Specifications for a Custom Fire Aerial Apparatus
INTENT OF SPECIFICATIONS - It is the intent of these specifications to cover the furnishing and delivery to the Fire Department of a complete apparatus equipped as hereinafter specified. With a view to obtaining the best results and the most acceptable apparatus, these specifications cover minimum requirements as to the type of construction and tests to which the apparatus must conform. Minor details of construction and materials, where not otherwise specified, are left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features. The apparatus shall conform to the requirements of the current (at time of bid) NFPA Standard 1901, unless otherwise noted herein, with the exception of Minor Equipment. The only minor equipment supplied will be stated in these specifications.

Each bidder shall furnish two (2) complete (original and a copy) "Proposal Specifications", printed on their own stationery. Copies or reproduction of these "advertised specifications" can only be used as an attachment to the proposal specifications, for comparison/compliance purposes. **No Exceptions will be allowed to this requirement.**

QUALIFICATIONS OF THE BIDDERS - Bids will only be considered from manufacturers with an established reputation in the field of fire apparatus construction. Manufacturer must be a current member of the Fire Apparatus Manufacturers Association (FAMA). Bids from non-established builders will not be considered.

Each bidder shall furnish satisfactory evidence of his ability to construct the apparatus specified, and shall state the location of the factory where the apparatus is to be built. Units with the apparatus body and chassis not constructed entirely in the United States will be automatically rejected, with no further explanation given. **No exceptions will be allowed to these requirements.**

THE RIGHT TO REJECT BIDS – The City reserves the right to select the equipment which best suits its needs, whether or not it is the lowest bid, and also reserves the right to reject any or all bids and to waive informalities. Bidders may not withdraw bids for a period of ninety (90) days after the date of the bid opening.

REFERENCES- All bidders shall submit a list containing a minimum of fifteen (15) customers who are operating a similar model fire apparatus as described in this specification. The customer list shall contain the department name, address, phone number, and current contact person. **No exception will be allowed to this requirement.**

SERVICE REQUIREMENTS - Each bidder shall be able to show that he is in a position to render prompt service and to furnish replacement parts within a 48 hour time frame.

BIDDER COMPLIES: Yes____ No____

BID SECURITY - Each bidder shall furnish a bid bond in an amount equal to 5% of the bid price. The surety company must be listed in the United States Treasury Department Circular
The surety company must be licensed in the state of Nebraska. **No Exceptions will be allowed to the bid security requirement.**

**PERFORMANCE BOND** – The successful bidder shall furnish a performance bond in the amount of 100% of the contract price will be required for the faithful performance of the contract agreement. **There will be no exception to this requirement.**

**PROPOSAL DRAWING** - Each bidder shall submit four (4) detailed scaled drawings of the apparatus as proposed. The drawings shall include left side view, rear view, front view, and right side body view. The drawing shall be minimum 20” x 30” in size (D Size). **There will be no exception to this requirement.**

**LIABILITY** - The successful bidder shall assume all liability for the use of his patented process, device or article forming a part of the apparatus. An insurance binder in the amount of fifteen million dollars ($15,000,000) will be included in the bidders’ proposal book. **There will be no exception to this requirement.**

**CONTRACT AGREEMENT** - These specifications, together with any other documents required herein, shall be included in the contract executed by the Purchaser and the successful bidder. Bid date will be stated in calendar days after execution of contract. Each bidder shall submit a copy of his proposed contract form. Said contract form shall be subject to approval or modification until acceptable by both parties. **There will be no exception to this requirement.**

**CONTRACT AWARD** – Contract will be awarded to the most “responsible bidder”, provided that bid is in the best interest of the purchaser. The City will evaluate the bids based on total price, compliance to specifications, apparatus design, quality, delivery, economy of operation, warranty, the experience of the manufacturer, materials, availability of service for repair and maintenance, and adaptability. The delivery date will be an important consideration. This will be used to analyzing bids to determine the most “responsible bidder.”

BIDDER COMPLIES: **Yes**____ **No**____

**TERMS OF PAYMENT** - The chassis shall be paid for upon completion and shipment to the apparatus manufacturer. The remaining balance shall be paid upon acceptance by the Fire Department, which shall be upon delivery and completion of operation demonstration.

BIDDER COMPLIES: **Yes**____ **No**____

**TRADE-IN ALLOWANCE** – Allowance for trade-in of a 1985 Stuphen, 100 foot mid-mount, platform aerial, a Hale 1500 Gallon Per Minute (GPM) single stage pump, with a Detroit 8V92 Silver 475 horsepower engine and Allison 709 transmission, approximately 25,361 miles and 2839 hours as of January 2015. Pull-out tray for a portable generator to supply outlets but generator is not included. All ground ladders included. No other equipment will be included. Bidders may make an appointment with the Fire Department to inspect the aerial.
BIDDER COMPLIES: Yes____ No____

BID PROPOSAL - Each bidder’s proposal shall clearly state the make and model, total price, and terms of payment. All bids must remain firm for a period of ninety (90) days.

BIDDER COMPLIES: Yes____ No____

EXCEPTIONS - It is the intent of these specifications to obtain maximum efficiency of the apparatus and equipment delivered, with emphasis on crew safety, ease of operation, resistance to corrosion, and availability of service and parts. Certain major components and features have been requested in support of this, and exceptions taken in these areas will not be acceptable. Each bidder shall list all exceptions or substitutions proposed; however minor, on a separate page titled "EXCEPTIONS", and shall furnish adequate supportive data to allow the Fire Department to determine acceptability. After each item listed within this specification is a “Bidder Complies” line with the words “YES” indicating the bidder is fully compliant with the specification and “NO” indicating the bidder is not fully compliant and an exception is taken. To assist the purchaser in the proper evaluation of bids, each bidder shall clearly mark the appropriate word, yes or no, to indicate whether or not the bid meets specifications in the adjoining paragraph. A completed copy of this must be included with all bids. All exceptions must be indicated. Not noting an exception when there is variance between the bidders’ submitted proposal and these advertised specifications will result in immediate rejection of the bid. No Exception shall be allowed to this requirement.

GENERAL CONSTRUCTION - The apparatus shall be designed and the equipment mounted with due consideration to distribution of load between the front and rear axles, so that all applicable specified equipment, including filled water tank, a full complement of personnel, and equipment will be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the National Fire Protection Association and the Society of Automotive Engineers. Special consideration will be given to accessibility of various components that require periodic maintenance, ease of operations, and symmetrical proportions. A computer generated weight and balance sheet shall be included with all bids. Bids not submitted with required weight and balance sheet shall be automatically rejected, with no further explanation given. There will be No Exception to this requirement.

PLANT INSPECTION TRIPS – Two (2) inspection trips to the manufacturers’ plant facility shall be provided for Six (6) Fire Department personnel. All applicable expenses including meals, lodging and transportation shall be the responsibility of the bidder. If the manufacturing plant facility is in excess of 300 miles from the City of Fremont, Nebraska, air transportation shall be provided.

BIDDER COMPLIES: Yes____ No____
WARRANTY - The successful bidder shall warrant the apparatus to be free from defects in materials and workmanship for a period of one (1) year. Component parts, if found to be defective, shall be repaired or replaced without costs other than transportation charges. This warranty shall be exclusive of the chassis, fire pump, and other trade accessories which are normally warranted by their respective manufacturers. Other warranties may be required as specified in the accompanying specifications. Each bidder must submit a copy of his proposed warranty in compliance with these requirements.

BIDDER COMPLIES: Yes____ No____

MAX HEIGHT

The maximum height of the apparatus shall not exceed 11' 1". NO EXCEPTIONS.

MAX LENGTH

The maximum length of the apparatus shall not exceed 48' 0". NO EXCEPTIONS.

MAX WIDTH

The maximum width of the apparatus shall not exceed 102".

BIDDER COMPLIES: Yes____ No____

WHEELBASE

A wheelbase restriction has not been specified for this apparatus.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

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.

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.
BIDDER COMPLIES:  Yes____  No____  

**ELECTRONIC STABILITY CONTROL**

Electronic stability control shall be supplied on the chassis.

BIDDER COMPLIES:  Yes____  No____  

**DEMONSTRATION**

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 factory trained Specialist who shall be responsible for complete instruction as to operation and maintenance of the chassis, and the completed vehicle.

The demonstration specialist shall remain at the Fire Department for a period of three (3) days to provide thorough demonstrations to all personnel, or as instructed by Chief of the Department. All meals, motel and travel costs shall be the responsibility of the successful bidder.

BIDDER COMPLIES:  Yes____  No____  

**DELIVERY**

The successful bidder shall, at his expense, deliver the apparatus to the Fire Department. 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.

BIDDER COMPLIES:  Yes____  No____  

**DELIVERY TIME**

Indicate the number of days from acceptance of contract/bid to delivery of apparatus ________________ .

BIDDER COMPLIES:  Yes____  No____  

**BUMPER TO BUMPER WARRANTY**

The manufacturer shall provide a one (1) year bumper-to-bumper warranty. The manufacturer shall supply details of their warranty information with their bid submission.

BIDDER COMPLIES:  Yes____  No____  

**ALUMINUM BODY WARRANTY - TEN YEAR**
The manufacturer shall provide a ten (10) year structural and corrosion perforation warranty for the fabricated aluminum body. The manufacturer shall supply details of their warranty information with their bid submission.

BIDDER COMPLIES: Yes____ No____

**GALVANIZED STEEL SUBFRAME WARRANTY**

The manufacturer shall provide a lifetime warranty for the galvanized steel sub frame of the apparatus body. The manufacturer shall supply details of their warranty information with their bid submission.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**COMPLETE PRINTED MANUAL**

The manufacturer shall provide with the vehicle upon delivery, one (1) complete delivery manual. This manual shall be in a notebook type binder, with reference tabs for each section of the vehicle. A companion compact disk (CD) with all of the printed material in an electronic format (Adobe Acrobat PDF) shall be provided.

Within each section shall be:

- Individual component manufacturer instruction and parts manuals
- Warranty forms for the body
- Warranty forms for all major 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 of the body portion of the apparatus
- Technical publications for training and instruction on major body components
• Warning and safety related notices for personnel protection
• Cab and chassis manuals on parts, service and maintenance shall be provided

The manufacturer shall supply details of their manual information with their bid submission.

BIDDER COMPLIES:  Yes____  No____

"ON-LINE" SERVICE MANUAL SUPPORT

As part of the standard delivery manual, the manufacturer shall give a password-protected link to the end user, allowing access to the manufacturers' database on service parts. The internet-based system shall allow the end user to access the major component supplier's service parts listing such as Hale, Waterous, Akron, etc. This shall be accomplished with simplistic point and click features on the manufacturer line item within the "stripper" or "line sheet". This will include automatic updates, printable schematics, and manufacturer's web links and is available in a commercially available format of Adobe Acrobat Reader to access these documents. The manufacturer shall submit with the bid proposal, a sample set of on line Adobe formatted material that has been printed from the manufacturer’s website. Failure to do so will result in rejection of the proposal. Reference to "on delivery" or "at pre-build" submission is not an acceptable response for the bid document.

Parts Listings within Manuals

The manuals will include cross-reference part numbers from the apparatus manufacturers' part number to the vendor parts. Example: Brand X Fire Apparatus, Hydraulic Ladder Rack, Part #WW-MN-0302 cross-referenced to Ziamatic Corporation Part 098-MN2345. This will allow for reference between individual parts and complete installation assemblies as completed by the body builder. The manuals will list all components of the vehicle that includes a vendor part utilized in a complete installation via the manufacturers "line item sheet" or "stripper" utilized to manufacture the completed vehicle. These are "As Built" and proposals with "typical" or "generic" manuals will be rejected.

Illustrative Schematics within Manuals

The manufacturer shall include installation diagrams and drawings of all major sub assemblies. This will include components such as hydraulic ladder rack assemblies, pump panels, tanks, fire pumps, etc. The drawings shall be linked via an Internet based service program, in an electronic format from the manufacturers “stripper” (line item listing) of the manufacturing document. The manufacturer shall submit, with the bid proposal, a sample schematic. Failure to do so will result in rejection of the proposal. Reference to "on delivery" or "at prebuild" submission is not an acceptable response for the bid document.

Digital Images within Manuals

In addition to two and three-dimensional installation drawings, the manufacturer shall make accessible, via an internet based link, the actual photos of the installed components listed within the "stripper" or line sheet. This will include, but not limited to Wiring terminals, main body
distribution strips, fire pump shifting, auxiliary components, etc. The manufacturer shall submit a sample of these with the bid submission. Failure to submit the digital images with the bid will result in rejection of the proposal. Reference to "on delivery" or "at pre-build" submission is not an acceptable response for the bid document.

**Installation Instructions within Manuals**

The manufacturers "work instructions" or "installation instructions" shall be included with the service manuals. These documents shall be accessible via a web-based link to the individual vehicle manufactured. The work instructions shall give systematic instructions of the installation process. The manufacturer shall submit, with the bid proposal, a sample set of instructions. Failure to do so will result in rejection of the proposal. Reference to "on delivery" or "at prebuild" submission is not an acceptable response for the bid document.

**Automatic Updates of Manuals and Parts Listings**

The online manuals will include automatic updates that are accessible via the web link. When clicking on the part within the manufacturers’ stripper or line sheet, it will allow the end user to access the component manufacturer website for updated information. This will allow for latest parts and service components from the individual part manufacturer or vendor.

**Electrical Schematics**

To maintain the vehicles electrical systems, the manufacturer shall provide to the purchaser the instructional manuals, complete electrical information and schematics on the vehicle. The electrical information shall be provided as follows:

**Wiring Systems 12 and 120 Volt:**

- Graphic symbols for electrical diagrams.
- Wire labeling, imprinting codes and index.
- Computer generated electrical schematics indicating the circuit number, wire size, switches, circuit breaker and terminals on the vehicle.

The manufacturer shall submit, with the bid proposal, a sample set of diagrams. Failure to do so will result in rejection of the proposal. Reference to "on delivery" or "at prebuild" submission is not an acceptable response for the bid document.

BIDDER COMPLIES:  Yes____  No____

**CUSTOM CHASSIS**

A custom fire truck chassis shall be furnished per the following specifications.

BIDDER COMPLIES:  Yes____  No____

**NFPA 2009 STANDARDS**
This unit shall comply with the NFPA standards effective January 1, 2009.

Certification of slip resistance of all stepping, standing and walking surfaces shall be supplied with delivery of the apparatus.
A plate that is highly visible to the driver while seated shall be provided which states the overall height, length, and gross vehicle weight rating.

The manufacturer shall have programs in place for training, proficiency testing and performance for any staff involved with certifications.
An official of the company shall designate, in writing, which is qualified to witness and certify test results.

BIDDER COMPLIES: Yes____ No____

**PAINT WARRANTY TEN YEAR**

The PPG paint performance guarantee will cover the areas of the vehicle finished with the specified product for a period of TEN (10) years beginning the day the vehicle is delivered to the purchaser.

The full apparatus and chassis shall be covered for the following paint failures as outlined on the guarantee certificate:
- Peeling or delaminating of the topcoat and/or other layers of paint.
- Cracking or checking.
- Loss of gloss caused by cracking, checking, or hazing.
- Any paint failure caused by defective PPG Fleet Finishes, which are covered by this guarantee.

All guarantee exclusions, limitations, and methods of claims are covered in the full certificate provided to the original purchaser.

Note: Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

ENGINE WARRANTY

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

BIDDER COMPLIES: Yes____ No____

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. Additional frame coating warranties
may be specified elsewhere in these specifications.

BIDDER COMPLIES: Yes____ No____

FRONT AND REAR AXLE WARRANTY

The front and rear axles shall be warranted for two (2) years with unlimited miles under the
general service application.

BIDDER COMPLIES: Yes____ No____

CAB AND CHASSIS WARRANTY

The cab and chassis shall carry a twenty-four (24) month warranty providing limited parts and
labor from the date the complete apparatus is delivered to the end user. The complete detail of
the warranty shall be outlined in a document provided upon request.

BIDDER COMPLIES: Yes____ No____

STATIC LOAD SEAT TEST INFORMATION

This model of seat shall have successfully completed the static load tests set forth by FMVSS
207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap
and shoulder belts and twenty (20) times the weight through the center of gravity. This model of
seat installed in the cab model, as specified, shall have successfully completed the dynamic sled
testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the
larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male
weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as
referred to in FMVSS 208.
The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

BIDDER COMPLIES:  Yes____  No____

**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.

BIDDER COMPLIES:  Yes____  No____

**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.

BIDDER COMPLIES:  Yes____  No____

**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.

**BIDDER COMPLIES:**    Yes____      No____

**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.

**BIDDER COMPLIES:**    Yes____      No____

**ENGINE AND TRANSMISSION MANUALS**

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

**BIDDER COMPLIES:**    Yes____      No____

**ENGINE SERVICE MANUALS**

One (1) printed copy of the Cummins engine service manual shall accompany the cab and chassis.

**BIDDER COMPLIES:**    Yes____      No____

**TRANSMISSION SERVICE MANUALS**

Each cab and chassis shall include one (1) printed copy of the service manual for the Allison brand transmission.

**BIDDER COMPLIES:**    Yes____      No____

**AS BUILT WIRING DIAGRAMS**

Each cab and chassis shall include one (1) digital copy of the wiring schematics and component wiring. The wiring schematics shall be developed on a software program such as VeSys Design or equal that provides continuity in files and diagram. The software shall allow you to trace through the design schematics to identify cross referenced items such as in-line connectors and wires. The software shall be interactive which allows you to view one electrical assembly drawing, click on a wire routing and the program will take you to the related circuit assembly or termination point. The software shall also provide a searchable function allowing you to view
multiple diagrams using readily available pdf viewers. The digital copy of the wiring schematics shall be compatible with hand held devices such as I-Pads.

BIDDER COMPLIES: Yes____ No____

ROAD SAFETY KIT

One (1) 2-1/2# ABC DOT Approved fire extinguisher shall be provided. The fire extinguisher shall be shipped loose with the chassis.

One (1) set of DOT approved hazard triangles shall be supplied with the chassis. They shall be stored in a plastic case and shipped loose with the chassis.

One (1) first aid kit

BIDDER COMPLIES: Yes____ No____

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.

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.

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.

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.

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 third wall / barrier is .13” thick 5052-H32 work hardened aluminum façade panels. All panels shall be 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 4.45 square feet of floor space at the officer’s feet.

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

The cab shall include 4 doors. They shall have two (2) front cab doors with an approximate clear opening of 42.5" wide by 81” high measured from the top of the lower cab step to the top of the door opening.; and the rear two (2) crew doors shall have an approximate clear door opening of 38.5" wide by 91.5” high measured from the top of the lower cab step to the top of the door opening. The length of the door will vary depending on door type.

BIDDER COMPLIES: Yes____ No____

**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.

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.

BIDDER COMPLIES: Yes____ No____

**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 have a cab structure opening of 42.5" wide; and the rear crew doors shall be a minimum of 41" wide, and a cab structure opening of 38.5" wide to provide enhanced entry and egress of the cab.

The two (2) forward doors shall offer a clear opening measurement of 51.5" wide and the two (2) rear crew doors shall have a clear opening measurement of 45.75" wide, measured from cab door seal to open door seal.

All cab doors shall open a minimum of 85 degrees for the safety of personnel during entrance or egress from the cab.

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.

BIDDER COMPLIES:  Yes____  No____

CAB STEPS

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

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 top crew step shall incorporate an angle approximately midway from the rear wall to the crew door hinge extending out the flooring under the rear facing outer seat positions, offering foot placement for safety while seated in this position.

BIDDER COMPLIES:  Yes____  No____

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.

BIDDER COMPLIES:  Yes____  No____

FULL HEIGHT DOORS

All doors shall be full height from the roof of the cab extending down to cover and protect the entrance step areas.

BIDDER COMPLIES:  Yes____  No____
**DOOR FILL PANEL**

The door fill panel shall have the same finish as the door.

BIDDER COMPLIES:  Yes____  No____

**DOOR HANDLES**

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

The interior door handle shall be a chrome plated paddle style latch. The paddle shall be hinged towards the front of the cab and shall include a manual door lock unless otherwise specified.

Each door latch shall feature a military grade aligning dove tail guide striker assembly for precision door closure which prevents sagging throughout the life of the vehicle.

BIDDER COMPLIES:  Yes____  No____

**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.

BIDDER COMPLIES:  Yes____  No____

**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.

BIDDER COMPLIES:  Yes____  No____

**INTERIOR CAB DOOR FINISH**

All cab doors shall be finished with a polyurethane coating for durability. The finish shall be gray in color.

BIDDER COMPLIES:  Yes____  No____

**INTERIOR FRONT DOOR PULL**
The interior driver and officer cab doors shall each 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 an “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.

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.

BIDDER COMPLIES: Yes  No

**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.

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.

BIDDER COMPLIES: Yes  No

**GRAB HANDLES "A" PILLAR**

There shall be two (2) additional molded 9.00” rubberized grab handle shall be installed inside the front cab doors. The handles shall be located one on the Driver’s side A Pillar and one on the officer's side on the A Pillar.

BIDDER COMPLIES: Yes  No

**WINDSHIELD**
A one (1)-piece, safety glass full width windshield with more than 3,228 square inches of clear viewing area will be provided. 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 layer, the middle safety laminate, and the inner layer. 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.
- 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.

BIDDER COMPLIES: Yes____ No____

**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 provide optimum windshield clearing.

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

BIDDER COMPLIES: Yes____ No____

**WINDSHIELD WIPER ACTIVATION**

The windshield wipers shall be activated through a switch on the smart wheel, with intermittent control.

BIDDER COMPLIES: Yes____ No____

**WINDOW - DRIVER'S DOOR**

The driver's door shall provide a minimum clear viewing area of 535 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.

BIDDER COMPLIES: Yes____ No____

**WINDOW- OFFICER'S DOOR**
The officer's door shall provide a minimum clear viewing area of 535 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.

BIDDER COMPLIES: Yes____ No____

REAR DRIVER SIDE CREW WINDOW

The rear driver's side crew door shall provide a minimum clear viewable area of 581 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.

BIDDER COMPLIES: Yes____ No____

REAR OFFICER SIDE CREW WINDOW

The rear officer's side crew door shall provide a minimum clear viewable area of 581 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.

BIDDER COMPLIES: Yes____ No____

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 provide a minimum clear viewable area of 411.25 square inches and shall include a standard automotive tint and shall be trimmed in a black anodized rubber ring for a tight seal.

BIDDER COMPLIES: Yes____ No____

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 provide a minimum clear viewable area of 411.25 square inches and shall include a standard automotive tint and shall be trimmed in a black anodized rubber ring for a tight seal.

BIDDER COMPLIES: Yes____ No____

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 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.

BIDDER COMPLIES: Yes   No

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.

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.

BIDDER COMPLIES: Yes   No

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.

BIDDER COMPLIES: Yes   No
**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.

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 ceiling panels shall feature this soft trim and shall be gray in color.

**BIDDER COMPLIES:** Yes____ No____

**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 rear wall and ceiling panels shall be insulated.
BIDDER COMPLIES: Yes____ No____

REAR WALL INTERIOR MATERIAL

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

BIDDER COMPLIES: Yes____ No____

FLOOR MAT

The interior flooring of the cab shall be covered with an advanced gray 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.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

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.

The cab dash shall offer a finish of a polyurethane coating for a rugged design and finish. The polyurethane finish shall provide a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured and skid-resistant surface. The polyurethane finish shall offer durability and scratch resistance even against today's advanced firefighting turnout materials with consistent, even coverage and a uniform texture. The polyurethane coating finish shall resist fading from UV light.

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 six (6) additional switches or the HVAC controls and additional switching 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 or provisions for switches and gauges to the left of the Officer.

BIDDER COMPLIES:   Yes____  No____

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.

The tunnel shall feature a polyurethane 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.
• 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.
- 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

BIDDER COMPLIES: Yes____ No____

**CAB DASH & ENGINE TUNNEL**

The cab dash and the engine tunnel of the cab shall be coated with a polyurethane coating for a durable finish. The color shall be gray.

BIDDER COMPLIES: Yes____ No____

**MOBILE DATA TERMINAL PROVISION**

The officer dash shall feature a mobile data terminal base which shall support a customer provided docking station for their laptop computer or a tablet and keyboard. This provision shall include a slide out which shall offer easy access and storing to the Officer.

BIDDER COMPLIES: Yes____ No____

**OFFICER GLOVE COMPARTMENT**

The officer side of the cab dash shall include a glove compartment with door and latch.

BIDDER COMPLIES: Yes____ No____

**GLOVE COMPARTMENT LIGHTING**

The glove compartment shall include a Whelen LED lamp to light the interior of the compartment.

BIDDER COMPLIES: Yes____ No____

**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:

**BIDDER COMPLIES: Yes____ No____**

**BLACK MOUNTING PLATE FOR POWER POINTS**

Two (2) black mounting plate(s) containing one (1) 12 volt power point and one (1) dual USB power point shall be provided and incorporated in the modular dash console.

**BIDDER COMPLIES: Yes____ No____**

**CONSOLE MOUNTED MAP LIGHTS**

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

**BIDDER COMPLIES: Yes____ No____**

**CONSOLE MOUNTED CUP HOLDER**

Two (2) black mounting plate(s) containing two cup holders shall be provided and incorporated in the modular dash console.

**BIDDER COMPLIES: Yes____ No____**

**INSTRUMENTATION PANEL**

The instrumentation panel inlay shall be painted job color.

**BIDDER COMPLIES: Yes____ No____**
INTERIOR CAB FINISH

The interior cab shall be finished in a high performance polyurethane 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.
- Gray in color.

BIDDER COMPLIES: Yes____ No____

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.

The cab header shall offer a finish of a polyurethane coating for a rugged design and finish. The polyurethane finish shall provide a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured and skid-resistant surface. The polyurethane finish shall offer durability and scratch resistance even against today's advanced firefighting turnout materials with consistent, even coverage and a uniform texture. The polyurethane coating finish shall resist fading from UV light.

The cab header shall also be purpose built for integration of Fire/EMS components and ease of maintenance with panels above both the driver and officer positions measuring 8” wide x 15"long for mounting radios, aerial controls and switches.

BIDDER COMPLIES: Yes____ No____

HVAC HEATING AND COOLING SYSTEMS

The interior cab climate control shall be comprised of a triple system that 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 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 and a third party independent certified testing laboratory, including all three systems. Documentation of test results shall be provided with the bid.

The HVAC system shall be a total and complete system, and shall provide sufficient defrosting, heating and cooling to the entire cab. The HVAC system shall meet or exceed all specified items without the use of auxiliary heating and cooling systems.

BIDDER COMPLIES: Yes____ No____

**DEFROSTING SYSTEM**

The defrosting system shall feature:

- To provide maximum defrost and heating performance, a 30,000 BTU heater-defroster unit with 780 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.
- Six (6) vents shall be located in the top forward portion of the dash for superior defrosting properties across the entire windshield.
- The system shall be capable of clearing 90 percent or more of the windshield in fifteen (15) minutes or less after a three (3) hour cold soak at 0 degrees Fahrenheit (-17.78 degrees Celsius).
- The system shall exceed Flash Flogging standards that are set forth in the SAE Heavy Duty Cab with Sleeper specifications. Documentation from a third party testing facility shall be available upon request.
- 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.

BIDDER COMPLIES: Yes____ No____

**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 880 CFM of air flow measured at the front seated positions and 1580 CFM of air flow per side in the rear seated positions for a combined total of 4040 CFM of air flow in the cab.
• The heater shall be plumbed with a shut off valve at the engine, so that the coolant bypasses the heaters.
• The heater hoses used will be silicone high heat heater hose.

BIDDER COMPLIES: Yes____ No____

AIR CONDITIONING

The air conditioning system shall feature:

• A minimum of 96,000 BTU/hour of cooling capacity to the entire cab.
• One (1) evaporator shall be located under the center dash and 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.
• 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 condition system shall be capable of cooling the cab from 110 degrees Fahrenheit (43.33 degrees Celsius) to 70 degrees Fahrenheit (21.11 degrees Celsius) at 80% humidity in less than 30 minutes with an engine RPM of 1200; after a three (3) hour heat soak. A certification document from the testing facility shall be available upon request.

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.

BIDDER COMPLIES: Yes____ No____

CAB PAINT AIR CONDITIONING CONDENSER

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

BIDDER COMPLIES: Yes____ No____
CON D E N S O R

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

BIDDER COMPLIES: Yes____ No____

AUXILIARY DEFROSTER FANS

Two (2) each 6" diameter defrost fans integrated into the driver and officer header angled towards the windshield and individually switched for improved air circulation.

BIDDER COMPLIES: Yes____ No____

HEATING AND COOLING CONTROLS

The HVAC system shall be controlled from the center dash through three (3) turn style knobs for the temperature control, the fan control and for the mode. Fan controls shall also be available to the rear crew area.

BIDDER COMPLIES: Yes____ No____

REAR CREW AREA CONTROLS – CENTERED OVERHEAD

The controls for the crew area heat shall be mounted overhead, centered between the rear facing seating positions.

BIDDER COMPLIES: Yes____ No____

SEAT AND SEAT BELT COLOR

This seat in the cab shall be gray in color with a red seat belt.

BIDDER COMPLIES: Yes____ No____

DRIVER SEAT

The driver's seat shall be a H.O. Bostrom Sierra high back reclining ABTS (All Belts To Seat/Integrated Seat Belts) bucket seat with Air-50 Suspension. The seat shall have contoured, high-density cushions with lumbar support. The seat cushion shall be supported with a serpentine spring suspension. 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 shall have a double-locking five-inch fore and aft adjustment and Occupancy sensor in the seat cushion. The seat shall include a pneumatic suspension with 3” of vertical ride range adjustable with a molded switch located on the retractor side of the seat assembly. The suspension shall be internally tethered and shall not require secondary tethers from the suspension to the cab structure.
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. 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.

BIDDER COMPLIES: Yes____ No____

SEAT BACK

The seat back shall incorporate a standard style headrest.

BIDDER COMPLIES: Yes____ No____

SEAT MOUNTING DRIVER

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

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

DRIVER SEAT BOX STORAGE COMPARTMENT

There shall be a storage area under the driver’s seat. The compartment shall be 21.25 inches wide, 22.50 inches long and 6.25 inches high. The access opening shall be 12.00 inches wide and 4.50 inches high.

BIDDER COMPLIES: Yes____ No____

ALUMINUM ACCESS DOOR

There shall be an aluminum door cover provided for the driver and officer seat compartment. The door shall be coated to match the interior of the cab, and it shall be equipped with a piano style hinge and a manual latch.

BIDDER COMPLIES: Yes____ No____

OFFICER SEAT
The officer's seat shall be a H.O. Bostrom 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 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.

BIDDER COMPLIES: Yes____ No____

SEAT BACK

A SecureAll™ 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 SecureAll™ 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.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

OFFICER’S SEAT BOX STORAGE COMPARTMENT
There shall be a storage area under the officer’s seat. The compartment shall be 19.75 inches wide, 17.50 inches long and 6.25 inches high. The access opening shall be 9.00 inches wide and 4.50 inches high.

BIDDER COMPLIES:  Yes____      No____

REAR FACING OUTER SEAT

Two (2) rearward facing outer crew seats shall be 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.

BIDDER COMPLIES:  Yes____      No____

SCBA SEAT

The seat shall be an HO Bostrom Tanker 450 series seat. 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 SCBA's with rigid waist belts.

BIDDER COMPLIES:  Yes____      No____

SEAT BACK

A SecureAll™ 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 SecureAll™ 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.

BIDDER COMPLIES: Yes____ No____

**REAR FACING OUTER SEAT MOUNTING**

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

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**SEAT FRAME FORWARD FACING ENCLOSED**

The forward facing center seats shall include an enclosed seat box which is located and installed on the rear wall.

The seat box shall be constructed of no less than 5052-H32 .19" thick aluminum plate.

Note: The rear wall medical cabinet will be mounted on this seat base.

BIDDER COMPLIES: Yes____ No____

**SEAT FRAME FORWARD FACING ACCESS**

The seat frame shall include a cutout in the center of the wall facing the tunnel for access.

BIDDER COMPLIES: Yes____ No____

**SEAT COMPARTMENT FINISH**

The seat frame shall be finished in a high performance polyurethane coating. The color shall be gray.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES:  Yes  No

**SCUFF PLATE**

The grab handles shall include a stainless steel scuff plate to protect painted surfaces.

BIDDER COMPLIES:  Yes  No

**ADDITIONAL GRAB HANDLE**

The cab face shall include a 11” aluminum grab handle mounted on stanchions which shall be mounted in the center of the cab face above the grille.

BIDDER COMPLIES:  Yes  No

**CAB FASCIA**

The cab fascia shall offer a traditional 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

BIDDER COMPLIES:  Yes  No

**FRONT GRILLE**

The front grille shall have an outboard wing style warning light bezels and heavy framework. The front grille shall feature:

- Fabricated construction for superior strength and durability.
- Stainless Steel mirror finish for a distinctive appearance.
- 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.

BIDDER COMPLIES:  Yes  No
LIGHT BEZEL

The front grille shall include wing light bezels. The bezels shall be constructed of a stainless material.

BIDDER COMPLIES: Yes____ No____

FRONT GRILLE INLAY

The front grille shall include a honeycomb inlay of stainless steel, painted black, which shall provide air flow through the grille.

The horizontal bars shall be overlaid with polished stainless steel strips.

BIDDER COMPLIES: Yes____ No____

FLUID FILLS & CHECK

For ease of maintenance and access, the following fluid checks shall be located behind the tiltable and/or removable 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.

BIDDER COMPLIES: Yes____ No____

HEADLIGHTS

A quadruple headlight assembly shall be provided in the fascia. 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.

BIDDER COMPLIES: Yes____ No____

DAYTIME RUNNING LIGHTS
The daytime running light feature shall include the headlights on low beam and the marker lights shall be illuminated and a wig-wag or alternating feature.

BIDDER COMPLIES:  Yes  No

**HEADLIGHT FLASHER**

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.

BIDDER COMPLIES:  Yes  No

**HEADLIGHT FLASHER SWITCH**

The alternating high beam headlamp switch shall be located in the VISTA screen.

BIDDER COMPLIES:  Yes  No

**FRONT TURN SIGNALS**

Two (2) Whelen M6 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.

BIDDER COMPLIES:  Yes  No

**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.

BIDDER COMPLIES:  Yes  No

**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.

BIDDER COMPLIES:  Yes  No

**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.

BIDDER COMPLIES:  Yes  No
**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.

BIDDER COMPLIES: Yes____ No____

**CAB EXTERIOR TRIM**

The lower front sides of the cab shall include a 10" polished stainless steel wrap which is in line with the bumper for a more pleasing appearance.

BIDDER COMPLIES: Yes____ No____

**CAB EXTERIOR TRIM**

The rear corners of the cab shall be trimmed in polished stainless steel to provide protection for painted surfaces and to enhance the appearance of the cab.

BIDDER COMPLIES: Yes____ No____

**FRONT MUD FLAPS**

The cab and chassis shall be provided with rubber front mud flaps.

BIDDER COMPLIES: Yes____ No____

**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.

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.

There shall be a manual pump incorporated in the event of a system failure to the cab tilt system. A warning light shall illuminate in the cab instrument panel to indicate whenever the cab is not fully latched in the locked down position, and the parking brake is release.

BIDDER COMPLIES: Yes____ No____

**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.
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.

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.

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 (.5 to 1.0 dry film build) for maximum adhesion to the body material. The next two to four coats shall be a polyurethane primer resurfacing agent (PPG K36). 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 FDG polyurethane two-component color (single stage). The film build shall be 2-3 mils when dry. The single stage polyurethane shall provide a UV barrier to prevent fading and chalking.

The cab shall then be painted with the specific colors designated by the customer with a minimum thickness of 2.00 mils of finished paint, followed by a clear top coat not to exceed 2.00 mils.

BIDDER COMPLIES: Yes No
**CAB PAINT UPPER**

The upper cab color shall be PPG **BLACK** color and ____TBD____ number.

BIDDER COMPLIES: Yes____ No____

**CAB PAINT LOWER**

The lower or primary cab color shall be PPG **RED** color and ____TBD____ number.

BIDDER COMPLIES: Yes____ No____

**CAB UNDERCOAT**

The cab shall have an undercoat applied prior to the cab being set on the running gear. The undercoat shall be a waterborne, one-component, air dry undercoat formulated to prevent chipping, cracking and marring of painted or unpainted surfaces after exposure to high impact sand, gravel or other abrasive materials. It shall also have high corrosion resistance.

BIDDER COMPLIES: Yes____ No____

**FRONT AXLE**

An 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 or greater
- A 3.74” drop and a 71” king pin intersection (KPI)
- A conventional style hub with a standard knuckle
- A reinforced brake spider

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**FRONT SUSPENSION**

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

- Capacity rating of 22,800 pounds or greater
- 9 Leafs or greater
- Case hardened threaded bushings
• A Grease fitting
• Double wrapped front eye

BIDDER COMPLIES: Yes_____ No____

FRONT SHOCK ABSORBERS

Two (2) 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.

The ride afforded through the use of a gas shock is more consistent and shall not deteriorate with heat, the same way a conventional oil filled hydraulic shock would.

The front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and “road sensing” shock designs and shall contribute to the durability and long life of the shock absorbers.

Proposals offering the use of conventional twin tube or “road sensing” designed shocks shall not be considered.

BIDDER COMPLIES: Yes_____ No____

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.

BIDDER COMPLIES: Yes_____ No____

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.

**BIDDER COMPLIES:** Yes____ No____

**FRONT AXLE CRAMP ANGLE**

The chassis shall have a front axle cramp angle of 46 degrees or higher to the left and right.

The manufacturer shall provide third party verification of cramp angle upon request from the fire department.

**BIDDER COMPLIES:** Yes____ No____

**FRONT TIRES**

The front tires shall be 425 65R 22.5 "L” tubeless radial XFE regional tread or equivalent.

The front tires shall feature:
- A stamped load capacity of 22,800 pounds per axle with a speed capacity of 65 miles per hour when properly inflated to 120 pounds per square inch

**BIDDER COMPLIES:** Yes____ No____

**FRONT WHEEL**

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch 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.

**BIDDER COMPLIES:** Yes____ No____

**FRONT BRAKES**

The front brakes shall be disc brakes with 17" vented rotors.

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

**BIDDER COMPLIES:** Yes____ No____
STEERING WHEEL AND COLUMN

The vehicle shall include an 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 backlit 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.

The chassis shall have a 12-volt electric horn with a minimum 110 decibels.
BIDDER COMPLIES:   Yes____      No____

REAR AXLE

A tandem driving axle shall be incorporated as the rear axle for the chassis. The axle shall feature:

- Rated capacity of 63,000 pounds or greater.
- 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 .56” for extra strength and rigidity.

BIDDER COMPLIES:   Yes____      No____

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

BIDDER COMPLIES:   Yes____      No____

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

BIDDER COMPLIES:   Yes____      No____

REAR SUSPENSION
The tandem axle rear suspension shall be in accordion elastomer springs, incorporating a straddle mount pedestal and urethane pivot bushings, preset load distribution and independent axle movement.

The rear tandem suspension capacity shall be rated at 63,000 pounds.

BIDDER COMPLIES: Yes____ No____

REAR BRAKES

The rear brakes shall be 16.50 inch X 8.63 inch S-cam drum type.

The rear brakes shall include brake chambers shall be approved per application.

BIDDER COMPLIES: Yes____ No____

REAR BRAKE SLACK ADJUSTERS

The rear brakes shall include 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.

BIDDER COMPLIES: Yes____ No____

REAR SHOCK ABSORBERS

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

BIDDER COMPLIES: Yes____ No____

REAR AXLE DIFFERENTIAL CONTROL

The tandem axles shall include an inter-axle differential lock which shall allow both axles to be engaged as drive axles.

BIDDER COMPLIES: Yes____ No____

INTERAXLE DIFFERENTIAL LOCK CONTROL ACTIVATION

The inter-axle differential lock control shall be activated through a switch on the drivers panel, NOT the VMux screen.

BIDDER COMPLIES: Yes____ No____

REAR TIRES
The rear tires shall be 315/80R 22.5 20PR “L” tubeless radial XDY3 mixed service tread or equivalent.

The rear tires shall feature:

- A stamped load capacity of 33,080 pounds per axle with a speed capacity of 65 miles per hour when properly inflated to 130 pounds per square inch

BIDDER COMPLIES: Yes____ No____

**REAR WHEEL**

The rear wheels shall be Alcoa hub piloted, heavy duty, 22.50 inch X 9.00 inch polished aluminum wheels with 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.

BIDDER COMPLIES: Yes____ No____

**WHEEL GUARDS**

The rear wheels shall include a plastic isolator approximately 0.04” thick installed between the aluminum and steel to help prevent corrosion caused by dissimilar metal contact.

- Note: If alum outer and steel inner rims the guard will be between rims, if all alum rims it will be installed between inner rim and hub.

BIDDER COMPLIES: Yes____ No____

**VEHICLE TOP SPEED**

The top speed of the vehicle shall be programmed at approximately 60 MPH +/-2 MPH at governed engine RPM.

BIDDER COMPLIES: Yes____ No____

**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. 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.

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.

The ABS and ESC system shall come with a three (3) year/300,000 mile parts and labor warranty.

BIDDER COMPLIES: Yes____ No____

MUD / SNOW SWITCH

A momentary 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.

BIDDER COMPLIES: Yes____ No____

AIR TANK BRACKETS

The air tank shall be mounted to the frame rail with brackets that are hot dipped galvanized thereby creating a barrier and cathodic protection from corrosion, and 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. Powder coated or painted air tank brackets shall not be accepted.

BIDDER COMPLIES: Yes____ No____
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.

BIDDER COMPLIES: Yes____  No____

PARK BRAKE CONTROL

A 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.

BIDDER COMPLIES: Yes____  No____

AIR DRYER

The brake system shall include an 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.
- Integrated with the air governor.

BIDDER COMPLIES: Yes____  No____

MOISTURE EJECTORS

A heated, automatic moisture ejector with a manual drain provision shall be installed on the wet tank of the air supply system. Manual pet-cock type drain valves shall be installed on all remaining reservoirs of the air supply system.

BIDDER COMPLIES: Yes____  No____

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 orange, the parking brake line yellow and the auxiliary (outlet) will be black; in accordance with SAE standards.

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

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

FRAME

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.

The chassis frame shall consist of three (3) “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 8.69” high x 3.00” 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 3,572,000 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.

BIDDER COMPLIES: Yes____ No____

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

BIDDER COMPLIES: Yes____ No____

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.
• 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.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

**FRAME FINISH**

Prior to assembly, each frame rail section and cross member shall be hot dip galvanized. The galvanizing process will permeate each frame section to prevent rust and corrosion and not be merely an over-coating. The galvanized frame 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.

Galvanizing shall provide a barrier and cathodic protection from corrosion. During the galvanizing process, the complete frame sections and cross members 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.

BIDDER COMPLIES: Yes____ No____

**FRONT FRAME EXTENSION FINISH**

The front frame extension shall be hot dipped galvanized to resist weather, dirt and other corrosive material. Proposals offering powder coated or painted frames shall not be accepted.

BIDDER COMPLIES: Yes____ No____

**FRAME GALVANIZING WARRANTY**

In addition to the lifetime framerail structural warranty, the chassis manufacturer hereby warrants the galvanizing of the frame rails shall be warranted for a period of twenty 20 years and includes the following coverage:

- The galvanized surfaces of the frame rails and cross members shall be free from corrosion caused by dissimilar metals, adhesion, blistering or peeling.
- The galvanized surfaces of the frame rails and cross members shall be free from any corrosion perforation.

Under this warranty, the chassis manufacturer agrees to repair or refinish any galvanized surface that has been found to have a defect caused by defective manufacturing methods or galvanized material where there is no indication of abuse, neglect, unusual or other than normal service providing that such item or items are, at the option of the chassis manufacturer, made available for our inspection at our request, returned to our factory or other location designated by us with
transportation prepaid within thirty days after the date of failure or within twenty years from the date of delivery of the apparatus to the original purchaser, whichever occurs first, and inspection indicates the failure was attributed to a defect caused by defective manufacturing methods or galvanized material selection. Written authorization for repair or item replacement must be sought from the chassis manufacturer customer service prior to the repair or item replacement occurring.

**Coverage Period**
0 – 10 years = 100%
11 – 15 years = 50%
16 – 20 years = 25%

BIDDER COMPLIES: Yes____ No____

**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 than 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.

BIDDER COMPLIES: Yes____ No____

**ENGINE**

A Cummins ISX 12.0 liter 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.
- 729 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.
- Electric fuel lift pump.
The engine shall be coupled with a Holset VGT™ (Variable Geometry Turbocharger).

The engine shall be 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 2013 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.

BIDDER COMPLIES:  Yes____  No____

**AIR COMPRESSOR**

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

BIDDER COMPLIES:  Yes____  No____

**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.

BIDDER COMPLIES:  Yes____  No____

**HORSEPOWER AND TORQUE**

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.

BIDDER COMPLIES:  Yes____  No____

**ENGINE FAN DRIVE**
The engine cooling system fan shall incorporate a thermostatically controlled, one (1) piece eleven (11) blade Horton clutched type fan drive, and shroud.

When the clutched fan is disengaged it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail safe so that if the clutch drive fails, the fan shall engage to prevent engine overheating due to the fan clutch failure.

BIDDER COMPLIES: Yes____  No____

**CLUTCH FAN SWITCH**

A switch on the dash shall be provided to turn the fan clutch on and off manually. The switch shall not function to turn off the fan when the fan is activated due to high coolant temperature. The clutch fan shall automatically engage in pump mode (when applicable).

BIDDER COMPLIES: Yes____  No____

**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.

BIDDER COMPLIES: Yes____  No____

**TRANSMISSION PRE-SELECT**

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

BIDDER COMPLIES: Yes____  No____

**AUXILIARY ENGINE BRAKE CONTROL**

An auxiliary engine 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 auxiliary brake shall be controlled through an on/off switch and individual low/medium/high selector switches on the right side of the steering wheel.

BIDDER COMPLIES: Yes____ No____

ENGINE PROGRAMMING HIGH IDLE SPEED

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

The high idle will be operational only when the parking brake is set and the truck transmission is in neutral.

BIDDER COMPLIES: Yes____ No____

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control. The high idle 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 through a virtual switch in the Vista, or automatically re-engage when the brake is set, or when the transmission is placed in neutral. A light on the Vista screen shall indicate the high idle speed control.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes___ No___

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.

The diffuser shall lower exhaust gas temperatures during the regeneration cycle.

The DPF and SCR shall be mounted to the frame using brackets that shall be hot dipped galvanized thereby creating a superior barrier from corrosion. Powder coated or painted brackets shall not be accepted.

BIDDER COMPLIES: Yes___ No___

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.

BIDDER COMPLIES: Yes___ No___

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.

BIDDER COMPLIES: Yes____ No____

**ENGINE EXHAUST ACCESSORIES**

An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.

BIDDER COMPLIES: Yes____ No____

**ENGINE EXHAUST WRAP**

The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**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.
- The charge air cooler and radiator shall measure not less than 1382 square inches.
- 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.
• 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.
• Shut off valves by the coolant filter shall be supplied.

BIDDER COMPLIES: Yes____ No____

COOLANT HOSES

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

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

TRANSMISSION

The drive train shall include an Allison model EVS 4000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters 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 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

BIDDER COMPLIES:  Yes____  No____

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.

BIDDER COMPLIES:  Yes____  No____

TRANSMISSION DRAIN PLUG

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

BIDDER COMPLIES:  Yes____  No____

AUTOMATIC NEUTRAL

The transmission shall be provided with an automatic neutral. When the parking brake is applied the transmission automatically returns to neutral.

BIDDER COMPLIES:  Yes____  No____

TRANSMISSION FLUID

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.

BIDDER COMPLIES:  Yes____  No____

TRANSMISSION SHIFT SELECTOR
An Allison GEN V 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.

BIDDER COMPLIES: Yes____ No____

**PTO LOCATION**

The transmission driven power take off (PTO) shall be mounted in the 1:00 o’clock position.

BIDDER COMPLIES: Yes____ No____

**TRANSMISSION MODE PROGRAMMING**

The transmission, upon start-up, will select the fifth speed operation without the need to press the mode button.

BIDDER COMPLIES: Yes____ No____

**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. The transmission will detect the pump engaged signal and automatically select or deselect fourth gear lock-up. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

A nine (9) pin diagnostic connector will be provided next to the steering column.

The trans module shall contain the following circuits:

<table>
<thead>
<tr>
<th>Function ID</th>
<th>Description</th>
<th>Wire assignment</th>
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</thead>
<tbody>
<tr>
<td>C</td>
<td>PTO Request</td>
<td>142</td>
</tr>
<tr>
<td>J</td>
<td>Fire Truck Pump Mode (4th Lockup)</td>
<td>122 / 123</td>
</tr>
<tr>
<td>C</td>
<td>Range Indicator</td>
<td>145 (4th)</td>
</tr>
<tr>
<td>G</td>
<td>PTO Enable Output</td>
<td>130</td>
</tr>
<tr>
<td></td>
<td>Signal Return</td>
<td>103</td>
</tr>
</tbody>
</table>
All drivelines shall be heavy duty metal tube and equipped with Spicer 1810 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®.

Any carrier bearing brackets that are utilized on the apparatus shall be hot dipped galvanized as to provide a superior barrier and cathodic protection from corrosion. Proposals offering powder coated or painted brackets shall not be accepted.

The fuel tank shall have a capacity of fifty (50) gallons/one hundred eighty-nine (189) liters and shall measure 35.00 inches in width X 15.00 inches in height X 24.00 inches in length. 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”.
- Two (2) 2” NPT fill ports for left and right 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 and shall be constructed of steel.
- A black Powder Coated exterior to ensure 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.

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.

BIDDER COMPLIES: Yes      No

**FUEL FILTER/WATER SEPARATOR**

The fuel system shall have a fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.

A water in fuel sensor shall be provided and wired to an instrument panel lamp and audible alarm to indicate when water is present in the fuel/water separator.

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

BIDDER COMPLIES: Yes      No

**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.

BIDDER COMPLIES: Yes      No

**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.

BIDDER COMPLIES: Yes      No

**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.

The fuel cooler shall be mounted to the frame using hot dipped galvanized brackets. Powder coated or painted brackets shall not be acceptable.

BIDDER COMPLIES: Yes      No

**ALTERNATOR**
The charging system shall include a 360 amp 12 volt alternator. The alternator shall include a self-exciting integral regulator.

BIDDER COMPLIES: Yes____ No____

**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 solenoids will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

BIDDER COMPLIES: Yes____ No____

**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 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.

**BIDDER COMPLIES:** Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**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
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.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**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

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

INDICATOR LAMP AND ALARM PROVE-OUT
Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper
performance.

BIDDER COMPLIES: Yes____ No____

**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)

BIDDER COMPLIES: Yes____ No____

**BACKLIGHTING COLOR**

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

BIDDER COMPLIES: Yes____ No____

**MULTIPLEX DISPLAYS**

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

The touch screen 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.
- Virtual controls 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.
• There shall be a display which indicates any open door with a visual display.
• There shall be a text message indication for low washer fluid.

The displays shall offer varying fonts and background colors. The display shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

BIDDER COMPLIES: Yes____ No____

**DRIVER SWITCHES**

The driver switch panel to the right of the Driver's position shall include one (1) row with six (6) backlit rocker switches with laser etched labels located under the Weldon Vista screen.

Standard switches shall include:

• Windshield Wiper/Washer Control (except when Smart Wheel is specified).
• Dash panel dimmer switch.

BIDDER COMPLIES: Yes____ No____

**ACCESSORY POWER DISTRIBUTION PANEL**

An accessory power distribution panel shall be installed behind the officer's seat. The panel shall feature ten (10) blade type fuses protected by a 40 amp fuse. The panel shall be capable of carrying up to a maximum 40 amp battery direct load.

BIDDER COMPLIES: Yes____ No____

**COMMUNICATION ANTENNA BASE**

A communications antenna base shall be provided and mounted on the cab roof on the Officer's side.

BIDDER COMPLIES: Yes____ No____

**COMMUNICATION ANTENNA CABLE ROUTING**

The cable routing for the communication antenna shall terminate under the dash panel.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**BATTERIES**

The single start electrical system shall include six (6) 1000 CCA batteries.

The batteries shall feature:
- A 180 minute reserve capacity
• 4/0 welding type dual path starter cables per SAE J541
• Heat shrink and sealant encapsulated ends on the cables
• Maintenance free
• Gel Cell

BIDDER COMPLIES: Yes____ No____

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, 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.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

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 of the steering wheel adjacent to the driver's knee.

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.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**GROUND LIGHT ACTIVATION**

The ground lights shall activate when the park brake is engaged.

BIDDER COMPLIES: Yes____ No____

**CAB STEP LIGHTING**

One (1) LED light shall be mounted to the riser of the middle cab step, a total of eight (8) 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.

BIDDER COMPLIES: Yes____ No____
STEP LIGHT ACTIVATION

The step lighting shall be activated by opening any of the cab doors on the respective side.

BIDDER COMPLIES:  Yes  No

ENGINE COMPARTMENT LIGHTING

Two (2) LED lights 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.

BIDDER COMPLIES:  Yes  No

INTERIOR OVERHEAD CAB LED LIGHTING

Each cab door shall include a dual red and white LED lamp. There shall be one (1) light centered over each of the Driver and Officer’s seat and one centered over each crew door. 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 lighted switches on each lamp.

BIDDER COMPLIES:  Yes  No

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include a flashing red Whelen round LED light with a red lens clearly labeled "Do Not Move Apparatus". The flashing red light shall be 3.00 inches in diameter and shall be located centered left to right for greatest visibility. The light shall be interlocked for activation when either a cab door is not firmly closed or an apparatus compartment door is not closed, and the parking brake is released.

BIDDER COMPLIES:  Yes  No

BACK-UP ALARM

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

BIDDER COMPLIES:  Yes  No

BATTERY CHARGER AND AIR COMPRESSOR

A Kussmaul Pump Plus 1200 Model # 091-187-12-R-B1 battery charger and air compressor system shall be installed. The 120 volt compressor system shall be designed to maintain the air pressure in the chassis brake system whenever the pressure drops below a predetermined level.
The battery charger shall be supplied from the 120 volt shore power receptacle and be a fully automatic high output charging system. The unit shall be mounted in a clean dry area and will be accessible for service and/or maintenance.

BIDDER COMPLIES: Yes____  No____

**MANUAL SHORELINE CONNECTION**

A manual 20-amp plug shall be provided and installed on the 110 volt shoreline connection complete with weatherproof cover and matching plug. The connection shall be completely sealed to prevent contamination of the mechanism by inclement weather and road conditions.

BIDDER COMPLIES: Yes____  No____

**SHORE POWER PLUG**

The shore power plug shall be located over the left front wheel of the custom chassis.

BIDDER COMPLIES: Yes____  No____

**REAR FACING CAMERA**

A rear facing box style rearview camera shall be installed on the rear of the vehicle. The camera shall activate when the vehicle transmission is shifted into reverse with the image viewed on the Driver and Officer's side Vista screens.

BIDDER COMPLIES: Yes____  No____

**ELECTRIC SIREN AND CONTROL**

Supply and install one (1) Whelen Model 295SL100 full function siren plus radio repeat and public address. Operates up to two 100 watt speakers. Includes Hands-Free operation and Scan-Lock™ siren tones. Self-contained unit for under-dash mounting. Two models to choose from; hard-wired microphone or removable microphone with a volume control knob. Two year warranty. Backward compatible to the original 295HF100 and WS2100 Series connector. A microphone with a volume control knob. Two year warranty. Backward compatible to the original 295HF100 and WS2100 Series connector.

BIDDER COMPLIES: Yes____  No____

**SPEAKER**

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

BIDDER COMPLIES: Yes____  No____

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SPEAKER LOCATION

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

BIDDER COMPLIES: Yes____ No____

FEDERAL MECHANICAL SIREN

One (1) Federal Signal Q2B mechanical siren shall be recess mounted into the left side of 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.

BIDDER COMPLIES: Yes____ No____

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. A hinged, flip-up diamond plate cover will be provided and installed to prevent accidental activation of the floor switch.

BIDDER COMPLIES: Yes____ No____

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. A hinged, flip-up diamond plate cover will be provided and installed to prevent accidental activation of the floor switch.

BIDDER COMPLIES: Yes____ No____

SIREN BRAKE

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

BIDDER COMPLIES: Yes____ No____

LIGHTBAR

One (1) Whelen NFPA Edge Ultra Freedom light bar shall be included with the apparatus cab. The light bar shall be model FN72QLED and shall be mounted on the roof of the cab towards the front, above the windshield.

The light bar shall feature:
- A 72” light bar designed for high performance
• Two (2) front corner red linear LED light heads
• Four (4) front linear LED light heads, two (2) red and two (2) white
• Two (2) end red linear LED light heads with square ends
• A lens configuration of red/ clear/ red to offer the most ultra-bright, ultra-wide angle impact
• Designed in accordance with NFPA Zone A lighting requirements

Note: Bar colors to be RED/CLEAR/BLUE.

BIDDER COMPLIES:  Yes____  No____

TRAFFIC LIGHT CONTROL

One (1) 3-M Opticom traffic light emitter system and control device shall be installed as specified in the lightbar.

Note: Emitter must be installed in the light bar. Alternative mountings are not acceptable.

BIDDER COMPLIES:  Yes____  No____

LIGHTBAR ACTIVATION

The front upper light bar activation shall be wired into the master warning switch.

BIDDER COMPLIES:  Yes____  No____

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 a red lens.

BIDDER COMPLIES:  Yes____  No____

REAR WARNING LIGHT MOUNTING

The upper rear lights shall be mounted on the upper corners of the apparatus body, one on each side. If needed by the application, a pedestal mount may be utilized for the officer’s side rear rotator.

BIDDER COMPLIES:  Yes____  No____

UPPER REAR WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side on the upper rear of the apparatus body. The dimensions of the lights shall be 4-5/16" x 6-3/4".

Note: Lights to be split head RED/BLUE.
BIDDER COMPLIES: Yes____ No____

**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".

Note: Lights to be split head RED/BLUE.

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

BIDDER COMPLIES: Yes____ No____

**INBOARD HEADLIGHT 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, inboard of the turn signals. The dimensions of the lights shall be 4-5/16" x 6-3/4".

Note: Lights to be split head RED/BLUE.

BIDDER COMPLIES: Yes____ No____

**INTERSECTION WARNING LIGHTS**

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

Note: Lights to be split head RED/BLUE.

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

BIDDER COMPLIES: Yes____ No____

**LOWER REAR CHASSIS WARNING LIGHTS**

One (1) pair of Whelen model M6 LED warning lights shall be installed one each side of the body just rearward of the chassis cab, towards the lower portion of the body. The dimensions of the lights shall be 4-5/16" x 6-3/4".

Note: Lights to be split head RED/BLUE.

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

BIDDER COMPLIES: Yes____ No____

**LOWER MID-BODY WARNING LIGHTS**


One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side of the apparatus, mid-body. The dimensions of the lights shall be 4-5/16" x 6-3/4".

Note: Lights to be split head RED/BLUE.

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

BIDDER COMPLIES: Yes____ No____

LOW REAR SIDE WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side of the apparatus body, towards the rear of the body. The dimensions of the lights shall be 4-5/16" x 6-3/4".

Note: Lights to be split head RED/BLUE.
There shall be chrome bezels supplied and installed on the warning lights.

BIDDER COMPLIES: Yes____ No____

LOW REAR WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side on the lower rear of the apparatus body. The dimensions of the lights shall be 4-5/16" x 6-3/4".

Note: Lights to be split head RED/BLUE.

BIDDER COMPLIES: Yes____ No____

LOW VOLTAGE ELECTRICAL SYSTEM SPECIFICATIONS

The following specifications describe the low voltage electrical system on the specified rescue fire apparatus. 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 1901 standards.

The apparatus shall have a Weldon V-MUX multiplexing system, to provide diagnostic capability. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The electrical system shall be pre-wired for computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics, troubleshooting, or program additions. There shall be a diagnostic display provided in the cab. The multiplexed system shall use twisted-pair shielded wire within the electrical system for noise reduction. The diagnostic display shall allow for fault and condition messages to be displayed. For superior system integrity, the networked system shall meet the following minimum requirement components:

- Power management center
- Load shedding power management
• Solid-state circuitry
• Switch input capability
• Responsible for lighting device activation
• Self-contained diagnostic indicators
• Power distribution module
• Diagnostic display for warning message indication

All wiring shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for which the protected circuit. Voltage drops in all wiring from the power source to the device shall not exceed 10 percent. The wiring, wiring harness and insulation shall be in conformance to applicable SAE J-1128 with GXL temperature properties and NFPA standards. All exposed wiring shall be protected in a loom with a minimum temperature rating of 289 degrees Fahrenheit. 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 in an enclosed terminal junction panel. 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 direct water spray. In addition, the main body junction panel shall house the automatically reset breakers and relays as required.

There shall be no exposed electrical cabling, harnesses, or terminal connections located in compartments, unless they are enclosed in an electrical 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 at least every two feet (2') by color coding or permanent marking with a circuit function code and identified on a reference chart or electrical wiring schematic per requirements of the applicable NFPA 1901 standards.

The electrical circuits shall be provided with low voltage over current protective devices. Such devices shall be accessible and located in required terminal connection locations or weather resistant enclosures. The over current protection shall be suitable for electrical equipment and shall be the 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 the maximum current for which the protected circuit. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards.

The electrical system shall include the following:
• 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.
• The electrical wiring shall be harnessed or be placed in a protective loom.
• 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.
• Any electrical component that is installed in an exposed area shall be mounted in a manner that will not allow moisture to accumulate.
• A coil of wire must be provided behind each electrical appliance to allow them to be pulled away from the mounting area for inspection and service work.
• 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. Individual rocker switches shall be provided only for warning lights added over the minimum requirement level of warning lights in either the stationary or moving modes. All electrical equipment switches shall be mounted on a switch panel mounted in the cab convenient to the operator. Rocker type warning light switches shall be utilized. For ease of nighttime operation, an integral indicator light shall be provided to indicate 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 be automatically activated per requirements of the NFPA 1901 standard. All "clear" warning lights shall be automatically turned off upon application of the parking brake.

BIDDER COMPLIES: Yes____ No____

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 the delivery documentation per requirements of the NFPA 1901 standard. 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.

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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 shall be permitted during this test. However, if an alarm sounds due to excessive battery discharge, as detected by the system requirements in the NFPA 1901 standard, or a system voltage of less than 11.7 volts dc for a 12 volt system is present for more than 120 seconds, the test shall be considered a failure.

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.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

ELECTRIC TRAFFIC HORN AND AIR HORN SELECTOR SWITCH

One (1) selector switch shall be provided on the cab's dash that will allow the chassis steering wheel horn button to activate either the electric traffic horn or air horn system.
AIR HORN FOOT SWITCH

One (1) foot switch shall be installed to activate the air horn system on the officer's side of the floor. A hinged, flip-up diamond plate cover will be provided and installed to prevent accidental activation of the floor switch.

BIDDER COMPLIES: Yes____ No____

PUMP ENCLOSURE LIGHTS

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

BIDDER COMPLIES: Yes____ No____

LIGHT MOUNTING LOCATION

The mounting location for the specified light shall be on the front edge of the chassis cab roof.

BIDDER COMPLIES: Yes____ No____

12VOLT FLOODLIGHT

One (1) Whelen Pioneer Plus Super LED model PFP2 dual lamp brow light shall be provided. The light shall draw 13 amps and generate 10,000 lumens. The bulb shall be accessible through the front. The lamphead shall be approximately more than 3" deep by 4-5/8" high by 14" wide. Lamphead and brackets shall be powder coated white.

BIDDER COMPLIES: Yes____ No____

LIGHT SWITCH REMOTE LOCATION

A switch shall be installed from a remote location in the chassis cab. The weatherproof on-off toggle switch shall be used for the remote switching.

BIDDER COMPLIES: Yes____ No____

BACKUP CAMERA

One (1) chassis supplied rear camera system shall be mounted on the rear of the vehicle. All system components shall be installed by the apparatus body manufacturer.

BIDDER COMPLIES: Yes____ No____
PORTABLE LANTERN

Two (2) Streamlight Vulcan Model 44451 LED portable handlights with Lithium-ion batteries shall be installed, wired to the chassis battery system. Each lantern shall include a vehicle mounting bracket.

Note: Lights to be mounted one (1) each side of the EMS compartment.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

INTERCOM SYSTEM

The vehicle shall be equipped with a FireCom 5100D intercom master station. The system comes standard with connections for up to six (6) positions. Additional positions can be added through daisy chaining or wireless transmitters.

This system can operate with one (1) mobile radio. Connection of this system to the mobile radio in not included, unless specified.

BIDDER COMPLIES: Yes____ No____

INTERCOM HEADSET

Two (2) UHW-51 Wireless Headset(s) plus wireless base station with single channel transmitter for each headset shall be provided with the intercom system. The red PTT button activates radio transmit. The mic is always live for intercom communication. Appropriate for driver or officer positions.

BIDDER COMPLIES: Yes____ No____

WIRELESS BASE STATIONS - SINGLE CHANNEL

Two (2) single-user Radio Transmit Wireless Base Stations that support one push/toggle-to-talk wireless UHW-51 headset with radio transmit when used with 5X00D intercoms.

BIDDER COMPLIES: Yes____ No____

INTERCOM HEADSET
Two (2) UHW-52 Wireless Under-The-Helmet-Headset shall be provided with the system. The black PTT button activates Mic for intercom communication ONLY. Appropriate for jumpseat positions. Requires (1) WLSM wireless base station with multiple channel transmitter.

BIDDER COMPLIES: Yes____ No____

**WIRELESS BASE STATION**

One (1) WLSM wireless base station with multiple channel transmitter. Supports multiple UHW-52 non-radio transmit wireless headsets.

BIDDER COMPLIES: Yes____ No____

**HEADSET HANGER HOOK**

Four (4) headset hanger hooks shall be provided and installed in the cab for storage of the headsets while not in use.

BIDDER COMPLIES: Yes____ No____

**RADIO AND ANTENNA**

One (1) fire radio and antenna shall be supplied by the customer and installed on the apparatus by the apparatus manufacturer. The location shall be determined by the customer. The radio shall be interfaced to the specified intercom system.

BIDDER COMPLIES: Yes____ No____

**KNOX BOX**

One (1) Sentralock master key box shall be supplied by the customer and installed. The location shall be determined by the customer.

Note: Apparatus builder will be installing customer (Department) supplied Knox box.

BIDDER COMPLIES: Yes____ No____

**MARKER LIGHTS**

LED marker lights shall be installed on the vehicle in conformance to the Department of Transportation requirements.

BIDDER COMPLIES: Yes____ No____

**LICENSE PLATE BRACKET**

One (1) license plate mounting provisions shall be provided at the rear bumper and be illuminated by a LED light.
TAIL LIGHTS

Two (2) Whelen M6 LED tail/brake lights shall be provided. The rectangular 4"x6" light shall be red.

BIDDER COMPLIES:    Yes____      No____

TURN SIGNALS

Two (2) Whelen M6 LED turn signals shall be provided.

BIDDER COMPLIES:    Yes____      No____

BACKUP LIGHTS

Two (2) Whelen Series M6 LED backup lights shall be installed on the rear of the apparatus body. The dimensions shall be 4" x 6" and the lens color shall be clear.

BIDDER COMPLIES:    Yes____      No____

FOUR LIGHT HOUSING

Two (2) chrome plated tail light housings shall be supplied. Each housing shall be designed to hold four (4) Whelen M6 rear lights located at the lower rear corners of the body.

BIDDER COMPLIES:    Yes____      No____

MID BODY LED TURN SIGNALS

Two (2) mid body LED turn signals shall be provided. The location of the turn lights shall be at mid-body near the rear wheel axle.

BIDDER COMPLIES:    Yes____      No____

GROUND LIGHTS

There shall be two (2), one each side, Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the rub rail of the pump house.

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

The ground lighting shall be activated when the parking brake is set.
GROUND LIGHTS

There shall be two (2), one each side, Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the rub rail, mid body.

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

The ground lighting shall be activated when the parking brake is set.

GROUND LIGHTS

There shall be two (2) Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the rear step.

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

The ground lighting shall be activated when the parking brake is set.

GROUND LIGHTS

There shall be two (2) Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the compartments, behind the rear wheels.

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

The ground lighting shall be activated when the parking brake is set. The ground lights shall automatically activate when the parking brake is applied.

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.

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

Six (6) Whelen M6 Series Super-LED 6-3/4" x 4-5/15" gradient scene light(s) with chrome plated surface mount flange shall be installed.

SCENE LIGHT LOCATION
Two (2) scene light shall be located on the left side of the apparatus body.

SCENE LIGHT LOCATION
Two (2) scene light shall be located on the right side of the apparatus body.

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

LEFT SIDE SCENE LIGHT SWITCHING
One (1) left side scene light switch shall be provided with the driver’s side VISTA screen. The light(s) shall be activated by one of the switches below the driver’s side Vista screen. Switches shall be in this order - left side lights / rear lights / right side lights.

RIGHT SIDE SCENE LIGHT SWITCHING
One (1) right side scene light switch shall be provided with the driver’s side VISTA screen. The light(s) shall be activated by one of the switches below the driver’s side Vista screen. Switches shall be in this order - left side lights / rear lights / right side lights.

REAR SCENE LIGHT SWITCHING
One (1) rear scene light switch shall be provided with the driver’s side VISTA screen. The light(s) shall be activated by one of the switches below the driver’s side Vista screen. Switches shall be in this order - left side lights / rear lights / right side lights.

BIDDER COMPLIES:  Yes____  No____

SCENE LIGHT

Two (2) Whelen M9 Series Super-LED 7-1/8" x 9-1/8" gradient scene light(s) with chrome plated surface mount flange shall be installed.

SCENE LIGHT LOCATION
One (1) scene light shall be located on the left side of the cab.  
Note: Locate above center window.

SCENE LIGHT LOCATION
One (1) scene light shall be located on the right side of the cab.  
Note: Locate above center window.

BIDDER COMPLIES:  Yes____  No____

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.

BIDDER COMPLIES:  Yes____  No____

**DATA & WARNING LABELS**

**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.

**CAB SEATING POSITION LIMITS**
One (1) label shall be installed in the cab to indicate seating positions for firefighters. A weight allowance of 250 pounds for each shall be factored into the gross vehicle weight rating of the chassis.

**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.

BIDDER COMPLIES:  Yes____  No____

**COUNTERWEIGHT**
Counterweight can be installed on the rear of the apparatus to improve the ratio of the front to rear weight balance.

BIDDER COMPLIES:  Yes____  No____
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 3/8" plate steel with a 4" I.D. hole, large enough for passing through a tow chain end hook.

The tow plates shall be painted black.

BIDDER COMPLIES: Yes_____ No_____

BUMPER

The chassis shall feature a standard, two (2) rib 12" high by 102" wide wrap around style bumper constructed from highly polished, 10 gauge, 316 stainless steel.

Integral stainless steel bumper "wings" shall extend from the bumper to the cab.

The bumper shall be mounted to a twenty inch (20") long chassis frame extension.

A contoured apron / gravel shield fabricated from NFPA compliant, slip-resistant polished aluminum shall enclose the area between the bumper and the cab.

BIDDER COMPLIES: Yes_____ No_____

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.

Note: Minimum hosewell capacity is 100' of 1 3/4" D.J. hose and nozzle.

BIDDER COMPLIES: Yes_____ No_____

BUMPER COMPARTMENT DOOR

One (1) raised aluminum tread plate door for the front bumper compartment shall be supplied. The door shall have a minimum 1" lips on all sides surrounding the entire compartment opening, a stainless steel hinge at the rear and a latch to secure the compartment.

One (1) 18" long Whelen Fluorent™ Plus Model F18PC LED light(s) shall be installed to illuminate the front bumper compartment(s) and contain two (2) LEDs per inch producing approximately 120 lumens. The light 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 light shall be provided with a 5 year HDP® Heavy Duty Professional warranty.

The light shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.
The light shall activate automatically when the compartment door is opened. The light switch shall activate the "Do Not Move Apparatus" warning light in the cab indicating that the bumper compartment door is not secure.

BIDDER COMPLIES:  Yes     No

**BUMPER COMPARTMENT DOOR SHOCK**

A gas shock shall be supplied to hold the front bumper compartment door in the open position.

BIDDER COMPLIES:  Yes     No

**COMPARTMENT MATTING**

The bumper compartment floor shall be fitted with removable vinyl 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.

BIDDER COMPLIES:  Yes     No

**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.

BIDDER COMPLIES:  Yes     No

**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.

BIDDER COMPLIES:  Yes     No

**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.

BIDDER COMPLIES:  Yes     No

**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.
BIDDER COMPLIES: Yes____ No____

**EXHAUST HEAT SHIELD**

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

BIDDER COMPLIES: Yes____ No____

**REAR MUD FLAPS**

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

BIDDER COMPLIES: Yes____ No____

**CAB EXTERIOR REAR WALL PROTECTION PANEL**

The exterior rear wall of the custom cab shall be covered with an aluminum tread plate protection panel for the full height and width.

BIDDER COMPLIES: Yes____ No____

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

Note: Cabinet to be full width of the rear seat riser, to near the chassis cab ceiling.

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

Three (3) adjustable shelves shall be installed in the interior cab compartment. The shelves shall be constructed from aluminum.

Two (2) 45" long Whelen Fluorent™ Plus Model F45PC LED lights shall be installed, one each side of the door opening. Each light shall contain two (2) LEDs per inch producing approximately 450 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.
BIDDER COMPLIES: Yes____ No____

**CAB REFERENCE MATERIAL AND Binder STORAGE MODULE**

One (1) cab storage module shall be provided at the rearward area of the engine enclosure to accommodate a minimum of four (4) 3” three ring binders. The binders shall be stored one (1) wide and four (4) high in the module. The compartment shall be fabricated of smooth aluminum.

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

The cabinet’s interior shall have a natural finish.

BIDDER COMPLIES: Yes____ No____

**WATEROUS S100C20 SINGLE STAGE PUMP**

A Waterous model S100C20, single stage centrifugal pump shall be designed to mount on the chassis frame rails and shall be split-drive shaft driven. The pump casing shall be of high-tensile, close-grained ductile iron. Pump body shall be in a single impeller housing, for easy removal of impeller assembly including wear rings and bearings.

**IMPELLER**

A matched bronze impeller specifically designed for the fire service will be provided. It will be accurately balanced both mechanically and hydraulically, for vibration-free operation. Stainless steel heat-treated and precisely ground to size. It shall be supported by oil or grease lubricated ball bearings.

Replaceable wear rings, bronze, reverse-flow, labyrinth-type shall be provided. Deep groove ball bearings shall be located outside the pump to give rugged support and proper alignment to the impeller shaft. The bearings shall be oil or grease lubricated. All bearings shall be completely separated from the water being pumped.

**PUMP TRANSMISSION**

The housing shall be constructed of high tensile aluminum and be of three (3) piece, horizontally split design. The transmission driveline shafts shall be made from alloy steel forging, hardened and ground to size. The drive and driven sprockets shall be made of steel and shall be carbonized and hardened.

The drive chain shall be Morse HV involute form chain. The lubrication system shall be an impeller shaft driven oil pump to deliver oil to an integral spray header, to completely pressure lubricate the drive chain.

**PUMP MOUNTING**

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

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

BIDDER COMPLIES:  Yes____  No____

2000 GPM FIRE PUMP SPECIFICATIONS

The centrifugal type fire pump shall be a Waterous model S100C20 midship mounted with a rated capacity of 2000 GPM. The pump shall meet NFPA 1901 requirements.

The pump shall be certified to meet the following deliveries:

- 2000 GPM  @  150 PSI
- 2000 GPM  @  165 PSI
- 1400 GPM  @  200 PSI
- 1000 GPM  @  250 PSI

BIDDER COMPLIES:  Yes____  No____

GATED 6" INTAKE -- LEFT SIDE

One (1) 8" gated suction intake shall be installed behind the left side pump panel to supply the fire pump from an external water supply. A manually operated butterfly valve with built in adjustable relief valve shall be provided on the intake. The valve shall be manually operated with a hand wheel control located adjacent to the intake connection.

The intake shall be provided with manual drain valves. An inlet fitting with 6" NST thread shall be provided, complete with a removable strainer screen.
Note:  8" valve with 6" NST threads to increase water flow.

An Innovative Controls ¾” cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift, to open and push down, to close. The valve shall be mounted with an insulating gasket between the valve and the panel to reduce freezing potential.

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

BIDDER COMPLIES:  Yes____  No____

GATED 6" INTAKE -- RIGHT SIDE
One (1) 8" gated suction intake shall be installed behind the right side pump panel to supply the fire pump from an external water supply. A manually operated butterfly valve with built in adjustable relief valve shall be provided on the intake. The valve shall be manually operated with a hand wheel control located adjacent to the intake connection.

The intake shall be provided with manual drain valves. An inlet fitting with 6" NST thread shall be provided, complete with a removable strainer screen.

Note:  8" valve with 6" NST threads to increase water flow.

An Innovative Controls ¾” cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift, to open and push down, to close. The valve shall be mounted with an insulating gasket between the valve and the panel to reduce freezing potential.

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

BIDDER COMPLIES:  Yes____  No____

**FIRE PUMP MECHANICAL SHAFT SEAL**

The Waterous fire pump shall be equipped with self-adjusting, maintenance free, 'mechanical shaft seal' which is designed to be functional in the unlikely event of a seal failure.

BIDDER COMPLIES:  Yes____  No____

**IMPELLER HUBS**

The Waterous fire pump impeller hubs shall be "Flame Plated", impregnated with tungsten carbide to assure maximum pump life and efficiency despite the presence of abrasive particles, such as fine sand, in the water being pumped.

BIDDER COMPLIES:  Yes____  No____

**FIRE PUMP ANODE SYSTEM**

The Waterous fire pump plumbing system shall be provided with an anode system to reduce corrosion within the piping. The anode system shall consist of replaceable zinc intake screens installed in the suction barrels and bolt-in or screw-in type replaceable anodes that are easily replaced. These items are designed to sacrifice the zinc element to galvanic corrosion. Without this protection, galvanic corrosion may damage the iron pump body and fittings.

BIDDER COMPLIES:  Yes____  No____

**ELECTRIC/PNEUMATIC PUMP SHIFT**
The fire pump shift shall be air-operated incorporating an air cylinder with an electrically actuated pneumatic switch to shift from ROAD to PUMP and back. The fire pump shift control switch and 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 the applicable NFPA standard interlocks, pump shift and OK TO PUMP indicator lights in the cab and pump panel. The fire pump shift system shall be equipped with an interlock system to ensure that the pump drive system components are properly engaged in the pumping mode of operation so 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.

BIDDER COMPLIES: Yes____ No____

**PRIMER – AUTOMATIC**

An automatic fire pump priming system shall be provided and installed. The system shall be oil-less type and environmentally safe. Once engaged, the system shall be fully automatic and not require any action from the pump operator/engineer when pump draft is lost. This feature provides an additional safety margin by maintaining pump flow from the available water source automatically during drafting operations. When air is introduced during a drafting operation from conditions such as whirlpools or turbulence from porta-tank refill operations, the priming system shall automatically engage to remove the air and stabilize water flow and pump pressure. For additional safety, the entire system shall operate at less than 70dBA of ambient noise.

The priming system shall engage automatically whenever the pump discharge falls below five (5) psi and shall remain engaged until a pump prime has been achieved. The priming system shall automatically disengage when a positive pump discharge pressure has been established. The electrical current draw from the chassis batteries shall not exceed four (4) amps at any given time of operation and allow for unlimited run time without causing an overheat condition for any of the system components.

A single engagement switch shall be provided on the pump control panel that will allow the operator to engage the automatic pump priming system. There shall be a light provided on the pump control panel to indicate when the system is engaged. 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.

BIDDER COMPLIES: Yes____ No____
PRESSURE GOVERNOR AND ENGINE-PUMP MONITORING

One (1) Fire Research InControl series TGA400 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 5 1/2" high by 10 1/2" wide by 2" deep. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. 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:

- Pump discharge; shown with four daylight bright LED digits more than 1/2" high
- Pump Intake; shown with four daylight bright LED digits more than 1/2" high
- Pressure / RPM setting; shown on a dot matrix message display
- Pressure and RPM operating mode LEDs
- Throttle ready LED
- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display.

The 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. All LED intensity shall be automatically adjusted for day and night time operation.

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Battery Voltage
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Transmission Temperature
- Low Engine Oil Pressure
- High Engine Coolant Temperature
- Out of Water (visual alarm only)
- No Engine Response (visual alarm only).

The program features shall be accessed via push buttons and a control knob located on the front of the control panel. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.
Inputs to the control panel from the pump discharge and intake pressure sensors shall be electrical. The discharge pressure display shall show pressures from 0 to 600 psi. The intake pressure display shall show pressures from -30 in. Hg to 600 psi.

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 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.

The pressure governor, monitoring and master pressure display shall be programmed to interface with a specific engine.

BIDDER COMPLIES:  Yes___  No___

**PUMP ANODES**

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

BIDDER COMPLIES:  Yes___  No___

**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.

BIDDER COMPLIES:  Yes___  No___

**FIRE PUMP MASTER DRAIN**

The fire pump plumbing system and fire pump shall be piped to a single push-pull type master pump drain assembly.

BIDDER COMPLIES:  Yes___  No___

**ADDITIONAL LOW POINT DRAINS**
The plumbing system shall be equipped with additional low point manually operated 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.

BIDDER COMPLIES: Yes____ No____

**STAINLESS STEEL INTAKE MANIFOLD**

The suction manifold assembly shall be fabricated with Schedule #10 type 304 stainless steel. All threaded fittings shall be a minimum of Schedule 10 stainless steel. The suction manifold assembly shall have radius sweep elbows to minimize water turbulence into the suction volute. The suction manifold shall be welded and pressure tested prior to installation. The stainless steel manifold assembly shall be attached to the pump intake volute with a heavy-duty, flexible Victaulic coupling.

The stainless steel manifold assembly shall have a ten (10) year warranty.

BIDDER COMPLIES: Yes____ No____

**STAINLESS STEEL DISCHARGE MANIFOLD**

The discharge manifold assembly shall be fabricated with minimum of Schedule #10 Type 304 stainless steel. All threaded fittings shall be a minimum of Schedule #40 stainless steel. The discharge manifold assembly shall have radius sweep elbows to minimize water turbulence. The manifold shall be welded and pressure tested prior to installation. The stainless steel manifold inlet shall be attached to the pump discharge and have additional brackets as required to support the discharge manifold, valves and related components.

The stainless steel manifold assembly shall have a ten (10) year warranty.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**HOSE THREADS**

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

BIDDER COMPLIES: Yes____ No____

**WATER TANK TO PUMP LINE**
One (1) 4" water tank to fire pump line shall be provided with a full flow quarter turn butterfly valve, 4" 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.

The specified 4" valve shall be equipped with one (1) air operated actuator control installed on pump panel. A color coded engraved type name plate installed over the valve control.

BIDDER COMPLIES: Yes____ No____

**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.

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

One (1) Akron valve equipped with an Akron Navigator 9323 controller and a 12 volt electric motor actuator shall be provided on the specified 2" discharge. The controller shall be push button type and provide position indication through a full color backlit LCD display. It shall have manual adjustment of the brightness as well as an auto-dimming option. A color-coded name plate shall be installed over the valve control.

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.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**INTAKE RELIEF/DUMP VALVE**

One (1) TFT A18 series, 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-monitor to a non-relieving position when excessive pressure is no longer present.
Discharge side of the intake relief valve shall be plumbed away from the pump operator.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**OVERHEAT PROTECTION MANAGER**

The Waterous fire pump shall be equipped with an overheat protection manager which monitors the temperature of the water inside the pump and relieves water when the temperature inside the pump exceeds 140 degrees Fahrenheit. The Waterous Model #OPM shall also have an warning light on the pump panel to provide additional protection in the event the temperature inside the pump continues to rise with the overheat protection valve open. The warning light and test button shall be mounted to a heavy polished casting that is mounted to the pump operator's panel.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**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.
BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**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.

An Innovative Controls ¾” cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close. The valve shall be mounted with an insulating gasket between the valve and the panel to reduce freezing potential.

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.

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

The specified 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 name plate.
BIDDER COMPLIES: Yes____ No____

2-1/2" DISCHARGE FRONT CENTER BUMPER

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

A Class 1 automatic type 3/4" bleeder valve shall be installed.

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

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

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

One (1) Akron valve equipped with an Akron Navigator 9323 controller and a 12 volt electric motor actuator shall be provided on the specified 2-1/2" discharge. The controller shall be push button type and provide position indication through a full color backlit LCD display. It shall have manual adjustment of the brightness as well as an auto-dimming option. A color-coded name plate shall be installed over the valve control.

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.

BIDDER COMPLIES: Yes____ No____

TWO (2) 1-1/2" 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 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.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close. The valve shall be mounted with an insulating gasket between the valve and the panel to reduce freezing potential.
The specified valve shall be an Akron 8000 Series two-inch (2") valve with a stainless ball.

Two (2) Akron valve equipped with an Akron Navigator 9323 controller and a 12 volt electric motor actuator shall be provided on the specified 2" discharge. The controller shall be push button type and provide position indication through a full color backlit LCD display. It shall have manual adjustment of the brightness as well as an auto-dimming option. A color-coded name plate shall be installed over the valve control.

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.

BIDDER COMPLIES: Yes____ No____

**2-1/2" CROSSTRAW 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.

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 3" diameter double jacket hose with the hose and nozzle provided by the fire department.

A Class 1 automatic type 3/4" bleeder valve shall be installed.

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

One (1) Akron valve equipped with an Akron Navigator 9323 controller and a 12 volt electric motor actuator shall be provided on the specified 2-1/2" discharge. The controller shall be push button type and provide position indication through a full color backlit LCD display. It shall have manual adjustment of the brightness as well as an auto-dimming option. A color-coded name plate shall be installed over the valve control.

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.

BIDDER COMPLIES: Yes____ No____

**BI-FOLD CROSSTRAW HINGED COVER WITH END FLAPS**

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

Note: Flap color to be RED.
CROSSLAY HOSE BED TRIM

The crosslay hosebed shall be equipped anodized aluminum angle overlays, 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

Three (3) 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.

An Innovative Controls ¾” cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close. The valve shall be mounted with an insulating gasket between the valve and the panel to reduce freezing potential.

Three (3) chrome plated elbow with rocker lugs shall be provided with 2-1/2" NST swivel female x 2-1/2" NST male hose threads.

Three (3) 2-1/2" NST rocker lug chrome plated vented cap and cable or chain securement shall be provided.

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

Three (3) Akron valve equipped with an Akron Navigator 9323 controller and a 12 volt electric motor actuator shall be provided on the specified 2-1/2" discharge. The controller shall be push button type and provide position indication through a full color backlit LCD display. It shall have manual adjustment of the brightness as well as an auto-dimming option. A color-coded name plate shall be installed over the valve control.

Three (3) 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

Two (2) 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.

An Innovative Controls ¾” cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close. The valve shall be mounted with an insulating gasket between the valve and the panel to reduce freezing potential.

Two (2) chrome plated elbow 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.

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

Two (2) Akron valve equipped with an Akron Navigator 9323 controller and a 12 volt electric motor actuator shall be provided on the specified 2-1/2" discharge. The controller shall be push button type and provide position indication through a full color backlit LCD display. It shall have manual adjustment of the brightness as well as an auto-dimming option. A color-coded name plate shall be installed over the valve control.

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 -- 3" x 4" DISCHARGE

One (1) 3" discharge shall be installed on the right side pump panel area and shall be controlled by a full flow 3" slow-close quarter turn ball valve. The discharge shall have 4" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.

A 3/4" quarter turn bleeder valve shall be installed.

One (1) lightweight aluminum elbow with 30 degree slant shall be provided. Threads shall be 5" Storz with lugs and manual locks x 4" female swivel NST with rocker lugs.

One (1) 5" lightweight aluminum Storz cap with cable or chain securement shall be provided.

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

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One (1) Akron valve equipped with an Akron Navigator 9323 controller and a 12 volt electric motor actuator shall be provided on the specified 3” discharge. The controller shall be push button type and provide position indication through a full color backlit LCD display. It shall have manual adjustment of the brightness as well as an auto-dimming option. A color-coded name plate shall be installed over the valve control.

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.

BIDDER COMPLIES: Yes_____ No_____  

AERIAL DISCHARGE

One (1) 4” fire pump discharge shall be piped directly to the aerial waterway with 4” steel pipe and controlled with a slow close valve on the pump panel.

There shall be a 1-1/2” drain installed in the aerial supply line with control on the apparatus body. There shall be an adjustable relief valve installed in the aerial supply line.

A color coded nameplate label shall be provided at the control location(s).

An Innovative Controls ¾” cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift, to open and push down, to close. The valve shall be mounted with an insulating gasket between the valve and the panel to reduce freezing potential.

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 Navigator 9323 controller and a 12 volt electric motor actuator shall be provided on the specified 4” discharge. The controller shall be push button type and provide position indication through a full color backlit LCD display. It shall have manual adjustment of the brightness as well as an auto-dimming option. A color-coded name plate shall be installed over the valve control.

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.

BIDDER COMPLIES: Yes_____ No_____  

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 in-line 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.

BIDDER COMPLIES: Yes____ No____

**TURNTABLE EGRESS LADDERS**

There shall be a swing out and down access ladder supplied and installed on both sides of the body, ahead of the pump compartments and pump panels, for accessing the aerial turntable. They 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. The pump enclosure shall include the egress ladders on each side to reach the turntable.

BIDDER COMPLIES: Yes____ No____
FORWARD PUMP PANEL COMPARTMENTS

There shall be a compartment, with a single vertically hinged door, on each side of the turntable. These compartments shall be located forward of the pump panels, and rearward of the turntable egress ladders. The rear compartment wall of each compartment shall be removable to gain access to the turntable.

Uni-struts will be provided and installed on the forward and rearward walls of both the compartments.

One (1) 1/8” aluminum fabricated shelf will be located in each of the compartments, a total of two shelves.

Two (2) 27” long Whelen Fluorent™ Plus Model F27PC LED lights shall be installed per compartment, one each side of each door opening. Each light shall contain two (2) LEDs per inch producing approximately 270 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.

BIDDER COMPLIES: Yes____ No____

LEFT SIDE RUNNING BOARD -- SIDE MOUNT PANEL

The left 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.

BIDDER COMPLIES: Yes____ No____

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 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.

The pump operator's instrument panel shall have a stainless steel continuous hinge that shall swing for easy access to gauges. The panel shall be located to the left of the pump panel.

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.

RIGHT SIDE PUMP PANEL -- BOLTED

The pump panel installed on the right hand side of the pump enclosure shall be fastened to the pump enclosure with 1/4" stainless steel bolts.

PUMP COMPARTMENT HEATER SYSTEM

The interior of the pump enclosure shall be equipped with a minimum of 30,000 BTU hot water heater system. The unit shall be piped to the chassis radiator system with standard heater hose. The hose shall be properly clamped and secured in place, and be properly protected from engine exhaust or mechanical damage.

The heater unit shall be equipped with a 12-volt blower fan with control located on the pump operator's panel.

PUMP ENCLOSURE HEAT PAN

A removable casing constructed of galvanized steel, completely enclosing the underside of the pump compartment and heated by the engine exhaust shall be provided. The heat pan assembly shall include individual panels that can be easily removed from their mounting locations. The two outer slide-out panels shall be bolted in place.
BODY AND PUMP HOUSE FLEX JOINT RUBBER GASKET

A flexible rubber gasket shall be installed between the pump compartment and the apparatus body. This gasket will be designed to seal the pump compartment to the apparatus body as tightly as practical. This gasket is necessary for winter operation in extremely cold climates.

BIDDER COMPLIES: Yes____ No____

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.

BIDDER COMPLIES: Yes____ No____

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.

Innovative Controls permanent type nameplates and instruction panels shall be installed on the pump panel for safe operation of the pumping equipment and controls.

BIDDER COMPLIES: Yes____ No____

MIDSHIP PUMP PANEL LIGHTS -- LEFT SIDE

Three (3) Whelen Strip-Lite Series Super-LED lights Model PSC0ADCR 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.

BIDDER COMPLIES: Yes____ No____

MIDSHIP PUMP PANEL LIGHTS -- RIGHT SIDE

Three (3) Whelen Strip-Lite Series Super-LED lights Model PSC0ADCR 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.

BIDDER COMPLIES: Yes____ No____
**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.

BIDDER COMPLIES: Yes____ No____

**MASTER DISCHARGE AND INTAKE GAUGES**

Two (2) 4” diameter 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.

The master gauges shall have clear scratch resistant molded crystals with captive O-ring seals shall be used to ensure distortion free viewing and to seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F. Each gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy. A polished chrome-plated brass bezel shall be provided to prevent corrosion and protect the lens and gauge case.

BIDDER COMPLIES: Yes____ No____

**TEST TAPS**

Test taps for pump intake and pump pressure shall be provided on the pump instrument panel and be properly labeled.

BIDDER COMPLIES: Yes____ No____

**WATER TANK GAUGE**

The apparatus shall be equipped with one (1) ClassI “Intelli-Tank” water tank level gauge system. 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.
- A super bright LED 4-light displays 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.

The primary water tank level gauge shall be installed at the pump panel.

BIDDER COMPLIES: Yes____ No____
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 Class 1 Intell-tank remote driver.

Note: Lights to be located on left and right sides of chassis, behind the rear chassis doors.

BIDDER COMPLIES: Yes____ No____

HANDRAIL SIDE PUMP PANEL

Two (2) extruded aluminum non-slip handrails, approximately 24" in length, shall be provided and vertically mounted, one (1) each side on the side pump panel.

BIDDER COMPLIES: Yes____ No____

HANDRAIL SIDE PUMP PANEL

Two (2) extruded aluminum non-slip handrails, approximately 18" in length, shall be provided and horizontally mounted, one (1) each side on the side pump panel.

BIDDER COMPLIES: Yes____ No____

WATER TANK

The apparatus shall be equipped with a rectangular tank.

BIDDER COMPLIES: Yes____ No____

WATER TANK - 300 GALLON

The apparatus shall be equipped with a three-hundred (300) gallon polypropylene water tank. The tank shall be equipped with a three-inch (3") 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.

The 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 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 a 3.0" IPT schedule 80 female flange with plug, located in the bottom of the tank sump.

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 water tank manufacturer shall certify 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.

BIDDER COMPLIES: Yes____ No____

**WATER TANK FILL TOWER**

A fill tower measuring approximately 10” x 10” square shall be provided on the water tank up to and including 500 gallons total capacity.

The apparatus shall be equipped with a polypropylene water tank. The tank body and end bulkheads shall be constructed of .75" 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 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.

BIDDER COMPLIES: Yes____ No____

WATER TANK WARRANTY

The tank manufacturer warrants each tank to be free from manufacturing defects in material and workmanship for the service life of the vehicle (vehicle must be actively used in fire suppression). The tank must be installed in accordance with the manufacturer's installation manual. Every tank should thoroughly inspected and tested for leaks before leaving manufacturing facility. Should any problems develop with the water tank and will not meet performance criteria during the service life of the vehicle, the tank manufacturer will be notified in writing or by calling the TOLL FREE SERVICE HOT LINE. If the tank problem would render the truck out of service, the tank manufacturer will dispatch a service technician WITHIN 48 HOURS (2 DAYS) to repair the tank. (This time period is for North America only)

Manufacturer will repair, or at our option, replace the tank with a new tank. The tank manufacturer will cover customary and reasonable costs to remove and install the tank.

BIDDER COMPLIES: Yes____ No____

TANDEM AXLE MID MOUNT AERIAL/PLATFORM BODY

A tandem axle mid mount aerial/platform body shall be provided and constructed as follows:

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 pump operator's panel, 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.

BIDDER COMPLIES: Yes____ No____

SAFETY HARNESS

All NFPA required life safety harnesses shall be provided and mounted by the manufacturer before the apparatus is placed into service.

BIDDER COMPLIES: Yes____ No____

1/8" ALUMINUM BODY

The body shall be fabricated of aluminum extrusions, smooth aluminum sheet and aluminum treadplate.

The aluminum extrusion alloy shall be 6061 with a temper rating of T6, and have a tensile strength of 45,000 PSI and yield strength of 40,000 pounds. The aluminum extrusions shall 3" x 3" aluminum tubing, 1-3/4" x 3" aluminum tubing and 3" x 3" aluminum angle and specially designed extrusions, up to .250" wall thickness where applicable.

The smooth aluminum sheet material alloy shall be 5052 with a temper rating of H32, and have a tensile strength of 33,000 PSI and yield strength of 28,000 pounds.

The aluminum treadplate alloy shall be 3003 with a temper rating of H22, and have a tensile strength of 30,000 PSI and yield strength of 28,000 pounds. The extrusions shall be designed as structural-framing members with the smooth aluminum and treadplate fabricated to form compartments, hosebeds, and floors. All aluminum material shall be welded together using the latest mig spray pulse arc welding system.
Compartment floors shall be of the sweep out design with the floor higher than the compartment
door lip and to be water and dust proof. All compartments shall be made to the maximum
practical dimensions to provide maximum storage capacity. To ensure maximum storage space,
the apparatus shall be constructed without any void spaces between the body and the
compartment walls. Double wall construction does not meet this requirement.

All exterior compartments shall have polished aluminum drip moldings installed above the doors
where necessary to prevent water from entering the compartments.

Wheel well panels shall be formed aluminum that is welded in place. There shall be no visible
bolt heads, retention nuts or fasteners on the exterior surface of the panel. To fully protect the
wheel well area from road debris and to aid in cleaning, a full depth radius wheel well liner shall
be provided. The frame side of the wheel well area on each side of the opening shall be attached
to the frame side of the front and rear compartments. All seams on the frame side of the body
shall be welded and caulked to prevent moisture from entering the compartments.

The rear wheel wells shall be radius cut for a streamlined appearance. A polished aluminum
fenderette shall be furnished at each rear wheel well opening, held in place with stainless steel
fasteners.

BIDDER COMPLIES: Yes____ No____

**FASTENERS**

All aluminum and stainless steel components shall be attached using stainless steel fasteners.

Compartment door hinges, handrails and running boards shall be attached using minimum 1/4"
diameter machine bolt fasteners.

3/16" diameter fasteners shall only be used in nonstructural areas such as; door handles, trim
moldings, gauge mounting, etc.

BIDDER COMPLIES: Yes____ No____

**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.

**BIDDER COMPLIES: Yes____ No____**

**OUTRIGGER COVERS**

Polished stainless steel covers shall be attached to the extending outrigger assemblies.

**BIDDER COMPLIES: Yes____ No____**

**COMPARTMENT FLOORS**

The compartment floors shall be constructed of aluminum treadplate material.

**BIDDER COMPLIES: Yes____ No____**

**TANDEM AXLE WHEEL AREA**

For ease of accessibility and maintenance, wheel well panels shall be double break formed painted smooth plate that is welded in place.

To fully protect the wheel well area from road debris and to aid in cleaning, a full depth (minimum of 25") radius wheel well liner shall be provided. Wheel well liner shall be smooth aluminum to prevent corrosion.

**BIDDER COMPLIES: Yes____ No____**

**FENDERETTES**

The rear wheel wells shall be radius cut for a streamlined appearance. A polished aluminum fenderette shall be furnished at each rear wheel well opening, held in place with concealed stainless steel fasteners.

**BIDDER COMPLIES: Yes____ No____**

**AERIAL HOSEBED**

The apparatus hosebody is to be properly reinforced without the use of angles or structural shapes, and free from all projections which might injure the fire hose.

The main apparatus hosebed shall run from the forward body bulkhead to the rear of the body and around the pedestal of the aerial.

**BIDDER COMPLIES: Yes____ No____**

**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 7.5" wide and shall be welded into a one-piece grid system to prevent the accumulation of water and allow ventilation to assist in drying hose.

The hose bed shall be designed to have storage capacity for 800’ of 2.5” Double Jacket fire hose.

Note: This hose will be carried in the center body hosebed, above the ground ladder storage area.

Hose lengths shall be coupled in fifty foot lengths.

BIDDER COMPLIES:    Yes____      No____

ALUMINUM HOSEBED DIVIDER

One (1) adjustable hosebed divider constructed of .250" aluminum shall be installed on the apparatus.

BIDDER COMPLIES:    Yes____      No____

HOSBED COVER

The hosebed cover shall be secured utilizing a Velcro fastening system at the front and sides of the hosebed body.

BIDDER COMPLIES:    Yes____      No____

HOSEBED STORAGE AREA

The hosebed shall run along the right side of the apparatus body above the lower compartments. The rear of the hose bed shall be open, and designed to pay out hose without damaging the hose or apparatus body. The apparatus hosebody is to be properly reinforced without the use of angles or structural shapes, and free from all projections which might injure the fire hose.

The hose bed must be able to be loaded with the fire fighter standing safely on the ground.

The width of the hosebed shall be from the side wall of the aerial torque box to the side sheet of the apparatus body. The hosebed lowering device shall be a dual arm, over center, self leveling design. The lowering and leveling device shall be driven by helical hydraulic rotary actuators. The apparatus shall be capable of being driven during the loading of the hose.

The hosebed shall be equipped with reflective striping and red flashing marker lights, front and rear, which activate when the rack is moved out of the stored position. A warning light shall be provided in the cab. The light shall flash whenever the rack is out of the stored position. An interlock shall be provided so that the hosebed cannot be lowered without the aerial ladder and outriggers in the stowed position.
The hosebed shall have a capacity of approximately 40 cubic feet and have a capacity of 1500 lbs.

The hosebed shall be hydraulically driven to swing down over the lower body compartments, to aid in the reloading of hose. When in the lowered position is shall be approximately 48” off of the ground and the outside edge shall not extend more than 30” from the body when deployed. The apparatus shall be driveable for loading hose with the hosebed in the lowered position.

Will consider an equivalent or alternative firefighter ground loading hosebed design.

BIDDER COMPLIES: Yes____ No____

**HOSEBED OPERATION CONTROLS**

A control station to allow for lowering / raising of the power operated hosebed shall be provided and installed on the officers’ side pump panel. This will give the operator full vision of the bed while raising and lowering the unit. The station will be provided with all appropriate controls required to meet current NFPA standards.

BIDDER COMPLIES: Yes____ No____

**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 7.5” wide and shall be welded into a one-piece grid system to prevent the accumulation of water and allow ventilation to assist in drying hose.

The hose bed shall be designed to have storage capacity for 800’ of 5” LDH Single Jacket rubber fire.

Hose lengths shall be coupled in one hundred foot lengths.

Note: This hose will be carried in the power operated officer side hosebed.

BIDDER COMPLIES: Yes____ No____

**HOSBED COVER**

The hosebed cover shall be secured utilizing a Velcro fastening system at the front and sides of the hosebed body.

BIDDER COMPLIES: Yes____ No____

**HOSEBED COVER TRIM**

Stainless steel trim shall be installed on the front of the hosebed to secure the hosebed cover.
TANDEM AXLE SUBFRAME AERIAL BODY

The apparatus body subframe shall be constructed entirely of heavy steel structural channel material.

The front subframe shall be attached to the chassis frame rails using heavy "U" bolt fasteners to allow removal of the subframe and body assembly from the chassis. There shall be a barrier provided between the subframe and body to prevent electrolysis.

The rear subframe and lower body platform support members shall be fabricated of 3.4 lb. Per foot heavy channel and bolted to the frame rails.

This steel subframe shall carry the weight of the apparatus body, tank, water and equipment. This method of apparatus construction gives an excellent strength/weight ratio.

BODY WIDTH

The overall width of the aerial body shall not exceed 102".

COMPARTMENT DEPTH

The side compartments on the aerial body shall be 26" deep the full height of the compartments.

COMPARTMENT DEPTH

The side compartments on the aerial body shall have the maximum available height and depth dimensions. These dimensions shall remain consistent for the full height and depth of the compartment.

HINGED COMPARTMENT FLUSH DOOR CONSTRUCTION

All hinged compartment doors shall be of the flush 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 tread plate compartment tops into an extended drip edge and on the bottom by the rub rail.
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. The compartment doors shall have a foam panel glued in place between the exterior and interior door skin. Exterior door panels shall be smooth with no welds visible on the exterior skin. Double door compartments shall be equipped with a secondary latch to hold the secondary door in position.

All compartment door hinges shall be full-length piano type constructed of a minimum 16-gauge type 304, stainless steel with 3/16" stainless steel hinge pin with dual directional bolt holes for ease of adjustment.

When horizontally hinged lift-up doors are specified, they shall be equipped with heavy-duty gas filled dampeneners 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 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.

A non-moisture absorbing gasket shall be installed between the door latch and the door skin panel.

**BIDDER COMPLIES:** Yes____ No____

**EXTERIOR DOOR HANDLES**

All compartment doors shall be furnished with a large solid STAINLESS STEEL spring loaded Maltese Cross 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.

**BIDDER COMPLIES:** Yes____ No____

**LEFT SIDE BODY COMPARTMENTS**
The left side body compartments shall be as follows:

**LEFT OVERWHEEL COMPARTMENT**
There shall be two (2) compartments located above the rear wheels. Each compartment shall be equipped with a single hinged lift up door.

The compartment shall be equipped with the following:

One (1) louver with filter shall be installed in the compartment.

**SWING-OUT ALUMINUM TOOL BOARD**

Two (2) swing-out vertical tool board assembly constructed of .188" smooth aluminum shall be provided. with locks for holding it in the "in" and "out" positions.

The tool board shall have a chrome grab handle, for easy access with a gloved hand.

Note: One (1) board in each upper compartment. Boards will be hinged at the front of the compartment, and will allow enough space at the rear for the SCBA units on the rearward walls.

**BIDDER COMPLIES:** Yes___ No___

**EQUIPMENT SECUREMENT**

The compartment storage bins shall be equipped with nylon straps with velcro fasteners to secure the equipment. The nylon straps shall be secured with footman loops with stainless steel fasteners.

Note: Straps to be utilized for the SCBA brackets.

The floor area of the compartment 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.

**BIDDER COMPLIES:** Yes___ No___

**SCBA MOUNTING BRACKET**

Two (2) Zico 45 minute SCBA cylinder mountings with spring tension bracket included. Brackets will be for 45 minute Scott cylinders.

Note: Brackets to be mounted on the rearward wall (closest to the rear of the apparatus) of each upper compartment.

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.

**BIDDER COMPLIES: Yes____ No____**

**LEFT REAR COMPARTMENT**

There shall be two (2) full height compartments located behind the rear wheels. Each compartment shall be equipped with a full height hinged double doors.

The compartment shall be equipped with the following:

One (1) louver with filter shall be installed in the compartment.

**ADJUSTABLE SHELVING TRACKS**

The compartments shall be equipped with four (4) aluminum adjustable tracks, vertically mounted, that are bolted in place for adjustable shelving and equipment mounting.

**ADJUSTABLE SHELF**

Two (2) adjustable shelves shall be constructed of .188” smooth aluminum plate with 1.5” formed vertical lip front & back. Shelf supports on each side to be constructed of .188” aluminum and bolted to an aluminum extrusion (mounted vertically) by use of 3/8” bolts and spring-loaded cam locks. If shelf is longer than 40” a reinforcement by aluminum gusset is to be placed full-length on bottom of shelf.

Note: One in each compartment behind the rear wheels.

The shelf/tray 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.

**500# ROLLOUT TRAY**

Two (2) roll-out equipment trays shall be installed in the compartment. The tray with telescoping slides and cam follower bearings shall be rated to a maximum load of 500 lbs. The tray shall have a gas shock to hold the tray extended or closed. There shall be a lock to prevent movement, when the tray is in the closed position.

The tray shall be formed of .188” smooth aluminum plate, fabricated with two (2) inch sides. Reflective material measuring 1” x 6” shall be installed on the front corner both on the face and side of tray for firefighter safety.

Note: One in each compartment behind the rear wheels, bolted to the compartment floor.
The shelf/tray 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.

The floor area of the compartment 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.

Two (2) 45" long Whelen Fluorent™ Plus Model F45PC LED lights shall be installed, one each side of the door opening. Each light shall contain two (2) LEDs per inch producing approximately 450 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.

BIDDER COMPLIES: Yes____ No____

**ACCESS LADDER**

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 lathes to hold it in position.

BIDDER COMPLIES: Yes____ No____

**RIGHT SIDE BODY COMPARTMENTS**

The right side body compartments shall be as follows:

**RIGHT REAR COMPARTMENT**

There shall be two (2) low compartments located behind the rear wheels. Each compartment shall be equipped with hinged double doors.

The compartment shall be equipped with the following:

One (1) louver with filter shall be installed in the compartment.

**ADJUSTABLE SHELVING TRACKS**
The compartments shall be equipped with two (2) aluminum adjustable tracks, vertically mounted, that are bolted in place for adjustable shelving and equipment mounting.

The floor area of the compartment 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.

Two (2) 27" long Whelen Fluorent™ Plus Model F27PC LED lights shall be installed, one each side of the door opening. Each light shall contain two (2) LEDs per inch producing approximately 270 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.

**BIDDER COMPLIES:**  Yes____  No____

**REAR COMPARTMENT**

There shall be one (1) compartment located at the rear of the apparatus. The compartment, located within the aerial torque box, shall have provisions to accommodate the following ladders and pike poles.

The compartment shall be enclosed on all sides, and shall be equipped with a single hinged aluminum treadplate lift up door.

**COMPARTMENT LIGHTS**

Two (2) vertically mounted LED strip lights shall be installed inside the compartment. The lights shall have a polycarbonate lens to eliminate breakage from impact and eliminate heat build-up and each light shall be approximately 30" in length.

The compartment light shall be mounted in the door jamb to illuminate the compartment interior.

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

**BIDDER COMPLIES:**  Yes____  No____

**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.

The ladder storage area will be capable of holding an NFPA Compliant 115' ladder load within the specified ladder storage area.

BIDDER COMPLIES: Yes____  No____

**LADDER SOURCE**

New ground ladders shall be provided by the apparatus manufacturer.

BIDDER COMPLIES: Yes___  No___

**PIKE POLE MOUNTING BRACKET**

Six (6) tubes shall be provided for pike pole mounting. Each tube shall have a 2" interior diameter and shall be mounted inside of the apparatus body.

BIDDER COMPLIES: Yes___  No___

**PIKE POLE SOURCE**

The pike poles shall be provided by the apparatus manufacturer.

BIDDER COMPLIES: Yes___  No___

**D-HANDLE TRASH HOOK PIKE POLE STORAGE**

One (1) storage area for a 6' D-handle trash hook style pike pole will be provided and installed in the main ladder compartment of the body. The pike pole will be provided by the apparatus manufacturer.

BIDDER COMPLIES: Yes___  No___

**BACKBOARD STORAGE PROVISIONS**

Two (2) fire department provided backboards will be carried in vertical slots in the main ladder storage compartment. The backboards provided by the department will each measure 72" L x 18" W x 2" Thick. The boards will be removable from the rear of the apparatus ladder compartment door.

BIDDER COMPLIES: Yes___  No___

**AERIAL REAR BUMPER**
A 4" rear bumper shall be provided at the rear of the apparatus body, and be easily removable for replacement or repair. The rear bumper shall be constructed of .188" aluminum diamond plate or equal non-slip surface in compliance with NFPA #1901 standards.

BIDDER COMPLIES: Yes____ No____

**HANDRAIL TURNTABLE ACCESS**

Two (2) extruded aluminum non-slip handrails, approximately 48" in length, shall be provided and mounted on the apparatus, one (1) on each side of the turntable access.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**HANDRAIL SIDE PUMP PANEL**

Two (2) extruded aluminum non-slip handrails, approximately 12" in length, shall be provided and horizontally mounted, one (1) each side on the side pump panel.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**FRONT BODY PROTECTION PANELS**

Aluminum tread plate overlays and panels shall be installed on the front of the body compartment from the lower edge to the top of the compartment doors.

BIDDER COMPLIES: Yes____ No____

**REAR BODY PROTECTION PANELS**

The rear body panels of the body shall be a smooth material, to allow for the proper application and installation of a "Chevron" stripe on the rear.

BIDDER COMPLIES: Yes____ No____
**FOLDING STEP LEFT SIDE FRONT**

A folding step of die cast high-strength zinc/aluminum alloy, plated with a superior automotive grade chrome finish shall be provided. The greater than 42 sq. in. serrated non-skid step traction area also offers an oversized non-slip grasp hand-hold. A heavy duty stainless steel spring design firmly holds the step in the open or closed positions. A rubber stop prevents any transit noise and rattles in the closed position. Step lighting shall be from a Truck Lite light mounted below the step.

The step has been third part tested to assure conformation of NFPA 1901 and FHA, 49CFR specifications for stepping surfaces and handhold.

The step shall be installed on the left side front compartment face.

BIDDER COMPLIES: Yes____ No____

**FOLDING STEP RIGHT SIDE FRONT**

A folding step of die cast high-strength zinc/aluminum alloy, plated with a superior automotive grade chrome finish shall be provided. The greater than 42 sq. in. serrated non-skid step traction area also offers an oversized non-slip grasp hand-hold. A heavy duty stainless steel spring design firmly holds the step in the open or closed positions. A rubber stop prevents any transit noise and rattles in the closed position. Step lighting shall be from a Truck Lite light mounted below the step.

The step has been third part tested to assure conformation of NFPA 1901 and FHA, 49CFR specifications for stepping surfaces and handhold.

The step shall be installed on the right side front compartment face.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**FUEL TANK ACCESS PANEL**

There shall be a removable panel in the bottom of the torque tube, used to gain access to the fuel tank and fuel gauge-sending unit.

BIDDER COMPLIES: Yes____ No____

**WHEEL WELL PROVISION LOCATION**

The wheel well provisions shall be located on the left side of the apparatus, ahead of the rear
wheels.

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 aluminum. 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 aluminum door with push button trigger latch shall be provided.

All SCBA compartments mounted in the wheel well area shall have an o-ring gasket with finger latch assembly.

Note: SCBA cylinders are Scott High Pressure 45 minute cylinders.

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.

BIDDER COMPLIES: Yes____ No____

**WHEEL WELL PROVISIONS LOCATION**

The wheel well provisions shall be located on the left side of the apparatus, between the rear tandem wheels.

Two (2) breathing air cylinder storage compartment for two (2) SCBA cylinders (not supplied) shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of aluminum. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

The compartment shall be provided with SCBA cylinder scuff protection.

Note: Doors to be similar in design to the SCBA bottle compartment doors ahead and behind the rear wheels.

Note: SCBA cylinders are Scott High Pressure 45 minute cylinders.

Four (4) 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.
compartment. The strap shall loop over the valve.

BIDDER COMPLIES: Yes____ No____

WHEEL WELL PROVISION LOCATION

The wheel well provisions shall be located on the left side of the apparatus, behind of the rear wheels.

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 aluminum. 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 aluminum door with push button trigger latch shall be provided.

All SCBA compartments mounted in the wheel well area shall have an o-ring gasket with finger latch assembly.

Note: SCBA cylinders are Scott High Pressure 45 minute cylinders.

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.

BIDDER COMPLIES: Yes____ No____

WHEEL WELL PROVISION LOCATION

The wheel well provisions shall be located on the right side of the apparatus, ahead of the rear wheels.

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 aluminum. 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 aluminum door with push button trigger latch shall be provided.

All SCBA compartments mounted in the wheel well area shall have an o-ring gasket with finger
latch assembly.

Note: SCBA cylinders are Scott High Pressure 45 minute cylinders.

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.

BIDDER COMPLIES: Yes____ No____

WHEEL WELL PROVISIONS LOCATION

The wheel well provisions shall be located on the right side of the apparatus, between the rear tandem wheels.

Two (2) breathing air cylinder storage compartment for two (2) SCBA cylinders (not supplied) shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of aluminum. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

The compartment shall be provided with SCBA cylinder scuff protection.

Note: Doors to be similar in design to the SCBA bottle compartment doors ahead and behind the rear wheels.

Note: SCBA cylinders are Scott High Pressure 45 minute cylinders.

Four (4) 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.

BIDDER COMPLIES: Yes____ No____

WHEEL WELL PROVISION LOCATION

The wheel well provisions shall be located on the right side of the apparatus, behind of the rear wheels.

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 aluminum. 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 aluminum door with push button trigger latch shall be provided.

All SCBA compartments mounted in the wheel well area shall have an o-ring gasket with finger latch assembly.

Note: SCBA cylinders are Scott High Pressure 45 minute cylinders.

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.

BIDDER COMPLIES: Yes____ No____

**GENERATOR**

One (1) Smart Power, Model HR8, 8000 watt hydraulic generator shall be provided. The generator is designed specifically for mounting on top of the vehicle, at the specified location. If required, the generator can be easily separated into its three major components (tray, cooler/fan assembly, and reservoir) for mounting in custom locations.

The generator system and the Command and Control Center (CCC) shall be Sole Source manufactured and shall be covered by a standard 5 year/1,000 hour fully transferable warranty from the manufacturer.

The unit shall come equipped with a generator tray assembly (which includes the generator, hydraulic motor, cooler, fan, electronics package, 10 micron spin-on fluid filter and reservoir), an axial piston hydraulic pump with pressure compensated control, and Command and Control Center (CCC) display with all required wiring harnesses.

The CCC display shall be an interactive operator control center, equipped with smart touch solid state buttons, with displays for voltage, frequency, amperage, hour meter, service reminders, operator warnings, system faults and diagnostics.

The generator shall have the following features. No exceptions.

- Smart Start engagement to reduce mechanical stress
- Precise voltage and frequency control
- Cold Start System
- Automatic Load and Temperature Compensation
- Integrated Diagnostics System

The generator electrical enclosure, the oil cooler/fan enclosure, the hydraulic fluid reservoir and other steel structural components will be protected with a white powder coat finish.

The generator tray assembly shall be delivered with the cooler/fan assembly mounted such that the hot air is exhausted straight up through the top of the assembly.
An NFPA compliant aluminum grate will be attached over top of the assembly to provide a non-slip walking surface.

The body of the generator tray assembly (including reservoir) shall be 32” long x 13.5” wide x 17” high, weighing approximately 185 pounds. The hydraulic pump shall be driven by a chassis transmission mounted power take off (PTO).

**Ratings and Capacity**

**Rating:**
- 9000 watts peak
- 8000 watts continuous

**Volts:**
- 120/240 volts

**Phase:**
- Single, 4 wire

**Frequency:**
- 60 Hz

**Amperage:**
- 66 amps @ 120 volts or 33 amps @ 240 volts

**Engine speed at engagement:**
- Standard soft start feature allows for any speed engagement

**Operation range:**
- 880 to 3120 RPM

**Testing**

The generator shall be tested in accordance with all current N.F.P.A. 1901 standards.

**Notes**

*All ratings and capacities shall be derived utilizing current NFPA 1901 test parameters.*

**BIDDER COMPLIES:** Yes____ No____

**ELECTRICAL SYSTEM INSTALLATION**

The line voltage electrical system shall comply with the applicable NFPA standards and also comply with the applicable sections of the National Electric Code #70 standards. Line voltage carrying equipment downstream of the power source shall be "listed" (where available) and installed in accordance with manufacturers’ instructions. The electrical equipment installed shall be suitable for intended use and type locations (wet, dry, or underbody and chassis).

The grounding and bonding shall comply with applicable sections of NFPA standards. The chassis frame rail, body sheet metal, and cab sheet metal shall be properly bonded per NFPA schematic. The bonding copper conductor shall be rated at 115 % of current rating of power source.

**OVER CURRENT PROTECTION PANEL**
Manually re-settable over current devices shall be installed to protect the line voltage electrical system components. A main over current protection device shall be provided. The device shall be either incorporated in the power source or connected to the power source by a power supply assembly. The size of the main over current protection device shall not exceed 100 percent of the nameplate amperage rating on the power source specification label or the rating of the next larger available size over current protection device where so recommended by the power source manufacturer.

The conductor used in the power supply assembly between the output terminals of the power source and the main over current protection device shall not exceed 144 inches in length. If over this distance, a separate master disconnect shall be installed at the generator area.

Over current protection devices shall be provided for each individual circuit and shall be sized at not less than 15 amps in accordance with NEC. Each over current protection device shall be marked to identify the function of the circuit it protects. The circuit breaker panel and instruments shall be located so that all circuit breakers are readily visible under normal operating conditions. The panel shall be readily visible and located so that there is unimpeded access to the panel board controls.

HYDRAULIC COMPONENTS

A hydraulic system filter, fluid level gauge, and fluid temperature gauge shall be provided as integral components within the hydraulic reservoir. The reservoir shall be easily accessible to allow filter changes and fluid level checks. There shall be at least 10 inches of clear space above the reservoir to allow removal of the filter element. Interconnecting hoses and fittings shall meet the generator system manufacturer's recommendations for pressure, size, and type of hose used. Where any hydraulic hose contacts other surfaces, the hose shall be protected from chafing. The hydraulic pump shall be driven by a power take-off mounted to the chassis automatic transmission.

CONTROL PANEL

The panel shall include the following:
- Green indicator light to indicate PTO engagement. The light shall be labeled "GENERATOR ENGAGED."
- Red indicator to indicate hydraulic fluid overheating.
- Main circuit breaker panel with "main" breaker and individual line breakers.
- All breakers, outlets, switches, and receptacles shall be labeled per requirements of applicable NFPA standards.
- The generator shall be capable of producing full rated power throughout the entire RPM range of the engine.

INSTRUCTION LABEL

An instruction label indicating essential generator operating instructions, including power-up and power-down sequence shall be permanently attached at or near the operator's panel.
BIDDER COMPLIES:  Yes____  No____

**ELECTRICAL SYSTEM TESTING**

All apparatus installed wiring and associated equipment shall be tested by the apparatus manufacturer in compliance to applicable NFPA standards. The apparatus manufacturer shall test the generator system at the continuous duty rating for a minimum of two (2) hours.

If the apparatus is equipped with a fire pump, both the generator and fire pump shall be operated simultaneously at full pump capacity and generator at "continuous rating" for two (2) hours. Failure of either the generator system or fire pump system during testing will require retesting of both components simultaneously.

The conditions specified shall be recorded at least every 1/2 hour during the test. The results of these tests shall be submitted to the purchaser upon delivery.

Each outlet shall be tested individually to device rating.

Electrical polarity verification shall be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

BIDDER COMPLIES:  Yes____  No____

**CIRCUIT BREAKER BOX**

One (1) circuit breaker box for single phase voltage equipment shall be provided capable of holding twelve (12) breakers. Breaker sizes will be appropriate for the load intended.

BIDDER COMPLIES:  Yes____  No____

**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.

BIDDER COMPLIES:  Yes____  No____

**GENERATOR STARTUP**

An activation switch for the hydraulic generator shall be installed in the apparatus cab.

BIDDER COMPLIES:  Yes____  No____

**GENERATOR MOUNTING LOCATION**

The generator shall be installed on top of the body.
LINE VOLTAGE WIRING INSTALLATION

Line voltage wiring in the apparatus shall be with Type SO or approved cable suitable for mobile applications. The flexible electrical cable shall have 600-volt insulation rated for at least 194 degrees F. All junction boxes shall conform to the National Electric Code and shall be accessible for service.

Electrical cable shall be supported within 6 inches of any junction box and at a minimum of every 24 inches of run. Supports shall be made of corrosion protected metal that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle.

Electrical cable shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring and shall be separated by a minimum of 12 inches from exhaust piping or properly shielded and separated from fuel lines by a minimum of 6 inches distance.

All wiring connections and terminations shall provide a positive mechanical and electrical connection. Connectors shall be installed in accordance with the manufacturer's instructions. Wire nuts or insulation displacement and insulation piercing connectors shall not be used.

120V ELECTRIC RECEPTACLE -- STRAIGHT BLADE

One (1) 120-volt 20 amp straight blade, 3-prong duplex receptacle with spring loaded weatherproof cover shall be provided.

The electric receptacle shall be located inside the rear portion of the crew cab.

Note: Exact location to be determined at the pre-construction conference.

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 upper left side body compartment behind the rear wheels.

Note: Mount to ceiling of rear compartment, behind the forward compartment door.

A two hundred foot (200') length of 10/3 black 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 so as to be hard wired directly to a junction box.

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.

BIDDER COMPLIES: Yes____ No____

JUNCTION BOX

One (1) Akron electrical junction box shall be provided. 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.

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.
BIDDER COMPLIES:  Yes____  No____

**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 upper right side body compartment behind the rear wheels.

Note: Mount in the curb side rear compartment, in the front half of the compartment, behind the forward compartment door.

A two hundred foot (200') 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 so as to be hard wired directly to a junction box.

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) Akron electrical junction box shall be provided. 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.

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.

BODY PAINT PROCESS

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 seams 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 DelFleet 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.

Note: Body to be RED, same paint number as the lower chassis color.
**INTERIOR COMPARTMENT FINISH**

Eight (8) apparatus side compartment interiors are to be painted with a spatter finish material. The compartments shall be cleaned with a grease remover, and then the surface sanded and prepared for painting. The compartment shall be provided with two (2) coats of white epoxy. The compartments are then coated with a splatter paint top coat.

Note: Splatter top coat to be RED, same color as body exterior.

**BIDDER COMPLIES:** Yes____ No____

**TOUCH-UP PAINT**

One (1) two (2) ounce bottle of touch-up paint shall be furnished with the completed truck at final delivery.

**BIDDER COMPLIES:** Yes____ No____

**SIMULATED GOLD LEAF LETTERING**

The lettering shall be applied in simulated gold leaf material, shaded in black and encapsulated in clear Mylar. A quantity of fifty (50), four (4) inch letters are to be placed on the rear cab doors as directed by fire department.

**BIDDER COMPLIES:** Yes____ No____

**SCOTCHLITE REFLECTIVE LETTERING**

The lettering shall be applied with BLACK Scotchlite reflective material, shaded in RED. A quantity of thirty (30) letters are to be placed on the cab and on the body as directed by fire department. The letters shall be between eight and twelve inches in height. Lettering to be FREMONT FIRE DEPT. on both sign panels, sized to fit.

**BIDDER COMPLIES:** Yes____ No____

**APPARATUS DOOR GRAPHICS**

Two (2) custom door graphics designed primarily with artistic features shall be proposed for installation on the front doors of the chassis cab. The department will provide color photos of current graphics for duplication.

**BIDDER COMPLIES:** Yes____ No____

**LETTERING**
Two (2) painted panels shall be supplied for attachment to the sides of the aerial device. The panels shall be painted to match the color of the aerial device. Lettering (up to fifty (50) letters) shall be provided on the aerial sign panels. The maximum size of the panels shall be up to 22" x 144". The lettering provided shall be painted or vinyl with the color specified by the customer at pre-construction conference.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**CAB AND BODY STRIPE**

A straight Scotchlite reflective stripe, 6" minimum in width, shall be applied horizontally around the cab and body in compliance with applicable NFPA 1901 standards. The purchaser shall specify the color and location of the stripe.

BIDDER COMPLIES: Yes____ No____

**COLOR OF STRIPING MATERIAL**

The color of the 3M brand striping material shall be black.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES: Yes____ No____

**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.

BIDDER COMPLIES:  Yes_____  No____

**REFLECTIVE STRIPE**

Reflective striping shall be installed on the interior of each chassis door.

BIDDER COMPLIES:  Yes_____  No____

**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.

BIDDER COMPLIES:  Yes_____  No____

**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.

BIDDER COMPLIES:  Yes_____  No____

**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.

BIDDER COMPLIES:  Yes_____  No____

**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.

BIDDER COMPLIES:  Yes_____  No____

**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.

BIDDER COMPLIES:  Yes_____  No____

**COMBINATION LADDER**
One (1) Duo Safety Model 300-A, 10/15 foot combination aluminum ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA Standards.

**BIDDER COMPLIES:  Yes_____ No_____**

**PIKE POLE**

Two (2) 6' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

**BIDDER COMPLIES:  Yes_____ No_____**

**TRASH HOOK PIKE POLE**

One (1) 6' trash hook pike pole with “D” handle shall be provided. The pike pole shall be of fiberglass construction.

**BIDDER COMPLIES:  Yes_____ No_____**

**PIKE POLE**

Two (2) 8' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

**BIDDER COMPLIES:  Yes_____ No_____**

**PIKE POLE**

Two (2) 12' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

**BIDDER COMPLIES:  Yes_____ No_____**

**100' FIVE SECTION MID MOUNT PLATFORM**

**Platform Design and Construction**

The 100 foot five-section, steel aerial platform has a maximum height of 100' 5.9" at the top of the platform handrail at 75 degrees elevation. The horizontal reach from the outside edge of the platform to the center of the turntable is 94' 8.9".

**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.

**Extension And Retraction System**
The extension and retraction system has eight pairs of cables and two 5” inside diameter cylinders with 2.5” outside diameter rods and a 100” stroke. The specified extension cylinders shall not exceed the specified length. The required length cylinders shall place the cylinder weight closer to the base of the aerial device. Smaller size cylinders are required since they are easier to handle for removal for service reasons. In addition, the specified shorter stroke cylinders provide less potential for damage to the rod by hitting an obstacle when extended.

The lowest-mid section cables shall have a .75” diameter to pull the ladder out with a .625” diameter to pull the ladder in. The center-mid-section cables shall have a .625” diameter to pull the ladder out with a .625” diameter to pull the ladder in. The upper most mid section cables shall have a .625” diameter to pull the ladder out with a .50” diameter to pull the ladder in, and fly section cables have a .50” diameter to pull the ladder out and a .375” diameter to pull the ladder in.

The platform sections shall travel 200” each at full extension. The lowest-mid section shall overlap the base section by 84”. The center-mid section shall overlap the lowest-mid section by 85”. The uppermost-mid-section overlaps the center-mid-section by 86”. The fly section shall overlap the upper most mid-section by 87.”

The extension cylinders have counter balance valves mounted directly to them. The extension cylinders extend and retract the platform with a 2:1 cable cylinder arrangement from totally retracted to 100' at 75 degrees totally extended.

There are no restrictions on the waterway as the ladder is extended and retracted.

Ladder Cradle Alignment Light
Two amber LED indicator lights, left rotation disabled and right rotation disabled, will be supplied on the control console to indicate to the operator when the aerial is aligned with the travel bed support and can be lowered into the travel support.

A limit switch on the base section shall signal by means of an amber indicator light when the aerial rungs are in alignment.

State-of-the Art Technology
The aerial device materials, parts, technology or procedures used in construction of the apparatus are subject to change at the manufacturer's discretion to provide "equal or better" products and must be in compliance to applicable NFPA #1901 standards and industry standard practice.

BIDDER COMPLIES: Yes____ No____

BASE SECTION
The platform base section length shall be 23 feet 8 inches, with inside dimension of 46.25”; distance between the top of the handrail and the centerline of the rungs shall be 35.875”.

The base rails shall be 100,000 PSI material and the handrails shall be 100,000 PSI material.

BIDDER COMPLIES: Yes____ No____
LOWER MID SECTION

The platform lower-mid section length shall be 23 feet 9 inches, with inside dimension of 39.25"; distance between the top of the handrail and the centerline of the rungs shall be 28".

The base rails shall be 100,000 PSI material and the handrails shall be 100,000 PSI material.

BIDDER COMPLIES:  Yes____  No____

MID SECTION

The platform mid-section length shall be 23 feet 10 inches, with inside dimension of 32.25"; distance between the top of the handrail and the centerline of the rungs shall be 22.875".

The base rails shall be 100,000 PSI material and the handrails shall be 100,000 PSI material.

BIDDER COMPLIES:  Yes____  No____

UPPER MID SECTION

The platform upper-mid-section length shall be 23 feet 11 inches, with inside dimension of 27.375"; the distance between the top of the handrail and the centerline of the rungs shall be 18.875".

The base rails shall be 100,000 PSI material and the handrails shall be 70,000 PSI steel material.

BIDDER COMPLIES:  Yes____  No____

FLY SECTION

The platform fly section length shall be 25 feet 10 inches, with inside dimension of 21.625"; the distance between the top of the handrail and the centerline of the rungs shall be 15.375".

The base rails shall be 70,000 PSI material and the handrails shall be 70,000 PSI steel material.

BIDDER COMPLIES:  Yes____  No____

PLATFORM BASKET

The platform basket shall be constructed of a steel frame with two (2) aluminum doors at the front of the basket. One (1) additional door shall be installed on the driver’s side of the rear of the platform basket for easy access into the platform bucket.

The floor or the platform basket of nineteen square feet (38” x 72”) with a continuous 42” high guard railing. The floor shall be built of aluminum bar grating for a skid resistant surface and to provide for drainage.
The gates on the left and right front corners shall swing inward and a gate for entry from the ladder to the platform shall swing upward.

**Heat Shield**
A heat reflective shield is provided on the front, sides, and bottom of the platform.

**Water Curtain Spray System**
A water curtain system provides a cooling spray under the entire floor of the platform with a minimum of 75 gallons per minute. A single quarter turn valve with an actuator accessible from the platform shall control the spray system.

**Safety Belt Attachment and Rope Eyelets**
The platform shall have provisions for personnel working on the platform to attach fall protection harnesses. Four (4) safety belt loops shall be provided in the platform, two at the back, one on each side.

Two (2) rope rescue eyelets, with a combined lifting capacity of 1000 pounds, shall be welded to the bottom of the platform. The eyelets shall be able to carry 500 lbs per eyelet with no other in or attached to the platform.

**Saw Holder**
There shall be brackets installed in the platform to hold a Stihl, model MS 460 saw. They are not meant for storage of the saw while the truck is traveling down the road. The sole purpose of the brackets shall be to secure the saw in the platform while moving the platform around while on the scene of a fire.

BIDDER COMPLIES: Yes____ No____

**TECHNICAL DRAWINGS**
Technical and engineering drawings shall be provided for the aerial platform as follows: left side view, right side view, top view, front view and rear view.

BIDDER COMPLIES: Yes____ No____

**ELECTRICAL DRAWINGS**
Technical and engineering drawings shall be provided for the 12 volt electrical system for the model of apparatus specified.

BIDDER COMPLIES: Yes____ No____

**HYDRAULIC DRAWINGS**
Technical and engineering drawings shall be provided for the aerial device hydraulic system.

BIDDER COMPLIES: Yes____ No____
AERIAL OPERATION INSTRUCTIONS

As required by applicable sections of NFPA #1901, operating instructions and demonstration of the aerial apparatus shall be provided at the purchaser's location. The aerial manufacturer shall provide these instructions and demonstration of the aerial apparatus.

Personnel providing the instructions shall be professionally trained by the aerial manufacturer prior to the delivery process. All costs of these instructions shall be borne by the aerial manufacturer. The bidder shall notify the purchaser a minimum of 14 days prior to the instruction period. The bidder shall provide classroom instructions, instruction and operating manuals as required by NFPA #1901, and provide all other necessary material necessary to assure proper operation of the aerial device.

This instruction period shall be for a minimum and maximum of three (3) days at the purchaser's location.

BIDDER COMPLIES: Yes____ No____

AERIAL OPERATION MANUALS

The bidder shall supply, at time of delivery, an electronic manual that shall include aerial operation and service documentation. The documentation shall address at least the inspection, service, and operations of the fire apparatus and all major components thereof. This documentation and manuals shall be provided in the English language.

BIDDER COMPLIES: Yes____ No____

TRAINING/UL CERTIFICATION

For the each year up to a maximum of 6 years after the truck is received the aerial will be maintenance and 3rd party certified. The scheduling of this will be done through the aerial manufacturer and Fire Department not to exceed the truck being out of service for more than 8 hours unless third party deficiencies are found.

BIDDER COMPLIES: Yes____ No____

AERIAL PARTS & LABOR WARRANTY

Aerial manufacturer shall provide a two (2) year or 100,000 miles overall parts and labor warranty as follows:

The aerial manufacturer shall warrant to the purchaser that the complete aerial device and system was manufactured to comply with the manufacturer's bid specifications and free in all respects from any defects in materials or workmanship.
The warranty shall expire on the earlier of two (2) year or 100,000 miles from the date of delivery. This warranty shall include all parts and labor. The cost of transportation of vehicle to the warranty location shall be provided by the manufacturer.

The obligations of the aerial manufacturer, pursuant to the foregoing warranty, with respect to the aerial shall be limited to the cost of bringing such aerial into compliance with the specifications or of removing any defects in materials or workmanship.

All warranty work performed must be completed at manufacturer’s facility or an approved service center.

Any work or alterations on or misuse of the aerial performed by anyone other than the aerial manufacturer's designated personnel, either before or after delivery to the purchaser, shall not be warranted by the manufacturer and shall cause to make this warranty invalid.

This warranty shall not apply to those items which are usually considered normal maintenance and upkeep services, including, but not limited to electrical lamps, valve seals, normal lubrication and/or proper adjustment of minor items.

**BIDDER COMPLIES:**  Yes____  No____

**THIRD PARTY TESTING**

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.

**BIDDER COMPLIES:**  Yes____  No____

**PERFORMANCE WATER FLOW TESTING**

The waterway flow test shall be conducted by an accredited third party testing organization with certified results provided on delivery of the apparatus. If the aerial device is equipped with a permanent water system and has a rated vertical height of 110 ft (34 m) or less, standard model flow test data shall be provided to the purchaser.

If the water system has been modified from the standard model configuration, a new flow test shall be conducted to determine that the friction loss in the water system between the base of the swivel and the monitor outlet does not exceed 100 psi (700 kPa) with 1000 gpm (3748 L/min) flowing and with the water system at full extension.

A flow test shall be conducted on each vehicle to determine that the water system is capable of flowing 1000 gpm (3748 L/min) (or rating as specified in these specifications) at 100 psi (700 kPa) nozzle pressure with the aerial device at full elevation and extension.
Where the apparatus is equipped with a fire pump designed to supply the water system, the test shall be conducted using the onboard fire pump.

The intake pressure to the fire pump shall not exceed 20 psi (140 kPa).

BIDDER COMPLIES:  Yes____    No____

**GALVANIZED OUTRIGGERS**

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.

BIDDER COMPLIES:  Yes____    No____

**CORROSION RESISTANT WARRANTY**

A galvanized steel corrosion protection warranty shall be provided for the aerial outriggers and stabilizers for a period of twenty-five (25) years. The conditions of the corrosion protection warranty shall be as follows.

1. This warranty shall cover parts and labor to correct the affected area or parts only and shall not be deemed to include entire outrigger or stabilizer assemblies. This warranty does not include the turntable, aerial ladder sections, or torque box.

2. Should any warranty claim occur, the affected area shall be inspected, reviewed and approved by the aerial manufacturer prior to any work being completed.

3. Any authorized warranty work shall be only performed by the aerial manufacturer or its designated repair personnel or facility. Any repairs completed by un-authorized repair shops or personnel shall cause this warranty to be invalid.

4. Transportation costs associated with this corrosion protection warranty shall be the responsibility of the manufacturer.
5. Warranty shall not cover damage due to lack of specified normal maintenance and service as outlined and required in the service and operating manuals provided with the apparatus.

6. Warranty shall not cover damage from accidents, abuse, physical and mechanical damage, and all other conditions not considered as "normal" operating conditions.

7. The obligations of the aerial manufacturer pursuant to the foregoing warranty with respect to the outriggers and stabilizers shall be limited to the cost of bringing the affected area into compliance with the specifications or of removing any defects in materials or workmanship.

BIDDER COMPLIES: Yes____  No____

GALVANIZED TORQUE BOX

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 overcoating 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.

BIDDER COMPLIES: Yes____  No____

CORROSION RESISTANT WARRANTY

A galvanized steel corrosion protection warranty shall be provided for the aerial torque box for a period of twenty-five (25) years. The conditions of the corrosion protection warranty shall be as follows.

1. This warranty shall cover parts and labor to correct the affected area or parts only and shall not be deemed to include the entire torque box assembly. This warranty does not include the turntable, aerial ladder sections, or outrigger/stabilizers.

2. Should any warranty claim occur, it shall be inspected, reviewed and approved by the aerial manufacturer prior to any work being completed.
3. Any authorized warranty work shall be only performed by the aerial manufacturer or its designated repair personnel or facility. Any repairs completed by un-authorized repair shops or personnel shall cause this warranty to be invalid.

4. Transportation costs associated with this corrosion protection warranty shall be the responsibility of the manufacturer.

5. Warranty shall not cover damage due to lack of specified normal maintenance and service as outlined and required in the service and operating manuals provided with the apparatus.

6. Warranty shall not cover damage from accidents, abuse, physical and mechanical damage, and all other conditions not considered as "normal" operating conditions.

7. The obligations of the aerial manufacturer pursuant to the foregoing warranty with respect to the torque box shall be limited to the cost of bringing the affected area into compliance with the specifications or of removing any defects in materials or workmanship.

BIDDER COMPLIES: Yes____ No____

AERIAL SECTIONS CORROSION PROTECTION & PAINTED

After all welding is completed and prior to assembly each aerial ladder section shall be fully immersed in a corrosion protection liquid. The aerial ladder sections are to be coated inside and out, including base rails, hand rails, diagonals, rungs and K-Braces. The corrosion protection liquid will permeate each ladder section to form a bond to the steel at the molecular level to prevent rust. The aerial ladder sections shall be provided in the corrosion protection liquids natural finish or then topped with the fire department desired paint color. The corrosion resistant barrier on the ladder shall reduce the maintenance requirement based on duty cycle.

BIDDER COMPLIES: Yes____ No____

STRUCTURAL WARRANTY

The aerial ladder sections shall carry a warranty against structural failures caused by defective design or workmanship for a period the earlier of twenty-five (25) years or 100,000 miles. This warranty shall commence on the date vehicle is accepted by the original purchaser.

The structural warranty shall be conditional upon normal and reasonable maintenance as outlined in the operating and service manuals provided with the vehicle. In addition, the apparatus shall be maintained, inspected, and tested in compliance to applicable NFPA #1901, #1911, and #1914 standards. The structural warranty does not cover defects caused from misuse, negligence, accident. This warranty shall not apply if the aerial device is remounted on another chassis.

BIDDER COMPLIES: Yes____ No____
PAINT WARRANTY

A paint warranty shall be provided for the aerial ladder sections for the shorter of a period of five (5) years or 100,000 miles. The conditions of the paint warranty shall be as follows.

1. Aerial manufacturer will not be held responsible for any damage due to high temperatures from fire conditions, chemicals, or any material that could attack the painted surface.

2. The paint warranty shall cover re-spraying of affected areas only.

3. Should any paint warranty claim occur, it shall be inspected, reviewed and approved by the aerial manufacturer prior to any work being completed.

4. Any authorized paint warranty work shall be only performed by the aerial manufacturer, its designated repair personnel or facility. Any painting completed by un-authorized repair shops or personnel shall cause this warranty to be invalid.

5. Transportation costs associated with this paint warranty shall be the responsibility of the manufacturer.

6. This paint warranty shall cover parts and labor to the affected area or parts only and shall not be deemed to include individual ladder sections or the entire aerial device. This warranty does not include aerial rung coverings. Additionally, provisions of the paint manufacturer warranty shall also apply on all paint warranty claims; a copy of same shall be available on written request.

7. Warranty shall not cover damage due to lack of specified normal maintenance and service as outlined and required in the service and operating manuals provided with the apparatus.

8. Warranty shall not cover damage from accidents, abuse, physical and mechanical damage, and all other conditions not considered as "normal" operating conditions.

9. The obligations of the aerial manufacturer pursuant to the foregoing warranty with respect to any such aerial ladder sections shall be limited to the cost of bringing the painted area into compliance with the specifications or of removing any defects in materials or workmanship.

BIDDER COMPLIES: Yes____ No____

AERIAL SECTIONS CORROSION PROTECTION WARRANTY

A galvanized steel corrosion protection warranty shall be provided for the aerial ladder sections for a period of twenty-five (25) years. The conditions of the corrosion protection warranty shall be as follows.
1. Aerial manufacturer will not be held responsible for any damage due to high temperatures from fire conditions, chemicals, or any material that could attack the galvanized surface.

2. The galvanized coating warranty shall cover re-coating of affected areas only.

3. Should any warranty claim occur, it shall be inspected, reviewed and approved by the aerial manufacturer prior to any work being completed.

4. Any authorized warranty work shall be only performed by the aerial manufacturer or its designated repair personnel or facility. Any repairs completed by un-authorized repair shops or personnel shall cause this warranty to be invalid.

5. Transportation costs associated with this corrosion protection warranty shall be the responsibility of the manufacturer.

6. This warranty shall cover parts and labor to the affected area or parts only and shall not be deemed to include entire ladder sections or the entire aerial device. This warranty does not include aerial rung coverings.

7. Warranty shall not cover damage due to lack of specified normal maintenance and service as outlined and required in the service and operating manuals provided with the apparatus.

8. Warranty shall not cover damage from accidents, abuse, physical and mechanical damage, and all other conditions not considered as "normal" operating conditions.

9. The obligations of the aerial manufacturer pursuant to the foregoing warranty with respect to any such aerial ladder sections shall be limited to the cost of bringing the affected area into compliance with the specifications or of removing any defects in materials or workmanship.

BIDDER COMPLIES:  Yes____  No____

**PLATFORM BASEKET GALVANIZED & PAINTED**

The outside support structure of the aerial platform basket shall be galvanized. This shall not include walking surfaces, aluminum tread plate areas, stainless steel hand rails, waterway, or other basket accessories.
The aerial platform basket framework shall be entirely coated. The process shall eliminate the rusting, scratching or paint chips on the basket. 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 platform basket framework.
The galvanizing shall provide the steel platform basket with both barrier and cathodic protection from corrosion. The galvanizing process shall immerse the complete platform basket 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.

The aluminum covering of the platform basket will be painted the same color as the aerial sections if the galvanized aerial sections are painted. If the ladder sections are just galvanized then the platform shall be painted Metallic Gray to match to galvanizing.

BIDDER COMPLIES: Yes____ No____

**HANDRAIL STAINLESS STEEL**

The handrails shall be knurled stainless steel.

BIDDER COMPLIES: Yes____ No____

**LADDER BED**

A heavy duty hydraulic tank built into the ladder bed shall provide support of the aerial in the travel position.

On the base section of the aerial device, a stainless steel scuff plate shall be installed where the aerial comes in contact with the travel support.

Mounting plates shall be installed on the cradle of the aerial for cradle cover mounting plates to be installed. The 'R' covers shall be installed by the final OEM.

BIDDER COMPLIES: Yes____ No____

**RUNG COVERS**

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. There shall be neon glowing striping to run down the center or the rung cover on all sections.

BIDDER COMPLIES: Yes____ No____

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.

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.

BIDDER COMPLIES: Yes____ No____

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 right handrail and the inside of the left handrail to indicate extension position of the ladder in operation. The markings shall be BLACK reflective numbers that will mark every 10 feet with a hash mark between the numbers.

BIDDER COMPLIES: Yes____ No____

RESCUE BASKET

A Junkins rescue basket, model #JSA-200 or approved equal plastic rescue basket, and mounting shall be installed on the outside of the base section on the passenger’s side. Rescue basket shall be modified to attach to the repelling arms at the front of the platform. The mounting will be an aluminum box mounted on the outside of the base section of the aerial ladder for storage of a rescue basket. The box shall have a hinged cover with latches to secure the cover.

The box shall be approximately 26" high x 10" wide x 86" long. It shall be constructed of 1/8" smooth aluminum and painted to match ladder sections.

BIDDER COMPLIES: Yes____ No____

BREATHING AIR

A breathing air system shall be provided from the base section of the platform to the tip of the platform basket. The system shall be installed to comply with all applicable sections of NFPA #1901 standards. The cylinders shall be shipped fully pressurized with breathing air.
The breathing air system service and operation shall be covered in the manuals provided with the apparatus on delivery.

The installation shall include the following equipment:

- One (1) 6000 PSI 509 cubic foot DOT air cylinders on drivers’ side. The cylinder will be painted RED, the same paint number as the red on the lower portion of the chassis cab.
- One (1) pressure gauges on the cylinders
- One (1) air pressure regulator with downstream pressure gauge
- One (1) Grade D air filter
- Two (2) air outlets in platform basket must connect to SCOTT airpack # __TBD__

BIDDER COMPLIES:    Yes_____    No_____

**BREATHING AIR QUICK DISCONNECT**

A breathing air quarter-turn refill valve shall be mounted between the breathing air regulator and the air cylinder and shall be used for refilling the base section air cylinder(s). In addition, 50 feet of high pressure breathing air hose shall be provided with appropriate quick disconnect fittings.

BIDDER COMPLIES:    Yes_____    No_____

**BREATHING AIR MONITORING SYSTEM**

The Smart Aerial breathing air system indicator shall be displayed on the smart screen at the turntable control stand and platform control stand. The indicator will change from green to amber to red to red flashing to alert the operator that the air is getting low.

If a smart screen is not selected the smart breathing air system shall be displayed through a single light on the turntable and platform control stands. The Air Monitor uses a pre-calibrated pressure range based on the full calibration of the air bottle. An LED indicator light flashes in a slow, two flashes per second pattern when the system pressure reaches 30 percent or less. When the pressure is below 20 percent, the light flashes rapidly, 5 flashes per second, and a warning horn chirps twice every three seconds. When air pressure is less than 1 percent, the warning horn stops chirping, but the RED LED indicator light remains flashing at a rate of 5 flashes per second.

BIDDER COMPLIES:    Yes_____    No_____

**ROOF LADDER BRACKETS FLY**

There shall be welded plates and bolt on roof ladder mounting brackets installed on the inside of the fly section.

BIDDER COMPLIES:    Yes_____    No_____
**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 inside of the fly section. The ladder shall meet or exceed applicable NFPA standards. The ladder shall be a 14" narrow width Duo-Safety roof ladder.

BIDDER COMPLIES:  Yes____   No____

**PIKE POLE WELD PLATES**

Welded-in mounting plates shall be installed for a pike pole mounting on the left side of the fly section.

BIDDER COMPLIES:  Yes____   No____

**PICK POLE BRACKETS: FLY**

Bolt on mounting brackets for a pike pole shall be installed mounting plates on the located on the left side of the tip of the fly section.

BIDDER COMPLIES:  Yes____   No____

**PIKE POLE**

One (1) 6' long trash hook shall be provided on the left hand side of the tip of the fly section.

BIDDER COMPLIES:  Yes____   No____

**PLATFORM FLOOR LIGHTING**

White LED lighting will be provided to illuminate the platform. The platform floor lighting shall be activated by the aerial master switch.

BIDDER COMPLIES:  Yes____   No____

**PLATFORM SELF LEVELING**

The platform leveling system shall be provided and designed so that the platform can be supported and maintained level relative to the turntable, regardless of elevation.

The platform leveling system shall consist of electric controls powering hydraulic cylinders, with manual override. Leveling of the platform shall be maintained with two (2) hydraulic cylinders located at the platform. The system shall not require a slave cylinder and shall provide a simpler, more reliable system.
The system shall provide the capability to manually tilt the basket and hold this position for better access to the work area.

BIDDER COMPLIES:  Yes____  No____

**PLATFORM 8" EXTENSION**

The platform sides shall be extended 8" beyond the platform basket frame with a rubber bumper along the outside edge.

BIDDER COMPLIES:  Yes____  No____

**PLATFORM EXTENDING ARMS**

Extending arms shall be provided to permit connection of a roof ladder or rescue basket to the platform basket. They are secured to the platform using a retainer pin. These arms rotate and will lock into place in the travel position and rescue position. Each arm is rated at 250lbs. Together the arms are rated at 500lbs.

BIDDER COMPLIES:  Yes____  No____

**PLATFORM MAN-SAVER BAR**

One (1) Fire Research 24" ManSaver aerial safety bar with 6" loop shall be installed. The safety bar shall open either upward or inward, and be spring loaded to automatically return to the horizontal closed position. The safety bar assembly shall be made of aluminum and stainless steel.

The length of bar shall be: 24". Location of safety bar shall be installed at the platform basket opening from the aerial fly section to the platform basket.

BIDDER COMPLIES:  Yes____  No____

**PLATFORM STORAGE BOX**

Two (2) aluminum storage boxes shall be installed. Each box holds 100' of 1-3/4" hose and/or platform extending arms and breathing air masks.

BIDDER COMPLIES:  Yes____  No____

**PLATFORM STORAGE BOX: SIDES**

Two (2) storage boxes shall be installed on each side at the center of the platform basket.

BIDDER COMPLIES:  Yes____  No____

**PLATFORM STORAGE BOX PAINTED**
The platform storage box (s) shall be painted the same color as the platform basket.

BIDDER COMPLIES: Yes____ No____

**PLATFORM ULTRA SONIC SENSORS**

Ultra Sonic Sensor shall be fastened on the outside of the platform for extra protection. The sensor shall be able to indicate when any side of the platform is within 28 inches from the front and 48 inches from the side of coming into contact with an object. A momentary override switch will be located on the turntable and platform control console to move the platform away from the contacted area.

BIDDER COMPLIES: Yes____ No____

**PLATFORM ROTATION SYSTEM**

Two (2) hydraulic motors to operate two (2) planetary gearboxes, capable of field adjustment, to rotate the aerial platform activating the rotation system.

A 48” 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 is bolted to the bearing base plate using thirty (30) 1.00" SAE Grade 8 bolts. The bearing is bolted to the turntable using thirty (30) 1.00" SAE Grade 8 bolts.

Two hydraulic release/spring brakes provide a positive lock for the rotation.

Two (2) pressure reducing valves control the force of the rotation to protect the side load of the aerial platform.

BIDDER COMPLIES: Yes____ No____

**CONTROL PANEL LANGUAGE**

All panels including main operations stations, outrigger stations, warning labels and load charts shall be written in English.

BIDDER COMPLIES: Yes____ No____

**CONTROL PANEL**

The main and platform control system is monitored by programmable logic control. The programmable logic control operating system must be able to monitor the following functions continuously to offer maximum safety. The monitored aerial control functions are as follows:
Command Pedestal
The aerial command pedestal consists of a stand up control pedestal with the combination of a single joystick controller in combination with the aerial SMART Screen. A hinged and latched access door with vertical hinge will be provided for maintenance access. The minimum clear flanged opening will be 13" W x 28" H. The gasketed door shall lap over the flanged opening, shall have two push button quick release latches, and shall be painted to match the pedestal.

SMART Screen
One (1) aerial SMART Screen shall be installed at the main control station and one (1) at the platform control station. The screen shall consist of multiple pages. The first page shall be the main information screen. It shall give the following information:

- Aerial rotation
- Aerial height
- Aerial reach
- Aerial extension defined by the amount of feet left to extend
- Rungs aligned indicator
- Operational envelop indicators
- Emergency stop engaged indicator
- Aerial load gauge
- Outrigger not extended indicator
- Auto bedding indicator with switch to operate auto bedding
- Tip lights switch with indicator
- Tracking lights switch with indicator
- Flow and Pressure gauge

The second page shall display the following information:

- Side to side leveling
- Front to back leveling

The third page shall display the following engine diagnostics information:

- Engine RPM
- Engine coolant temperature
- Engine oil pressure
- Battery charging condition
- Transmission fluid temperature
- Fuel level

The fourth page shall display the following information:

- Aerial operations defined by outrigger extensions
- Outrigger extension by percentage

The fifth page shall display the following information:

- Load and reach chart
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 twelve (-12) degrees. When the aerial is fully retracted the aerial speed shall be 20 percent faster than when fully extended.

The single joystick controller shall have a trigger switch that shall be engaged to activate to operate the aerial. With the trigger 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 indicators on the screen to indicate Right Rotation Disabled, Down Disabled and Left Rotation Disabled. Each individual indicator shall illuminate when aerial functions (right rotation, left rotation or lowering) are disabled. All three indicators shall illuminate when the E-STOP is pushed or the outrigger interlock is active.

Auto Bedding
The main operators’ station and platform operators’ station shall have a switch for auto bedding in the SMART screen. Activation of the 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.

Rung Alignment
The aerial rung alignment light shall be monitored by an absolute encoder system. The indicator shall illuminate on the SMART Screen when the rungs are aligned for the safety of climbing the aerial.

Joystick Controller
A single joystick controller shall control aerial left/right, extend/retract and raise/lower functions. The trigger on the back side of the joystick shall enable the high idle. The joystick shall have built in ramp up and ramp down capabilities.

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. An indicator shall appear on the SMART screen at them main operators’ station and platform operators’ station to 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.
Aerial Load Gauge
An aerial load gauge shall give a continuous reading of the load on the device on the SMART Screen at both the main operators’ station and platform operators’ station. This gauge shall have a green indicator showing the load is in the safe operating parameters on the ladder, an amber indicator alerts the operator when the aerial is nearing the rated load and a red indicator 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.

Lighting
Lights shall illuminate the main control station and turntable work area for added operator visibility and safety.

Main & Platform Control Panel

The turntable shall have the control console mounted on the driver's side (when the aerial is stowed). The following items shall appear on the panel at the main control station:

- One (1) aerial SMART Screen
- One (1) system pressure gauge, 0-5,000 psi minimum
- One (1) emergency stop button
- One (1) joystick controller
- Monitor switches

The system shall be capable of performing simultaneous outrigger functions or simultaneous aerial functions

The following items shall appear on the panel at the platform control station:

- One (1) aerial SMART Screen
- One (1) emergency stop button
- One (1) joystick controller
- Monitor switches.

BIDDER COMPLIES: Yes_____ No_____

CONTROL STAND LID

There shall be a lid installed on the command pedestal to give extra protection to the screen and Joystick. The lid shall be designed to completely cover the top of the command pedestal when closed, overlapping at the sides of the panel to create close tolerances. The hinged lid will be gasketed.

BIDDER COMPLIES: Yes_____ No_____
**TURNTABLE**

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 covered handrails capable of withstanding a 225 pound force applied from any direction shall be installed on the turntable.

BIDDER COMPLIES: Yes____  No____

**TURNTABLE MAN SAVER BARS**

Two (2) Fire Research ManSaver bars shall be installed on the left and right side of the turntable. The safety bars shall lift either upward or inward to open, and be spring loaded to automatically return to the horizontal closed position. The safety bar assembly shall be made of aluminum and stainless steel. The length of bars shall be 24".

BIDDER COMPLIES: Yes____  No____

**TURNTABLE FINISH**

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.

BIDDER COMPLIES: Yes____  No____

**TURNTABLE LID DOOR AJAR LIGHT**

The cover of the turntable control console shall be designed to indicate when the lid is open. The light will be connected to the door ajar/outrigger extended light in the cab.

BIDDER COMPLIES: Yes____  No____

**HYDRAULIC HIGH PRESSURE 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.

BIDDER COMPLIES: Yes____  No____

**HYDRAULIC RETURN FILTER**
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.

BIDDER COMPLIES: Yes____ No____

**WARNING LABELS**

Danger, caution, and warning labels shall be installed at all aerial control stations, individual controls, and at various locations on the aerial device. These labels shall be in compliance to industry warning symbols, ASME, SAE, and applicable NFPA #1901 standard. These labels shall be with symbols commonly used in the fire industry.

BIDDER COMPLIES: Yes____ No____

**LOAD CHART**

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.

BIDDER COMPLIES: Yes____ No____

**AIR HORN**

A momentary switch shall be provided for controlling the vehicle's air horn at the turntable control console. The switch will be mounted on the turntable control console.

BIDDER COMPLIES: Yes____ No____

**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 torque box will be enclosed front, top, bottom and both sides. The rear of the torque box shall be open for ground ladder and pike pole storage, through the specified rear ladder / pike pole compartment access door.
**OUTRIGGER COMPONENTS**

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.

**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.

**Extension Beams**

The extension beams shall entirely enclose the extension cylinders to prevent damage to the rods and hoses. Each outrigger shall be controlled with an independent 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.

BIDDER COMPLIES: Yes____ No____

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 directly behind the cab and attached to the super structure.

Front Outriggers
The front outrigger assemblies shall consist of the following components:

- A 2.5" inside diameter cylinder with a 1.375" outside diameter rod shall extend and retract the outrigger 60".
- A 5" inside diameter cylinder with a 3" outside diameter rod shall raise and lower each jack tube a distance of 28".

**Front Outrigger Spread**

The total width from the center of pivot pin to center of pivot pin when the outriggers are fully extended shall be: 17' 6".

**Rear Outrigger assemblies**

The rear outrigger assemblies shall consist of the following components:

- A 2" inside diameter cylinder with a 1.125" outside diameter rod shall extend and retract the outrigger 48".
- A 5" inside diameter cylinder with a 3" outside diameter rod shall raise and lower each jack tube a distance of 22".

**Rear 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".

**BIDDER COMPLIES:**

Yes____ No____

**OUTRIGGERS DIRECTLY BEHIND CAB**

Outriggers will be moved from original placement at the front of the torque box to directly behind the cab.

**BIDDER COMPLIES:**

Yes____ No____

**SHORT JACKING**

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.

BIDDER COMPLIES: Yes____ No____

OUTRIGGER CONTROL PANEL

The outrigger control panel shall have a switch to energize the hydraulic system for outrigger functions.

Control Panel

The control panel shall include a SMART Screen that will display the following pages. There shall be three (3) switches not located on the screen at the rear of the truck.

a) Manual override system to override the outrigger/aerial interlock system
b) One (1) switch for the emergency power unit.
c) Outrigger on/off switch

The first page shall be the main information screen. It shall give the following information:

- Aerial rotation
- Aerial height
- Aerial reach
- Aerial extension defined by the amount of feet left to extend
- Rungs aligned indicator
- Operational envelop indicators
- Emergency stop engaged indicator
- Aerial load gauge
- Outrigger not extended indicator
- Tip lights switch with indicator
- Tracking lights switch with indicator
- Flow and Pressure gauge
- Hydraulic pressure filter indicator

The second page shall display the following information:

- Side to side leveling
- Front to back leveling
- Outrigger hour meter

The third page shall display the following information:

- Aerial operations defined 360 degree graph determined by outrigger extension
• Outrigger extension by percentage

The fourth page shall display the following information:
  • Load and reach chart

The fifth page shall display the following engine diagnostics information:
  • Engine RPM
  • Engine coolant temperature
  • Engine oil pressure
  • Battery charging condition
  • Transmission fluid temperature
  • Fuel level

BIDDER COMPLIES: Yes____  No____

**ELECTRIC OUTRIGGER CONTROLS**

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.

BIDDER COMPLIES: Yes____  No____

**AUTOMATIC SELF LEVELING**

The apparatus shall be equipped with an automatic self-leveling system for four (4) outriggers. The system shall operate as follows:

  • With the automatic leveling switch in the down, on position, the operator will need to manually extend the outriggers and manually lower the jacks until they touch the ground.
  • After the outriggers are extended and the last outrigger jack touches the ground, the automatic jack leveling system will level the truck.
  • When storing the outriggers, raising the switch to the up position will automatically raise the outriggers.
  • The operator will manually retract the outriggers for safety purposes. The operator can then switch the automatic leveling switch to the down position to be ready for the next set up.
  • With the switch in the middle position, the auto leveling system shall be in the off position.

BIDDER COMPLIES: Yes____  No____

**OUTRIGGER 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.

Note: There will be mountings for the outrigger ground plate beside the associated outrigger.

BIDDER COMPLIES: Yes____ No____

OUTRIGGER STOWED INDICATOR LIGHT

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.

BIDDER COMPLIES: Yes____ No____

PERFORMANCE CAPABILITIES

The following are aerial platform 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.

Platform Operations With Waterway Dry

-12 Degrees to 30 Degrees 1,000 pounds in the platform basket or 1,000 pounds evenly distributed

30 Degrees to 45 Degrees 1,000 pounds in the platform basket or 1,500 pounds evenly distributed

45 Degrees to 60 Degrees 1,000 pounds in the platform basket or 2,000 pounds evenly distributed

60 Degrees to 75 Degrees 1,000 pounds in the platform basket or 2,500 pounds evenly distributed

Platform Operations With 1500 GPM Water Flowing 90-degree to the side and 45 degrees up and 45 degrees down

The following capabilities are based upon continuous 360-degree rotation and up to full extension.

Elevation Platform Weight Capacity

-12 Degrees to 45 Degrees 500 pounds in the platform basket or 750 pounds evenly distributed
45 Degrees to 60 Degrees  500 pounds in the platform basket
or 1,500 pounds evenly distributed

60 Degrees to 75 Degrees  500 pounds in the platform basket
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 must meet the 2:1 safety factor requirement for material based on the weight of the ladder plus a 1,000 pound live load at the platform, flowing 1,500 GPM of water at 90 degrees to the side of the platform at zero degrees elevation.

BIDDER COMPLIES:    Yes____      No____

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.

BIDDER COMPLIES:    Yes_____  No____

WATERWAY

An 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. 5-1/2" outside diameter at the base section
2. 5" outside diameter at the lower mid-section
3. 4.5" outside diameter at the mid-section
4. 4" outside diameter at the upper mid-section
5. 3.5" outside diameter at the fly section

Monitor Installation
An electronic controlled monitor with nozzle is mounted to the platform. Monitor controls are located at the platform and on the turntable control console.

**Butterfly Valve**

One (1) hand wheel controlled 4" butterfly valve shall be installed before the monitor at the end of the waterway.

**BIDDER COMPLIES: Yes____ No____**

**WIRELESS RADIO REMOTE**

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 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.

**BIDDER COMPLIES: Yes____ No____**

**MONITOR**

Task Force Tips Monsoon RC, model # Y4-E21A-P-01 remote controlled aerial ladder monitor shall be provided at the end tip of the aerial. The monitor shall operate with 12 volt direct current and controlled by a monitor mounted switch panel with functions that control rotations, elevation and nozzle patterns. The monitor shall be compatible with a hard wire touch pad at the aerial control stand and at the platform control stand.

The electrical controls for the monitor shall be waterproof and utilize current limiting position encoders to protect the drive train at the ends of travel. Monitor will be pre-wired to a control/connection box with 4 feet of wire such that the control connection box is mountable to the ladder at a nearby location. Control box on monitor will contain a membrane switch panel for control of unit from top of the ladder. An electrical connection for a TFT remote control nozzle shall be provided. The monitor shall be equipped with small override knobs for use in the event of power failure of electrical malfunction. The knobs control stainless steel worm gears for rotation and elevation adjustment.

The monitor shall have the following capabilities:

- Control box mounted to top center of monitor for maximum clearance
• Override control shafts shall be short in length to provide maximum clearance
• Small override knobs installed
• Horizontal stops preset to 90 degrees left and right of center
• The rotation of the monitor is 0 degrees below and 0 degrees to 45 degrees below horizontal elevation
• Flow capability of 2000 GPM with 16 PSI of loss
• Maximum operating pressure of 200 PSI

For resistance to corrosion the monitor shall be constructed from hardcoat anodized aluminum with silver powder coat interior and exterior finish. A threaded port for an optional pressure gauge shall be provided.

The monitor shall be designed with a unique waterway that minimizes the path of travel, reduces friction loss and turbulence, and produces a far reaching water stream. The monitor shall be configured with a 4" ANSI 150 flange inlet and 3-1/2" male NH outlet.

**BIDDER COMPLIES:** Yes____ No____

**NOZZLE**

Task Force Tips Master Stream, model MERP1500-NN automatic nozzle with electrically operated pattern control shall be provided. The nozzle design shall allow for straight stream through dense wide fog patterns.

The electric drive unit shall develop over 400 pounds of torque, be enclosed in a waterproof cast aluminum housing and include a manual override device in the event the power source fails. The unit shall be compatible with a 12 volt power system and require no more than a 3 amp power draw and include a 24" connecting cable.

Nozzle stream shaper actuator shall have position encoder for smooth transition between straight stream and fog pattern with fine stream adjustment.

For corrosion resistance and durability the nozzle and actuator shall be constructed from hardcoat anodized aluminum alloy, include a protective rubber bumper with fog teeth, laser engraved serial number, and reflective labeling. The nozzle shall have a 3-1/2" female NH swivel rocker lug coupling and a flow range of 300 - 1500 GPM at 100 PSI. A weatherproof six-pin electrical connection for use with TFT remote control monitors shall be included.

**BIDDER COMPLIES:** Yes____ No____

**PRECONNECT**

One (1) TFT manual Valve Under Monitor (VUM) shall be installed between the end of the waterway and the monitor. There shall be less than 7 psi loss at 2000 GPM and the VUM
incorporates TFT's stainless quarter ball design. One 2-1/2" port shall be opened for use of the discharge with a 1-1/2 reducer connected.

**BIDDER COMPLIES:** Yes____ No____

### 2.5" RELIEF VALVE

A 2.5” relief valve shall be installed above the turntable.

**BIDDER COMPLIES:** Yes____ No____

### INTERCOM

The two station intercom communication system shall have the master station at the platform aerial turntable and secondary intercom and speaker at the platform basket area.

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.

*Fire Research Intercom*

Fire Research ACT Intercom model ICA900-112 two-way system shall be installed. The intercom kit shall include two control modules, one that is hands free and one that has a push-to-talk button, two speakers, and cables. The control modules shall have an LED volume display and push-button volume control. The hands free module shall constantly transmit to the other module unless the push-to-talk button is pressed.

The intercom shall be designed for exterior use. The control module shall be no more than 2 7/8" high by 5 1/8" wide by 1 7/8". The speaker shall be no more than 5 1/8" high by 5 1/8" wide by 1 1/2" deep. The power requirements for each control module with a speaker shall not exceed 1/2 amp at 12 VDC.

**BIDDER COMPLIES:** Yes____ No____

### TRACKING LIGHTS

Two (2) Pioneer LED single panel, model # PFA1, floodlights shall be installed at the lower end of the base section ahead of the lift cylinders of the ladder. The light runs off 12 volts, 3 amps, 35 watts and 3,000 usable lumens. The housing of the lights shall be white in color. These are to be activated from the tracking light switch on the main control station and from a switch on the lamp head.

**BIDDER COMPLIES:** Yes____ No____
FORWARD TIP LIGHTS

Two (2) Pioneer LED single panel, model # PFA1, floodlights shall be installed at the front of the platform. The light runs off 12 volts, 3 amps, 35 watts and 3,000 usable lumens. The housing of the light shall be white in color. These lights shall be activated from the tip light switch on the main control station and from a switch on the lamp head.

BIDDER COMPLIES: Yes____ No____

SIDE TIP LIGHTS

Two (2) Pioneer Super-LED lights, model PFP1AP1 light shall be installed one (1) on each side of the platform towards the front. The rectangular die cast light fixture shall measure 9-1/8" wide by 5-3/8" high by 4-7/8" deep and have a white powder coat finish. The 750 watt 120 volt light shall have a quartz halogen bulb with a field replaceable modular, 4-7/32" high by 8" wide electro-polished aluminum reflector and molded, high heat polycarbonate handle. The fixture shall have a locking swivel joint with a 3/4" diameter NPT threaded base to allow the light to be manually tilted up/down and locked in position by the operator. The lights shall be activated by the tip lights switch. A waterproof on/off toggle switch shall be mounted on the side or underneath the light fixture.

BIDDER COMPLIES: Yes____ No____

DOT LIGHTS

Five (5) red DOT travel lights shall be installed three (3) on the front of the platform basket and one (1) on each side. The lights are connected to the ignition power.

No platform warning lights.

BIDDER COMPLIES: Yes____ No____

SCENE LIGHTS

Two (2) Whelen Pioneer LED, model PFP1, lights shall be installed under the platform. The single lamp flood light shall operate on 12V, 6 amps and produce 75 watts and have 7000 usable lumens. Activate these lights from the tip light switch on the turntable and the scene light switch at the platform.

BIDDER COMPLIES: Yes____ No____

TRIPOD LIGHTS

Two (2) Whelen Pioneer LED, model PSP1APA, tripod lights shall be installed on one (1) on each side of the platform toward the rear. There shall be a receptacle next to each light for them to be plugged into.
PLATFORM RECEPTACLE

One (1) 120-volt AC circuit shall be run through the collector ring swivel, with one (1) with a 20 amp breaker, 15 amp receptacle mounted in the platform basket. Only one box is needed. The receptacle(s) shall be a twist-lock three prong type with a weather proof cover.

BIDDER COMPLIES: Yes___ No____

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 blue in color.

BIDDER COMPLIES: Yes___ No____

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.

BIDDER COMPLIES: Yes_____ No_____

**HYDRAULIC GATED DRAIN LINE**

One (1) quarter turn shut-off valve shall be connected in the drain line of the hydraulic oil tank.

BIDDER COMPLIES: Yes_____ No_____
HYDRAULIC GATED DRAIN LINE

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.

BIDDER COMPLIES: Yes____ No____

ELEVATION SYSTEM

The hydraulic elevation system shall have two (2) 7" inside diameter cylinders that have 4.50" diameter rods and a 42" stroke. The elevation system shall elevate the aerial from -12 degrees to +75 degrees. Each cylinder shall have lock valves connected directly to the barrel of the cylinder. The cylinders shall be equipped with spherical bushings to minimize cylinder rod wear.

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.

BIDDER COMPLIES: Yes____ No____

PTO

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.

BIDDER COMPLIES: Yes____ No____

EMERGENCY BACK UP PUMP

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.

BIDDER COMPLIES: Yes____ No____

COLOR CAMERA
An Intec color camera, model # CVC471HXL, shall be installed at the tip of the aerial. The camera shall incorporate a 1/3" high density CCD interline transfer pickup device with at least 250,000 [510 (H) x 492 (V)] pixels. The camera shall produce a horizontal resolution of at least 330 lines. The camera shall deliver a usable color picture at a scene illumination of 0.5 lux. The camera shall provide a horizontal field of view of at least 123 degrees and a vertical field of view of at least 91 degrees. The camera/cable connection shall be qualified as waterproof to IP68. The camera shall be able to transmit images to a display/monitor using a single cable.

An Intec color display, model # CVD640LCD, shall be installed at the pump panel. The display shall incorporate a 6.4" color non-glare LCD which shall produce a horizontal resolution of at least 960 lines. The display shall have a shock/vibration rating of at least 4.5G @ 0-2000 cpm and be able to transmit images from a CVC Series camera using a single cable. The display and controller assembly shall have automatic brightness adjustment, automatic on-screen distance markers, and standard extended sun visor. The display must be IP68 rated. The display shall be FCC, RoHS, CE and e mark compliant.

BIDDER COMPLIES: Yes____ No____