,000 BTU/hour of heat to the entire cab.
- Heat and air circulation shall be provided to the driver and officer foot area of the cab as standard through ducting in the foot well area of both positions.
- Substantial air movement and heating provided to the driver and officer's position, with six (6) adjustable louvers, located in the dash, three (3) adjustable louvers directed at the driver and three (3) adjustable louvers directed at the officer
- Dual overhead units, with five (5) adjustable louvers shall be mounted above the rear facing seat positions on the driver and officer side of the cab
- A minimum of 530 CFM of air flow measured at the front seated positions and 240 CFM per side in the rear seated positions.

AIR CONDITIONING

The air conditioning system shall feature:

- A minimum of 67,000 BTU/hour of cooling capacity to the entire cab.
- Two (2) crew overhead evaporators located near the B-pillar on each side of the cab allowing for greater frontal visibility for the forward facing crew seating and allowing for more interior mounting of accessories.

- A gravity condensation drain system shall be utilized. These drains shall remove all condensation from the evaporator units and direct it to the exterior of the chassis cab for optimal performance. Systems utilizing pumps to remove condensation, or gravity systems with poles or other obstructions located within the cab to route drains through shall not be acceptable.

NO EXCEPTIONS.

- Substantial air movement for optimum cooling shall be provided to the driver and officer positions, with six (6) adjustable louvers, located in the dash, three (3) adjustable louvers shall be directed at the driver and three (3) adjustable louvers shall be directed at the officer

- The air conditioning system is capable of cooling the cab to a minimum of 70-degrees within 30-minutes from a temperature of 100-degrees and 60-percent relative humidity. Documentation for this test shall be provided with the bid. **No Exceptions.**

Proposals offering ceiling mounted evaporator units in the center of the cab above or on the engine tunnel shall not be accepted as this is a safety consideration due to the lack of visibility and communication within the cab.

A/C COMPRESSOR

A refrigerant compressor shall be provided to power the air conditioning evaporators.

A belt driven, model TM-31, 19.1 cubic inch compressor shall be installed on the engine.

CONDENSOR

The cab air conditioning system shall include one (1) low profile HE-condenser which shall be centered on the drivers side roof of the cab.

AIR COMPRESSOR AND HEATING FOR IDLE REDUCTION SYSTEM

The air conditioning system shall include an additional air compressor for the Idle Reduction system.

The heating system shall incorporate an additional heating unit on the engine which shall be routed to the crew area for additional heat.

ENGINE PLACEMENT

The engine shall be a maximum of 36" from the center line of the front axle to the front face of the engine block. The engine valve cover shall be a maximum of 23" from the top of the frame.

The engine placement shall provide optimal weight distribution to the front axle to enhance vehicle handling. More weight out in front of the front axle can cause a “fulcrum effect” and cause unsafe “bump steer” conditions.

The engine shall be mounted in a position that provides for the lowest possible height of the interior engine tunnel. An engine tunnel height from the floor of the chassis cab shall be no more then 21” high inside the cab. Engine placement shall provide a minimum of 11” between the engine fan and radiator to maximize the airflow and cooling of the engine.

ENGINE

A Cummins ISX 12.0 liter, four-cycle diesel fueled, turbo charged engine shall feature the following:

- One of the highest power to weight ratios in its class

- Heavy-duty replaceable wet liners, roller followers, by-pass oil filtration with replaceable spin on cartridge and targeted piston cooling for longer service in tough work environments

- Improved cooled EGR system

- 912 Cubic inches of displacement

- High pressure common rail fuel system producing a precise quantity of fuel at ultra high pressures

- Fully integrated, robust electronic engine controls

The engine shall be coupled with a Holset VGT™ (Variable Geometry Turbocharger).

The engine shall filled with Citgo brand Citgard 500 (or equivalent) SAE 15W40 CJ4 low ash engine oil for proper engine lubrication.

The engine shall be EPA certified to meet the 2010 emissions standards without compromising performance, reliability or durability using cooled exhaust gas recirculation and selective catalytic reduction technology.

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

The engine shall include programming which will govern the top speed of the vehicle.

HORSEPOWER

The engine shall have 500 horsepower at 1800 RPM, with a governed speed of 2100 RPM.

The engine shall have 1645 foot pounds of torque at 1200 RPM.

AUXILIARY ENGINE BRAKE

A Cummins engine compression brake, for the six (6) cylinder engine, shall be provided. The engine compression brake shall:

- Activate upon 0% accelerator when in operation mode and activate the vehicle's brake lights.

A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs.

TRANSMISSION PRE-SELECT

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

ENGINE PROGRAMMING HIGH IDLE SPEED

A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation.

The high idle will be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle.

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 and optimize output of the HVAC system.

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.

FLUID FILLS & CHECK

For ease of maintenance and access, the following fluid checks shall be located behind the tiltable and/or removeable mesh panel:

- Engine Oil dipstick
- Engine Coolant Sight Glass
- Power Steering Fluid dipstick
- Windshield Washer Fluid

The following fluid fill shall be located behind the tiltable and/or removable mesh panel:

- Engine Oil
- Power Steering
- Windshield Washer

Proposals including access to fluid checks and fills through the tunnel or by raising the cab shall not be considered.

ENGINE COOLING SYSTEM

The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system requirements.

The system shall include and feature the following:

- A vertically stacked charge air cooler providing the maximum cooling capacity for the engine. Proposals offering horizontally stacked charge air cooler shall not be acceptable**. NO EXCEPTIONS**
- The charge air cooler and radiator shall measure not less than 1382 square inches
- A one (1) piece nine (9) blade fan and shroud
- A surge tank with a low coolant probe and capable of removing entrained air from the cooling system
- Radiator re-circulation shields to prevent heated air from re-entering the cooling system and affecting performance
- Mounts allowing the entire radiator to drop through the frame for service when needed - **NO EXCEPTIONS**
- Engine placement shall provide a minimum of 8” between the engine fan and radiator to maximize the airflow and cooling of the engine.
- A Spin on Element water filter with corrosion inhibitor shall be provided for the cooling system. **NO EXCEPTIONS.**

COOLANT HOSES

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include stainless steel constant torque band clamps.

ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. 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 F.

Supplemental coolant additives (SCA) are not required as this is part of the extended life coolant makeup.

ENGINE AIR INTAKE

The engine air intake system shall include an ember separator air intake filter which shall be located behind the fascia.

The filter shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a corrosion resistant steel frame.

This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack, while creating only minimal air flow restriction through the system. Periodic cleaning or replacement of the screen shall be all that is required after installation.

The intake shall also feature a cyclone style water separator to remove unwanted moisture from incoming air.

The engine shall include an air intake filter which shall be bolted to the frame and located under the front of the cab. This dry type filter shall ensure dust and debris is safely contained inside the disposable housing, eliminating the chance of contaminating the air intake system during air filter service via a leak-tight seal.

The filter must have a capacity of no less than 1350 cubic feet of air per minute. The filter paper media must be of a flame retardant treated material. An electric air filter restriction indicator shall also be included with the system.

ENGINE EXHAUST SYSTEM

The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction catalyst (SCR) to meet current EPA standards.

The selective catalytic reduction catalyst shall utilize a diesel exhaust fluid solution consisting of urea and purified water to convert nitrogen oxide into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be injected into the system through the decomposition tube between the DPF and SCR.

The system shall utilize 0.065 inch thick stainless steel exhaust tubing between the engine turbo and the DPF.

The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall all be connected with zero leak gasketed clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires with an exhaust gas diffuser.

DIESEL EXHAUST FLUID TANK

There shall be a molded cross linked polyethylene tank for the Diesel Exhaust Fluid (DEF). The tank shall have a capacity of not less than five (5) usable gallons and shall be mounted on the left hand side of the chassis frame in front of the batteries below the frame.

The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.

DIESEL EXHAUST FLUID TANK

There shall be an access door provided in the top rear step of left side crew area for access to the DEF tank.

TRANSMISSION

The drive train shall include an Allison Gen IV-E 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 and Allison approved 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 Gen IV-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

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

PTO LOCATION

The transmission driven power take off (PTO) shall be mounted in the 1:00 o'clock position.

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.

TRANSMISSION DRAIN PLUG

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

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located on the tunnel to the right of the driver.

The shift selector shall provide an indicator on the digital display and shall alert the driver/operator when a specific maintenance function is required.

TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will automatically select a five (5) speed operation.

TRANSMISSION PROGRAMMING

The EVS group package number 127 shall contain the 198 vocational package for the fire service for 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 which requires re-selecting the 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.

An eight (8) pin diagnostic connector will be provided next to the steering column.

The trans module shall contain the following circuits:

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

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1710 series universal joints.

The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®.

FUEL FILTER/WATER SEPARATOR

The fuel system shall incorporate a Racor 3150R-1210, 10 micron fuel filter/water separator as a primary filter. The fuel filter shall have a sight bowl to allow visual inspection of fuel and a drain valve to remove visible contaminants. The instrument panel shall signal when water is present in the fuel/water separator through an audible alarm and lamp.

A water-in-fuel sensor probe shall be installed in the filter bowl and wired to the water in fuel (WIF) indicator lamp on the cab dash.

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

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black aramid braided lines with a fiber outer braid. The fuel lines shall connected with reusable steel fittings. Fuel line is compatible with bio-fuel blends.

FUEL SHUTOFF VALVE

Two (2) fuel shutoff valves shall be installed at the fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

FUEL COOLER

The cross flow air to fuel cooler shall be all aluminum and shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the battery box, under the frame.

The fuel cooler shall incorporate a fan for improved heat transfer.

FUEL SYSTEM

The fuel tank shall have a capacity of sixty-eight (68) gallons/two hundred fifty-seven (257) liters.

The tank shall offer:

- A vent port which will facilitate venting to the top of the fill neck for rapid filling without any “blow-back”
- One (1) 2” NPT fill port for left hand fill with a .5” NPT drain plug centered side to side, 9" from the front of the tank

- A roll over ball check vent for temperature related fuel expansion and draw
- A design including dual draw tubes and sender flanges
- A baffled design which shall be constructed of steel
- An exterior painted with a PRP Corsol™ black anti-corrosive exterior metal treatment finish which offers superior external corrosion resistance

The fuel tank shall be mounted below the frame, behind the rear axle. There shall be two (2) three-piece strap hanger assemblies with "U" straps bolted midway on the fuel tank, allowing the tank to be easily lowered and removed for service purposes.

The strap hanger material shall be stainless steel. **NO EXCEPTIONS**.

For isolation of vibration and movement, rubber isolating pads shall be provided between the tank and the hanger strap assemblies. The tank straps shall be attached to rubber coated cross members which help isolate the tank from frame flex.

Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

All fuel lines shall be connected with steel fittings with all fittings pointed towards the right side (curbside) of the chassis.

The chassis fuel lines shall feature an additional 4' of length provided so the tank can be easily lowered and removed for service purposes which shall be coiled and secured at the top of the tank.

FRONT AXLE

A Meritor MFS Easy Steer non-drive axle shall be incorporated as the front axle for the chassis. The axle shall feature:

- A capacity of 23,000 pounds
- A 3.74" drop and a 71" king pin intersection (KPI)
- A conventional style hub with a standard knuckle

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 SUSPENSION

The front suspension shall include a Hendrickson leaf spring suspension. The suspension shall feature:

- Capacity rating of 22,800 pounds
- 9 Leafs
- Case hardened threaded bushings
- A Grease fitting
- Double wrapped front eye

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 shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.

STEERING WHEEL AND COLUMN

The vehicle shall include a Douglass Autotech 18" tilt/telescopic steering column which shall offer up to seven (7) tilt positions. The steering column shall include a self-canceling turn signal lever, a four-way hazard switch and headlamp dimmer switch. The steering column shall also incorporate a steer angle sensor.

The steering wheel shall be a four (4) spoke VIP SmartWheel and shall be finished with vinyl covering foam padding and shall include a horn button. The smart wheel shall include controls on each side of the wheel. The left side switches shall control fog lights, wiper variable, wiper off, wash and wiper high and low. The right side switches shall control the air horn, engine brake off, low, medium and high functions.

POWER STEERING GEAR WITH ASSIST

The power steering gear shall be a TRW model TAS 85 and shall include the following:

- A balanced, hydraulic, positive displacement, sliding vane power steering pump which is gear driven from the engine
- One-piece, 2" diameter drag link for maintaining consistent wheel alignment resulting in less maintenance.
- The steering gear shall be mounted on a plane that is at a 9-degree angle in relationship to the center plane of the chassis. This mounting technique is designed to reduce the operating angle of input steering shafts. A more direct, responsive, and smoother handling vehicle will result from these unique design characteristics.

A certified torque and geometry study by TRW shall be available upon request.

REAR AXLE

A single Meritor RT-46-160 tandem driving axle shall be incorporated as the rear axle for the chassis. The axle shall feature:

- Rated capacity of 48,000 pounds
- Heavy duty Hypoid gearing for longer life, increased strength and quieter operation
- Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage
- Rigid differential case for high axle strength and reduced maintenance
- Rugged Dependability
- Rectangular shaped, hot formed housing with a standard wall thickness at spring seat of .50” for extra strength and rigidity
- Precision forged, single differential gearing

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR SUSPENSION

The tandem axle rear suspension shall be a Neway ADZ 246, air ride suspension. It shall have 8.00" of axle travel. The axle spacng shall be a minium of 52.00 inches apart,

The rear tandem suspension capacity shall have a fire service rating of 48,000 pounds.

REAR AXLE DIFFERENTIAL CONTROL

The first of the tandem rear axles shall include a driver controlled differential lock. This shall allow the main differential to be locked and unlocked when encountering poor road or highway conditions, where maximum traction is needed, for use at speeds no greater than 25 MPH.

The differential lock shall be controlled by a locking rocker switch on the driver's panel. The light on the switch shall illuminate with positive engagement of the differential control.

The tandem axles shall also include an inter-axle differential lock which shall allow both axles to be engaged as drive axles. This feature shall be controlled by a locking rocker switch on the driver's panel and shall illuminate with positive engagement of the inter-axle differential control.

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR SUSPENSION

The tandem axle rear suspension shall be a Neway ADZ 246, air ride suspension. It shall have 8.00" of axle travel. The axle spacng shall be a minium of 52.00 inches apart,

The rear tandem suspension capacity shall have a fire service rating of 48,000 pounds.

REAR SHOCK ABSORBERS

Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.

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.

Alignment documentation shall be delivered with chassis.

FRONT TIRES

The front tires shall be Michelin 365/70R 22.5 20PR “L” tubeless radial XZA1 highway tread.

The front tires shall feature:

- A stamped load capacity of 21,000 pounds per axle with a speed capacity of 75 miles per hour when properly inflated to 125 pounds per square inch
- A US Fire Service Intermittent Usage load capacity of 22,500 pounds per axle with a speed capacity of 75 miles per hour when properly inflated to 130 pounds per square inch.

REAR TIRES

The rear tires shall be Michelin 11R 22.5 16PR “H” tubeless radial XZE 2 regional tread.

The rear tires shall feature:

- A stamped load capacity of 24,020 pounds per axle with a speed capacity of 75 miles per hour when properly inflated to 120 pounds per square inch

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 10.5 inch polished aluminum wheels with a Dura-Bright® finish with XBR technology as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. 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 a polished finish that lasts.

REAR WHEEL

The rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch 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.

VEHICLE TOP SPEED

The top speed of the vehicle shall be programmed at approximately 60 MPH +/-2 MPH at governed engine RPM.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include a three (3) air tank, four (4) reservoir system with a minimum of 5852 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. A spring brake release valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss. The system shall include an anti-compounding feature. 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 six (6) sensor, six (6) modulator Anti-lock Braking System (ABS) shall be installed on the front and tandem rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. 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 tandem rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

A momentary rocker style switch 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 and the light on the rocker switch 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.

FRONT BRAKES

The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17" vented rotors.

The front brakes shall include brake chambers supplied by Meritor and shall be approved per application.

REAR BRAKES

The rear brakes shall be Meritor 16.50 inch X 7.00 inch S-cam drum type.

The rear brakes shall include brake chambers supplied by Meritor and shall be approved per application.

REAR BRAKE DUST SHIELDS

The rear brakes shall be equipped with brake dust shields.

REAR BRAKE SLACK ADJUSTERS

The rear brakes shall include Meritor automatic slack adjusters installed on the axle which features a simple, durable design offering reduced weight. The automatic slack adjusters shall feature a manual adjusting nut which cannot inadvertently be backed off and threaded grease fittings for easy serviceability.

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 dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

In addition to the mechanical rear brake engagement, the front service brakes will also engage via air pressure, providing additional braking capability. **NO EXCEPTIONS**

AIR DRYER

The brake system shall include a Wabco System Saver 1200 Plus air dryer with an integral 100 watt heater with a Metri-Pack sealed connector. The system shall have an integrated purge volume and integrated governor.

The system shall have the following features:

- Premium desiccant provides greater water adsorption
- Replaceable spin on cartridge for simple maintenance
- Compact light weight design
- Pressure relief safety valve
- Turbo cut-off valve for boosted compressor applications
-
- Service components are external for easy replacement
- Common service components proven for reliability and quality

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 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. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and

bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

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 integrated in the air dryer assembly.

AUXILIARY AIR TANK

A auxiliary air reservoir shall offer a 1200 cubic inch reservoir, isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

MOISTURE EJECTORS

Heated, automatic moisture ejectors with a manual drain provision shall be installed on all reservoirs of the air supply system. The manual drain provision shall include an actuation pull cable coiled and tied at each drain valve. The supplied cables when extended shall be sufficient in length to allow each drain to be activated from the side of the apparatus.

AIR SUPPLY LINES

A dual air system plumbed with color coded reinforced nylon tubing air lines shall be installed on the chassis. 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.

AIR HORN RESERVOIR

One (1) air tank, with a 1200 cubic inch reservoir, 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.

FRAME

The chassis frame shall consist of two (2) "C" style parallel rails, constructed of high strength low alloy and shall feature the following:

- A Domex **MODEL 110XF** 10.19" high by 3.63" deep cold rolled steel frame.
- Inner channel measuring 9.31" high x 3.25" deep x .25" thick
- The 10.19" frame height shall be maintained throughout the entire length of the frame to allow for maximum storage capacity for the entire apparatus.
- If frame rails that are larger than those specified are to be utilized, the maximum height of each frame rail shall not exceed 10.25" at any point on the frame rail. This will ensure the lowest possible vehicle center of gravity allowing maximum stability as well as providing the lowest body height possible.
- Frame rail shall have a consistent frame web throughout the entire length.
- The entire frame rail design shall be manufactured in the United States of America and readily available on the aftermarket.
- Grade 8 Yellow zinc coated fasteners, huck bolts shall not be acceptable
- Manufacturer's lifetime warranty

The frame ratings shall be as follows:

- 110,000 PSI minimum yield strength high strength low alloy steel
- Minimum Resisting Bending Moment (RBM) of 2,810,000 inch pounds per rail

To avoid frame cracking and failure over time, the top flange of the frame adjacent to the engine installation shall have a tapered design. Notches for engine components shall not be accepted due to fatigue and the potential for cracking. **NO EXCEPTIONS**

UNDER FRAME REINFORCEMENT

An under slung frame reinforcement shall be installed below the frame rails in the transmission area to increase the vertical rigidity of the frame.

The under frame reinforcement provides:

- Enhanced handling
- Improved ride quality
- Increase resistance to frame and cross member fatigue
- Enhanced vehicle stability providing improved safety to occupants

CROSS MEMBERS

There shall be a minimum of seven (7) steel plate cross members installed on the apparatus.

- 50,000 psi minimum yield strength steel plate cross members
- Manufacturer's lifetime warranty to match frame warranty. No Exceptions.
- Installed with one-piece cross member gusset to maximize vertical strength and minimize cross member flex
- Crossmembers can be inverted when required to allow for PTO drive line installation without the need for notching or modifying the cross members in anyway. **NO EXCEPTIONS.**

FRONT FRAME EXTENSION

A single piece 80,000 PSI steel extension shall be installed on the front of the frame rails.

- Reduces frame flex which translates into improved vehicle handling and ride quality
- Designs using multiple piece, bolted together extensions will not be acceptable since they are prone to more flexing, possible frame failure and cab cracking
- Allows radiator to be removed through the bottom of the frame extension without tilting the chassis cab
- Minimizes damage to the chassis cab in the event of frontal impact accident
- Maintains structural integrity of the chassis frame rails while attaching bumper extensions of varying lengths
- Splayed or notched frame rails and/or extensions shall not be accepted
- Provides foundational strength and stability of the cab tilt system which provides superior access to engine and cooling components

FRAME FINISH - NO EXECPTIONS

The frame shall be **HOT DIPPED GALVANIZED** to resist weather, dirt and other corrosive material

FRONT BUMPER

The chassis shall be equipped with a Maximum Force front bumper featuring:

- 12” high with a 3” flange and 102” wide
- ASTM A572 Grade 50 steel offering superior strength and rigidity with less weight
- A flange thickness of .5”
- Web face thickness of .282”

BUMPER EXTENSION

The bumper shall extend 12.5” from the cab fascia to the edge of the bumper face.

FRONT BUMPER PAINT

The front bumper shall be painted the same color as the lower color of the apparatus.

TOW HOOKS

Two (2) tow hooks shall be mounted to the bumper extension under the bumper towards the rearward section of the extension. The tow hooks shall be steel and shall be powder coated black.

ELECTRICAL SYSTEM

There shall be a 12 volt direct current single starting electrical system providing power to all components for the cab and chassis. The system shall feature:

- A Weldon Multiplexed system
- 300 degree Fahrenheit high temperature, flame retardant loom
- All SAE wiring color coded and labeled as to its function
- Wiring which is cross link with 311 degree Fahrenheit insulation
- A suppressed system in accordance with SAE J551

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload.

General protection circuit breakers will be a combination of automatic and manual reset breakers. This will provide a durability and capacity maximization of the electrical system. When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

EMI/RFI PROTECTION

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself.

EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL HARNESSING INSTALLATION

To ensure rugged dependability, all wiring harnesses installed by the apparatus manufacturer will conform to the following specifications:

SAE J1128 - Low tension primary cable

SAE J1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring

SAE J163 - Low tension wiring and cable terminals and splice clips

SAE J2202 - Heavy duty wiring systems for on-highway trucks

NFPA 1901 - Standard for automotive fire apparatus

FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses

SAE J1939 - Serial communications protocol
SAE J2030 - Heavy-duty electrical connector performance standard
SAE J2223 - Connections for on board vehicle electrical wiring harnesses NEC - National Electrical Code
SAE J561 - Electrical terminals - Eyelet and spade type
SAE J928 - Electrical terminals - Pin and receptacle type A

For increased reliability and harness integrity, harnesses will be routed throughout the cab and chassis in a manner which allows the harnessing to be laid into its mounting location. Routing of harnessing which requires pulling of wires through tubes will not be allowed.

Wiring will be run in loom or conduit where exposed, and have grommets or other edge protection where wires pass through metal. Wiring will be color, function and number coded. Wire colors will be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires and uses a single wire color for all wires will not be allowed. Function and number codes will be continuously imprinted on all wiring harness conductors at 3.00" intervals. All wiring installed between the cab and into doors will be protected by an expandable rubber boot to protect the wiring. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

- All wire ends not placed into connectors will be sealed with a heat shrink end cap. Wires without a terminating connector or sealed end cap will not be allowed.

- All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.

- Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.

- For low cost of ownership, electrical components designed to be removed for maintenance will be quickly accessible. For ease of use, a coil of wire will be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.

- Corrosion preventative compound will be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation of the plug.

- Any lights containing non-waterproof sockets in a weather-exposed area will have corrosion preventative compound added to the socket terminal area.

- All electrical terminals in exposed areas will have protective Coating applied completely over the metal portion of the terminal.

- Rubber coated metal clamps will be used to support wire harnessing and battery cables routed along the chassis frame rails.

- Heat shields will be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust will be protected by a heat shield.

- 10.Cab and crew cab harnessing will not be routed through enclosed metal tubing. Dedicated wire routing channels will be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab will allow for easy routing of additional wiring and easy access to existing wiring.

- 11. All braided wire harnesses will have a permanent label attached for easy identification of the harness part number and fabrication date.

- 12. All standard wiring entering or exiting the cab will be routed through sealed bulkhead connectors to protect against water intrusion into the cab.

BATTERY CABLE INSTALLATION

All 12-volt battery cables and battery cable harnessing installed by the apparatus manufacturer will conform to the following requirements:

SAE J1127 - Battery Cable
SAE J561 - Electrical terminals, eyelets and spade type
SAE J562 - Nonmetallic loom
SAE J836A - Automotive metallurgical joining
SAE J1292 - Automotive truck, truck-tractor, trailer and motor coach wiring
NFPA 1901 - Standard for automotive fire apparatus

Battery cables and battery cable harnessing will be installed utilizing the following guidelines:

- All battery cables and battery harnesses will have a permanent label attached for easy identification of the harness part number.

- Splices will not be allowed on battery cables or battery cable harnesses.

- For ease of identification and simplified use, battery cables will be color coded. All positive battery cables will be red in color or wrapped in red loom the entire length of the cable. All negative battery cables will be black in color.

- For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus will be coated to prevent corrosion.

ELECTRICAL COMPONENT INSTALLATION

All lighting used on the apparatus will be, at a minimum, a two (2) wire light grounded through a wired connection to the battery system. Lights using an apparatus metal structure for grounding will not be allowed.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests will be recorded and provided to the purchaser at time of delivery.

BATTERY COMPARTMENTS

A well ventilated battery storage compartment shall house the batteries on the officer and driver side of the chassis and shall be located so as to offer easy access to the batteries when the cab is tilted.

The each battery compartment shall feature:

- 3/16" steel construction with powder coated finish
- A complete floor of heavy duty, industrial grade, recycled Turtle Tile brand interlocking matting
- A double hinged powder coated steel cover with two (2) push button latches shall be utilized providing easy access to the batteries, while also being capable of supporting a 250 lb. load. No tools shall be required to gain access to the batteries.
- When in the open position, the double hinged door shall be flush with the bottom of the battery compartment, allowing for a sweep out style floor and removal of the batteries when necessary, without the inference of a lower lip. **NO EXCEPTIONS.**

BATTERY CABLES

The starting system shall include cables which shall be protected by a 275 degree F, minimum high temperature flame retardant loom.

The loom shall be sealed to keep out dirt, dust and debris.

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.

BATTERIES

The single start electrical system shall include six (6) AC-Delco BCI 31 950 CCA batteries.

The batteries shall feature:

- A 210 minute reserve capacity
- 4/0 welding type dual path starter cables per SAE J541
- Heat shrink and sealant encapsulated ends on the cables

ALTERNATOR

The charging system shall include a 320 amp Leece Neville 12 volt alternator. The alternator shall include a self-excited integral regulator.

HEADLIGHTS

A quadruple headlight assembly shall be provided in the fascia to enhance the look. The top two (2) bezels shall include head lamps while the lower bezels shall house a turn signal in the outboard position and a warning light in the inboard position.

HEADLIGHT FLASHER

An alternating high beam headlamp flashing system shall be installed into the high beam headlamp 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.

FRONT TURN SIGNALS

Two (2) Whelen Series 600 LED square, front turn signal assemblies shall be included on the front fascia directly below the headlights, one each side of the cab grille. Each turn signal shall be mounted in an attractive façade style bezel which is an integral part of the fascia.

SIDE MARKER LIGHTS

Two (2) Weldon amber LED round, side marker light assemblies shall be mounted on the side of the cab ahead of the driver door, adjacent to the front head lamp bezel.

FRONT MARKER LAMPS

The cab front shall include five (5) LED amber marker lamps above the windshield in accordance with the Department of Transportation requirements.

CORNERING LIGHTS

There shall be two (2) Whelen #600 halogen cornering lights which shall be mounted, one (1) on each of the driver and officer bumper tails for additional lighting when turning a corner. Each lamp shall illuminate when the respective turn signal is activated.

GROUND LIGHTS

Each door shall include a Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the cab step below each door.

Each light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.

CAB STEP LIGHTING

One (1) LED light shall be mounted to the riser of the middle cab step, a total of four (4) step lights for the cab, in accordance with NFPA.

Each light shall include a polycarbonate lens and shall be contained in a housing which is vibration welded with a bulb which shall be shock mounted. Each step light shall not be any larger than 3" in diameter.

ENGINE COMPARTMENT LIGHTING

One (1) LED light shall be mounted to the engine compartment in such a fashion as to provide as much light as possible to the engine compartment area. The engine compartment lighting shall activate with the tilting of the cab.

INTERIOR OVERHEAD CAB LED LIGHTING

Each cab door shall include an LED lamp with a red and a clear lens.

The clear lamp shall illuminate with the opening of each respective door with both the red and clear portions of the lamp activated by individual switches on each lamp.

CAB INSTRUMENTATION

The instrumentation panel within the cab shall feature a Pacific Insight gauge panel which shall include three (3) 5"diameter information centers, telltale indicator lamps, control switches, alarms, and a LCD diagnostic panel.

The gauges shall be easy to read including red backlighting.

The instrument panel shall contain the following gauges and indictors:

The middle information center shall include:

- A programmable speedometer to read either 0 to 140 MPH or 0 to 140 KM/H
- An amber telltale lamp indicating the Check Engine
- An amber telltale lamp indicating MIL Engine Emissions System Malfunction
- A red telltale lamp indicating Stop Engine
- A tachometer gauge with 0-3,000 RPM

The right hand side information center shall include:

- A gauge to display the engine oil pressure with high and low level indicators and stop engine alarm
- A fuel level gauge with a low fuel indicator and alarm
- An LED bar displaying 4 stages of the level for the Diesel Exhaust Fluid (DEF) with a refill indicator
- A voltage gauge with low voltage indicator
- A water temperature gauge with high water temp indicator and alarm

The left hand side information center shall include:

- A primary air PSI gauge including low air and high air warning displays
- A secondary air PSI gauge with low and high air warning indication

An LCD diagnostic display, located in the left hand side information center shall include digital readouts for the following:

- Odometer
- Transmission oil temp
- Engine oil temp
- Speedometer
- Engine hours
- Engine and transmission code
- Exhaust temp
- Engine coolant temp
- Engine oil PSI
- Turbo boost PSI

- Primary air pressure
- Secondary air pressure
- Engine load %
- Engine torque
- Battery volts
- Fuel level %
- Vehicle speed
- RPM
- DEF level
- Instant fuel economy
- Average fuel economy
- Engine hours
- Capable to record four trips, each shall be include · Trip distance · Fuel economy · Fuel used · Idle fuel used
- The LCD screen shall also provide diagnostic capability

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located below the middle information center. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols. The following indicator lamps shall be located on the Telltale panel:

BLUE Indicator Lights

- High Beam Headlight

GREEN Indicator Lights

- Right Turn Indicator
- Left Turn Indicator
- Battery On (Always On)

YELLOW Indicator Lights

- Particle Filter Regeneration (DPF)
- Regeneration Inhibit (Switch Engaged)
- Check Transmission
- Air Intake Restriction
- High Exhaust System Temperature (HEST)
- Wait to Start
- ATC (Automatic Traction Control) (when applicable)
- Water in Fuel

RED Indicator Lights

- Low Engine Coolant Level
- Air Bag Warning (when applicable)
- High Transmission Temperature
- ABS
- Parking Brake

ALARMS

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Alarm silence: Any active audible alarm will be able to be silenced with a button on the right side of the LCD screen.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

DIAGNOSTIC PANEL

A diagnostic panel shall be accessible while standing on the ground and located inside the driver's side door, left of the steering column. The diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved trouble shooting providing a lower cost of ownership. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist.

The diagnostic panel shall include the following:

- Engine diagnostic port
- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (when applicable)
- V-Mux USB diagnostic port (when applicable)
- Engine diagnostic switch (blink codes flashed on check engine telltale indicator)
- Diesel particulate filter regeneration switch (when applicable)
- Diesel particulate filter regeneration inhibit switch (when applicable)

ELECTRONIC WINDSHIELD WASHER INDICATION

The windshield washer level shall be electronically available to the Driver through the Vista screen.

ELECTRONIC POWER STEERING FLUID INDICATION

The level of the power steering fluid shall be electronically available to the Driver through the Vista screen.

IGNITION

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a Land & Sea brand two position switch, of which shall be mounted on the left side Driver kick Panel.

A push button type starter button shall be provided on the driver dash to the left of the steering wheel.

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

POWER & GROUND STUD

An electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud.

MULTIPLEX DISPLAYS

Two (2) Weldon Vista IV displays shall be located one (1) on the driver's side dash and one (1) on the officer's side of the dash.

The Vista IV displays shall feature:

- A full color LCD display screens
- A message bar displaying the time of day, and important messages requiring acknowledgement by the user
- Four (4) push button style controls on either side of the screen for the on-board diagnostics
- Seven (7) push button style controls located below the screen for the on-board diagnostics
- Video ready display screens for back- up cameras, thermal cameras, and DVD
- A DIN type input connector ready for GPS interfacing shall be incorporated into the back of the display

The Vista IV displays shall measure approximately 10.38" wide x 7.5" in height. Each shall offer varying fonts and background colors, shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

BACKLIGHTING COLOR

The instrumentation gauges and the switch panel legends shall be backlit using amber LED backlighting.

INSTRUMENTATION PANEL

The instrumentation panel inlay shall be painted job color.

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 through an on/off switch and individual low/medium/high selector switches on the right side of the steering wheel. The engine brake status shall be displayed through indicator lights on the dash panel in view of the driver.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The head light shall be activated through a button on the left side of the steering wheel. The marker lights shall be activated through the Vista.

HEADLIGHT FLASHER SWITCH

The alternating high beam headlamp switch shall be located on the driver console.

GROUND LIGHT ACTIVATION

The ground lights shall activate when the park brake is engaged.

The step lighting shall activate by opening any of the cab doors.

REARVIEW MIRROR REMOTE ACTIVATION

The driver's panel shall include activation for the rearview mirrors remote function. The activation for the mirror heat shall be through the Weldon Vista screen.

HEATING AND COOLING CONTROLS

The HVAC system shall be controlled through all available vistas, and the HVAC system for the crew area shall be controlled through a manual panel located in the crew area.

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 driver's side dash to the right of the steering column within easy reach of the driver.

WINDSHIELD WIPER ACTIVATION

The windshield wipers shall be activated through a switch on the smart wheel.

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. Each switch shall be located in a covered location.

DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder system installed. The system shall be designed to meet NFPA 1901. 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
- Service Brake
- Engine Hours
- 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. The laptop connection shall be a panel mounted female type A USB connection point, remotely mounted in the left side foot well of the cab. The latest software shall be available for download from the Weldon website.

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 activate an indicator light in the instrument panel, a digital seat position indicator with a seat position legend in the switch 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.

REARVIEW CAMERAS

A heavy duty rearview style camera system shall be supplied including one (1) teardrop style cameras mounted to the officer's side of the apparatus below the windshield ahead of the front door and one (1) box style at the rear of the apparatus.

The cameras shall feature:

- Views of side and rear available through the multiplex screen on the driver dash
- Activation of the rear camera when the transmission is placed in reverse
- Activation of the right side camera with the activation of the right indicator
- Additional activation through the multiplex system

FLUID DATA PLAQUE

One (1) fluid data plaque containing required information shall be provided based on the applicable components for this apparatus, compliant with NFPA Standards:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Drive axle lubricant
- Power steering fluid
- Pump transmission lubrication fluid
- Other NFPA applicable fluid levels or data as required

Location shall be in the driver's compartment or on driver's door.

DATA LABEL

HEIGHT LENGTH & WEIGHT

A highly visible label indicating the overall height, length, and weight of the vehicle shall be installed in the cab dash area.

CAB SEATING POSITION LIMITS

The label shall also include the seating positions for firefighters. A weight allowance of 250 pounds for each shall be factored into the gross vehicle weight rating of the chassis.

NO RIDE LABEL

One (1) "NO RIDERS" label shall be applied on the vehicle at the rear step area or other applicable areas. The label shall warn personnel that riding in or on these areas, while the vehicle is in motion is prohibited.

HELMET WARNING TAG

One (1) label shall be installed in the cab, visible from each seating position. The label shall read "CAUTION: DO NOT WEAR HELMET WHILE SEATED." Helmets must be properly stowed while the vehicle is in motion according to the current edition of NFPA 1901.

REAR TOWING PROVISIONS

There shall be two (2) tow eyes furnished at the rear of the body and attached directly to each chassis frame rail. The tow eyes shall be accessible above the rear tailboard. The tow eyes shall be constructed of 3/4" plate steel with a 3" I.D. hole, large enough for passing through a tow chain end hook.

FRONT BUMPER GRAVELSHIELD

A 12" front to rear filler panel constructed from NFPA compliant, slip resistant aluminum tread plate shall be provided on the front chassis frame extension. The extension shall be covered on the top and sides, up to the level of front bumper and shall be reinforced to support one (1) firefighter (approximately 250 pounds) and the equipment specified to be installed.

HUB AND LUG NUT COVERS

The apparatus shall have chrome or stainless steel hub and lug nut covers on the front and tandem rear axles.

TIRE PRESSURE INDICATOR

There shall be a tire pressure indicator at each tire’s valve stem on the vehicle that shall

indicate if there is insufficient pressure in the specific tire.

EXHAUST SYSTEM

The chassis exhaust shall be modified and redirected to the right side of the apparatus and will exit ahead of the rear wheel.

EXHAUST HEAT SHIELD

A heat shield shall be installed under the body in the areas where the exhaust system is routed.

FRONT MUD FLAPS

One (1) pair of black mud flaps shall be installed behind the front wheels.

REAR MUD FLAPS

One (1) pair of black mud flaps shall be installed behind the rear wheels.

ON-SPOT TIRE CHAINS

"On-Spot" automatic tire chains shall be installed on the rear axle of the apparatus. A switch installed on the cab dash shall allow the operator to "Engage" and "Disengage" the tire chains without stopping to enhance traction and braking while in forward or reverse motion. The system shall include protective switch guard, continuous duty solenoid, arm bearings and replaceable chainplates.

INTERIOR CABINET

There shall be one (1) full height storage cabinet installed on the back wall of the interior cab. The cabinet shall be constructed of smooth aluminum plate. The cabinet shall have approximate interior dimensions of 36" Wide x 18" Deep x Full Height.

Three (3) vertically adjustable shelves shall be installed in the cabinet. The shelves shall be constructed of smooth aluminum plate. Each shelf shall have a 1" front bend for added strength.

The shelves shall be mounted with extruded aluminum adjustable shelf track attached to the walls and secured with aluminum brackets to the tracks to allow for vertical height adjustment.

The cabinet shall be equipped with a roll-up door constructed of anodized aluminum.

The cabinet’s exterior finish shall match the interior finish of the chassis cab.

The cabinet’s interior shall have a natural finish.

Two (2) adjustable shelf shall be installed in the interior cab compartment. The shelf shall be constructed from aluminum.

REAR 4" AERIAL INLET

One (1) 4" rear inlet connection shall be installed to supply to the aerial device and piped with 4" steel pipe. The rear inlet shall have 4" NST male threads and a 4" NST rocker lug cap with cable or chain.

There shall be a 1-1/2" drain installed in the rear aerial supply line with control on the rear of the apparatus body. There shall be an adjustable relief valve installed in the aerial supply line. The relief valve shall be installed to dump water away from the operator's panel.

A color coded nameplate labels shall be provided at rear and on the pump panel control handle.

CHASSIS REQUIREMENTS FOR AERIAL APPARATUS

The following items shall be included with the chassis to operate the aerial device:

Truck chassis with a selectable high idle system. High idle to be set at 1,200 rpm

A red warning light installed in the driving compartment and visible to the driver to indicate if any outrigger is not in the stowed position.

There shall be a (hot shift) PTO system mounted to the chassis transmission. The PTO assembly shall supply power to the hydraulic pump for all aerial operations. Electrical safety wiring shall be installed that requires the transmission be in neutral, or the fire pump engaged and the parking brake set before the PTO will operate.

A PTO engaged indicator light shall be installed in the cab of the apparatus.

BODY BUILDER REQUIREMENTS FOR AERIAL APPARATUS

The following items shall be installed by the body builder for the aerial device:

Auxiliary outrigger plates, 2 ft. X 2 ft. for each outrigger. Outrigger plates to be installed on heavy aluminum brackets and installed adjacent to each outrigger.

A preset relief valve capable of protecting the waterway system by relieving pressure through the dumping of water to the environment. Relief valve shall be plumbed to dump excess water below chassis frame.

A 1-1/2 inch minimum drain valve shall be installed at the low point of the waterway inlet system. Handle to operate drain valve shall be extended to rear of body.

Reflective striping shall be installed on all stabilizers that protrude beyond the body of the apparatus.

Warning signs for the aerial and outriggers shall be installed to meet the aerial manufacturer recommendations.

A leveling bubble shall be installed on the rear of the truck, for side to side leveling.

A leveling bubble shall be installed at the rear of the truck, for front to rear leveling.

There shall be a ladder alignment indicator provided on the turntable to indicate when the ladder is aligned with the travel support and may be lowered into it.

A Load Chart with indicator arrow shall be mounted, visible to aerial operator.

SAFETY HARNESS

The aerial apparatus shall be equipped with four (4) Pac Mule A2241 belts. The safety belts shall be provided by the apparatus body builder.

HEAVY DUTY EXTRUDED ALUMINUM BODY

To prevent possible interaction of dissimilar metals and to reduce the weight of the completed apparatus, the body and ALL STRUCTURAL SUPPORTS shall be constructed entirely of aluminum sheet and aluminum extrusions.

Aluminum extrusions or sheet aluminum of smaller thicknesses or lesser grades to those specified herein are not acceptable.

All extrusions utilized in the body superstructure, substructure and framing shall be 6061-T6 alloy aluminum. For strength and rigidity, all aluminum sheet utilized in the apparatus body for structural support shall be a minimum of 3/16" 5052-H32 alloy aluminum sheet. All extrusions shall be beveled at each joint and all seams shall be electrically seam welded using #5356 alloy aluminum wire.

FASTENERS

All fasteners use in the apparatus body shall be attached with Ny-Lok type fasteners.

All aluminum and stainless steel components shall be attached using stainless steel fasteners. Zinc or cadmium plated fasteners are not acceptable for use with any aluminum or stainless steel components on the vehicle.

Compartment door hinges, handrails and running boards shall be attached using a minimum of 1/4" diameter machine bolt fasteners. Fasteners used in nonstructural areas such as; door handles, trim moldings, gauge mounting, etc shall be 3/16" in diameter.

BODY SUPERSTRUCTURE CONSTRUCTION

All vertical and horizontal structural members of the outer apparatus body shall be constructed of no less than 4.00" by 12.00", 6061-T6 aluminum extrusions with a minimum .200" wall thickness fully welded together forming a unitized support system for the body and compartments. In order to provide a complete internal and integrated body super-structure, full height extruded structural members shall be provided at each corner of the apparatus and between each exterior equipment compartment.

EXTERIOR COMPARTMENT CONSTRUCTION

Compartment sides and walls shall be welded to the super-structure. Seams shall be sealed using an engineered grade polyurethane adhesive-sealant.

The compartments shall be designed to provide protected raceways for vertically hinged door fastener retention elements. This requirement shall eliminate the possibility of door hinge hardware from being damaged by or damaging equipment stored in the compartments.

The compartment door openings are to be full width of the compartment with no loss of space. The raceways shall be designed to allow door hardware removal by a single person with simple hand tools.

Full height access panels fastened with stainless steel fasteners shall be provided to access all wiring routed through vertical super-structure extrusions. There shall be no exposed wiring allowed within the compartment interiors.

Compartment flooring shall be constructed of a combination aluminum extrusion and aluminum treadplate welded in place to the extruded aluminum framework creating a double compartment floor for added strength. Due to the high usage and wear and tear caused by removal of equipment, only treadplate aluminum with a raised pattern will be acceptable for compartment flooring. Bolted or welded in smooth raw aluminum or painted aluminum does not meet the intent nor technical requirement of raised pattern treadplate.

There shall be no floor welds visible from the interior of the equipment compartments.

The tops of the side exterior compartments shall be constructed of NFPA #1901 Standards compliant non-slip polished aluminum treadplate fastened to the body with stainless steel fasteners. Compartment tops that are welded in place do not meet the serviceability intent of this requirement.

SHELVING TRACKS

The vertical extrusions forming the framework of the side exterior compartmentation shall be designed to incorporate FULLY RECESSED adjustable shelving standards. Shelving tracks shall run full height of ALL side exterior equipment compartment.

The intent of this requirement is to allow full use of the available storage areas without the interference of shelving tracks extending into and reducing the interior widths of the compartments which will allow equipment to be stored within the full width of the compartment interiors.

Shelving, when specified, shall have a width of no less than .50" of the overall compartment width.

Adjustable shelving tracks welded or bolted onto interior walls of the compartments do not meet the intent of these specifications.

ELECTROLYSIS CORROSION CONTROL

The apparatus shall be assembled using ECK or electrolysis corrosion control, on all high corrosion potential areas, such as door latches, door hinges, trim plates, fenderettes, etc. This coating is a high zinc compound that shall act as a sacrificial barrier to prevent electrolysis and corrosion between dissimilar metals. This shall be in addition to any other barrier material that may be used.

All 1/4" diameter and smaller screws and bolts shall be stainless steel with a powdered aluminum coating. This coating shall be bonded metallurgically to the stainless screws to prevent peeling and flaking. This coating is designed to reduce the potential for electrolysis and corrosion to occur where items are assembled and attached.

Due to the expected life of the vehicle, proposals will only be acceptable from manufacturers that include these corrosion features.

OUTRIGGER COVERS

Polished 3/16" aluminum treadplate covers shall be attached to the extending outrigger assemblies.

HINGED COMPARTMENT DOOR CONSTRUCTION

Any compartment calling for a hinged door shall be supplied with a flush style door, so that all hinged compartment doors shall be of the overlapping style so that the entire door fits flush against the apparatus body sides. Doors shall be designed, in the closed position, to have the painted edges protected from damage on the tops by forming the treadplate compartment tops into a extended drip edge, on the bottoms by the rub rail and on the front and rear by extending the front and rear vertical scuff plates into protective edges. There shall be no visible painted door edge surfaces when the doors are in the closed position. Doors shall not extend into the compartments thereby reducing the usable compartment depths.

Doors shall be a minimum 2" thick, fabricated of a minimum of 1/8" smooth aluminum. Full panel inner compartment door liners shall be provided and constructed from smooth aluminum. Exterior door panels shall be smooth with no welds visible on the exterior skin. Double door compartments shall not require nor be equipped with a secondary latch to hold the same in position.

All compartment door hinges shall be full length piano type constructed of a minimum 14 gauge type 304 polished stainless steel with 1/4" stainless steel hinge pin with dual directional bolt holes for ease of adjustment. Door hinges shall be fully recessed and protected from the environment by the door gasket. The door hinges shall not be visible from the outside of the body when the doors are in the closed position.

Striker plates shall be a minimum of 12 gauge stainless steel and posts shall be positioned so they do not interfere with the clear door openings by pointing down. Door retention studs or posts on striker plates that extend into the clear door frame opening do not meet the technical intent of these specifications and are not acceptable. Door hinges and striker plates shall be attached with minimum 5/16" stainless steel nuts and bolts.

On vertically hinged double door compartments, the secondary door shall have a nylon door holders, top and bottom of the interior of the door to hold the door in place when closed. When specified, horizontally hinged lift-up doors shall be equipped with heavy-duty gas filled dampeners to hold the doors in the open position. All other hinged doors shall be equipped with spring loaded hold open devices specifically designed for use on vertically hinged doors. Door holders shall be bolted in position. The door ajar switches shall be fully enclosed within structural members and shall not extend into the clear door opening.

All hinged compartment doors shall be provided with hollow core weather stripping to provide a weather tight seal at the door opening and to prevent road spray and debris from entering the compartment.

Hinge door openings shall match the compartment sizes. NO EXCEPTIONS.

EXTERIOR DOOR HANDLES

All compartment doors shall be furnished with a large Hanson Model #102 solid STAINLESS STEEL spring loaded D-handle with slam type latches. D-handles shall have the large style "bent" D-ring for ease of grabbing the handle even when wearing mitts or gloves. Chrome plated standard steel D-handles are not acceptable.

Door handles shall be held in place with four stainless steel stud fasteners secured on the interior of the

door skin to eliminate bolt heads on the exterior latch ring. To prevent possible interaction between dissimilar metals, the studs shall not break any painted surface. A non-moisture absorbing gasket shall be installed between the door latch and the door skin panel.

Handles which are held in place with visible fasteners, two sided tape or glue do not meet the intent of this requirement.

SIDE BODY HEADER

All high side compartment tops shall be NFPA approved non-slip treadplate with the side body header area above the compartment doors a smooth aluminum painted surface.

Lower or rear face compartments, if specified shall be provided with polished aluminum drip rails.

TANDEM AXLE REAR MOUNT AERIAL/PLATFORM BODY

A tandem axle rear mount aerial/platform body shall be provided and constructed as follows:

HEAVY DUTY EXTRUDED ALUMINUM BODY SUB-STRUCTURE

A minimum of four (4) 4.00" high by 2.50" wide tubular "I" beam horizontal crosstubes with a .375" vertical wall thickness shall be provided on each side of the body. The horizontal "I" beams shall run from within 1.00" of the aerial torque box outward and shall be routed through and fully welded to the vertical and horizontal structural extrusions forming the body super-structure.

The exterior side equipment compartments shall be bolted to no less than three (3) horizontal formed steel channels welded directly to the aerial torque box. The channels shall be no less than 3.00" X 10.75" X .25" with a return lip of no less than 3.00" and shall be formed to "receive" the horizontal aluminum extruded I-beams incorporated into the body sub-structure system. The horizontal "I" beam shall be bolted to the horizontal formed steel channels. All interface areas between the steel channels and aluminum extruded members shall be isolated by an elastomeric isolator.

BODY WIDTH

The overall width of the aerial body shall not exceed 100". The overall width across the rub rails shall be 101".

COMPARTMENT LINING

The floor area and all shelves for all compartments shall be fitted with removable vinyl Turtle Tile matting. The matting shall be interlocking modules approximately 12" square by 9/16" thick. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

TRANSVERSE COMPARTMENT (L2 to R2)

A separate enclosed, full body width, transverse compartment module shall be furnished to the rear of the chassis cab. This compartment is to be furnished with full height hinged double doors on each side of the module.

The floor of the transverse compartment shall extend from the running board level in to the chassis frame, then up and over the frame rails providing a full width opening above the frame rail level.

49” wide x 60”high x 25” deep in lower section

A removable louvered vents shall be provided in the compartment.

The compartment shall be equipped with the following:

ADJUSTABLE SHELF – LEFT SIDE

One (1) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

ADJUSTABLE SHELF – RIGHT SIDE

One (1) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

500# ROLLOUT TRAY – LEFT SIDE

One (1) rollout equipment tray shall be installed in a standard depth compartment. The 500# rated tracks shall have roller bearings. The tray shall be constructed of .188" smooth aluminum plate, fabricated with four 3" sides.

The unit shall roll fully out of the compartment, with a gas operator to hold tray in both the "in and out" positions.

500# ROLLOUT TRAY – RIGHT SIDE

One (1) rollout equipment tray shall be installed in a standard depth compartment. The 500# rated tracks shall have roller bearings. The tray shall be constructed of .188" smooth aluminum plate, fabricated with four 3" sides.

The unit shall roll fully out of the compartment, with a gas operator to hold tray in both the "in and out" positions.

Two (2) 54" long Fire Research Sun Strip LED Work Lights model LED200-A54 shall be installed, one (1) on each side of the door openings on both the officer and drivers sides. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have fifty-four (54) white LEDs that generate a rated 900 lumens of light at 12 vdc/1.05 amps and have a life span of over 50,000 hours. Each light shall fit in a 56" space and be secured with four (4) molded nylon mounting clips.

The compartment lights will be controlled by an automatic "On-Off" switch located on each compartment door

LEFT FRONT COMPARTMENT (L1) - ABOVE FRONT OUTRIGGER

There shall be one (1) compartment located above the front outrigger. The compartment shall be equipped with a single horizontal hinged lift up door.

24” long x 17” high x 12” deep

A removable louvered vent shall be provided in the compartment.

Two (2) 9" long Fire Research Sun Strip LED Work Lights model LED200-A09 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be

suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have nine (9) white LEDs that generate a rated 150 lumens of light at 12 vdc/0.17 amps and have a life span of over 50,000 hours. Each light shall fit in an 11" space and be secured with two (2) molded nylon mounting clips.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

LEFT FRONT COMPARTMENT (L3)- AHEAD OF REAR WHEELS

There shall be one (1) full height compartment located ahead of the rear wheels. The compartment shall be equipped with a full height double hinged doors.

40” wide x 60” high x 25” deep

A removable louvered vent shall be provided in the compartment.

The compartment shall be equipped with the following:

250# TIP-DOWN TRAY

One (1) SlideMaster SMT-R Series tip-down equipment tray(s) shall be installed that is(are) approximately half the depth of the body width. The tray assembly shall have a silver powder coated steel slide frame with sealed roller bearings rated to 250 pounds. A tray constructed of .190" smooth aluminum plate with four 3" sides shall be mounted to the slide frame. The slide frame shall extend out of the compartment while tipping downward to approximately 30 degrees when fully extended. A integrated manual quarter turn lock shall hold tray in the "in" position. Gravity shall hold the tray in the "out" position. The slide shall have a 2-5/8" deck height.

Two (2) 54" long Fire Research Sun Strip LED Work Lights model LED200-A54 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

LEFT UPPER COMPARTMENT (L4) - ABOVE FRONT TANDEM

There shall be one (1) compartment above the tandem's front wheels. The compartment shall be equipped with a single hinged lift up door.

74” wide x 26” high x 24” deep

A removable louvered vent shall be provided in the compartment.

The compartment shall be equipped with the following:

SWING-OUT ALUMINUM TOOL BOARD

One (1) 250 lb. rated capacity fire apparatus swing-out tool board(s) shall be provided. Swing-out tool board(s) shall be provided with 3/16" cadmium plated mounted brackets securely mounted to reinforced mounting points on the apparatus body. Two (2) mounting points shall be on a vertical surface, (1) at the top of the bracket and (1) at the bottom extending approximately 5" from the vertical mounting point. The upper and lower pivot points of the swing-out tool board shall include heavy duty bronze bearings for extended life. Due to the weight of the equipment intended to be carried on the tool board, the mounting

points on the apparatus body shall be suitably designed to support the intended weight.

A single latch mechanism shall be provided to lock the tool board in the stored position and in the opened position. The handle shall be an inverted "U" shape for easy access with a gloved hand, painted yellow in color.

The frame of the tool board shall be fabricated of steel tubing welded into a module. Attached to this module shall be a .125" aluminum tool board panel for mounting equipment. Special brackets attached to this tool board shall be provided as listed elsewhere in these specifications.

Two (2) 18" long Fire Research Sun Strip LED Work Lights model LED200-A18 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have eighteen (18) white LEDs that generate a rated 300 lumens of light at 12 vdc/0.35 amps and have a life span of over 50,000 hours. Each light shall fit in a 20" space and be secured with two (2) molded nylon mounting clips.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

LEFT UPPER COMPARTMENT (L5) - ABOVE REAR TANDEM

There shall be one (1) upper compartment above the above the tandem's rear wheels and the low compartment behind the tandem's rear wheels. The compartment shall be equipped with a single hinged lift up door.

28”wide x 17” high x 23” deep

A removable louvered vent shall be provided in the compartment.

The compartment shall be equipped with the following:

Two (2) 9" long Fire Research Sun Strip LED Work Lights model LED200-A09 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have nine (9) white LEDs that generate a rated 150 lumens of light at 12 vdc/0.17 amps and have a life span of over 50,000 hours. Each light shall fit in an 11" space and be secured with two (2) molded nylon mounting clips.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

LEFT REAR COMPARTMENT (L6) - BEHIND REAR WHEELS

There shall be one (1) low compartment located behind the rear wheels. The compartment shall be equipped with low double hinged doors.

34” wide x 51” high x 23” deep

A removable louvered vent shall be provided in the compartment.

The compartment shall be equipped with the following:

SCBA CYLINDER STORAGE

One (1) formed aluminum storage unit shall be provided to store twenty (20) fire department-supplied air cylinder. Unit to be horizontally or vertically installed and with 1/8" rubber lining for durability and to provide scuff protection to the air cylinder. The aluminum storage unit shall have a sanded aluminum finish.

Two (2) 18" long Fire Research Sun Strip LED Work Lights model LED200-A18 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have eighteen (18) white LEDs that generate a rated 300 lumens of light at 12 vdc/0.35 amps and have a life span of over 50,000 hours. Each light shall fit in a 20" space and be secured with two (2) molded nylon mounting clips.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

LEFT TURNTABLE ACCESS - BEHIND REAR OUTRIGGER

There shall be one (1) left side turntable access cavity, 25" wide, located behind the rear outrigger. The floor and sides of the turntable access cavity shall be finished with polished aluminum treadplate.

RIGHT SIDE BODY COMPARTMENTS

The right side body compartmentation shall be as follows:

RIGHT FRONT COMPARTMENT (R1)- ABOVE FRONT OUTRIGGER

There shall be one (1) compartment located above the front outrigger. The compartment shall be equipped with a single horizontal hinged lift up door.

24” long x 17” high x 12” deep

A removable louvered vent shall be provided in the compartment.

Two (2) 9" long Fire Research Sun Strip LED Work Lights model LED200-A09 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have nine (9) white LEDs that generate a rated 150 lumens of light at 12 vdc/0.17 amps and have a life span of over 50,000 hours. Each light shall fit in an 11" space and be secured with two (2) molded nylon mounting clips.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

RIGHT FRONT COMPARTMENT (R-3) - AHEAD OF REAR WHEELS

There shall be one (1) full height compartment located ahead of the rear wheels. The compartment shall be equipped with a full height double hinged doors.

40” wide x 60” high x 25” deep

A removable louvered vent shall be provided in the compartment.

The compartment shall be equipped with the following:

250# TIP-DOWN TRAY

One (1) SlideMaster SMT-R Series tip-down equipment tray(s) shall be installed that is(are) approximately half the depth of the body width. The tray assembly shall have a silver powder coated steel slide frame with sealed roller bearings rated to 250 pounds. A tray constructed of .190" smooth aluminum plate with four 3" sides shall be mounted to the slide frame. The slide frame shall extend out of the compartment while tipping downward to approximately 30 degrees when fully extended. A integrated manual quarter turn lock shall hold tray in the "in" position. Gravity shall hold the tray in the "out" position. The slide shall have a 2-5/8" deck height.

Two (2) 54" long Fire Research Sun Strip LED Work Lights model LED200-A54 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

RIGHT UPPER COMPARTMENT – (R4) ABOVE FRONT TANDEM

There shall be one (1) compartment above the tandem's front wheels. The compartment shall be equipped with a single hinged lift up door.

74” wide x 26” high x 24” deep

The compartment shall be equipped with the following: SWING-OUT ALUMINUM TOOL BOARD

One (1) 250 lb. rated capacity fire apparatus swing-out tool board(s) shall be provided. Swing-out tool board(s) shall be provided with 3/16" cadmium plated mounted brackets securely mounted to reinforced mounting points on the apparatus body. Two (2) mounting points shall be on a vertical surface, (1) at the top of the bracket and (1) at the bottom extending approximately 5" from the vertical mounting point. The upper and lower pivot points of the swing-out tool board shall include heavy duty bronze bearings for extended life. Due to the weight of the equipment intended to be carried on the tool board, the mounting points on the apparatus body shall be suitably designed to support the intended weight.

A single latch mechanism shall be provided to lock the tool board in the stored position and in the opened position. The handle shall be an inverted "U" shape for easy access with a gloved hand, painted yellow in color.

The frame of the tool board shall be fabricated of steel tubing welded into a module. Attached to this module shall be a .125" aluminum tool board panel for mounting equipment. Special brackets attached to this tool board shall be provided as listed elsewhere in these specifications.

A removable louvered vent shall be provided in the compartment.

Two (2) 18" long Fire Research Sun Strip LED Work Lights model LED200-A18 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have eighteen (18) white LEDs that generate a rated 300 lumens of light at 12 vdc/0.35 amps and have a life span of over 50,000 hours. Each light shall fit in a 20" space and be secured with two (2) molded nylon mounting clips.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

RIGHT UPPER COMPARTMENT (R5) - ABOVE REAR TANDEM

There shall be one (1) upper compartment above the above the tandem's rear wheels and above the low compartment behind the tandem's rear wheels. The compartment shall be equipped with a single hinged lift up door.

28”wide x 17” high x 23” deep

A removable louvered vent shall be provided in the compartment.

The compartment shall be equipped with the following:

Two (2) 9" long Fire Research Sun Strip LED Work Lights model LED200-A09 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have nine (9) white LEDs that generate a rated 150 lumens of light at 12 vdc/0.17 amps and have a life span of over 50,000 hours. Each light shall fit in an 11" space and be secured with two (2) molded nylon mounting clips.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

RIGHT REAR COMPARTMENT (R6)- BEHIND REAR WHEELS

There shall be one (1) compartment located behind the rear wheels. The compartment shall be equipped with low double hinged doors.

34” wide x 51” high x 23” deep

The compartment shall be equipped with the following:

ADJUSTABLE SHELF

One (1) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

500# ROLLOUT TRAY

One (1) rollout equipment tray shall be installed in a standard depth compartment. The 500# rated tracks shall have roller bearings. The tray shall be constructed of .188" smooth aluminum plate, fabricated with four 3" sides.

The unit shall roll fully out of the compartment, with a gas operator to hold tray in both the "in and out" positions.

A removable louvered vent shall be provided in the compartment.

Two (2) 18" long Fire Research Sun Strip LED Work Lights model LED200-A18 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan

tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have eighteen (18) white LEDs that generate a rated 300 lumens of light at 12 vdc/0.35 amps and have a life span of over 50,000 hours. Each light shall fit in a 20" space and be secured with two (2) molded nylon mounting clips.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door.

RIGHT TURNTABLE ACCESS - BEHIND REAR OUTRIGGER

There shall be one (1) right side turntable access cavity, 25" wide, located behind the rear outrigger. The floor and sides of the turntable access cavity shall be finished with polished aluminum treadplate.

REAR COMPARTMENT

There shall be one (1) compartment located at the rear of the apparatus. The compartment shall be located within the aerial torque box to accommodate the ladders and pike poles as specified. The compartment shall be equipped with a single hinged aluminum treadplate lift up door.

A removable louvered vent shall be provided in the compartment.

Two (2) 18" long Fire Research Sun Strip LED Work Lights model LED200-A18 shall be installed, one (1) on each side of the door opening. The LEDs and electronics shall be enclosed in a 5/8" diameter Lexan tube that is sealed at both ends with EPDM rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120 degrees. The tube shall rotate to adjust the beam direction as required.

Each light shall have eighteen (18) white LEDs that generate a rated 300 lumens of light at 12 vdc/0.35 amps and have a life span of over 50,000 hours. Each light shall fit in a 20" space and be secured with two (2) molded nylon mounting clips.

The compartment light will be controlled by an automatic "On-Off" switch located on each compartment door

ACCESS LADDER – LEFT

There shall be a swing out and down access ladder supplied and installed on the left side apparatus, for accessing the aerial turntable. It shall be of an all aluminum design and shall incorporate treads six (6") inches deep and no more than eighteen (18") inches apart. The ground to the first step dimension, on level ground, shall be no more than eighteen (18") inches. When in the deployed position the ladder shall have an angle of approximately 75-degrees to facilitate ascending and descending the ladder. The ladder shall be retained in the stowed and deployed position by two (2) gas cylinders and shall not require the use of latches to hold it in position. A weatherproof switch shall sense the down position of the step and alert the driver should the vehicle emergency brake be released. This switch will be wired into the open door warning system.

ACCESS LADDER - RIGHT

There shall be a swing out and down access ladder supplied and installed on the right side apparatus, for accessing the aerial turntable. It shall be of an all aluminum design and shall incorporate treads six (6") inches deep and no more than eighteen (18") inches apart. The ground to the first step dimension, on level ground, shall be no more than eighteen (18") inches. When in the deployed position the ladder shall have an angle of approximately 75-degrees to facilitate ascending and descending the ladder. The ladder shall be retained in the stowed and deployed position by two (2) gas cylinders and shall not require the use of lathes to hold it in position.

REAR RUB RAIL

A single piece full body width polished aluminum rub rail shall be bolted in place at the rear of the body. The rub rail is to be removable for ease of repair or replacement. The rear rub rail shall be a heavy extruded aluminum "C" channel.

TANDEM WHEEL WELL LINER AND FENDERETTES

For ease of accessibility and maintenance, the tandem wheel well panels shall be constructed for ease of accessibility and maintenance, wheel well panels shall be double break formed painted smooth aluminum plate that is fully gasketed and bolted in place with stainless fasteners. Wheel wells shall be of the removable design so as to provide replacement in the event of damage. There shall be no visible bolt heads, retention nuts or fasteners on the exterior surface of the panel. Wheelwell panel shall be isolated from the apparatus body utilizing .25" nylon spacer blocks.

To fully protect the wheel well area from road debris and to aid in cleaning, a full depth (minimum of 24.00") radius wheel well liner constructed of exterior grade .25" black polyethylene sheet shall be provided. For ease of removal, the liner shall be held in place via means of a self-tension retention system. Due to possible corrosion and contamination by road debris in the wheel well area, mechanical fasteners shall not be used to secure the wheel well liner.

FENDERETTES

The rear wheel wells shall be radius cut for a streamlined appearance. A polished type 304 stainless steel radius fenderette shall be furnished at each rear wheel well opening, held in place with concealed stainless steel fasteners with nylon isolators to prevent contact of the fastener with the wheelwell housing panel. A black rubber gasket shall be installed between the stainless fenderette and the apparatus body sides. Silicone caulking does not meet the intent nor the technical requirement of a solid gasket material in this area and is not acceptable.

OUTRIGGER BODY PANELS

Body panels shall be installed at each outrigger to provide a clean, finished look to the outrigger cavity. Outrigger panels shall be double break formed from polished aluminum treadplate that is fully gasketed and bolted in place with stainless fasteners.

WHEEL WELL COMPARTMENT LEFT SIDE AHEAD OF WHEELS

One (1) wheel well compartment shall be located on the left side in the rear wheel well panel ahead of the rear wheels of the type specified herein.

One (1) breathing air cylinder storage compartment shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

One (1) one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

WHEEL WELL COMPARTMENT LEFT SIDE BETWEEN TANDEMS

One (1) wheel well compartment shall be located on the left side in the rear wheel well panel between the rear tandem wheels of the type specified herein.

Two (2) breathing air cylinder storage compartment shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Two (2) one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

WHEEL WELL COMPARTMENT LEFT SIDE BEHIND WHEELS

One (1) wheel well compartment shall be located on the left side in the rear wheel well panel behind the rear wheels of the type specified herein.

FUEL FILL DOOR

A fuel fill access assembly shall be provided on the left side rear wheel well area. The assembly shall include a brushed stainless steel fuel fill enclosure door and a black polymer fuel assembly. A label indicating DIESEL FUEL ONLY shall be applied.

WHEEL WELL COMPARTMENT RIGHT SIDE AHEAD OF WHEELS

One (1) wheel well compartment shall be located on the right side in the rear wheel well panel ahead of the rear wheels of the type specified herein.

One (1) breathing air cylinder storage compartment shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

One (1) one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

WHEEL WELL COMPARTMENT RIGHT SIDE BETWEEN TANDEMS

One (1) wheel well compartment shall be located on the right side in the rear wheel well panel between the rear tandem wheels of the type specified herein.

Two (2) breathing air cylinder storage compartment shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

Two (2) one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

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The cylinder storage compartment shall be constructed entirely of black polymer. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

Compartment shall be provided with SCBA cylinder scuff protection. A brushed stainless steel door shall be provided.

One (1) one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

STEP LIGHT

Two (2) LED step light(s) with clear lens shall be installed.

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SLIDE OUT REAR LADDER AERIAL TORQUE BOX

Ground ladders and pike poles shall be accessed from the rear of the apparatus. All ladders shall mounted individual brackets and slide on composite material so as not to damage the main beams of the ladders. Pike poles and the folding ladder shall be stored in individual storage area. Ladders shall have stops provided on the front of all slides so ladders will not slide forward during emergency braking conditions.

LADDER SOURCE

New ground ladders shall be provided by the bidder.

FOLDING ATTIC LADDER SOURCE

New folding attic ladders shall be provided by the bidder.

ROOF LADDER

One (1) Duo Safety Model 775-A, 14 foot aluminum roof ladder with folding steel roof hooks on one end and steel spikes on the other end shall be provided on the apparatus. The ladder shall meet or exceed all latest NFPA Standards.

ROOF LADDER

One (1) Duo Safety Model 875-A, 16 foot aluminum roof ladder with folding steel roof hooks on one end and steel spikes on the other end shall be provided on the apparatus. The ladder shall meet or exceed all latest NFPA Standards.

EXTENSION LADDER

One (1) Duo-Safety Model 900-A, 24 foot two (2) section aluminum extension ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA standards.

EXTENSION LADDER

One (1) Duo-Safety Model 1225-A, 35 foot three (3) section aluminum extension ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA standards.

FOLDING LADDER

One (1) Duo Safety Model 585-A, 10 foot folding aluminum ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA Standards.

COMBINATION LADDER

One (1) customer supplied Little Giant Ladder Model 10102, 9-15 foot combination aluminum extension ladder shall be mounted in the L2/R2 compartment.

PIKE POLE

Two (2) 4' pike pole with “D” handle shall be provided. The pike pole shall be of fiberglass construction.

PIKE POLE

Two (2) 6' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

PIKE POLE

Two (2) 8' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

PIKE POLE

Two (2) 10' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

PIKE POLE MOUNTING BRACKET

Four (4) tube shall be provided for pike pole mounting. The tube shall have a 2-1/4" interior diameter and shall be mounted within the ladder compartment.

PIKE POLE SOURCE

The pike poles shall be provided by the body builder.

HANDRAIL TURNTABLE ACCESS

Two (2) extruded aluminum non-slip handrails, approximately 30" in length, shall be provided and

mounted on the apparatus, one (1) on each side of the turntable access.

FRONT BODY PROTECTION PANELS

Aluminum tread plate overlays and panels shall be installed on the front of the body from the lower edge to the top of the compartment doors. The material shall be bolted in place and sealed to prevent any moisture entry between the overlay and the body structure.

REAR BODY PROTECTION PANELS

Smooth aluminum shall be installed on the rear of the body, to allow for the installation of a "Chevron" stripe on the rear.

EXTRUDED ALUMINUM RUB RAILS

Full body length polished aluminum rub rails shall be bolted in place on the lower right and left body sides. The side rub rails shall be a heavy extruded aluminum "C" channel. There shall also be a bolt on aluminum corner casting on each rear corner to blend the rear tail board assembly with the side rub rails.

SHORE POWER PLUG

The shore power plug shall be located at the left front cab door.

AUTO-EJECT

A Kussmaul "Auto-Eject" automatic disconnect device shall be provided and installed on the 110-volt shoreline connection complete with weatherproof cover and matching plug. The Auto-Eject shall be activated by the chassis starter switch to disconnect the plug.

GENERATOR MOUNTING LOCATION

The generator shall be installed in the front section of the hosebed.

CIRCUIT BREAKER BOX

One (1) circuit breaker box for single phase voltage equipment shall be provided capable of holding twelve (12) breakers.

CIRCUIT BREAKER BOX LOCATION

The circuit breaker box shall be installed in an outside body compartment.

The instrument panel for the generator shall be installed next to the breaker panel.

120V ELECTRIC RECEPTACLE -- TWIST LOCK

Two (2) 120-volt 20 amp twist lock (NEMA L5-20) receptacle with spring loaded weatherproof cover shall be provided.

The electric receptacle shall be located on the exterior left rear face of the body.

The electric receptacle shall be located on the exterior right rear face of the body.

IDLE REDUCTION TECHNOLOGY (IRT) NO EXECPTIONS

An Idle reduction technology system shall be supplied with the apparatus that will significantly reduce the amount of diesel exhaust soot, NOx and CO2 emissions into the atmosphere. Diesel engines contain pollutants that negatively impact human health and the environment. Diesel engines emit large amounts of nitrogen oxides, particulate matter and air toxics, which contribute to serious public health problems.

Idle reduction technology has been verified by the U.S. EPA to reduce diesel emissions from diesel powered vehicles and engines.

The IRT will reduce idle time through the use of an auxiliary power unit (APU) in conjunction with automatic diesel engine controls that will shut down the main chassis diesel engine during operations not requiring the use of the pump assembly. This system will be automated and will not require intervention from the vehicle operator. There will be a time delay engine shut down feature that will automatically shut down the chassis main diesel engine and engage the diesel driven APU. This feature will be available when the chassis air brake is set and when the pump assembly is not engaged.

All features below are available with the main chassis diesel engine off.

The chassis voltage system is protected against extreme drain of the battery bank. If the vehicles voltage drops to 12 VDC, the automatic engine controls will start the chassis diesel engine to provide a charge.

Reducing the amount of idle time for the chassis diesel engine will substantially reduce the fuel consumption.

AUXILIARY POWER UNIT (APU)

A MeccAlte 7.9 KW, 120/240 volt, diesel driven generator shall be provided. The generator shall be controlled electronically by the IRT system. The APU engine shall be a Kubota D1105-E3B diesel powered. The engine must comply with Tier 4 emissions regulations. NO EXECPTIONS

ALTERNATOR

A 160-amp alternator shall be supplied with the APU. The alternator shall be tied to the chassis batteries.

AUXILIARY 12 VOLT AIR CONDITIONING

The IRT system shall power an in cab climate control system. The system shall consist of a minimum 45,000 BTU air conditioning evaporator centrally located within the chassis crew area.

The system is to have a 12.6 cu. in. minimum compressor, belt driven by the APU engine, to provide the compressed refrigerant to the system. The compressor will be plumbed to a heavy duty, dual fan air conditioning condenser mounted on the cab roof. The condensing unit shall have an aerodynamic shroud that is painted to match the color of the cab roof. There shall be an extended life filter receiver/dryer with a pressure relief valve installed to protect the system from contaminates, moisture, and high pressure. It is to have a sight glass for visual inspection and ease of service.

The evaporator shall have an externally equalized expansion valve and be thermostatically protected to prevent freeze up. Dual high performance multi-speed blowers shall provide a minimum of 700 CFM air flow. Each blower is to be controlled separately. Adjustable diffusers with shutoff capability shall be utilized to direct the air flow through the cab.

The air conditioning on/off switch, thermostat control, and blower switches shall be conveniently located in the chassis cab area.

The air conditioning system shall use R134A freon.

BATTERY CHARGER

A Newmar PT-40W 110 volt battery charger will be supplied with the apparatus that will have a three phase battery conditioning procedure.

ELECTRIC CABLE REELS

Two (2) Hannay ECR-1600 series electric cable reels with an electric rewinds shall be installed on the vehicle. The reels shall be designed for use with 120 volt, three (3) wire cable. The duty rating of the

cable reels shall be for continuous usage. The reels shall be installed so that it is easily accessible for cord access and maintenance. A 12-volt motor controlled by a push button switch located in a convenient position and properly labeled shall perform the electric rewind function.

The installation of the cable reel shall meet applicable sections of the NFPA standards.

Reel Capacity

Each reel shall be sized to hold 110 percent of the capacity needed for the specified cable length. The wire size shall be in accordance with the National Electric Code.

Labeling

An information label shall be installed in a location visible adjacent to any permanently connected reel with the following data:

Voltage

Phase

Current type

Current rating

Total cable length

Electrical Supply Wiring To Reel

The wiring shall end in a sealed conduit box at the reel with mechanical connectors to allow removal of the reel. Appropriately, sized wire and circuit breakers shall be utilized.

The electric cable reel shall be installed in the upper rear body compartments R1 and L1.

A two hundred foot (200') length of 10/3 yellow electric cable shall be installed with specified plugs on each reel. The cable shall be type SEO-WA with a 20 amp, 120 volt rating.

The electric cables shall be configured with a 120-volt 20 amp NEMA L5-20C three prong, twist lock female receptacle.

One (1) four-sided nylon roller unit for each electric cable shall be installed on specified reels. The roller unit shall be mounted in the specified location to permit the cable to feed directly off the reel.

One (1) ball stop shall be attached to each electric cable to prevent total re-wind and to allow the cable to remain at a reachable position. The ball shall positively attach to the cable and be bright orange in color for high visibility.

JUNCTION BOXS

One (1) Circle-D model PF51G-5 yellow electrical junction box for each reel assembly shall have a 12" pigtail with a NEMA L5-20 twist-lock plug for connection to the cord reel. The unit shall have an integral pilot light to indicate electrical current.

The unit shall be equipped with four (4) 120 volt 20 amp NEMA L5-20 twist-lock receptacles, each with a hinged, weatherproof cover.

One (1) aluminum storage bracket designed to hold an electric junction box shall be supplied for each unit. The holder shall be mounted in the same compartment as the specified cable reel.

BROW MOUNT 750 WATT FLOODLIGHT

Two (2) Fire Research Optimum model OPA800-S75 contour roof mount light shall be installed. The mounting brackets shall attach to the bottom of the lamphead and be machined to conform to the roof radius. Wiring shall extend from a weatherproof strain relief at the rear of the lamphead.

The lamphead shall have one (1) quartz halogen 750 watt 120 volt bulb. The bulb will draw 6.3 amps and generate 19,600 lumens. The bulb shall be accessible through the front. The lamphead shall incorporate a vacuum deposit polished reflector and two optimizing mirrors to produce a uniform beam that lights up an area 100° vertically by 150° horizontally. The lamphead shall have a heat dissipating curved front lens. The curve of the lens shall have a radius of 5.16 inches to optimize light emission. The lamphead shall be no more than 4 3/4" deep by 5 1/8" high by 8 3/4" wide. Lamphead and brackets shall be powder coated white.

The brow quartz floodlight(s) shall be circuit breaker protected. The circuit breaker(s) shall be used as an ON/OFF switch(es) for the floodlight(s). The circuit breaker(s) shall be labelled "BROW LIGHTS".

TELESCOPIC TRIPOD 500 WATT FLOODLIGHT

Two (2) Fire Research Optimum model OPA642-S50 tripod telescopic light shall be provided. The light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall extend 28" and rotate 360 degrees. An internal brake shall slow the extension pole during lowering. The outer pole shall be a grooved aluminum extrusion. The folding legs shall be anodized aluminum tubing with plastic endcaps. The fully extended tripod system shall exceed a height of 8' and be 42” when collapsed. Wiring shall extend from the pole bottom with a 4' retractile cord.

The lamphead shall have one (1) quartz halogen 500 watt 120 volt bulb. The bulb will draw 4.2 amps and generate 10,500 lumens. The bulb shall be accessible through the front. The lamphead shall incorporate a vacuum deposit polished reflector and two optimizing mirrors to produce a uniform beam that lights up an area 100° vertically by 150° horizontally. The lamphead shall have a heat dissipating curved front lens. The curve of the lens shall have a radius of 5.16 inches to optimize light emission. The lamphead shall be no more than 4 3/4" deep by 5 1/8" high by 8 3/4" wide. Lamphead and brackets shall be powder coated white.

A tripod truck mount bracket set shall be installed. The set shall include a lower base plate and an upper lock with a quick release spring loaded locking pin.

The floodlights shall be installed at the rear of the apparatus body on the left and right sides .

The on/off switch(es) for the floodlight(s) shall be located on the base of the lamp housing.

The rear quartz floodlight(s) shall be circuit breaker protected. The circuit breaker(s) shall be used as an ON/OFF switch(es) for the floodlight(s). The circuit breaker(s) shall be labelled "REAR QUARTZ".

BODY PAINT PROCESS

While constructing the truck body, all aluminum parts that are to be finish painted shall be properly fitted on the body and then removed to be painted as individually. The back side of all aluminum parts shall be sanded smooth of any burrs and sharp edges.

During reassembly of the apparatus, care shall be exercised in fitting and fastening the parts back in their respective position on the vehicle.

All aluminum parts shall be bolted to the body using stainless steel fasteners. Zinc or Cadmium plated fasteners are not acceptable. All bright metal fittings, if unavailable in stainless steel shall be heavily chrome plated. Iron fittings shall be copper plated prior to chrome plating.

All seam shall be caulked both inside and along the exterior edges with a urethane automotive sealant to prevent moisture from entering between any body panels.

The body and all parts shall be thoroughly washed with a grease cutting solvent (PPG DX330) prior to

any sanding. After the body has been sanded and the weld marks and minor imperfections are filled and sanded, the body shall be washed again with (PPG DX330) to remove any contaminants on the surface.

The first coating to be applied is a pre-treat self etching primer (PPG DX1787) (.5 to 1.0 dry film build) for maximum adhesion to the body material. The next two to four coats (depending on need) shall be an acrylic urethane primer surfacer (PPG K38). The film build shall be 4-6 mils when dry. The primer surfacer coat, after appropriate dry time, shall be sanded with 320-600 grit sandpaper to ensure maximum gloss of the paint. The last step is the application of at least three coats of PPG Concept acrylic urethane two-component color (single stage). The film build being 2-3 mils dry. The single stage acrylic urethane, when mixed with component (PPG DCX61) catalyst shall provide a UV barrier to prevent fading and chalking.

All products and technicians are certified by PPG every two (2) years.

INTERIOR COMPARTMENT FINISH

The interior of the ten (10) compartments shall be unpainted and have a D/A orbital sander finish.

TOUCH-UP PAINT

One (1) two (2) ounce bottle of touch-up paint shall be furnished with the completed truck at final delivery.

LETTERING

The lettering shall match the Pawtucket Fire Department fleet.

AERIAL LIFT CYLINDER PROTECTIVE COVERS

There shall be aluminum protective covers provided, one over each of the two (2) aerial lift cylinder assemblies. The covers shall be constructed from .125 thick, smooth aluminum material and be designed to prevent damage to the lift cylinders due to impact from environmental factors. The protective covers shall be bolted in place using stainless steel fasteners and easily removable for service to the aerial lift cylinders. Lubrication points shall be accessible without the need to remove the protective covers. In addition to the added component protection, the lift cylinder covers shall provide added fire fighter safety from lift cylinder pinch point areas and a superior aesthetic appearance to the aerial device.

The exterior of the protective covers shall be painted to match the aerial body color using PPG automotive quality product. The application process shall conform to all PPG guidelines.

REFLECTIVE STRIPING

Reflective striping for the apparatus shall be supplied in compliance to applicable NFPA standards.

CHEVRON STRIPING

The front bumper shall have 3M reflective red and amber striping installed. The chevron style striping shall be applied at a 45-degree upward angle.

CHEVRON STRIPING

The entire rear portion of the body shall have 3M reflective red and amber striping installed. The chevron style striping shall be applied at a 45-degree upward angle pointing towards the center upper portion of the rear panel.

REFLECTIVE TAPE ON OUTRIGGERS

The outriggers that extend beyond the side of the body shall have white reflective tape applied to both the front and rear facing sides.

AERIAL INSTRUCTION LABELS

Safety and instructional labels shall be applied at all necessary areas on the aerial device to identify points critical to the safe operation and maintenance of the aerial.

EQUIPMENT PAYLOAD WEIGHT ALLOWANCE

In compliance with NFPA #1901 standards, the apparatus shall be engineered to provide an allowance of 2500 pounds of fire department provided loose equipment.

WHEEL CHOCKS WITH MOUNTS

A pair of Zico Model SAC-44 Quic-Chok folding wheel chocks shall be provided and mounted under the apparatus body with model SQCH-44H horizontal mounting brackets.

109' FOUR-SECTION REAR-MOUNT LADDER SPECIFICATIONS

Aerial Ladder Design and Construction

A 109' four-section steel rear mount aerial ladder shall be provided. It shall have a maximum height of 108' 7.3" at the top rung of the fly section at 75-degrees elevation. The horizontal reach from the top rung to the center of the turntable shall be 101' 10.8".

TESTING CRITERIA

The aerial ladder shall be inspected and tested by a third party. A non-destructive test shall be performed on each unit at a rate of 100% inspection by the Underwriters Laboratories inspector, exceeding the requirements applicable section of NFPA #1901 for new apparatus. All non-destructive procedures shall be fully documented and meet or exceed the requirements of applicable sections of NFPA #1901.

Operation on grades

The aerial shall be capable of being operated with full rated capabilities in any plane up to 5-degrees out of level with the turntable leveled as much as possible by placement of the outriggers. Operation beyond this limit shall be at the operator's discretion.

CORROSION PROTECTION -- GALVANIZED/PAINTED: NO EXCEPTIONS

Prior to assembly, each aerial ladder section shall be hot dip galvanized. The galvanizing process will permeate each ladder section to prevent rust and corrosion and not be merely an over-coating The galvanized aerial ladder sections shall be provided in the natural finish eliminating the requirement for finish paint and the subsequent requirements for touch up paint and/or total repaint after a period of time due to nicks, chips and corrosion resulting from hitting the ladder many times in use. The galvanized ladder shall reduce the maintenance requirement for grease once or twice a year, based on duty cycle.

The aerial ladder sections are galvanized inside and out, including base rails, hand rails, diagonals, rungs and K-Braces. This process eliminates the rusting, scratching or paint chips on the aerial sections. Galvanizing has been recognized as an effective way to protect steel from corrosion.

Galvanizing shall provide a barrier and cathodic protection from corrosion. During the galvanizing process, the complete aerial ladder sections shall be immersed in molten zinc. Through diffusion, the zinc shall bond to the steel at the molecular level. The resulting zinc coating shall provide a barrier that shields the steel from the environment

After the ladder sections are galvanized they shall be properly cleaned and prepared for paint. The galvanized ladder sections shall be painted Gray Metallic FDG 302200B

AERIAL LADDER RUNG COVER

For ease of climbing the ladder rungs shall be equally spaced on a maximum 14" centers and minimum 11.75" centers and shall have a skid-resistant surface or covering.

For added safety, skid-resistant rung covering shall be provided. The rung covering shall not twist and shall cover at least 60 percent of the climbing area of each rung.

Round rungs shall be provided and shall have a minimum outside diameter of 1-1/4", including the skid-resistant surface or covering.

For maximum strength, the minimum design load for each rung shall be 500lb distributed over a 3-1/2" wide area at the center of the length of the rung with the rung oriented in its weakest position.

Each aerial rung shall be covered with one (1) continuous piece of a protective, Hi-Traction safety walk non- skid material.

AERIAL WEAR PADS

The aerial wear pads shall be "PET" type and shall incorporate semi-crystalline hardness, rigidity, mechanical strength with exceptional sliding properties and very low sliding wear. The pads shall be used between the telescoping sections for maximum weight distribution, strength, and smooth operation. Side wear pads shall be nylatron GSM, stainless steel adjustment screws shall be provided on the side wear pads to permit proper side clearance.

AERIAL SIGN BRACKETS

The aerial manufacturer shall supply aerial sign brackets welded to the base section of the aerial. These brackets shall be located on both sides of the base section.

AERIAL SIGN PANELS

The base section of the aerial device shall include sign panels, 16" high x 133" long, one on each side of the aerial. The sign panels shall be painted black.

EXTENSION MARKINGS

To improve safety and to provide the operator with vital information, extension markings shall be provided. For best visibility the base section of the ladder shall include markings on the outside of the left handrail and the inside of the right handrail to indicate extension position of the ladder in operation. The markings will be RED numbers and mark every 10 feet with a hash mark between the numbers.

ROOF LADDER MOUNTING BRACKETS -- BASE SECTION

There shall be welded plates and bolt on roof ladder mounting brackets installed on the outside of the base section of the aerial opposite of the control panel.

ROOF LADDER

A Duo Safety Model 875-A, 16 foot aluminum roof ladder with folding steel roof hooks on one end and feet on the other end shall be provided on the outside of the base section. The ladder shall meet or exceed applicable NFPA standards. It shall be standard width 19" Duo-Safety roof ladder

FOLDING STEPS -- FLY SECTION

The ladder shall be equipped with two (2) folding steps, one on each side of the ladder at the upper end of the fly section. These steps are spring loaded to hold in the stowed position. Once lowered, steps lock in the lowered position for use.

When steps are in the use position there shall be approximately a 7-1/2" diameter circular space for a hose to be placed on the rungs. The folding steps shall comply to applicable standards of NFPA #1901.

ROPE RESCUE EYELETS -- FLY SECTION

Two (2) rope rescue eyelets shall be installed one on each side at the tip of the fly section, each anchor being rated at 250 pounds, for a total combined weight rating of 500 pounds.

MOUNTING PLATE FOR AXE AND PIKE POLE -- FLY SECTION

Welded-in mounting plates shall be installed for the an axe mounting on the right side and a pike pole mounting on the left side of the fly section.

MOUNTING BRACKETS FOR PIKE POLE

Bolt on mounting brackets for a pike pole shall be installed on the mounting plates on the located on the left side of the tip of the fly section.

ROTATION SYSTEM

The rotation system shall be powered by a hydraulic motor to drive an eccentric planetary gearbox, capable of field adjustment, to rotate the aerial.

A 43.6" pitch diameter external tooth bearing shall be provided for 360 degree continuous rotation in either direction. As turntable bearing bolts are required to be checked and re-torqued at regular intervals, to make this task relatively simple, the ability to re-torque all bolts from the top of the turntable is mandatory.

The bearing shall be bolted to the bearing base plate using sixty (60) 5/8" SAE Grade 8 bolts and shall also be bolted to the turntable using fifty five (55) 5/8" SAE Grade 8 bolts.

A hydraulic release spring applied brake shall provide a positive lock for the rotation.

Two [2] pressure relief valves shall control the force of the rotation to protect the aerial from excessive side loads.

LANGUAGE

All panels including main operations stations, outrigger stations, warning labels and load charts shall be written in English.

AERIAL CONTROL CONSOLE

Aerial Control Operating System

The aerial control system is monitored by programmable logic control. The programmable logic control operating system must be able to monitor the following functions continously to offer maximum safety. The monitored aerial control functions are as follows:

Aerial Speed

The speed of all aerial functions are proportionally regulated by the elevation and extension of the aerial. The aerial shall have proportional slow down on full extension and full retraction. The elevation system shall proportionally reduce the speed at sixty (60) degrees and ramp to off at full elevation. Lowering shall proportionally reduce the speed at three (3) degrees and ramp to off at minus ten (-10) degrees. When the aerial is fully retracted the aerial speed shall be 20 percent faster then when fully extended.

The turntable control console shall have a toggle switch to energize the hydraulic system for the aerial functions. The switch shall have three (3) functions, "high speed", "low speed", and "off". All ladder controls operate at high (full speed) or low (reduced speed). Each aerial "Soft Touch" control handle shall lock in the neutral position. With the ladder control handle activated the RPM's shall increase to 1,250 RPM and maintain there for two (2) seconds after returning to the neutral position. An emergency stop

button shall be used for emergency stopping and shall return the system to the "off" position, allowing the engine speed to return to normal idle speed and the hydraulic system to de-energized.

Cab and Body Collision Protection

Programmable cab and body collision protection will have three (3) amber lights to indicate Right Rotation Disabled, Down Disabled and Left Rotation Disabled. The lights shall illuminate when aerial functions (right rotation, left rotation or lowering) are disabled. All three lights shall illuminate when the E-STOP is pushed or the outrigger interlock is active. No Execptions

Auto Bedding

The aerial shall have a momentary switch for auto bedding. Activation of the momentary switch when the aerial is within 20 degrees left or right of the ladder bed, below 20 degrees elevation and 75 percent retracted will automatically bed the aerial. No Exceptions

Rung Alignment

The aerial rung alignment light shall be monitored by an absolute encoder system. The indicator light shall illuminate when the rungs are aligned for the safety of climbing the aerial.

Soft Touch Controls

All aerial controls left/right, extend/retract and raise/lower shall be Soft Touch controllers. The Soft Touch controls shall have built in ramp up and ramp down capabilities. No Execptions

Short Jack Outrigger

Programmable logic control system allows the aerial to rotate over the short jacked outriggers, when the aerial is within the safe operating parameters of the programmable logic control program. A red warning light at the outrigger and aerial operator's control consoles shall warn the operator that one (1) or more outriggers have been short set. In the event the vehicle has been set up with one (1) or more of the outriggers short set, any rotation of the turntable to an unsafe short set outrigger shall automatically ramp the rotation of the turntable to a feather-soft stop and allow the operator to return to safe operating parameters. No Execptions

Aerial Load Gauge

An aerial load gauge shall give a continuous reading of the load on the device. This gauge shall have a green light showing the load on the ladder, an amber light will tell the operator when the aerial is nearing the rated load and a red light will flash at the point where rated load capacity is reached. Additionally, there shall be a warning horn that shall sound if the ladder is overloaded by 0 - 10% of its rated capacity. The horn shall emit a constant sound when rated capacity is exceeded by more than 10%. If the ladder is over loaded the extension and lowering ability of the aerial shall be disabled until the weight can be removed or shifted. No Execptions

Aerial Control Panel

The turntable shall have the control console mounted on the driver's side (when the aerial is stowed) with the following items on the panel:

One (1) switch for High/Off/Low

One (1) switch for auto bedding

One (1) tip light switch

One (1) turntable tracking light switch (panel light and tracking lights shall be connected to this switch)

One (1) rung alignment light

One (1) emergency pump switch

One (1) system pressure gauge, 0-5,000 psi minimum

One (1) emergency stop button

One (1) red light to indicate when outriggers are not fully extended

Three (3) lights green, amber, and red with audible alarm for the aerial load system display

Three (3) amber lights for left rotation disable, down disable, and right rotation disable.

Three (3) remote monitor switches

Three (3) handles for operation of the aerial for raise / lower, extension / retraction, and swing left/right functions

The system shall be capable of performing simultaneous outrigger functions or simultaneous aerial functions.

Console Cover and Lighting

A hinged cover shall be provided on the turntable control console with one (1) courtesy light located in the cover.

Three (3) turntable work lights shall be provided on the turntable for added operator visibility and safety.

TURNTABLE SHAPE --TWO SIDED

The turntable shall be two sided (left and rear) with the corners cut to allow for personnel to enter and exit the turntable. The turntable walking area shall be covered with NFPA #1901 compliant skid resistant aluminum tread plate material, with a 2-1/2" lip. Two (2) 42" high, slip resistant handrails capable of withstanding a 225 pound force applied from any direction shall be installed on the turntable.

LIGHTED ANGLE ELEVATION INCLINOMETER

One (1) lighted angle elevation inclinometer shall be mounted on the left side of the base section of the aerial.

AERIAL LOAD CHART -- TURNTABLE CONTROL STAND

An aerial load chart shall be mounted on the base section of the aerial to supplement the load gauge installed on the aerial control console. The load chart shall include the height and reach and the load at six (6) different angles with and without water. An arrow will be attached to the load chart to indicate the angle of elevation. To comply with NFPA standards the load chart shall be illuminated by a light.

AERIAL TURNTABLE CONSOLE

The aerial control console will be constructed from smooth aluminum and painted to match the ladder sections. The back of the control panel will have one (1) full hinged door. The front of the control panel will have one (1) 8" x 8" hinged door. These doors are provided for maintenance and emergency operation of the aerial.

HYDRAULIC HIGH PRESSURE OIL FILTER

The hydraulic system shall be equipped with a 'high pressure' hydraulic oil filter between the pump and the control valve designed to meet the flow requirements of the system. There shall be a filter

replacement light on the outrigger control panel for the convenience of the mechanic. The return filter and pressure filter shall be connected together to the same light on the outrigger control panel to indicate replacement of filters.

HYDRALIC OIL RETURN LINE FILTER WITH LIGHT

A 10 micron low pressure return line filter element shall be connected to the hydraulic reservoir. The 10 micron return line replaceable filter. There shall be a filter replacement light on the outrigger control panel for the convenience of the mechanic. The return filter and pressure filter shall be connected together to the same light on the outrigger control panel to indicate replacement of filters.

GALVANIZED CORROSION PROTECTION -- TORQUE BOX ASSEMBLY – NO EXCEPTIONS

The torque box shall be hot dip galvanized inside and out. The galvanizing shall include the top and bottom and sides of the torque box, outrigger electrical compartment, and outrigger valve control compartment.

The torque box shall be totally hot dip galvanized. The galvanizing process shall not be an over-coating only to outside surfaces but shall permeate the metal. The galvanizing process shall prevent or greatly lessen rust and corrosion on the torque box and in areas between the torque box and chassis frame rails, as well as areas which cannot be reached when washing the unit and which cannot be visually inspected, and shall eliminate the need to finish paint the torque box.

The galvanizing process shall provide the steel torque box assembly with both barrier and cathodic protection from corrosion. The galvanizing process shall immerse the complete torque box component in molten zinc. The galvanizing diffusion process shall allow the zinc to bond to the steel, at the molecular level. The galvanized zinc coating shall provide a barrier that shields the steel from the environment.

TORQUE BOX

The torque box connecting the turntable to the outriggers shall provide the rigidity needed for the aerial to be operated at -12 degrees to a +75 degrees elevation and full extension.

The torque box shall have approximate dimensions of:

43" inside width

26" inside height

247" long (the back shall be open for ground ladder storage)

AERIAL OUTRIGGERS AND STABILIZER SPECIFICATIONS

The aerial device outriggers and stabilizers shall be designed to function with the Smart Aerial operational components. The system shall have a pad that pivots left-to-right and front-to-rear.

GALVANIZED OUTRIGGERS – NO EXCEPTIONS

The aerial outriggers assemblies, beam, outer jack tube, inner jack tube, jack cover plate, and jack pad shall be galvanized.

The outriggers shall be galvanized inside and out. The process shall eliminate the rusting, scratching or paint chips on the outriggers. The galvanizing process shall permeate the metal and shall not be an "over-coating only" on outside surfaces. The galvanized components shall lessen the potential for corrosion and eliminates the requirement for finish paint. The process shall negate any later requirement for touch-up paint or total repaint of the outrigger/stabilizer assemblies.

The galvanizing shall provide the steel outriggers with both barrier and cathodic protection from corrosion. The galvanizing process shall immerse the complete outrigger components in molten zinc. The

galvanizing diffusion process shall allow the zinc to bond to the steel, at the molecular level. The galvanized zinc coating shall provide a barrier that shields the steel from the environment.

Aerial Set-Up Requirements

With the stabilizers set, the aerial device shall be capable of being raised from the bedded position to maximum elevation and extension and rotated 90 degrees. Two or more of these functions shall be permitted to be performed simultaneously. These functions are required to be completed within 75 seconds or less, NO EXCEPTIONS.

Extension Beams

The extension beams shall entirely enclose the extension cylinders to prevent damage to the rods and hoses. Each outrigger shall be controlled independently with one (1) joystick controller, which can extend and lower the outrigger at the same time or raise and retract the outrigger at the same time.

A double box design shall enclose the jack cylinders completely to protect the rods from damage that could result from exterior circumstances.

Jack Cylinders

The jack cylinders shall have pilot operated check valves for both the raised and lowered positions. Each jack tube shall be drilled for mechanical pin locks for a safety backup.

The outrigger jack cylinders shall be mounted so they can be removed from the top of the outrigger jack tube. Jack cylinders that are removed from the bottom of the outrigger jack tube will not be accepted.

Outrigger Deployment Alarm and Warning System

The outrigger deployment alarm, of not less than 87 DBA, shall sound at all times while the outrigger master switch is in the on position and stops sounding only when the outrigger switch is turned off. The audible alarm shall warn personnel that outrigger movement is possible at any time the switch is on.

A red LED flashing light shall be mounted to the inside of the vertical outrigger jack beam. The aerial master switch shall activate the lights.

An amber indicator light shall be located on the outrigger control panel for each outrigger to indicate when the outrigger jack is supporting enough load to be in firm contact with the ground.

Safety Features

The outrigger system provides the following safety features:

Amber indicator light at the outrigger control station shall indicate circuit completion to show that the unit is ready for aerial operation.

Red warning lights at the outrigger and aerial operator's control consoles shall warn the operator that one (1) or more outriggers has been short set.

An aerial/outrigger interlock system shall be provided to prevent the lifting of the aerial from the nested position until the operator places all jacks in the load supporting configuration. An electrical can-bus encoder system at the ladder pivot prevents operation of the outriggers once the aerial has been elevated from the nested position.

LED Ground illumination lights shall be provided to illuminate the area directly under the outriggers for each extending outrigger.

Each outrigger shall have an auto retracting string-pot that shall be wired to the smart aerial can-bus system to indicate that the outriggers are stowed. A light will be provided in the cab to alert the operator.

Outrigger and Stabilizer Specifications

The specified outriggers and torque box system shall provide a 1-1/2 to 1 stability safety factor when the aerial is in any operating position.

The stability requirements shall be met by the apparatus on which the aerial device is mounted when that apparatus is in a service-ready condition but with all normally removable items such as water, hose, ground ladders, and loose equipment removed.

The aerial device shall be capable of sustaining a static load 1-1/3 times its rated capacity in every position in which the aerial device can be placed when the apparatus is on a slope of 5 degrees downward in the direction most likely to cause overturning.

All outriggers and stabilizers that protrude beyond the body of the apparatus shall be striped or painted with reflective material so as to indicate a hazard or obstruction. Each outrigger or stabilizer shall also be provided with one or more red warning light(s) located either on the stabilizer or in the body panel visible on the side of the apparatus where the stabilizer is located.

FRONT AND REAR OUTRIGGERS

Two (2) front and two (2) rear out and down outriggers shall be provided on the apparatus. The rear outriggers shall be located directly behind the rear axle and the front outriggers shall be located front of the torque box connected to the frame.

The outrigger assemblies shall consist of the following components:

1. A 2" inside diameter cylinder with a 1.125" outside diameter rod shall extend and retract the outrigger 48".

2. A 5" inside diameter cylinder with a 3" outside diameter rod shall raise and lower each jack tube a distance of 28".

Outrigger Spread

The total width from the center of pivot pin to center of pivot pin when the outriggers are fully extended shall be: 15' 6".

MOVING OUTRIGGERS

Outriggers will be moved from original placement at the front of the torque box to directly behind the cab.

SHORT-SET OUTRIGGERS

The aerial device shall be equipped with a Smart Aerial system for short-jacking.

A short-set outrigger is an outrigger that is not out at least 96 percent of its total extension capability. The smart aerial limits aerial functionality based on extension of all outriggers.

Short-set front outriggers shall not affect ladder movement while the ladder is less than 2 degrees or greater than 50 degrees of rotation on either side of the ladder bed and less than 45 degrees elevated.

Short-Set rear outriggers shall not affect ladder movement while the ladder is within 50 degrees either side of the ladder bed and less than 45 degrees elevated.

If a short-set restriction is active, the Outrigger Not Extended indicator light at all ladder control stations shall flash rapidly.

The smart aerial shall monitor the outrigger placement of all outriggers and the elevation extension and load on the aerial to determine if the aerial can rotate safely over a short set outrigger.

OUTRIGGER CONTROL PANEL

The outrigger control panel shall have a switch to energize the hydraulic system for outrigger functions. The switch shall increase the engine speed to 1,200 RPM when in the "ON" position. In the "OFF" position, the engine speed shall return to normal idle speed and the hydraulic system shall be de-energized.

Control Panel

The control panel shall include the following:

1. Manual override system to override the outrigger-aerial interlock system

2. One (1) switch to start and stop all aerial and outrigger operations.

3. One (1) switch for the emergency power unit.

4. Amber indicating lights shall signal when the outriggers are extended or supporting sufficient load.

5. A pulsing beeper shall be activated when the outrigger system is in use.

6. One (1) red flashing light shall be provided to indicate if outriggers have been short set.

7. One (1) aerial hour meter connected to the PTO shall be installed at the outrigger control station.

8. One (1) hydraulic pressure filter indicator light.

AMBER INDICATING LIGHTS

If an outrigger is extended and not lowered an amber indicator light shall flash rapidly, indicating the jack cylinder is not supporting any load. If the outrigger is fully extended and the jack cylinder is supporting sufficient load the amber indicator light shall be solidly lit. If an outrigger is short-jacked the amber indicator light shall flash slowly.

All Smart Aerials can operate all functions over a short-jacked outrigger. If the aerial were to become overloaded or unsafe the ladder would slow to a smooth stop and the right disable, left disable or down disable light shall illuminate indicating the direction the operator is no longer able to rotate. The aerial can operate away from the unsafe position with one operator.

ELECTRIC OUTRIGGER CONTROL VALVES

The aerial shall be equipped with four (4) out and down outriggers. These units shall be equipped with electric outrigger control valves activated by momentary rocker switches. The controls shall be located at the rear and to the outside of the chassis. This location shall give the operator full view and control of each outrigger.

OUTRIGGER AUXILIARY PLATES

An auxiliary outrigger plate shall be provided for each outrigger. The units shall be 2' x 2' in size, one for each outrigger made from 1/2" aluminum with a handle for easy movement.

OUTRIGGER STOWED INDICATOR

An outrigger stowed indicator light will be provided in the cab to show that one or more outriggers are not in the stowed position. The light will be connected to the door ajar / outrigger extend light in the cab.

AERIAL LADDER CAPABILITIES -- 1250GPM – Minimun Ratings - 500 LB LIVE TIP LOAD- NO EXECPTIONS

The following are aerial ladder and water capabilities for the operation of this unit in the unsupported configuration with the truck level, the outriggers fully extended and lowered to relieve the chassis weight from the axles. The capabilities are based upon 360-degree continuous rotation and up to full extension.

Ladder Operations

ELEVATION	CAPABILITIES
-10 Degrees to 30 Degrees	500 pounds at the outermost rung of the fly section
	or 1,000 pounds evenly distributed
30 Degrees to 45 Degrees	500 pounds at the outermost rung of the fly section
	or 1,500 pounds evenly distributed
45 Degrees to 60 Degrees	750 pounds at the outermost rung of the fly section
	or 2,000 pounds evenly distributed
60 Degrees to 75 Degrees	1,000 pounds at the outermost rung of the fly section
	or 2,500 pounds evenly distributed

Ladder Operations With 1250 GPM Water Flowing

The following capabilities are based upon continuous 360-degree rotation and up to full extension.

The aerial ladder and water system shall be designed to permit the following flows:

1,250 GPM	45-degrees to the side of the ladder centerline
1,250 GPM	135-degrees down from a line parallel to the centerline

ELEVATION	CAPABILITIES
-10 Degrees to 45 Degrees	500 pounds at the outermost rung of the fly section
	or 750 pounds evenly distributed
45 Degrees to 60 Degrees	500 pounds at the outermost rung of the fly section
	or 1,500 pounds evenly distributed
60 Degrees to 75 Degrees	500 pounds at the outermost rung of the fly section
	or 2,000 pounds evenly distributed

The above ratings shall be based on average weight of personnel on the ladder at 250 pounds each.

The ladder meets the 2:1 safety factor requirement for material based on the weight of the ladder plus a 500 pound live load at the tip of the aerial, flowing 1,250 GPM of water at 45 degrees to the side of the aerial at zero degrees elevation.

If a monitor is ordered that can elevate above 0 degrees the tip load shall be reduced to 250 lbs and the flow shall be restricted to 1000GPM.

4" WATERWAY SWIVEL

There shall be a 4" waterway swivel with 360 degrees continuous rotation. It shall be installed through the turntable and torque box to connect the aerial waterway plumbing from the water pump to the aerial. The hydraulic oil for the aerial shall be directed through a three-port hydraulic swivel with 360 degrees continuous rotation.

The swivel will be a Modular Three Component Swivel. It will have a separate electrical swivel, hydraulic swivel and waterway swivel that when connect with form one component. Therefore if the waterway swivel or another component were damaged the aerial electrical swivel and hydraulic swivel will still be able to run properly and the waterway swivel shall be the only swivel to be replaced.

No Execptions

TELESCOPING WATERWAY --AERIAL

A aerial waterway shall be provided from the base of the aerial device to the tip of the fly section. The aerial telescoping aluminum waterway shall be fabricated of aluminum and shall have four (4) tubes as follows:

1. 5" outside diameter at the base section

2. 4-1/2" outside diameter at the lower mid-section,

3. 4" outside diameter at the upper mid-section

4. 3.5" outside diameter at the fly section

Monitor Installation & Retractable

The monitor connected to a waterpan and shall be retractable allowing the monitor to be secured at the tip of the fly section for water tower operations or at the end of the next lower section for rescue operations. When the aerial is fully retracted the monitor lock shall be quickly movable and easily accessible at the tip of the aerial.

The rescue mode feature shall allow the tip of the fly section to be placed very close to the edge of a building or window minimizing the working and access heights on and off the ladder tip without worrying about the monitor being damaged.

Monitor controls shall be located on the retractable waterway pan and on the aerial control console. The retractable waterway pan electrical cable shall be guided by e-chain for protection of the cable when repositioning the monitor from the fly section to the next lower section. No manual hand plugs, external reels, or coiled self retracting cable shall be needed. All electrical connections shall be directly connected to the monitor.

WATERWAY RELIEF VALVE

A 2.5” relief valve shall be installed above the turntable.

SINGLE DISPLAY AERIAL WATERWAY FLOW METER

One (1) Classl Single Display Flowminder, part number FMS 9483, shall be provided. The digital pressure gauge includes large super bright digits for excellent readability in all types of emergency situations. Wires transmit signals from a transducer to the display so there is no water sensing lines to freeze up and cause problems.

FLOWMETER LOCATED AT TURNTABLE

The flowmeter display shall be located at the turntable control stand.

AERIAL RADIO REMOTE CONTROL – NO EXCEPTIONS

There shall be a radio receiver for the aerial and monitor controls supplied at the aerial control panel and powered by the chassis 12-volt electrical system The radio receiver shall have proportional outputs to drive the 12-volt electric proportional aerial control hydraulic valve as well as on/off output for monitor control.

The radio remote control transmitter/receiver shall be powered by two batteries and shall operate approximately 300 feet from the truck. The transmitter/receiver shall have a belt strap for comfortable operation of the three (3) proportional aerial functions (raise/lower, extension/retraction, and swing left/right) and the three (3) toggle switches for monitor functions (shape/stream, up/down and left/right operations). One (1) switch to select left or right monitor. The remote will also include an ON/OFF and HI/LOW switch and a push button switch to enable the aerial controls and another switch shall change the frequency. One (1) LCD panel will give continuous readings of the percent of the aerial live load, aerial elevation, aerial extension and rotation.

STYLE 3578 STREAM MASTER ELECTRIC MONITOR

An Akron Brass, model 3578, 2000 GPM rated monitor shall be provided at the end of the waterway. The monitor is an all electric single waterway monitor constructed of lightweight Pyrolite with a 4", 150 pound flange inlet and 3.5" thread outlet with cast-in turning vanes in each elbow. The monitor shall have fully enclosed motors and gears with manual overrides for both horizontal and vertical rotation. The manual override shall have captive cranks, one for horizontal and one for vertical rotation, and may be used simultaneously.

The monitor is not to exceed 16-1/4" high and 12-1/4" wide. The rotation of the monitor is from 0 degrees to 135 degrees below horizontal elevation. The logic box shall include coated, solid state components to resist water corrosion.

Three (3) toggle switches shall be located at the turntable aerial control stand and at the tip of the aerial. The switches will control the raise/lower, stream/shape, and left/right functions of the monitor. The controls at the aerial control stand will override the controls at the tip of the aerial.

STYLE 1577 SABERMASTER 1250 ELECTRIC MASTER STREAM NOZZLE

An Akron Brass model 1577 electrically controlled combination solid stream and fog nozzle shall be provided at the end of the monitor. The nozzle shall be constructed of Pyrolite, with a 2" orifice solid bore, and a fog flow of 1250 GPM at 80 PSI. The nozzle shall have a 12 volt electric motor, a 3.5" NH inlet, and built-in stream shaper, and shall not exceed 14-13/16" in length or 24 lbs, in weight.

2-1/2" GATED PRE-CONNECT DISCHARGE ON FLY SECTION

One (1) 4" handwheel operated butterfly valve shall be installed between the end of the waterway and the monitor. The butterfly valve shall direct water flow from the waterway to the 2-1/2" pre-connect discharge. A 2-1/2" quarter turn ball valve shall be installed ahead of the 2-1/2" pre-connect discharge. One (1) 2-1/2" cap and chain shall be supplied with pre-connect.

AERIAL COMMUNICATION SYSTEM

The two station intercom communication system shall have the master station at the turntable and secondary intercom and speaker at the tip of the aerial.

The master station shall have a volume control and a push-to-talk button. The remote station shall operate "hands free" and constantly transmit to the master station and speaker, unless the master station push-to-talk button is pressed.

The intercom shall be designed for exterior aerial application. Each station shall have a weather resistant and protective housing and water resistant speakers.

Atkinson Intercom

The Atkinson Dynamics Intercom AD26C master intercom and the AD26D slave intercom are designed for use in rugged, physical conditions and challenging acoustic environments. The durable construction is ideal for use on fire apparatus, emergency vehicles or any other mobile command equipment. The Atkinson Intercom provides high volume, clear audio communication.

The system is designed to provide clear communication for all personnel with minimum connections.

The remote unit, installed at the ladder tip, continuously transmits to the base stations. Base station units include a Push-to-Talk (PTT) button to transmit to other intercom positions.

TRACKING LIGHTS -- 12 VOLT BASE SECTION

Two (2) Collins model #CD-FX-HID spotlights shall be installed at the lower end of the base section ahead of the lift cylinders of the ladder. The lights shall have spot type bulbs. These are to be activated from the tracking light switch on the main control station and from a switch on the lamp head.

TIP LIGHTS -- 12 VOLT FLY SECTION

Two (2) Collins model # CD-FX-HID spotlights shall be installed at the upper end of the fly section. The spotlights shall have spot type bulbs. The lights shall be activated from the tip light switch on the main control station and a switch on the lamp head.

120 VOLT RECEPTACLE -- FLY SECTION

One (1) 120-volt AC circuit shall be run through the collector ring swivel, with a 20 amp receptacle mounted on tip of fly section. The receptacle(s) shall be a twist-lock three prong type with a weather proof cover.

TIP MARKER LIGHTS -- FLY SECTION

Two (2) red Whelen LED lights, model # 70R02FCR, shall be installed at the tip of the fly section. These lights shall be activated from the tip light switch on the turntable.

LADDER RUNG LIGHTING

The ladder rungs of each aerial section shall be equipped with 12-volt LED luma-bar lighting. The luma-bar shall run the full length of the climbing portion of each section. These lights shall be activated from the turntable tracking light switch. The ladder rung lights shall be "red" in color.

HYDRAULIC SYSTEM

The hydraulic system shall have a load sensing, variable gallonage, hydraulic piston pump with a 12-volt pressure reducing system. To reduce the normal time for aerial set up, the hydraulic pump shall be of the load sensing design. The hydraulic system shall have sufficient oil flow to provide the capability of performing multiple functions simultaneously without reducing operating speeds of the selected functions.

The hydraulic oil for the aerial shall be directed through a hydraulic swivel with 360 degrees continuous rotation. Enclosed in the hydraulic swivel shall be a minimum of twenty (20) electrical collector rings and a maximum of thirty-six (36) electrical collector rings with 360-degrees continuous rotation.

The hydraulic pump shall be large enough to provide oil to meet all of the requirements needed for aerial and outrigger operation standards.

A pressure reducing valve set at 500 PSI above the system pressure shall be connected to the hydraulic pump. This pressure reducing valve shall be a safety device for hydraulic pump failure. The hydraulic oil shall be directed through high pressure hydraulic hose and tubing.

The hydraulic system shall be designed to direct oil to the outriggers only while the ladder is in the bedded position. The oil can be directed to the aerial operation only when all of the outriggers are supporting sufficient load. This operation is made available through the use of electrical diverter valves with a manual override system for safety backup.

Hydraulic System Installation

The non-sealing moving parts of all hydraulic components, whose failure results in motion of the aerial device, shall have a minimum bursting strength of four times the maximum operating pressure to which the component is subjected.

Dynamic sealing parts of all hydraulic components, whose failure results in motion of the aerial device, shall not begin to extrude or otherwise fail at pressures at or below two times the maximum operating pressure to which the component is subjected.

Static sealing parts of all hydraulic components, whose failure results in motion of the aerial device, shall have a minimum bursting strength of four (4) times the maximum operating pressure to which the component is subjected.

All hydraulic hose, tubing, and fittings shall have a minimum bursting strength of at least three times the maximum operating pressure to which the components are subjected. All hydraulic hoses shall have a stamped embedded on one end of the metal fitting to include the date, technicians creating the hose identification number, PSI of hose and the company the hose was made by. This shall assist a mechanic in determining the age of the hydraulic hose.

All other hydraulic components shall have a minimum bursting strength of at least two times the maximum operating pressure to which the components are subjected.

The hydraulic system shall be provided with an oil pressure gauge at the control station position.

Hydraulic Reservoir

The hydraulic system shall be supplied by a 40 gallon oil tank with a 10 micron filter on the return line and a 100 mesh filter on the pump inlet side.

A means for checking and filling the hydraulic reservoir shall be readily accessible.

The fill location shall be conspicuously marked with a label that reads “Hydraulic Oil Only.”

Instructions for checking and filling the hydraulic reservoir shall be provided.

The hydraulic system components shall be capable of maintaining, under all operating conditions, oil cleanliness and temperature that comply with the component manufacturer's recommendations.

HYDRAULIC DRAIN LINE

One (1) quarter turn shut-off valve shall be connected in the drain line of the hydraulic oil tank..

HYDRAULIC OIL VALVE CONTROL

One (1) quarter turn shut-off valve shall be supplied between the suction line of the hydraulic oil tank and the inlet of the hydraulic pump.

EXTENSION SHAFT

Due to the design of the chassis an extension shaft shall be installed to connect the PTO to the hydraulic pump to avoid hitting the shackle.

HYDRAULIC SYSTEM -- ELEVATION SYSTEM

The hydraulic elevation system shall have two (2) 6" inside diameter cylinders that have 3-1/2" diameter rods and a 36" stroke. The elevation system shall elevate the aerial from -10 degrees to +75 degrees. The cylinders shall be equipped with spherical bushings to minimize cylinder rod wear. Each cylinder shall have lock valves connected directly to the barrel of the cylinder.

A pressure-reducing valve shall limit the force of the aerial when lowering and the system pressure limits the force when elevating the aerial.

All hydraulic cylinders utilized in the aerial elevation and extension system shall be commercially available and shall be of standard sizes and lengths rather than special sizes or of proprietary manufacture. This requirement is important since it assures quicker parts availability, shorter down time, and less costly replacement parts for cylinders.

HYDRAULIC PUMP DRIVE SYSTEM

An electrical start-stop "hot shift" PTO shall be mounted to the transmission. The PTO shall be connected to the hydraulic pump and shall supply power for all aerial and outrigger operations. Electrical safety wiring shall require that the vehicle be in neutral and the parking brake set before the PTO will operate. A "PTO Engaged" indicator light is installed in the cab of the apparatus.

EMERGENCY HYDRAULIC SYSTEM -- 12VOLT

An emergency hydraulic system shall be provided for capability for limited ladder functions and to stow the ladder and outriggers in case of prime motor failure.

The emergency system shall be powered from the 12-volt electrical system from the apparatus battery system and shall not be load managed.

EQUIPMENT MOUNTING ALOWANCE

A four thousand dollar ($4,000) equipment mounting allowance shall be included for equipment mounting.

SERVICE REQUIREMENTS

It is the intent of the purchaser to assure that parts and service are readily available for the apparatus specified. Service capabilities will be a major criteria for the award of this bid. To insure proper service, no bid will be accepted unless the bidder owns or offers facilities within 30 miles where complete parts and service are available and where such facility has been in business for a minimum of twenty five (25) years. The facility must be staffed by full time personnel who are factory trained and EVT certified in the operation and repair of fire apparatus, including the aerial, with full authorization of the manufacturer. The facility shall maintain a complete parts inventory in excess of $700,000 including major pump parts, body components, electrical items, fire apparatus hardware, etc. and shall offer on-site services including pump overhaul, body fabrication, collision repair, and a paint shop complete with a cross flow booth with air makeup and bake options to ensure the highest quality paint finish available. The bidder must also operate an on-site pump test facility and must be an “Authorized Parts and Service Center” for Hale Pumps and provide proof thereof.

Due to the highly specialized nature of fire apparatus repair, emergency vehicle technicians shall be in conformance with NFPA standards 1915 and 1071. There shall be a minimum of twelve (12) E.V.T. certified technicians including one (1) technician certified as a “Master Mechanic” (having amassed every EVT certification) on staff at the authorized service facility. Proof of current certification shall be supplied along with required service center information with the bid. Bids that do not meet these requirements shall not be considered. NO EXECPTIONS

5.0 - Insurance

The vendor shall maintain and keep in force such comprehensive general liability insurance as shall protect them from claims which may arise from operations under any

contract entered into with the City of Pawtucket, whether such operations be by themselves or by anyone directly or indirectly employed by them.

The amounts of insurance shall be not less than $1,000,000.00 combined single limit for any one occurrence covering both bodily injury and property damage, including accidental death.

The City of Pawtucket shall be named as additional insured on the vendor's General Liability Policy.

The vendor shall maintain and keep in force such Workers' compensation insurance limits as required by the statutes of the State of Rhode Island, and Employer's Liability with limits no less than $500,000.

6.0 - Acknowledgement of Risk & Hold Harmless Agreement

In addition to the indemnity provisions in the City of Pawtucket's Terms and Conditions of Purchase and to the fullest extent permitted by law, the selected vendor, its officers, agents, servants, employees, parents, subsidiaries, partners, officers, directors, attorneys, insurers, and/or affiliates (Releasors) agree to release, waive, discharge and covenant not to sue the City of Pawtucket, its officers, agents, servants or employees (Releasees) from any and all liability, claims, cross-claims, rights in law or in equity, agreements, promises demands, actions and causes of action whatsoever arising out of or related to any loss, damage, expenses (including without limitation, all legal fees, expenses, interest and penalties) or injury (including death), of any type, kind or nature whatsoever, whether based in contract, tort, warranty, or other legal, statutory, or equitable theory of recovery, which relate to or arise out of the Releasors use of or presence in and/or on City of Pawtucket property. The Releasors agree to defend, indemnify and hold harmless the Releasees from (a) any and all claims, loss, liability, damages or costs by any person, firm, corporation or other entity claiming by, through or under Releasors in any capacity whatsoever, including all subrogation claims and/or claims for reimbursement, including any court costs and attorneys fees, that may incur due to Releasors use of or presence in and on City of Pawtucket property; and (b) any and all legal actions, including third-party actions, cross-actions, and/or claims for contribution and/or indemnity with respect to any claims by any other persons, entities, parties, which relate to or arise out of Releasors use of or presence in and on City of Pawtucket property.

The Releasors acknowledge the risks that may be involved and hazards connected with use of or presence in and on City of Pawtucket property but elect to provide services under any contract with the City of Pawtucket with full knowledge of such risks. Releasors also acknowledge that any loss, damage, and/or injury sustained by Releasors is not covered by Releasees insurance. Releasors agree to become fully aware of any safety risks involved with the performance of services under any contract with the City of Pawtucket and any safety precautions that need to be followed and agree to take all such precautions.

The duty to indemnify and/or hold harmless the City of Pawtucket shall not be limited by the insurance required under the City of Pawtucket Terms and Conditions of Purchase.

7.0 - Additional Insurance Requirements

In addition to the insurance provisions in the City of Pawtucket Terms and Conditions of Purchase, the liability insurance coverage, except Professional Liability, Errors and Omissions or Workers' Compensation insurance required for performance of a contract with the City of Pawtucket shall include the City of Pawtucket, its divisions, officers and employees as Additional Insureds but only with respect to the selected vendor's activities under the contract. The insurance required through a policy or endorsement shall include:

A. a Waiver of Subrogation waiving any right to recovery the insurance company may have against the City of Pawtucket; and

B. a provision that the selected vendor's insurance coverage shall be primary with respect to any insurance, self insurance or self retention maintained by the City of Pawtucket and that any insurance, self insurance or self retention maintained by the City of Pawtucket shall be in excess of the selected vendor's insurance and shall not contribute.

There shall be no cancellation, material change, potential exhaustion of aggregate limits or non-renewal without thirty (30) days written notice from the selected vendor or its insurer(s) to the City of Pawtucket's Purchasing Agent. Any failure to comply with the reporting provision of this clause shall be grounds for immediate termination of the contract with the City of Pawtucket.

Insurance coverage required under the contract shall be obtained from insurance companies acceptable to the City of Pawtucket. The selected vendor shall pay for all deductibles, self insured retentions and/or self insurance included hereunder.

The City of Pawtucket's Purchasing Agent reserves the right to consider and accept alternative forms and plans of insurance or to require additional or more extensive coverage for any individual requirement.

8.0 - Proposal Content and Organization

Pricing must include all costs as specified in this solicitation. Pricing for this proposal must be indicated on the Bid Form in Section 12.0 and must be submitted in a separate, sealed envelope marked with the words "Pricing Proposal". Only one pricing proposal needs to be submitted.

All Bid Forms must be signed.

Vendors must include on the Bid Form a list of at least four (4) references with whom they have contracted to do similar work by including the company name, telephone number, contact person, and number of years they have served this customer. Preferably, references should be municipalities which are of approximate size as the City of Pawtucket, and a website address should be included if available.

Respondents must also include an overview of their company's experience including, but not limited to, the number of years the company has been providing these services,

the size of the company (including the number of employees and locations), a description of work undertaken that is similar to what is being requested in this RFP, and, if applicable, certifications that show a knowledge of equipment that would be serviced or provided under this contract.

If any subcontractors are to be used in the performance of any work contracted for under this RFP, please list their name(s), contractor license #, address and phone number, and specific description of the subcontract work to be performed.

Four (4) copies of your proposal, one (1) original and three (3) copies, must be submitted at the time of submission. Proposals must be in the following format:

Bid Form
Company overview
    Length of time your firm has been in business
    Length of time at current address
All licensing (List types and business license number(s)), certification and permits as required in the Scope of Work

Please state any and all additions, deletions, and exceptions, if any, that you are taking to any portion of this proposal. If not addressed specifically, the City of Pawtucket assumes that the vendor will adhere to all terms and conditions listed in this RFP.

Submission of a proposal is acknowledgement and acceptance of the City of Pawtucket's Purchasing Rules and Regulations and General Terms and Conditions of Purchase.

9.0 - Evaluation Criteria

The evaluation of proposals will be conducted in a time frame convenient to the City.

The City of Pawtucket reserves the right to award on the basis of cost alone, accept or reject any or all proposals, and to otherwise act in its best interest including, but not limited to, directly negotiating with any Supplier who submits a proposal in response to this RFP and to award a contract based upon the results of those negotiations alone. Further, the City reserves the right to waive irregularities it may deem minor in its consideration of proposals.

Proposals found to be technically or substantially non-responsive at any point in the evaluation process will be rejected and not considered further. The City of Pawtucket may elect to require presentations(s) by vendors in consideration for award.

Proposals will be evaluated in three (3) phases:

1. The first phase is an initial review to determine if the proposal, as submitted, is complete. To be complete, a proposal must meet all the requirements of this RFP.

2. The second phase is an in-depth analysis and review based on criteria below and their associated weights.

Evaluation Criteria	Importance

Meets Specifications	75%
Price	25%

3. The third is a comparison of each proposal's weighted evaluation relative to the costs proposed.

In the event that the City requires further information and/or a demonstration of any equipment or process offered in any proposal, all vendors asked for same will do so at no cost to the City.

10.0 - Miscellaneous

Vendors shall at all times comply with all federal, state, and local laws, ordinances and regulations and shall defend, indemnify and save harmless the City of Pawtucket against any claims arising from the violation of any such laws, ordinances and regulations, including but not limited to challenges as to the legality of any and all vendor installations.

The City is exempt from the payment of the Rhode Island State Sales Tax under the 1956 General Laws of the State of Rhode Island, 44-18-30, Paragraph 1, as amended. Further, the City is also exempt from the payment of any excise or federal transportation taxes. The proposal prices submitted must be exclusive of same, and will be so construed.

The City of Pawtucket reserves the right to cancel an agreement with the Vendor with thirty (30) days written notice and to award the contract to the next highest evaluated bidder.

The City reserves the right to pay the selected Vendor via credit card at its sole discretion.

11.0 – Bid Form

12-069 – Fire Apparatus

Date: _____

Submitted By: _____

(Include Name, Address and Telephone No.) _____

_____

_____

Name and remittance address that will appear on invoices:	Physical address of business:

General Information

Is your firm a sole proprietorship doing business under a different name? ____Yes _____ No

If yes, please indicate sole proprietorship, a name, and the name you are doing business under.

_____

_____

Is your firm incorporated? ____Yes _____ No

Will any of the work spelled out in this bid be outsourced? ____Yes _____ No

If so, please explain below:

_____

_____

_____

Have you or your firm been subject to suspension, debarment or criminal conviction by the City of Pawtucket, the State of Rhode Island, or any other jurisdiction?
Yes: _____ No: _____

Have the City of Pawtucket and/or the State of Rhode Island ever terminated contracts with your firm for cause?
Yes: _____ No: _____

Has your firm ever withdrawn from a contract with the City of Pawtucket and/or the State of Rhode Island during its performance?
Yes: _____ No: _____

Have you or your firm been involved in litigation against the City of Pawtucket and/or the State of Rhode Island.
Yes: _____ No: _____

If you answered yes to any of the foregoing, please explain the circumstances below. If you or your firm has been involved in litigation against the City of Pawtucket and/or the State of Rhode Island, please include the case caption, case number and status. (If more space is needed, please attach separate sheet and submit with the bid.)

_____

_____

_____

Is your company bonded? Yes ____ No ____

Please describe the nature and extent of all insurance coverage:

_____

_____

_____

Addenda

The following Addenda have been received. The noted modifications to the Bidding Documents have been considered and all costs are included in the Bid Sum.

Addendum #1, Dated:_____

Addendum #2, Dated:_____

Addendum #3, Dated:_____

References

Please list at least four (4) companies' with whom you have contracted to provide similar services. Preferably, references should be municipalities which are of approximate size as the City of Pawtucket, and a website address should be included if available.

Reference #1

Company Name: _____

Contact Person: _____ Telephone #: _____

Contract Dates: _____ To _____

Website Address: _____

Reference # 2

Company Name: _____

Contact Person: _____ Telephone #: _____

Contract Dates: _____ To _____

Website Address: _____

Reference # 3

Company Name: _____

Contact Person: _____ Telephone #: _____

Contract Dates: _____ To _____

Website Address: _____

Reference # 4

Company Name: _____

Contact Person: _____ Telephone #: _____

Contract Dates: _____ To _____

Website Address: _____

Number of miles from the purchaser to the nearest staffed authorized service facility.	
Number of EVT certified technicians on staff.	
Number of “Master Mechanics” on staff? Yes/No.	
Full body/collision repair, fabrication and paint booth on site? Yes/No.	
“Authorized” Hale Parts and Service Center? Yes/No.	
Does the service facility perform ALL warranty work for the products they represent?	
Over $700,000 in parts inventory at all times. Yes/No.	
Length of time the service facility has been in business as an emergency vehicle repair facility.	
On site pump test facility? Yes/No.	
Delivery date of the pumper fire truck?	
Delivery date of the ladder fire truck?	

Pricing Proposal

12-069

Having examined RFP # 12-069, we propose to enter into a contract to perform services per the bid specifications for the costs listed below:

The lump sum cost for the rear mount aerial ladder truck is:

$ | | | | , | | | | , | | | | . | | |

Numeric

Written

The lump sum cost for the class 1 pumper truck is:

$ | | | | , | | | | , | | | | . | | |

Numeric

Written

Bid Form Signature

(Bidder Name – Please Print)

By:

(Signature)

Title:

***** ***BID FORM MUST BE SIGNED*** *****

Appendix A

ANTI-KICKBACK ACKNOWLEDGMENT

ALL BIDDERS/OFFERORS MUST ATTEST TO THE FOLLOWING:

The vendor acknowledges, under the pains and penalties of perjury, that he/she has not been offered, paid, or solicited for any contribution or compensation, nor has he/she been granted a gift, gratuity, or other consideration, either directly or indirectly by any officer, employee or member of the governing body of the City of Pawtucket who exercises any functions or responsibilities in connection with either the award or execution of the project to which this contract pertains.

Further, the vendor acknowledges, under the pains and penalties of perjury, that he/she has not offered, paid, or solicited by way of any contribution or compensation, nor has he/she granted a gift, gratuity or other consideration either directly or indirectly to any officer, employee, or member of the governing body of the City of Pawtucket who exercises any functions or responsibilities in connection with either the award or execution of the project to which this project or contract pertains.

_____ _____

SIGNATURE OF OFFEROR DATE

_____

TITLE

_____

COMPANY

Title of RFP:

_____

Appendix B

CITY OF PAWTUCKET
GENERAL TERMS AND CONDITIONS OF PURCHASE

Preamble

The City of Pawtucket's Purchasing Office may, from time to time, make amendments to the General Terms and Conditions when the City of Pawtucket's Purchasing Agent determines that such amendments are in the best interest of the City of Pawtucket. Amendments shall be made available for public inspection at the Purchasing Office located in Pawtucket City Hall but shall not require formal public notice and hearing. Copies of the Terms and Conditions shall be provided to any individual or firm requesting them.

CITY OF PAWTUCKET'S PURCHASING OFFICE GENERAL CONDITIONS OF PURCHASE

All City of Pawtucket purchase orders, contracts, solicitations, delivery orders and service requests shall incorporate and be subject to the provisions of Rhode Island General Laws 8-15-4 and the City of Pawtucket purchasing rules and regulations adopted pursuant thereto, all other applicable provisions of the Rhode Island General Laws, the Pawtucket City Charter, specific requirements described in the Request or Contract, and the following General Conditions of Purchase:

1. GENERAL

   All purchase orders, contracts, solicitations, delivery orders, and service requests are for specified goods and services, in accordance with express terms and conditions of purchase, as defined herein. For the purposes of this document, the terms "bidder" and "contractor" refer to any individual, firm, corporation, or other entity presenting a proposal indicating a desire to enter into contracts with the City of Pawtucket, or with whom a contract is executed by the City of Pawtucket's Purchasing Agent, and the term "contractor" shall have the same meaning as "vendor".

2. ENTIRE AGREEMENT

   The City of Pawtucket's Purchase Order, or other City of Pawtucket contract endorsed by the City of Pawtucket Purchasing Office, shall constitute the entire and exclusive agreement between the City of Pawtucket and any contractor receiving an award. In the event any conflict between the bidder's standard terms of sale, these conditions or more specific provisions contained in the solicitation shall govern.

   All communication between the City of Pawtucket and any contractor pertaining to any award or contract shall be accomplished in writing.

   a. Each proposal will be received with the understanding that the acceptance, in writing, by contract or Purchase Order by the City of Pawtucket Purchasing Agent of the offer to do work or to furnish any or all the materials, equipment, supplies or services described therein shall constitute a contract between the bidder and the City of Pawtucket. This shall bind the bidder on his part to furnish and deliver at the prices and in accordance with the conditions of said accepted proposal and detailed specifications and the City of Pawtucket on its part to order from such contractor (except in case of emergency) and to pay for at the agreed prices, all materials, equipment, supplies or services specified and delivered. A contract shall be deemed executory only to the extent of funds available for payment of the amounts shown on Purchase Orders issued by the City of Pawtucket to the contractors.

   b. No alterations or variations of the terms of the contract shall be valid or binding upon the City of Pawtucket unless submitted in writing and accepted by the City of Pawtucket Purchasing Agent. All orders and changes thereof must emanate from the City of Pawtucket Purchasing Office: no oral agreement or arrangement made by a contractor with a department or employee will be considered to be binding on the City of Pawtucket Purchasing Agent, and may be disregarded.

   c. Contracts will remain in force for the contract period specified or until all articles or services ordered before date of termination shall have been satisfactorily delivered or rendered and accepted and thereafter until all terms and conditions have been met, unless:

1. terminated prior to expiration date by satisfactory delivery against orders of entire quantities, or
2. extended upon written authorization of the City of Pawtucket Purchasing Agent and accepted by the contractor, to permit ordering of the unordered balances or additional quantities at the contract price and in accordance with the contract terms, or
3. canceled by the City of Pawtucket in accordance with other provisions stated herein.

d. It is mutually understood and agreed that the contractor shall not assign, transfer, convey, sublet or otherwise dispose of this contract or his right, title or interest therein, or his power to execute such contract, to any other person, company or corporation, without the previous consent, in writing, of the City of Pawtucket Purchasing Agent.

e. If, subsequent to the submission of an offer or issuance of a purchase order or execution of a contract, the bidder or contractor shall merge with or be acquired by another entity, the contract may be terminated, except as a corporate resolution prepared by the contractor and the new entity ratifying acceptance of the original bid or contract terms, condition, and pricing is submitted to the City of Pawtucket Purchasing Office, and expressly accepted.

f. The contractor or bidder further warrants by submission of an offer or acceptance of a purchase order or other contract that he has no knowledge at the time of such action of any outstanding and delinquent or otherwise unsettled debt owed by him to the City of Pawtucket, and agrees that later discovery by the City of Pawtucket Purchasing Agent that this warranty was given in spite of such knowledge, except where the matter is pending in hearing or from any appeal therefrom, shall form reasonable grounds for termination of the contract.

3. SUBCONTRACTS

No subcontracts or collateral agreements shall be permitted, except with the City of Pawtucket's express written consent. Upon request, contractors must submit to the City of Pawtucket Purchasing Office a list of all subcontractors to be employed in the performance of any Purchase Order or other contract arising from this Request.

4. RELATIONSHIP OF PARTIES

The contractor or bidder warrants, by submission of an offer or acceptance of a purchase order or other contract, that he is not an employee, agent, or servant of the City of Pawtucket, and that he is fully qualified and capable in all material regards to provide the specified goods and services. Nothing herein shall be construed as creating any contractual relationship or obligation between the City of Pawtucket and any sub-bidder, subcontractor, supplier, or employee of the contractor or offeror.

5. COSTS OF PREPARATION

All costs associated with the preparation, development, or submission of bids or other offers will be borne by the offeror. The City of Pawtucket will not reimburse any offeror for such costs.

6. SPECIFIED QUANTITY REQUIREMENT

Except where expressly specified to the contrary, all solicitations and contracts are predicated on a specified quantity of goods or services, or for a specified level of funding.

a. The City of Pawtucket reserves the right to modify the quantity, scope of service, date of delivery or completion, or funding of any contract, with no penalty or charge, by written notice to the contractor, except where alternate terms have been expressly made a part of the contract.

b. The City of Pawtucket shall not accept quantities in excess of the specified quantity except where the item is normally sold by weight (where sold by weight, the City of Pawtucket will not accept quantities greater than ten per cent [10%] of the specified quantity), or where the Request or Contract provides for awards for other than exact quantities.

c. Purchase Orders or other contracts may be increased in quantity or extended in term without subsequent solicit with the mutual consent of the contractor and the City of Pawtucket, where determined by the City of Pawtucket Purchasing Agent to be in the City of Pawtucket's best interest.

7. TERM AND RENEWAL

Where offers have been requested or contracts awarded for terms exceeding periods of twelve (12) months, it is mutually understood and agreed that the City of Pawtucket's commitment is limited to a base term not to exceed twelve (12) months, subject to renewal annually at the City of Pawtucket's sole option for successive terms as otherwise described, except where expressly specified to the contrary. Purchase orders appearing to commit to obligations of funding or terms of performance may be executed for administrative convenience, but are otherwise subject to this provision, and in such cases the City of Pawtucket's renewal shall be deemed to be automatic, conditional on the continued availability of appropriated funds for the purpose, except as written notice of the City of Pawtucket's intent not to renew is served.

8. DELIVERY/COMPLETION

Delivery must be made as ordered and/or projects completed in accordance with the proposal. If delivery qualifications do not appear on the bidder's proposal, it will be interpreted to mean that goods are in stock and that shipment will be made within seven (7) calendar days. If the project completion date is not specified in the proposal, the date shall be determined by the City of Pawtucket Purchasing Agent. The decision of the City of Pawtucket Purchasing Agent, as to reasonable compliance with the delivery terms, and date of completion shall be final. Burden of proof of delay in receipt of order shall rest with the contractor. No delivery charges shall be added to invoices except when authorized on the Purchase Order.

9. FOREIGN CORPORATIONS

In accordance with Title 7 Chapter 1.1 (“Business Corporations”) of the General Laws of Rhode Island, no foreign corporation shall have the right to transact business in this state until it shall have procured a certificate of authority so to do from the Secretary of State.

10. PRICING

All pricing offered or extended to the City of Pawtucket is considered to be firm and fixed unless expressly provided for to the contrary. All prices shall be quoted F.O.B. Destination with freight costs included in the unit cost to be paid by the City of Pawtucket, except, where the Request or Contract permits, offers reflecting F.O.B. Shipping Point will be considered, and freight costs may then be prepaid and added to the invoice.

11. COLLUSION

Bidder or contractor warrants that he has not, directly or indirectly, entered into any agree participated in any collusion or otherwise taken any action in restraint of full competitive bidding. In special circumstances, an executed affidavit will be required as a part of the bid.

12. PROHIBITION AGAINST CONTINGENT FEES AND GRATUITIES

Bidder or contractor warrants that he has not paid, and agrees not to pay, any bonus, commission, fee, or gratuity to any employee or official of the City of Pawtucket for the purpose of obtaining any contract or award issued by the City of Pawtucket. Bidder or contractor further warrants that no commission or other payment has been or will be received from or paid to any third party contingent on the award of any contract by the City of Pawtucket, except as shall have been expressly communicated to the City of Pawtucket Purchasing Agent in writing prior to acceptance of the contract or award in question. Subsequent discovery by the City of Pawtucket of non-compliance with these provisions shall constitute sufficient cause for immediate termination of all outstanding contracts and suspension or debarment of the bidder(s) or contractor(s) involved.

13. AWARDS

Awards will be made with reasonable promptness and by written notice to the successful bidder (only); bids are considered to be irrevocable for a period of ninety (90) days following the bid opening unless expressly provided for to the contrary in the Request, and may not be withdrawn during this period without the express permission of the City of Pawtucket Purchasing Agent.

a. Awards shall be made to the bidder(s) whose offer(s) constitutes the lowest responsive price offer (or lowest responsive price offer on an evaluated basis) for the item(s) in question or for the Request as a whole, at the option of the City of Pawtucket. The City of Pawtucket reserves the right to determine those offers which are responsive to the Request, or which otherwise serve its best interests.

b. The City of Pawtucket reserves the right, before making award, to initiate investigations as to whether or not the materials, equipment, supplies, qualifications or facilities offered by the bidder meet the requirements set forth in the proposal and specification, and are ample and sufficient to insure the proper performance of the contract in the event of award. If upon such examination it is found that the conditions of the proposal are not complied with or that articles or equipment proposed to be furnished do not meet the requirements called for, or that the qualifications or facilities are not satisfactory, the City of Pawtucket may reject such a bid. It is distinctly understood, however, that nothing in the foregoing shall mean or imply that it is obligatory upon the City of Pawtucket to make any examinations before awarding a contract; and it is further understood that if such examination is made, it in no way relieves the contractor from fulfilling all requirements and conditions of the contract.

c. Qualified or conditional offers which impose limitations of the bidder's liability or modify the requirements of the bid, offers for alternate specifications, or which are made subject to different terms and conditions than those specified by the City of Pawtucket may, at the option of the City of Pawtucket, be
   1. rejected as being non-responsive, or
   2. set aside in favor of the City of Pawtucket's terms and conditions (with the consent of the bidder), or
   3. accepted, where the City of Pawtucket Purchasing Agent determines that such acceptance best serves the interests of the City of Pawtucket.

   Acceptance or rejection of alternate or counter-offers by the City of Pawtucket shall not constitute a precedent which shall be considered to be binding on successive solicitations or procurements.

d. Bids submitted in pencil, or which do not bear an original signature, in ink, by an owner or authorized agent thereof, will not be accepted.

e. Bids must be extended in the unit of measure specified in the Request. In the event of any discrepancy between unit prices and their extensions, the unit price will govern.

f. The City of Pawtucket Purchasing Agent reserves the right to determine the responsibility of any bidder for a particular procurement.

g. The City of Pawtucket Purchasing Agent reserves the right to reject any and all bids in whole or in part, to waive technical defects, irregularities, and omissions, and to give consideration to past performance of the offerors where, in his judgment the best interests of the City of Pawtucket will be served by so doing.

h. The City of Pawtucket Purchasing Agent reserves the right to make awards by items, group of items or on the total low bid for all the items specified as indicated in the detailed specification, unless the bidder specifically indicates otherwise in his bid.

i. Preference may be given to bids on products raised or manufactured in the City of Pawtucket or State of Rhode Island, other things being equal.

j. The impact of discounted payment terms shall not be considered in evaluating responses to any Request.

k. The City of Pawtucket Purchasing Agent reserves the right to act in the City of Pawtucket's best interests regarding awards caused by clerical errors by the City of Pawtucket Purchasing Office.

14. SUSPENSION AND DEBARMENT

The City of Pawtucket Purchasing Agent may suspend or debar any vendor or potential bidder, for good cause shown:

a. A debarment or suspension against a part of a corporate entity constitutes debarment or suspension of all of its divisions and all other organizational elements, except where the action has been specifically limited in scope and application, and may include all known corporate affiliates of a contractor, when such offense or act occurred in connection with the affiliate's performance of duties for or on behalf of the contractor, or with the knowledge, approval, or acquiescence of the contractor or one or more of its principals or

directors (or where the contractor otherwise participated in, knew of, or had reason to know of the acts).

b. The fraudulent, criminal or other serious improper conduct of any officer, director, shareholder, partner, employee, or any other individual associated with a contractor may be imputed to the contractor when the conduct occurred in connection with the individual's performance of duties for or on behalf of the contractor, or with the contractor's knowledge, approval or acquiescence. The contractor's acceptance of benefits derived from the conduct shall be evidence of such knowledge, approval, or acquiescence.

c. A vendor or contractor who knowingly engages as a subcontractor for a contract awarded by the City of Pawtucket to a vendor or contractor then under a ruling of suspension or debarment by the City of Pawtucket shall be subject to disallowance of cost, annulment or termination of award, issuance of a stop work order, or debarment or suspension, as may be judged to be appropriate by the City of Pawtucket's Purchasing Agent.

15. PUBLIC RECORDS

Contractors and bidders are advised that certain documents, correspondence, and other submissions to the City of Pawtucket's Purchasing Office may be voluntarily made public by the City of Pawtucket absent specific notice that portions of such submittals may contain confidential or proprietary information, such that public access to those items should be withheld.

16. PRODUCT EVALUATION

In all specifications, the words "or equal" are understood after each article when manufacturer's name or catalog are referenced. If bidding on items other than those specified, the bidder must, in every instance, give the trade designation of the article, manufacturer's name and detailed specifications of the item the bidder proposes to furnish; otherwise, the bid will be construed as submitted on the identical commodity described in the detailed specifications. The City of Pawtucket's Purchasing Agent reserves the right to determine whether or not the item submitted is the approved equal the detailed specifications.

a. Any objections to specifications must be filed by a bidder, in writing, with the City of Pawtucket's Purchasing Agent at least 96 hours before the time of bid opening to enable the City of Pawtucket's Purchasing Office to properly investigate the objections.

b. All standards are minimum standards except as otherwise provided for in the Request or Contract.

c. Samples must be submitted to the City of Pawtucket's Purchasing Office in accordance with the terms of the proposals and detailed specifications. Samples must be furnished free of charge and must be accompanied by descriptive memorandum invoices indicating whether or not the bidder desires their return and specifying the address to which they are to be returned (at the bidder's risk and expense), provided they have not been used or made useless by tests; and absent instructions, the samples shall be considered to be abandoned. Award samples may be held for comparison with deliveries.

d. All samples submitted are subject to test by any laboratory the City of Pawtucket's Purchasing Agent may designate.

17. PRODUCT ACCEPTANCE

All merchandise offered or otherwise provided shall be new, of prime manufacture, and of first quality unless otherwise specified by the City of Pawtucket. The City of Pawtucket reserves the right to reject all nonconforming goods, and to cause their return for credit or replacement, at the City of Pawtucket's option. Contract deliverables specified for procurements of services shall be construed to be work products, and subject to the provisions of this section.

a. Failure by the City of Pawtucket to discover latent defect(s) or concealed damage or non-conformance shall not foreclose the City of Pawtucket's right to subsequently reject the goods in question.

b. Formal or informal acceptance by the City of Pawtucket of non-conforming goods shall not constitute a precedent for successive receipts or procurements.

c. Where the contractor fails to promptly cure the defect or replace the goods, the City of Pawtucket reserves the right to cancel the Purchase Order, contract with a different contractor, and to invoice the original contractor for any differential in price over the original contract price.

d. When materials, equipment or supplies are rejected, the same must be removed by the contractor from the premises of the City of Pawtucket within forty-eight (48) hours of notification. Rejected items left longer than two days will be regarded as abandoned and the City of Pawtucket shall have the right to dispose of them as its own property.

18. PRODUCT WARRANTIES

All product or service warranties normally offered by the contractor or bidder shall accrue to the City of Pawtucket's benefit, in addition to any special requirements which may be imposed by the City of Pawtucket. Every unit delivered must be guaranteed against faulty material and workmanship for a period of one year unless otherwise specified, and the City of Pawtucket may, in the event of failure, order its replacement, repair, or return for full credit, at its sole option.

19. PAYMENT

Unless otherwise provided for by the Request or Contract, payment shall not be made until delivery has been made, or services performed, in full, and accepted. Payment shall not be due prior to thirty (30) working days following the latest of completion, acceptance, or the rendering of a properly submitted invoice.

a. Payment terms other than the foregoing may be rejected as being nonresponsive.
b. No partial shipments, or partial completion will be accepted, unless provided for by the Request or Contract.
c. Where a question of quality is involved, or failure to complete a project by the specified due date, payment in whole or part against which to charge back any adjustment required, shall be withheld at the direction of the City of Pawtucket Purchasing Agent. In the event a cash discount is stipulated, the withholding of payments, as herein described, will not deprive the City of Pawtucket from taking such discount.
d. Payments for used portion of inferior delivery or late delivery will be made by the City of Pawtucket on an adjusted price basis.
e. Payments on contracts under architectural or engineering supervision must be accompanied by a Certificate of Payment and Statement of Account signed by the architect or engineer and submitted to the City of Pawtucket Purchasing Office for approval.

20. THIRD PARTY PAYMENTS

The City of Pawtucket recognizes no assigned or collateral rights to any purchase agreement except as may be expressly provided for in the bid or contract documents, and will not accede to any request for third party or joint payment(s), except as provided for in specific orders by a court of competent jurisdiction, or by express written permission of the City of Pawtucket's Purchasing Agent. Where an offer is contingent upon such payment(s), the offeror is obligated to serve affirmative notice in his bid submission.

21. SET-OFF AGAINST PAYMENTS

Payments due the contractor may be subject to reduction equal to the amount of unpaid and delinquent state taxes (or other just debt owed to the State), except where notice of delinquency has not been served or while the matter is pending in hearing or from any appeal therefrom.

22. CLAIMS

Any claim against a contractor may be deducted by the City of Pawtucket from any money due him in the same or other transactions. If no deduction is made in such fashion, the contractor shall pay the City of Pawtucket the amount of such claim on demand. Submission of a voucher and payment, thereof, by the City of Pawtucket shall not preclude the City of Pawtucket's Purchasing Agent from demanding a price adjustment in any case when the commodity delivered is later found to deviate from the specifications and proposal.

a. The City of Pawtucket's Purchasing Agent may assess dollar damages against a vendor or contractor determined to be non-performing or otherwise in default of their contractual obligations equal to the cost of remedy incurred by the City of Pawtucket, and make payment of such damages a condition for consideration for any subsequent award. Failure by the vendor or contractor to pay such damages shall constitute just cause for disqualification and rejection, suspension, or debarment.

23. CERTIFICATION OF FUNDING

The Director of Finance shall provide certification as to the availability of funds to support the procurement for the current fiscal year ending June 30th only. Where delivery or service requirements extend beyond the end of the current fiscal year, such extensions are subject to both the availability of appropriated funds and a determination of continued need.

24. UNUSED BALANCES

Unless otherwise specified, all unused Blanket Order quantities and/or unexpended funds shall be automatically canceled on the expiration of the specified term. Similarly, for orders encompassing more than one fiscal year, unexpended balances of funding allotted for an individual fiscal year may be liquidated at the close of that fiscal year, at the City of Pawtucket's sole option.

25. MINORITY BUSINESS ENTERPRISES

Pursuant to the provisions of Title 37 Chapter 14.1of the General Laws, the City of Pawtucket reserves the right to apply additional consideration to offers, and to direct awards to bidders other than the responsive bid representing the lowest price where:

a. the offer is fully responsive to the terms and conditions of the Request, and
b. the price offer is determined to be within a competitive range (not to exceed 5% higher than the lowest responsive price offer) for the product or service, and
c. the firm making the offer has been certified by the R.I. Department of Economic Development to be a small business concern meeting the criteria established to be considered a Minority Business Enterprise.

26. PREVAILING WAGE REQUIREMENT

In accordance with Title 37 Chapter 13 of the General Laws of Rhode Island, payment of the general prevailing rate of per diem wages and the general prevailing rate for regular, overtime and other working conditions existing in the locality for each craft, mechanic, teamster, or type of workman needed to execute this work is a requirement for both contractors and subcontractors for all public works.

27. EQUAL OPPORTUNITY COMPLIANCE, HANDICAPPED ACCESS AND AFFIRMATIVE ACTION

Contractors of the City of Pawtucket are required to demonstrate the same commitment to equal opportunity as prevails under federal contracts controlled by Federal Executive Orders 11246, 11625, 11375 and 11830, and Title 28 Chapter 5.1 of the General Laws of Rhode Island.

Affirmative action plans shall be submitted by the contractor for review by the State Equal Opportunity Office. A contractor's failure to abide by the rules, regulations, contract terms and compliance reporting provisions as established shall be grounds for forfeiture and penalties as shall be established, including but not limited to suspension.

28. DRUG-FREE WORKPLACE REQUIREMENT

Contractors who do business with the City of Pawtucket and their employees shall abide by the State's drug-free workplace policy and the contractor shall so attest by signing a certificate of compliance.

29. TAXES

The City of Pawtucket is exempt from payment of excise, transportation and sales tax imposed by the Federal or State Government. These taxes should not be included in the proposal price. Exemption Certificates will be furnished upon request.

30. INSURANCE

All construction contractors, independent tradesmen, or firms providing any type of maintenance, repair, or other type of service to be performed on City of Pawtucket premises, buildings, or grounds are required to purchase and maintain coverage with a company or companies licensed to do business in the state as follows:

a. Comprehensive General Liability Insurance
    1) Bodily Injury $500,000 each occurrence/ $1,000,000 annual aggregate
    2) Property Damage $500,000 each occurrence /$500,000 annual aggregate

Independent Contractors
Contractual - including construction hold harmless and other types of contracts or agreements in effect for insured operations
Completed Operations
Personal Injury (with employee exclusion deleted)

b. Automobile Liability Insurance
Combined Single Limit not less than $150,000 each occurrence
Bodily Injury
Property Damage, and in addition non-owned and/or hired vehicles and equipment

c. Workers' Compensation Insurance
As required by the General Laws of Rhode Island.

The City of Pawtucket's Purchasing Agent reserves the right to consider and accept alternate forms and plans of insurance or to require additional or more extensive coverage for any individual requirement. Successful bidders shall provide certificates of coverage, reflecting the City of Pawtucket as an additional insured, to the City of Pawtucket Purchasing Office, forty-eight (48) hours prior to the commencement of work, as a condition of award. Failure to comply with this provision shall result in rejection of the offeror's bid.

31. BID SURETY

When requested, a bidder must furnish a Bid Bond or Certified Check for 5% of his bid, or for the stated amount shown in the solicitation. Bid Bonds must be executed by a reliable Surety Company authorized to do business in the State of Rhode Island. Failure to provide Bid Surety with bid may be cause for rejection of bid. The Bid Surety of any three bidders in contention will be held until an award has been made according to the specifications of each proposal. All others will be returned by mail within 48 hours following the bid opening. Upon award of a contract, the remaining sureties will be returned by mail unless instructed to do otherwise.

32. PERFORMANCE AND LABOR AND PAYMENT BONDS

A performance bond and labor and payment bond of up to 100% of an award may be required by the City of Pawtucket's Purchasing Agent. Bonds must meet the following requirements:

a. Corporation: The Bond must be signed by an official of the corporation above his/her official title and the corporate seal must be affixed over his/her signature.
b. Firm or Partnership: The Bond must be signed by all of the partners and must indicate that they are " Doing Business As (name of firm)."
c. Individual: The Bond must be signed by the individual owning the business and indicate "Owner."
d. The Surety Company executing the Bond must be licensed to do business in the State of Rhode Island or Bond must be countersigned by a company so licensed.
e. The Bond must be signed by an official of the Surety Company and the corporate seal must be affixed over his signature.
f. Signatures of two witnesses for both the principal and the Surety must appear on the Bond.
g. A Power of Attorney for the official signing of the Bond for the Surety Company must be submitted with the Bond.

33. SUSPENSION, DEFAULT AND TERMINATION

a. Suspension of a Contract by the City of Pawtucket

The City of Pawtucket reserves the right at any time and for any reason to suspend all or part of this contract, for a reasonable period, not to exceed sixty days, unless the parties agree to a longer period. The City of Pawtucket shall provide the contractor with written notice of the suspension order signed by the Purchasing Agent or his or her designee, which shall set forth the date upon which the suspension shall take effect, the date of its expiration, and all applicable instructions. Upon receipt of said order, the contractor shall immediately comply with the order and suspend all work under this contract as specified in the order. The contractor shall take all reasonable steps to mitigate costs and adverse impact to the work specified in the contract during the suspension period. Before the order expires, the City of Pawtucket shall either:

1. cancel the suspension order;
2. extend the suspension order for a specified time period not to exceed thirty (30) days; or

3. terminate the contract as provided herein.

The contractor shall resume performance once a suspension order issued under this section is canceled or expires. If as a result of the suspension of performance, there is a financial or schedule impact upon the contract, an appropriate adjustment may be made by, or with the approval of, the City of Pawtucket's Purchasing Agent. Any adjustment shall be set forth in writing. After a suspension order has been canceled or expires, the contractor shall provide any request for adjustment to the City of Pawtucket's Purchasing Agent within thirty (30) days after resuming work performance.

b. Termination of a Contract by the City of Pawtucket

1. Termination for Default or Nonperformance

If, for any reason, the contractor breaches the contract by failing to satisfactorily fulfill or perform any obligations, promises, terms, or conditions, and having been given reasonable notice of and opportunity to cure such default, fails to take satisfactory corrective action within the time specified by the City of Pawtucket, the City of Pawtucket may terminate the contract, in whole or in part, the termination of all outstanding contracts or sub-contracts held by the contractor, and the suspension or debarment of the contractor from future procurements by giving written notice to the contractor specifying the date for termination. The City of Pawtucket shall endeavor to provide such notice at least seven (7) calendar days before the effective date of the termination.

A contractor who fails to commence within the time specified or complete an award made for repairs, alterations, construction, or any other service will be considered in default of contract. If contractor consistently fails to deliver quantities or otherwise perform as specified, the City of Pawtucket's Purchasing Agent reserves the right to terminate the contract and contract for completion of the work with another contractor and seek recourse from the defaulting contractor or his surety. In the event of a termination for default or nonperformance, in whole or in part, the City of Pawtucket may procure similar goods or services in a manner and upon terms it deems appropriate, and the contractor shall be liable for the excess costs incurred by the City of Pawtucket as a result of the contractor's default. The contractor, or its surety, agrees to promptly reimburse the City of Pawtucket for the excess costs, but shall have no claim to the difference should the replacement cost be less.

2. Termination Without Cause

The City of Pawtucket may terminate the contract in whole or in part without cause at any time by giving written notice to the contractor of such termination at least thirty (30) days before the effective date of such termination. The notice shall specify the part(s) of the contract being terminated and the effective termination date.

Within thirty (30) days of the effective date of the termination of the contract the contractor shall compile and submit to the City of Pawtucket an accounting of the work performed up to the date of termination. The City of Pawtucket may consider the following claims in determining reasonable compensation owed to the contractor for work performed up to the date of termination:

a. contract prices for goods or services accepted under the contract;
b. costs incurred in preparing to perform and performing the terminated portion of the contract; or
c. any other reasonable costs incurred by the contractor as a result of the termination.

The total sum to be paid to the contractor shall not exceed the total contract price, less any payments previously made to the contractor, the proceeds from any sales of goods or manufacturing materials, and the contract price for work not terminated.

3. Contractor's Obligations in the Event of Termination

If the contract is terminated for any reason, or expires pursuant to its terms, the contractor shall transfer and deliver to the City of Pawtucket in the manner and to the extent directed by the City of Pawtucket:

a. all finished or unfinished material prepared by the contractor; and
b. all material, if any, provided to the contractor by the City of Pawtucket.

For the purposes of the contract, "material" shall include, but is not limited to, goods, supplies, parts, tools, machinery, equipment, furniture, fixtures, information, data, reports, summaries, tables, maps, charts, photographs, studies, recommendations, files, audiotapes, videotapes, records, keys, security badges, and documents.

If the contract is terminated for cause, the contractor shall not be relieved of liability to the City of Pawtucket for damages sustained because of any breach by the contractor. In such event, the City of Pawtucket may retain any amounts which may be due and owing to the contractor until such time as the exact amount of damages due the City of Pawtucket from the contractor has been determined by the City of Pawtucket Purchasing Agent. The City of Pawtucket may also set off any damages so determined against the amounts retained.

Upon termination of the contract, the contractor shall stop performance on the date specified, terminate any outstanding orders and subcontracts applicable to the terminated portion of the contract, and shall incur no further commitments or obligations in connection with the terminated performance. The contractor shall settle all liabilities and claims arising out of the termination of subcontracts and order generating from the terminated performance. The City of Pawtucket may direct the contractor to assign the contractor's right, title and interest under terminated orders or subcontracts to the City of Pawtucket or a third party.

Terminations of Purchase Order Contracts or Master Pricing Agreements shall require the signature of the City of Pawtucket Purchasing Agent or his designee. Notice of termination by either party shall be submitted in writing to the other party in accordance with the termination clause of the contract, or where no specific termination clause is included, written notice shall be provided no later than thirty (30) days before the expiration of the contract.

34. INDEMNITY

The contractor guarantees:

a. To save the City of Pawtucket, its agents and employees, harmless from any liability imposed upon the City of Pawtucket arising from the negligence, either active or passive, of the contractor, as well as for the use of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article or appliance furnished or used in the performance of the contract of which the contractor is not the patentee, assignee or licensee.

b. To pay for all permits, licenses and fees and give all notices and comply with all laws, ordinances, rules and regulations of the City of Pawtucket and of the State of Rhode Island.

c. That the equipment offered is standard new equipment, latest model of regular stock product with all parts regularly used with the type of equipment offered; also, that no attachment or part has been substituted or applied contrary to manufacturer's recommendations and standard practice.

35. CONTRACTOR'S OBLIGATIONS

In addition to the specific requirements of the contract, construction and building repair contractors bear the following standard responsibilities:

a. To furnish adequate protection from damage for all work and to repair damages of any kind, for which he or his workmen are responsible, to the building or equipment, to his own work, or to the work of other contractors;

b. The contractor, its subcontractor(s) and their employees and/or agents, shall protect and preserve property in the contractor or subcontractor's possessions in which the City of Pawtucket has an interest, and any and all materials provided to the contractor or subcontractor by the City of Pawtucket;

c. To clear and remove all debris and rubbish resulting from his work from time to time, as directed or required, a completion of the work leave the premises in a neat unobstructed condition, broom clean, and in satisfactory order and repair;

d. To store equipment, supplies, and material at the site only upon approval by the City of Pawtucket, and at his own risk;

e. To perform all work so as to cause the least inconvenience to the City of Pawtucket, and with proper consideration for the rights of other contractors and workmen;

f. To acquaint themselves with conditions to be found at the site, and to assume responsibility for the appropriate dispatching of equipment and supervision of his employees during the conduct of the work;

g. To ensure that his employees are instructed with respect to special regulations, policies, and procedures in effect for any City of Pawtucket facility or site, and that they comply with such rules, including but not limited to security policies or practices and/or criminal background checks for any employees and/or subcontractors;

h. The contractor shall ensure that its employees or agents are experienced and fully qualified to engage in the activities and services required under the contract;

i. The contractor shall ensure that at all times while services are being performed under this contract at least one of its employees or agents on the premises has a good command of the English language and can effectively communicate with the City of Pawtucket and its staff;

j. The contractor and contractor's employees or agents shall comply with all applicable licensing and operating requirements required by federal or state law and shall meet accreditation and other generally accepted standards of quality in the applicable field of activity;

k. The contractor shall secure and retain all employee-related insurance coverage for its employees and agents as required by law; and

l. The contractor, subcontractor, and his or her employees and agents shall not disclose any confidential information of the City of Pawtucket to a third party. Confidential information means:

(1) any information of a sensitive or proprietary nature, whether or not specially identified as confidential or proprietary; or

(2) any information about the City of Pawtucket gained during the performance of a contract that
is not already lawfully in the public domain.

36. FORCE MAJEURE

All orders shall be filled by the contractor with reasonable promptness, but the contractor shall not be held responsible for any losses resulting if the fulfillment of the terms of the contract shall be delayed or prevented by wars, acts of public enemies, strikes, fires, floods, acts of God, or for any other acts not within the control of the contractor and which by the exercise of reasonable diligence, the contractor is unable to prevent.