



**City of Cayce, South Carolina**

***Request for Proposals***

**Fire Ladder Apparatus, Rear Mount Platform  
Emergency Services/Fire**

**RFP Issue Date:** 5/7/2021

**RFP Contact(s):**  
*(MUST EMAIL BOTH CONTACTS)* Sarah Harris,  
Grant & Special Project Manager  
[sharris@caycesc.gov](mailto:sharris@caycesc.gov)

Steven Bullard,  
Battalion Chief  
[sbullard@cityofcayce-sc.gov](mailto:sbullard@cityofcayce-sc.gov)

**Email All Questions/Inquiries  
Date & Time:** Must receive all emails by,  
5/21/2021, Friday, by 12:00 PM

**Send RFP Proposal To:**  
*(MUST SUBMIT SEALED BID)* Sarah Harris  
Grant & Special Project Manager  
City of Cayce  
1800 12<sup>th</sup> Street  
Cayce, SC 29033

**RFP Closing Date & Time:** 6/18/2021, Friday, by 12:00 PM

**Number of Sealed Proposals:** One (1) original individually sealed proposal.  
One (1) original individually sealed redacted proposal.

**Proposals Requested:** Due to Covid, you must utilize the drive-thru services from the utility payment area of City Hall, to deliver your sealed packet(s).

**Important Information:** [www.caycesc.gov](http://www.caycesc.gov)  
Please carefully review all addenda and additional instructions located in the Latest News Tab of the City of Cayce website.

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## **1. INTRODUCTION AND PURPOSE OF RFP**

### **1.1.00 PURPOSE OF REQUEST FOR PROPOSAL**

The City of Cayce invites qualified proposals for the intent of these specifications to cover the furnishing and delivery of, a complete apparatus equipped as herein specified. Therefore, with a view of obtaining the best results and the most acceptable apparatus for service to the fire department, these specifications cover only the general requirements as to the type of construction and tests the apparatus must conform, together with certain details as to finish, material preferences, equipment and appliances with which the successful bidder 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 the time of the bid) National Fire Protection Association Pamphlet #1901 for Motor Fire Apparatus and all Federal Motor Vehicle Safety Standards, no exception.

Each bid shall be accompanied by a set of “Contractors Specifications” consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract must conform. Computer run-off sheets are not acceptable as descriptive literature.

The specifications shall indicate size, type, model and make of all component’s parts and equipment. The specifications listed herein are not intended to be restrictive in any way. The intent is to provide potential responders a basic guideline for what type of vehicle is acceptable.

### **1.2.00 QUESTIONS/INQUIRIES**

Questions and inquiries **must be submitted through email by 5/21/2021, Friday, by 12:00 PM, EST** to both Sarah Harris/Steven Bullard at [sharris@caycesc.gov](mailto:sharris@caycesc.gov) & [sbullard@cityofcayce-sc.gov](mailto:sbullard@cityofcayce-sc.gov). Questions/inquiries will not be accepted or considered after this deadline.

### **1.3.00 PROPOSAL INFORMATION**

The City of Cayce **invites proposals until 6/18/2021, Friday, by 12:00 PM, EST.**

Point of Contact(s):                   **Sarah Harris**  
  **Grant & Special Project Manager**  
  **City of Cayce**  
  **1800 12<sup>th</sup> Street, Cayce, SC 29033**  
  **(803) 550-9545 / (803) 550-9543**

The city reserves the right to reject any and all proposals, to waive any information or irregularities and to make the selection among the proposals as are deemed in the best interest of the City. The City is not liable for any incurred costs to prepare or present a response to this Request for Proposal (RFP).

### **1.4.00 GENERAL COMMUNITY INFORMATION**

The City of Cayce, South Carolina is a historic community whose land has been inhabited for over 12,000 years. The City is located in Lexington County and borders the west bank of the Congaree River across from the state capital, Columbia. Incorporated in 1914, Cayce has grown to 17 square miles and a population of 14,000 in 2017. Rich in natural and cultural resources, Cayce boasts 20 miles of trails along the Congaree River and Congaree Creek. It is also home to larger industries like Dominion Energy, CMC Steel, and a Martin Marietta granite quarry. The City of Cayce is a full-service city providing residents with public services such as water, sewer utilities, and public safety. Additional information about the City can be found at [www.caycesc.gov](http://www.caycesc.gov).

## **1.5.00 CONTRACT AWARD**

The City of Cayce shall have the right to select the Proposer who, in the opinion of the City, will be in the best interest of and/or the most advantageous to the City after considering the criteria set forth in this RFP. The City also reserves the right to reject any Proposer who has previously failed in the proper performance of a contract or to deliver on time contracts of a similar nature with other governmental entities or who, in the City's opinion, is not in a position to perform properly under the intended contract award. The City reserves the right to waive any minor informalities or technicalities in proposals received, as may be deemed in the best interest of the City in the City's sole discretion. In addition, the City reserves the right to reject any and all proposals at any stage, or to modify, withdraw, cancel, or reissue this RFP, in whole or in part, in the event that competition is deemed inadequate or the City determines in its sole discretion that it is otherwise in the best interest of the City. A recommendation of contract award does not constitute a contract. The award of contract to the selected respondent is subject to City Council approval and the execution of a contract with terms acceptable to the City. The city staff makes recommendations to the City Council, and the City Council ultimately has the authority to award contracts, including the right to re-rank Proposers differently than recommended by the City staff.

All proposals will be subject to a review and evaluation process. It is the intent of the City that all proposers responding to this RFP, who meet the requirements, will be ranked in accordance with the criteria established in these documents. The City will consider all responsive and responsible proposals received in its evaluation and award process. Prior to final selection of a proposer, the City may conduct interviews and discussions with prospective proposers.

Further, each proposal will be evaluated for full compliance with the RFP instructions to the proposers and the terms and conditions set forth within the RFP document. Proposals will be scored and ranked in accordance with the weighting and grade criteria specified in these documents. The City is not obligated to make an award to the Proposer with the lowest bid or price submitted. Proposals will be evaluated and an award made to that Proposer who is determined to be responsible and responsive to this Request for Proposal and whose proposal is the most advantageous to the City in terms of price, quality of service, the Proposer's qualifications and capabilities to provide the specified services and comply with the applicable conditions of this Request for Proposal and Contract, and who in the judgment of the City will best serve the needs and interests of the City.

## **1.6.00 BID PROTEST**

In the event of a protest concerning the apparent low bidder or disallowance of a bid at the opening, all instructions and procedures shall be explained in writing to the bidders at the opening. The protester shall have 5 business days to file with the City Manager a written protest specifying all grounds of protest, the decision by the City Manager will be communicated within 5 business days, any appeal from the decision of the City Manager shall be to the City Council and filed with the City Manager within 5 business days of the date of the decision, and the City Council shall hear and decide the appeal at its next regular or special meeting.

## **1.7.00 PROPOSAL ERRORS**

Submitters are cautioned to verify their Proposal prior to submission. Negligence on the part of the submitter in preparing the Proposal confers no right of modification of the Proposal after the closing time for its receipt. Inadvertent errors (such as the omission of one page of a multi-page document) that have a correction submitted after the designated submission time may be considered at the sole discretion of the City if the submitter submits with the correction sufficient information to prove that the error was inadvertent. Such amendments are not favored, and, in the case of doubt, requests will be denied.

## **1.8.00 LATE PROPOSALS; MISREPRESENTATIONS**

Late Proposals will not be accepted. The City requires that the sealed bid packet be delivered through the utility payment area of City Hall, addressed to the City of Cayce, Grants Administration/Fire Department, Sarah Harris/Steven Bullard, 1800 12th Street, Cayce, SC 29033. Therefore, the City cannot be held responsible for any

delay, regardless of reason, in the receipt of Proposals. Any material misrepresentations made by the submitter(s) will void the response and eliminate the submitter(s) from further consideration. The City reserves all rights concerning this solicitation.

### **1.9.00 GROUNDS FOR PROTESTS**

**Protest of Contents of Solicitation:** (Invitation For Bids or RFPs or other solicitation documents, whichever is applicable, or any amendment to it, if the amendment is at issue): Any Proposer who is aggrieved in connection with a solicitation document shall file a written protest to the City Manager, [thegler@cityofcayce-sc.gov](mailto:thegler@cityofcayce-sc.gov), within 5 calendar days of the date of posting of the solicitation, RFQ, RFP, or other solicitation document or any addendums to it on the City’s website.

**Protest of Award:** Any Proposer who is aggrieved in connection with the award of the contract shall file a written protest with the City Manager within 5 calendar days of the date the Intent to Award memorandum is posted on the City’s website. Any matter that could have been raised pursuant to the section above on protest of contents of solicitation, may not be raised as a protest of award.

**Exclusive Remedy:** The rights and remedies granted in this section to Proposers, either actual or prospective, are to the exclusion of all other rights and remedies of Proposers against the City.

**Failure to file Timely Protest:** If proposer fails to request a protest within the 5 calendar days, the solicitation or award shall be final.

### **1.10.00 PROCEDURES FOR PROTESTS**

**Protest:** A protest must be in writing, filed with the City Manager, and set forth the grounds of the protest and the relief requested with enough specificity to give notice of the issues to be decided. The protest must be received by the City Manager within the time provided.

**Burden of Proof:** The protestant bears the burden of proving the validity of the protest or claim against the City.

**Administrative Review and Decision:** The City Manager will conduct an administrative review of all claims set forth within the protest document and shall issue a decision in writing within 5 calendar days of receiving the protest.

**Appeals of Decision:** Any appeal of the City Manager’s decision pursuant to the above paragraph must be filed with the City Manager, in writing, within 5 calendar days of the date of the decision. The City Council shall hear and decide any appeals at its next regular or special council meeting.

**Stay of Award:** The contract award is stayed until issuance of a final decision by the City. Once a final decision is issued, the filing of a petition to appeal that decision does not stay enforcement of the City’s decision to award the contract.

### **1.11.00 INCURRED COST**

All costs incurred in the preparation and submission of Proposals shall be borne by the submitter.

### **1.12.00 RETURN OF PROPOSALS**

The City is under no obligation to return any Proposals or materials submitted by the submitter as a response to this RFP.

## **1.12.00 RESERVED RIGHTS**

The RFP Evaluation Committee shall represent the City in all matters pertaining to this RFP, and reserves the right to reject any and all Proposals during any stage of this RFP, or to modify, withdraw, cancel, or reissue this solicitation, either in whole or in part, in the event that responses are deemed inadequate or that it is otherwise in the best interest of the City.

The RFP Evaluation Committee also reserves the right to disregard any minor informality in the RFP when, in its opinion, the best interests of the City will be served by such action.

## 2. CALENDAR OF EVENTS

**Distribution Date:** 5/7/2021

**Questions Deadline** 5/21/2021  
**12:00 PM E.S.T.**

- Questions/inquiries will be prepared and emailed to both Sarah Harris/Steven Bullard at [sharris@caycesc.gov](mailto:sharris@caycesc.gov) & [sbullard@cityofcayce-sc.gov](mailto:sbullard@cityofcayce-sc.gov)
- Questions/inquiries must be emailed to both Sarah Harris/Steven Bullard and will not be accepted or considered in any other format or after the deadline indicated.

**Submittal Deadline:** 6/18/2021  
**12:00 PM E.S.T.**

- Sealed proposals must be delivered and addressed to the City of Cayce, Sarah Harris/Steven Bullard, Grants Administration/Fire Department, 1800 12<sup>th</sup> Street, Cayce, SC 29033.
- Proposals will not be accepted or considered after this deadline.

**Tentative Proposal Distribution Meeting:** 6/18/2021

**Tentative 1<sup>ST</sup> Evaluation Meeting:** 6/25/2021

**Interviews & Final Evaluation Meeting:** 7/7/2021

**Tentative Award Release Date:** 7/14/2021

**Tentative Council Approval:** 7/21/2021

**Tentative Contract Start Date:** 7/22/2021

**\*Times are tentatively scheduled committee meetings that may run behind or ahead of schedule.**

**Please note: Questions/Inquiries and Bid Proposals will not be accepted or considered after the indicated deadlines.**

### **3. SCOPE OF WORK**

#### **3.1.00 STATEMENT OF EXCEPTIONS TO NFPA 1901**

The specifications shall indicate size, type, model and make of all component's parts and equipment. The specifications listed herein are not intended to be restrictive in any way. The intent is to provide potential responders a basic guideline for what type of vehicle is acceptable.

At the time of delivery, if the apparatus is not in compliance, a statement of exception must be provided as indicated below.

1. Specific standard affected.
2. Statement describing why the manufacturer is not in compliance.
3. Description of the remedy and who the responsible party is.

Documentation provided, must be signed by an officer of the company, and an authorized agent of the purchaser.  
NO EXCEPTIONS.

#### **3.2.00 NFPA COMPLIANCE**

The manufacturer's supplied components of the apparatus shall be compliant with NFPA 1901, 2016 edition.

#### **3.3.00 QUALITY AND WORKSMANSHIP**

The design of the apparatus must embody the latest approved automotive design practices. The workmanship must be of the highest quality in its respective field. Special consideration shall be given to service access to areas needing periodic maintenance, ease of operation, and symmetrical proportions.

Construction must be heavy-duty and ample safety factors must be provided to carry loads as specified. The construction method employed will be in such a manner as to allow ready removal of any component for service or repair.

The apparatus shall conform to the National Fire Protection Association Standard for Automotive Fire Apparatus, number 1901, in its most recent edition, unless otherwise specified in this document. Only the specified firefighting support equipment listed in these specifications shall be provided.

The apparatus shall further conform to all Federal Motor Vehicle Safety Standards. No exception.

These specifications shall include size, location, type, and model of all component parts being furnished. Detailed information shall be provided on the materials used to construct all facets of the apparatus body.

#### **3.4.00 PERFORMANCE TESTS AND REQUIREMENTS**

A road test shall be documented with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles shall run quietly and free from abnormal vibration or noise throughout the operating range of the apparatus. The apparatus, when loaded, shall be approximately 66% on the rear axle. The successful bidder shall furnish a weight certification showing weight on the front and rear axle, and the total weight of the completed apparatus at the time of delivery.

- a. The apparatus must be capable of accelerating to 40 MPH from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed engine RPM.
- b. The service brakes shall be capable of stopping the fully loaded vehicle within 35 feet from a speed of 25 MPH on a level concrete highway.



c. The apparatus, fully loaded, shall be capable of obtaining a speed of 60 MPH on a level highway with the engine not exceeding 95% of its governed RPM (full load).

d. The apparatus shall be tested and approved by a qualified testing agency in accordance with their standard practices for pumping engines.

e. The contractor shall furnish copies of the Pump Manufacturer's Certification of Hydrostatic Test (if applicable), the Engine Manufacturer's current Certified Brake Horsepower Curve and the Manufacturer's Record of Construction Details.

### **3.5.00 THIRD PARTY TESTING**

If required by the specific chapters of NFPA-1901, the proposed unit shall be tested and certified by independent third-party inspectors.

All test work for fire pumps outlined in NFPA-1901, Edition shall be conducted.

The third-party inspectors shall provide the manufacturer a complete written examination and test report for each inspection performed at the manufacturer's facility.

This report specifies the points of inspection and results of such examinations and tests.

The inspectors performing the test work on the units are certified to Level II in the required NOT methods, under the requirements outlined in ASNT document CP-189.

The actual person(s) performing the inspection shall present for review proof of Level II Certification in the required NOT methods.

The apparatus manufacturer shall designate, in writing, who is qualified to witness and certify these test results.

Prior to submittal to the automotive fire apparatus manufacturer, the final Report shall be reviewed by the Supervisor of Fire Equipment Services and a Registered Professional Engineer, both of whom are directly involved with the aerial device certification program.

When the unit successfully meets all the requirements outlined in NFPA 1901, current edition, the third party inspector shall issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit's compliance with NFPA-1901.

### **3.6.00 FAILURE TO MEET TESTS**

In the event the apparatus fails to meet the test requirements of these specifications on the first trial, a second trial may be made at the option of the bidder within thirty (30) days of the date of the first trials. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Permission to keep and/or store the apparatus in any building owned or occupied by the purchaser shall not constitute acceptance of same.

### **3.7.00 EXCEPTIONS TO SPECIFICATIONS**

The following specifications shall be strictly adhered to. Exceptions shall be considered if they are deemed equal to or superior to the specifications, provided they are fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS." Exceptions shall be listed by page and paragraph. Failure to denote exceptions in the above manner shall result in immediate rejection of the proposal. In addition, a general statement taking "TOTAL EXCEPTION" to the specifications shall result in immediate rejection of bid.

### **3.8.00 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 specified equipment, including filled water tank, a full complement of personnel and fire hose shall be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the International Association of Fire Chiefs and National Fire Association (or American Insurance Association). Certified Laboratories certificate shall be submitted by the manufacturer. Weight of apparatus shall meet all federal axle load laws.

### **3.9.00 PRE-DELIVERY INSPECTION TESTS**

The apparatus, prior to acceptance, will be required to meet the performance tests of the applicable NFPA Automotive Fire Apparatus Standard. These tests shall include, but not be limited to acceleration, braking and G-loading tests using a fifth wheel device, all specified pump tests, a 20% brake hold tests, and turn radius tests. NFPA testing for Aerial Apparatus will be performed at the manufacture' s facility by a third-party test company. All apparatus(s) will receive a complete inspection including all electrical and mechanical devices for proper operation and correction of leaks or obvious problems.

### **3.10.00 PAINT CERTIFICATION**

The finish paint shall be certified by the apparatus manufacturer as conforming to all applicable Commercial Vehicle Paint Standards in effect at the date of contract.

### **3.11.00 FMVSS Requirement**

The chassis shall be certified by the apparatus manufacturer as conforming to all applicable Federal Motor Vehicle Safety Standards in effect at the date of contract.

This shall be attested to by the attachment of a FMVSS certification label on the vehicle by the contractor who shall be recognized as the responsible final manufacturer.

### **3.12.00 DELIVERY REQUIREMENTS**

The apparatus shall be completely equipped as per these specifications upon arrival and on completion of the required tests shall be ready for immediate service in the fire department of the purchaser. Any and all alterations required at the scene of delivery to comply with these specifications must be done at the contractor's expense. The completed unit shall be delivered to the purchaser with full instructions provided to City of Cayce personnel on operation, care and maintenance of apparatus.

### **3.13.00 SOLE SOURCE MANUFACTURER**

The manufacturer must be a true "sole source" manufacturer. The manufacturer engineers, designs, manufacturers, builds and paints their own fire apparatus cab, chassis, body, aerial devices and electrical systems which minimizes third party involvement on engineering, design, service, and warranty issues. All work is done in the manufacture owned and operated manufacturing facilities.

### **3.14.00 MATERIAL AND WORKMANSHIP**

All equipment furnished will be guaranteed to be new and of current manufacture, to meet all requirements of purchaser's specifications. All workmanship will be of high quality and accomplished in a professional manner so as to insure a functional apparatus with a pleasing, aesthetic appearance.

### **3.15.00 U.S.A. MANUFACTURER**

The entire apparatus shall be assembled within the borders of the Continental United States to insure more readily available parts (without added costs and delays caused by tariffs and customs) and service, as well as protecting the purchaser should legal action ever be required.

### **3.16.00 FAMA COMPLIANCE**

Manufacturer must be a current member of the Fire Apparatus Manufacturer's Association.

### **3.17.00 FUTURE PURCHASES AND "TAG ON" ORDERS**

The successful bidder shall accept "tag on" orders to this bid proposal for a period not to exceed three (3) years from the bid opening date. The successful bidder shall honor the priced quoted for a period of 90 days from the date of the bid opening. For the remainder of the year (275 days), the bidder shall agree to an economic price escalation of 1.5%. Future years beyond the initial first year shall have an economic price escalation of 3% as a normal course of business. Items outside the normal course shall include changes legislated by Federal, State or Local Governments that impact the cost to manufacture the truck. In addition, changes to NFPA 1901 that require additional cost shall be borne by the purchaser. These may include but are not limited to changes that affect the major vendors of the fire apparatus industry such as pump manufacturer, seat manufacturer, electrical power supplies (generators) and power-train (engine & transmission).

### **3.18.00 CONFIGURATION OF "TAG ON" ORDERS**

In many cases the entity wishing to "tag on" to an existing order may require their apparatus to be configured differently from the original proposed apparatus. The bidder shall allow changes to the configuration within good engineering guidelines. The changes will be subject to current pricing in effect at the time of order. For example, a different engine may be required. This shall be considered a "change order" and the purchase price shall be adjusted up or down depending on the current option price.

### **3.19.00 ISO COMPLIANCE**

The manufacturer will operate a Quality Management System meeting the requirements of ISO 9001:2000.

The International Organization for Standardization (ISO) is a recognized world leader in establishing and maintaining stringent manufacturing standards and values. The manufacturer's certificate of compliance affirms that these principles form the basis for a quality system that unswervingly controls design, manufacture, installation, and service.

The manufacturer's quality systems will consist of, but will not be limited to, all written quality procedures (aka QOP) and other procedures referenced within the pages of the manufacturer's Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts products or processes. In addition, all apparatus assembly processes will be documented for traceability and reference.

The manufacturer will also engage in the services of a certified third party for testing purposes where required. By its ISO compliance, the manufacturer will provide an apparatus that is built to exacting standards, meets the customer's expectations, and satisfies the customer's requirements. NO EXCEPTIONS.

### **3.20.00 PROPOSAL DRAWING**

The manufacture shall provide a scaled drawing of the specific apparatus being proposed. This drawing will be generated by the manufacture's engineering department in order to maintain the accuracy of the drawing.

### **3.21.00 APPROVAL DRAWING**

A detailed drawing of the apparatus shall be provided to the customer for approval before construction begins. A copy of this drawing will also be provided to The Dealer representative. The drawings shall show such items as the chassis being utilized, lights, horns, sirens, pump panels, and all compartment locations and dimensions. The blueprint shall be a visual interpretation of the unit as it is to be constructed. Upon the signature of the buyer authority, the finalized drawing will be a part of the total contract.

### **3.22.00 WIRING SCHEMATICS**

A USB containing wiring diagrams of the apparatus shall be provided at the time of delivery. Digital content must include operator, service and parts manual and warranty information.

### **3.23.00 PRE-CONSTRUCTION CONFERENCE (TRIP 1)**

After award of the contract, and prior to construction of the apparatus, a pre-construction conference shall be held at the facility of the manufacturer. A provision for two (2) shall be provided in the bid price for all travel, food and lodging.

### **3.24.00 FINAL INSPECTION TRIP (TRIP 2)**

A final inspection trip shall be provided at the manufacturer's facility, prior to delivery of the completed apparatus. A provision for two (2) shall be provided in the bid price for all travel, food and lodging.

### **3.25.00 FLUID LEVEL DATA PLATE**

A permanent plate shall be mounted in the driver's compartment which specifies the quantity and type of fluids required including:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid
- Pump primer system fluid
- Drive Axle(s) lubrication fluid
- Air conditioning refrigerant
- Air conditioning lubrication oil
- Power steering fluid
- Cab tilt mechanism fluid
- Transfer case fluid
- Equipment rack fluid
- CAFS air compressor system lubricant
- Generator system lubricant
- Front tire cold pressure
- Rear tire cold pressure
- Maximum tire speed ratings

### **3.26.00 PUMP CERTIFICATION**

The pump, when dry, shall take suction and discharging water in accordance with current NFPA 1901. The pump shall be tested at the manufacturer's facility by an independent, third-party testing service. The conditions of the pump test shall be as outlined in current NFPA 1901.

The tests shall include, at a minimum, the pump test, the pumping engine overload test, the pressure control system test, the priming device tests, the vacuum test, and the water tank to pump flow test as outlined in current NFPA 1901.

A piping hydrostatic test shall be performed as outlined in current NFPA 1901.

The pump shall deliver the percentage of rated capacities at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure
- 100% of rated capacity at 165 psi net pump pressure
- 70% of rated capacity at 200 psi net pump pressure

A test plate, installed at the pump panel, shall provide the rated discharges and pressures together with the speed of the engine as determined by the certification test, and the no-load governed speed of the engine.

A Certificate of Inspection certifying performance of the pump and all related components shall be provided at time of delivery. Additional certification documents shall include, but not limited to, Certificate of Hydrostatic Test, Electrical System Performance Test, Manufacturer's Record of Pumper Construction, and Certificate of Pump Performance from the pump manufacturer.

### **3.27.00 FOAM SYSTEM VERIFICATION**

If the unit has a foam system, performance shall be tested and certified in compliance with the applicable NFPA 1901 requirements.

### **3.28.00 GENERATOR TEST**

If the unit has a generator system, a third party will test, approve and certify the generator system. The test results will be provided to the Fire Department at the time of delivery.

### **3.29.00 BREATHING AIR TEST**

If the unit has a breathing air, the dealer will draw an air sample from the air system and have the sample certified that the air quality meets the requirements of NFPA 1989, Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection.

### **3.30.00 STEPPING, STANDING AND WALKING SURFACES**

All stepping, standing and walking surfaces on the body of the apparatus will meet NFPA #1901 anti-slip standards.

All step surfaces provided with a multi-directional, aggressive gripping surface (Gator Grip or Bustin stepping surfaces) incorporated into the aluminum smooth plate in accordance with current NFPA 1901.

### **3.31.00 SAFETY SIGNS (NFPA REQUIRED)**

Safety sign(s) shall be located on the vehicle at the rear step, and at any cross walkway(s), to warn personnel that riding in or on these areas while the vehicle is in motion is prohibited.

### **3.32.00 BID BOND**

The manufacture shall provide a Bid Bond in the amount of ten percent (10%) of the total bid if required by the City.

This shall serve as a guarantee which may be forfeited and retained by the Purchaser in lieu of its other legal remedies if a successful bidder's proposal is accepted by the Purchaser and the bidder shall fail to execute and return to the Purchaser the required contract and bonds within ten (10) days after delivery. If a Bid Bond is provided, it shall be issued by a bonding company licensed to bond in this State.

### **3.33.00 MANUFACTURER SERVICE & WARRANTY**

To provide an additional layer of service support the manufacturer shall have at least eight (8) separate factory owned service and parts facilities located in the United States.

The manufacturer shall stock inventory dedicated to service and replacement parts to ensure quick response and minimize down time. Furthermore, the manufacturer shall house the inventory in a dedicated facility, with a dedicated shipping area that ensures service parts are given priority. The prospective vendor will provide detailed documentation of service and replacement part resources.

Parts identification shall be provided to both the dealer and the Fire Department through an on-line web based application for the specific truck reflected in this specification.

Access shall be granted using the specific VIN number of the vehicle. The online web application will provide the ability to view complete bills of materials, parts drawings, assembly drawings, and access to all current operation, maintenance and service publications.

This site shall be set up where the customer can look up their parts through an internet site and communicate with the factory parts center directly to verify the parts, they need from the factory 24 hours a day. There shall be parts experts available for the customer to talk about his needs while he is on the computer deciding which parts he needs. The parts specialist shall be available from 8:00 am to 7:00 pm EST Monday -Friday.

The manufacturer shall employ a staff of adequate size specifically dedicated to providing customer support and parts for the fielded fleet of vehicles it has produced.

The manufacturer shall be capable of providing both in-house and on-site service for the apparatus.

The factory must have key full-time factory employed service technicians located throughout the United States that can provide additional service support for the dealer and the fire department.

The manufacturer shall offer at least eight (8) factory owned repair and parts centers across the nation. The manufacturer shall offer maintenance training classes to its dealers as well as its customers on all aspect of maintenance and repairs to the vehicles it manufactures.

The manufacturer will be required to employ certified EVT technicians on staff, not only providing technical expertise in the repair of fire apparatus, but also demonstrating the commitment to service after the sale parts. The manufacturer will be required to have factory employed EVT service technician located in at the factory and in the field to support the dealers in advanced repair when needed.

### **3.34.00 MANUFACTURERS PARTS CENTER**

The manufacturer parts department shall stock a minimum of \$5,000,000.00 worth of inventory dedicated to service and replacement parts to ensure quick response and minimize down time. The parts department shall house the inventory in a dedicated facility, with a dedicated shipping area that ensures service parts are given priority.

Manufacturer's Customer Support shall include the following:

- 24-Hour Factory Technical Support

- 24-Hour Dealer Customer Service
- Online Customer Parts Request
- Priority Truck-Down Service
- Comprehensive Product and Service Training -At the Factory and In the Field
- Comprehensive Manuals for Operations, Service and Parts
- Complete After-The-Sale Parts and Service
- Total Warranty Support

### **3.35.00 PROPRIETARY PARTS**

It is the intention of the Purchaser for all offerors to furnish the apparatus with major parts commonly used by the heavy-duty truck manufacturers and open market vendors whereas replacement parts are more readily available and at reduced cost. The use of proprietary parts such as but not limited to axles, suspensions, engines, transmissions, frontal air bags, electronic controls, multiplexing systems, seats, pumps, gauges, foam systems, etc., may not be acceptable by the purchaser.

### **3.36.00 ELECTRONIC OPERATOR MANUALS**

Two (2) copies of all operator, service, and parts manuals must be supplied at the time of delivery in digital format-no exceptions. The electronic manuals shall include the following information:

- Operating instructions, descriptions, specifications, and ratings of the cab, chassis, body, aerial (if applicable), installed components, and auxiliary systems.
- Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and firefighting systems.
- Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.
- Instructions regarding the frequency and procedure for recommended maintenance.
- Maintenance instructions for the repair and replacement of installed components.
- Parts listing with descriptions and illustrations for identification.
- Warranty descriptions and coverage.
- Electrical Wiring Diagrams prepared for the model of chassis and body will be provided.

The electronic document shall incorporate a navigation page with electronic links to the operator's manual, service manual, parts manual, and warranty information, as well as instructions on how to use the manual. Each copy shall include a table of contents with links to the specified documents or illustrations.

The electronic document must be formatted in such a manner as to allow not only the printing of the entire manual, but to also the cutting, pasting, or copying of individual documents to other electronic media, such as electronic mail, memos, and the like.

A find feature shall be included to allow for searches by text or by part number.

These electronic manuals shall be accessible from any computer operating system capable of supporting portable document format (PDF). Permanent copies of all pertinent data shall be kept file at both the local dealership and at the manufacturer's location.

### **3.37.00 FIRE APPARATUS SAFETY GUIDE**

The Purchaser shall be provided with Fire Apparatus Safety Guide published by FAMA, latest edition. This safety manual is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of a fire apparatus and to suggest possible ways of dealing with these

situations. This manual is NOT a substitute for the manufacture's fire apparatus operator and maintenance manuals or commercial chassis manufacturer's operator and maintenance manuals.

### **3.38.00 RECORD RETENTION**

Offeror shall be responsible for preparing and maintaining a record file of parts and assemblies used to manufacture the apparatus.

These records shall be maintained in the factory of the bidder for a minimum of twenty (20) years.

File shall contain copies of any and all reported deficiencies, all replacement parts required to maintain the apparatus, and original purchase documents including specifications, contract, invoices, incomplete chassis certificates, quality control reports and final delivery acceptance documents.

The Fire Department shall have access to any and all documents contained in this file upon official written request.

### **3.39.00 VEHICLE FAMILIARIZATION & DEMONSTRATION**

Familiarization and demonstration of the vehicle shall be by a competent and qualified person as defined in the current standard of NFPA 1901 Standard.

Familiarization of the vehicle shall include the following:

- How to locate gauges or indicators and check all fluid levels and operational issues of the vehicle.
- How to tilt the chassis cab or hood assembly for access to the engine, fire pump, or any other device to allow access to fluids or for required maintenance.
- Interior cab controls, instruments, mirrors, safety devices or alarms, brake operations, transmission control, pump controls, exhaust regeneration (if provided), seat adjustments, warning light engagement, and other operational equipment.

If the apparatus is provided with a fire pump system, the following minimum instructions:

- Setting of parking brake, proper transmission gear and fire pump engagement operations.
- Throttle control.
- Primer and tank-to-pump operation.
- Use of pressure control devices.
- Tank Refilling operations.
- Proper operation of discharge controls.
- Proper shutdown and draining of system.

If the apparatus is provided with a foam system, the following minimum instructions:

- Startup, operations and shutdown of foam system.
- Setting of foam percentages and other operational settings.
- Proper flushing and draining of the system.

### **3.40.00 DEALER SERVICE & WARRANTY**

The dealer must be actively engaged in the fire apparatus service business which operates in conjunction with the manufacturer as an authorized warranty, service and parts center capable of satisfying the requirements of the apparatus(s) being purchased.

The Dealer's Apparatus Service Center shall be your authorized full-service warranty center.



The Dealer's parts center shall facilitate your parts needs. The Dealer shall have a network of part manufacturers throughout the country in order to provide affordable pricing for your in-house maintenance needs. The dealer will be able to have parts expedited from the manufacturer or one (1) of the major vendors that supplies parts for the apparatus.

The Dealer's certified service technicians must have the ability to deploy on site testing capabilities for all testing services in order to keep your equipment operating with minimal downtimes. All testing must be performed to NFPA and industry standards.

The Dealer must have a 24-hour service hotline to call and speak to a dealer representative in the event of an emergency service situation. No Exceptions

### **3.41.00 SERVICE CENTER LOCATION**

Offeror shall have on-site mobile service unit for mobile service capability and repair facilities within 80 miles of Cayce, South Carolina. This service facility shall be available within 24 hours of request at either the fixed location or with mobile service. The successful bidder shall have a 24 hour call line in order to request emergency service.

Once a service request is made, a scheduled service call shall be arranged with a factory authorized representative of the manufacturer of the OEM. Any service technician representing either the manufacturer or the successful bidder shall be certified as an Emergency Vehicle Technician (EVT). No Exceptions.

The offeror shall list the locations of all service facilities in bid proposal.

### **3.42.00 FULL TIME SERVICE & WARRANTY STAFF**

The offeror shall have full time employee(s) on staff dedicated to our service center's apparatus parts and warranty division. The offeror shall have full time employee(s) dedicated to warranty services.

### **3.43.00 SERVICE VEHICLES**

The offeror shall have service vehicles that will be available 24 hours a day, seven days a week to respond to customer needs. The service vehicles shall be operated by full time EVT Certified Technicians.

### **3.44.00 OFFEROR SERVICES**

The proposed apparatus shall have a predelivery inspection check and pump test, if applicable, performed before it is delivered to the purchaser. The offeror shall provide the following services at no charge to the customer during the first year of the trucks warranty period:

- All manufacturer covered warranty issues or adjustments taken care of as prompt as possible after being notified by the customer. The Dealer will need to know the details on the issue and the mileage of the vehicle.
- 120-day Warranty Inspection will be performed on the truck at No charge to the customer.
- 330-day Warranty inspection will be performed at No charge to the customer.

### **NO EXCEPTIONS**

### **CHASSIS SPECIFICATIONS**

#### **3.45.00 HOSE BED CAPACITY**

Hose bed hose load allowance on the apparatus shall be 1000 lbs.

### **3.46.00 OVERALL HEIGHT RESTRICTION (NO EXCEPTIONS)**

The apparatus shall have overall height restriction (unloaded condition) of 11' 11".

The height of the apparatus shall be measured with no water/foam in the water/foam tank, no equipment, no ground ladders and no hoses.

### **3.47.00 OVERALL LENGTH RESTRICTION**

The unit has no overall length restrictions.

### **3.48.00 EQUIPMENT CAPACITY**

Equipment allowance on the apparatus shall be 2500 lbs. This allowance is in addition to the weight of the hoses and ground ladders listed in the shop order as applicable.

### **3.49.00 BUMPER**

A heavy duty 10" high steel channel type front bumper shall be provided. The front corners of the bumper shall be angled to reduce swing clearance. The bumper shall be painted job color.

### **3.50.00 FRONT BUMPER EXTENSION**

The bumper shall be extended approximately 20" from the face of the cab as required.

### **3.51.00 BUMPER GRAVEL SHIELD**

The extended front bumper gravel shield shall be made of 3/16" (.188") aluminum treadplate material. The gravel shield shall include 1" turn down lips to protect the top edge of the heavy duty bumper from damage.

### **3.52.00 LID, BUMPER HOSE TRAY**

The center bumper tray shall have a diamond plate lid. The lid shall be hinged and include a latch, rubber seal and held open with a pneumatic shock.

### **3.53.00 BUMPER TRAY-CENTER**

A hose tray constructed of 1/8" aluminum shall be recessed into the front bumper extension. The tray shall be located in the center of the bumper and be approximately 12" deep (11" to the top of the slats). One inch thick aluminum slats shall be included in the bottom of the hose tray to aid in the dissipation of water from the tray.

### **3.54.00 FRAME RAIL CONSTRUCTION (NO EXCEPTION)**

The chassis frame shall utilize an integral torque box type design. The integral torque box shall combine the chassis frame and aerial torque box into a single structure. The integral torque box shall provide an optimized design that lowers vehicle center of gravity, eliminates the need to torque aerial frame attachment bolts, and permits under-slung outriggers to maximize body compartmentation.

The 20.5" high x 34.25" wide torque box shall be fabricated of 100,000-psi minimum yield, high strength, low alloy steel. The main channels, top, bottom and integral bulkheads of the torque box shall be made from .5" plate. Certified welders shall construct the torque box. The design shall utilize 100% welded joints for a totally sealed box. Skip welding shall not be acceptable. Complete Finite Element Analysis and strain gauge testing shall be employed to verify minimum safety factors for road traveling (5:1) and aerial operation (2.5:1).

**The completed torque box shall have the following attributes:**

Resistance to bending moment 29,955,000 in. lbs. Section modulus 295.54 cu. in.

**The frame section immediately forward of the torque box shall have the following attributes:**

Resistance to bending moment 9,371,000 in. lbs. Section modulus 93.713 cu. in.

The torque box shall incorporate a stainless-steel schedule 40 4" water pipe through the torque box for the aerial waterway discharge. In addition, the torque box shall have two-(2) 4" conduits full length to encapsulate the hydraulic, air and electrical lines. The entire assembly shall be sand blasted and painted black before chassis assembly. A full lifetime warranty against defects in materials or workmanship shall be supplied by the apparatus manufacturer.

The custom chassis frame shall have a **WHEEL ALIGNMENT** in order to achieve maximum vehicle road performance and to promote long tire life. The alignment shall conform to the manufacturer's internal specifications. All wheel lug nuts and axle U-bolt retainer nuts shall be tightened to the proper torque at the time of alignment. The wheel alignment documentation shall be made available at delivery upon request.

**3.55.00 COATED FASTENDERS**

The custom chassis frame assembly shall be assembled using GEOMET 720 coated fasteners for corrosion resistance.

**3.56.00 SHOCK ABSORBERS FRONT**

Koni model 90 shock absorbers shall be provided for the front axle. The shocks shall be three way adjustable.

The shocks shall be covered by the manufacturer's standard warranty.

**3.57.00 REAR AXLES**

The vehicle shall utilize a Meritor RT-50-160, 54,000 lb. capacity rear tandem axle with single reduction hypoid gearing.

The axle shall be equipped with oil-lubricated wheel bearings with Meritor oil seals.

An Inter-Axle Differential (IAD) shall be provided for the rear axles. The IAD shall allow for speed differences between the forward and rear axles in a tandem while also providing equal pulling power from each axle of the tandem. The IAD shall be controlled by a switch accessible by the driver.

**3.58.00 FRONT AXLE**

The vehicle shall utilize a Dana D-2200W drop beam front axle with a rated capacity of 24,000 lbs. It shall have 71" kingpin centers. The axle shall be of I-beam construction and utilize grease-lubricated wheel bearings. The vehicle shall have a nominal cramp angle of 42 degrees, plus two (+ 2) degrees to minus three (-3) degrees including front suction applications.

The front axle hubs shall be made from ductile iron and shall be designed for use with 10 hole hub piloted wheels in order to improve wheel centering and extend tire life. The front springs shall be parabolic tapered, minimum 4" wide x 54" long (flat), minimum four (4) leaf, progressive rate. The springs shall have Berlin style eyes and rubber maintenance free bushings on each end with an additional standard wrap at the front eye. The capacity shall be 24,000 lbs. at the ground.

Tapered leaf springs provide a 20% ride improvement over standard straight spring systems. Supporting documentation/data shall be provided upon request.

The vehicle shall be equipped with a Sheppard integral model M-110 power steering gear, used in conjunction with a power assist cylinder. The steering assembly shall be rated to statically steer up to a maximum front axle load of 24,000 lbs. Relief stops shall be provided to reduce system pressure upon full wheel cut. The system shall operate mechanically should the hydraulic system fail.

### **3.59.00 REAR SUSPENSION**

The vehicle shall be equipped with a Ridewell Dynalastic rear suspension. The suspension shall consist of center trunnions, compensators, elastomer springs, and independent torque arms. Cross tubes and torque rods shall also be provided to maintain proper alignment during cornering and to absorb driving and braking forces. The suspension shall be rated for the maximum axle capacity.

A 4-year pro-rated warranty shall be provided as standard.

### **3.60.00 FRONT WHEELS**

The vehicle shall have two (2) polished (on outer wheel surfaces only) Alcoa aluminum disc wheels. They shall be forged from one-piece corrosion-resistant aluminum alloy and sized appropriately for the tires.

### **3.61.00 FRONT WHEEL TRIM PACKAGE**

The front wheels shall have stainless steel lug nut covers (for use with aluminum wheels) or chrome plated plastic (for use with steel wheels). The front axle shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless-steel universal baby moons. All stainless-steel baby moons shall carry a lifetime warranty plus a 2-year re-buffing policy. There shall be two (2) baby moons and twenty (20) lug nut covers.

### **3.62.00 REAR WHEELS**

The vehicle shall have eight (8) polished (on outer wheel surfaces only) Alcoa aluminum disc wheels. They shall be forged from one-piece corrosion-resistant aluminum alloy and sized appropriately for the tires.

### **3.63.00 REAR WHEEL TRIM PACKAGE, TANDEM AXLE**

The rear wheels shall have stainless steel lug nut covers (chrome plated steel lug nut covers not acceptable), or American made chrome plated plastic lug nut covers. The rear axle shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel, spring clip band mount high hats, DOT user friendly. All stainless-steel high hats shall carry a lifetime warranty plus a 2 year rebuffing policy. There shall be four (4) high hats and forty (40) lug nut covers.

### **3.64.00 FRONT TIRES**

The front tires shall be two (2) Michelin 425/65R22.5 tubeless type 20 PR radial tires with XFE highway tread.

The tires with wheels shall have the following weight capacity and speed rating: Max front rating 22,800 @ 65 mph.

Max front rating with Alcoa aluminum wheels -24,400 @ 65 MPH (intermittent fire service rating if GAW is over 22,800)

The wheels and tires shall conform to the Tire and Rim Association requirements.

### **3.65.00 REAR TIRES**

The rear tires shall be Michelin 12R 22.5 tubeless type radial tires with XDS mud and snow tread.

The tires with wheels shall have the following weight capacity:

54,000 lbs. (tandem duals) @ 65 MPH.

The wheels and tires shall conform to the Tire and Rim Association requirements.

### **3.66.00 INTERMITTENT TIRE SERVICE RATING**

The front and/orrear tires shall be provided with and intermittent emergency vehicle service rating. Tires rating shall conform to manufacturers service rating as applicable.

### **3.67.00 TIRE PRESSURE INDICATORS**

The apparatus shall be provided with Real Wheels AirGuard LED tire pressure indicating valve stem caps. When the tire is under inflated by 5-10 PSI, the LED indicator on the cap shall flash red. The indicator housings shall be shock resistant and constructed from polished stainless steel. The indicators shall be calibrated by attaching to valve stem of a tire at proper air pressure per load ratings and easily re-calibrated by simply removing and re-installing them during service.

Real Wheel Part number RWC1234 was superseded by RWC1235 as of June 2015

### **3.68.00 FRONT BRAKES**

The front axle shall be equipped with Dana ADB22X 17 inch disc brakes.

A 3 year/unlimited miles parts and 3 year labor brake warranty shall be provided as standard by Dana. The warranty shall include bushings and seals.

### **3.69.00 REAR BRAKES**

The rear axle shall be equipped with ArvinMeritor 16-1/2" x 7" S-cam brakes with cast brake drums. Q-Plus shoes shall be provided with up to 48,000 lb. axle ratings and P-Type shoes with over 48,000 lb. axle ratings.

The rear axle brakes shall be furnished with automatic slack adjusters. ArvinMeritor brand shall be supplied on RT-40-145, RT-46-160 and RT-50-160 axles, and Haldex brand shall be supplied on RT-58-185 axles.

A 3 year/unlimited miles parts and 3 year labor rear brake warranty shall be provided as standard by ArvinMeritor Automotive. The warranty shall include bushings, seals, and cams.

### **3.70.00 BRAKE SYSTEM**

The vehicle shall be equipped with air operated brake system. The system shall meet or exceed the design and performance requirements of current FMVSS-121 and test requirements of current NFPA 1901 Standard.

Each wheel shall have a separate integral brake chamber. A dual treadle valve shall split the braking power between the front and rear systems.

The air system shall be provided with a rapid build-up feature, designed to meet current NFPA 1901 requirements. A 1/4" brass quick-release air inlet with male connection shall be located inside the driver door on

the left side of the cab. The inlet shall allow a shoreline air hose to be connected to the vehicle, discharging into the wet tank.

A pressure protection valve shall be installed to prevent use of air horns or other air operated devices should the air system pressure drop below 80 psi. Two (2) air pressure needle gauges, for front and rear air pressure, with warning light and buzzer shall be installed at the driver's instrument panel.

One (1) reservoir shall serve as the wet tank and a minimum of one (1) tank shall be supplied for each of the front and rear axles. The total system shall carry a sufficient volume of air to comply with FMVSS-121.

The following tank sizes shall be installed:

<b>Tank Sizes in Cubic Inches</b>					
<b>Suspension</b>	<b>Wet</b>	<b>Front</b>	<b>Rear</b>	<b>Rear Extension</b>	<b>Total</b>
34-54K	1738	1738	2988	0	6464
58K	1738	1738	2988	1738	8202

An automatic drain valve shall be installed on the wet tank. All other tanks shall be equipped with manual drain valves.

A Wabco ABS system shall be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system shall be fitted to axles and all electrical connections shall be environmentally-sealed, water-, weather-, and vibration-resistant.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which shall sense approaching wheel lock and instantly modulate brake pressure up to five (5) times per second to prevent wheel lock-up. Each wheel shall be individually controlled. To improve field performance, the system shall be equipped with a dual circuit design. The system circuits shall be configured in a diagonal pattern. Should a malfunction occur, that circuit shall revert to normal braking action. A warning light at the driver's instrument panel shall indicate malfunction to the operator.

The system shall consist of a sensor clip, sensor, electronic control unit, and solenoid control valve. The sensor clip shall hold the sensor in close proximity to the tooth wheel. An inductive sensor consisting of a permanent magnet with a round pole pin and coil shall produce an alternating current with a frequency proportional to wheel speed. The unit shall be sealed, corrosion-resistant and protected from electro-magnetic interference. The electronic control unit shall monitor the speed of each wheel sensor and a microcomputer shall evaluate in milliseconds wheel slip. A deviation shall be corrected by cyclical brake application and release. If a malfunction occurs, the circuit shall signal the operator and the malfunctioning half of the system shall shut down. The system is installed in a diagonal pattern for side to side control. The system shall ensure that each wheel is braked in optimum efficiency up to five (5) times a second.

The system shall also interface with the application of the auxiliary engine, exhaust, or driveline brakes to prevent wheel lock.

To improve service trouble-shooting, provisions in the system for an optional diagnostic tester shall be provided. The system shall test itself each time the vehicle is started, and a dash-mounted light shall go out once the vehicle is moving above 4 MPH.

A 3 year/300,000 mile parts and labor Anti-Locking Braking System (ABS) warranty shall be provided as standard by Meritor Automotive.

**3.71.00 PARK BRAKE RELEASE**

One (1) Bendix-Westinghouse PP-5 parking brake control valve shall be supplied on the lower dash panel within easy reach of the driver.

### **3.72.00 ELECTRONIC STABILITY CONTROL**

The apparatus shall be equipped with a G4 6S6M Electronic Stability Control (ESC) system that combines the functions of Roll Stability Control (RSC) with the added capability of yaw-or rotational-sensing.

RSC focuses on the vehicle's center of gravity and the lateral acceleration limit or rollover threshold. When critical lateral acceleration thresholds are exceeded, RSC intervenes to regulate the vehicle's deceleration functions. The added feature of ESC is to automatically intervene to reduce the risk of the vehicle rotating while in a curve or taking evasive action, prevents drift out through selective braking, and controlling and reducing vehicle speed when lateral acceleration limits are about to be exceeded.

Intervention by the system occurs in three forms -engine, retarder and brake control. The ESC system uses several sensors to monitor the vehicle. These include a steering wheel angle sensor, lateral accelerometer, and yaw position sensor. ESC constantly monitors driving conditions and intervenes if critical lateral acceleration is detected or if the vehicle begins to spin due to low friction surfaces. The system provides control of engine and retarder torque as well as automatically controlling individual wheels to counteract both over steer and under steer.

To further improve vehicle drive characteristics, the unit shall be fitted with Automatic Traction Control (ATC). This system shall control drive wheel slip during acceleration from a resting point. An extra solenoid valve shall be added to the ABS system. The system shall control the engine and brakes to improve acceleration slip resistance. The system shall have a dash mounted light that shall come on when ATC is controlling drive wheel slip.

3 year/300,000 miles parts and labor warranties for ESC, RSC, and ATC shall be provided as standard by Meritor Automotive.

### **3.73.00 AIR DRYER**

The chassis air system shall be equipped with a Bendix-Westinghouse AD-9 air dryer to remove moisture from the air in order to help prevent the air lines from freezing in cold weather and prolong the life of the braking system components.

### **3.74.00 AIR INLET**

A 1/4" brass quick-release air inlet with a male connection shall be provided. The inlet shall allow a shoreline air hose to be connected to the vehicle, discharging air directly into the wet tank of the air brake system. It shall be located driver door jamb.

### **3.75.00 AIR LINES**

Air brake lines shall be constructed of color coded nylon tubing routed in a manner to protect them from damage. Brass fittings shall be provided.

### **3.76.00 AIR HORNS**

Dual Hadley e-tone air horns shall be provided, connected to the chassis air system. The horns shall be mounted through the front bumper. The front bumper shall have two (2) holes punched to accommodate the air horns. A pressure protection valve shall be installed to prevent the air brake system from being depleted of air pressure.

### **3.77.00 TRANSMISSION SELECTOR**

A push-button transmission shift module, Allison model 29538373, shall be located to the right side of the steering column within easy reach of the driver. The shift position indicator shall be indirectly lit for after dark operation. The shift module shall have a "Do Not Shift" light and a "Service" indicator light. The shift module shall have means to enter a diagnostic mode and display diagnostic data including oil life monitor, filter life monitor, transmission health monitor and fluid level. A transmission temperature gauge with warning light and buzzer shall be installed on the cab instrument panel.

### **3.78.00 TRANSMISSION FLUID**

The transmission fluid shall be TranSynd, Shell Spirax S6ATF A295, or equivalent synthetic.

### **3.79.00 VEHICLE SPEED**

Electronic speed limiting set at 60 MPH as required by NFPA 1901.

### **3.80.00 ENGINE (NO EXCEPTION)**

The vehicle shall utilize a Cummins X12 engine as described below:

- 500 Horsepower
- Six (6) cylinder
- Variable Geometry Turbocharged
- Charge Air Cooled (CAC) 4-cycle diesel
- Cummins XPI high pressure fuel injection system
- Fuel cooler (air to liquid)
- 720 cu.in. (11.8 liter) displacement
- 500 gross BHP at 1900 RPM and a peak torque of 1700 lb. ft. at 1000 RPM with a governed RPM of 2000
- Bore and stroke shall be 5.2 x 5.67
- Engine lubrication system shall have a minimum capacity, to include filter, of 49 quarts
- Cooled Exhaust Gas Recirculation (EGR)
- Delco-Remy 39 MT-HD 12 volt starter
- 26 cubic foot per minute air compressor
- Single module after treatment system consisting of an oxidation catalyst and diesel particulate filter and selective catalyst reduction system
- Ember separator compliant with current NFPA 1901 standard
- The engine shall be compliant with 2021 EPA Emission standards

The engine air intake shall draw air through the front cab grill. The intake opening shall be located on the officer (right) side behind front cab face with a plenum that directs air to the air filter. The air cleaner intake piping shall be made from aluminized steel tubing with flexible rubber hoses. The intake piping clamps shall be heavy-duty, constant-torque, T-bolt style to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

The air cleaner shall be an 11" diameter K&N for lower restriction and high air flow. The filtration media shall be washable and easily accessed for service. The air filter shall have a 3 year/300,000 mile warranty.

The engine exhaust piping shall be a minimum of 4" diameter welded aluminized steel tubing. The muffler shall be mounted horizontally under the right-hand frame rail in back of the cab in order to minimize heat transmission to the cab and its occupants. The exhaust shall be directed away from the vehicle on the right side ahead of the rear wheels in order to keep exhaust fumes as far away as possible from the cab and pump operator position.

A 5-year/100,000 miles parts and labor warranty will be provided as standard by Cummins.



A copy of the Engine Installation Review stating the engine installation meets Cummins recommendations shall be provided as requested. The engine installation shall not require the operation of any type of “power-down” feature to meet engine installation tests.

### **3.81.00 TRANSMISSION**

The vehicle shall utilize an Allison EVS4000P, electronic, 5-speed automatic transmission.

A transmission oil temperature gauge with warning light and buzzer shall be installed on the cab instrument panel to warn the driver of high oil temperatures that may damage the transmission.

The transmission shall have a gross input torque rating of up to 1850 lb. ft. and a gross input power rating of up to 600 HP.

The gear ratios shall be as follows:

- 1 -3.51
- 2 -1.91
- 3 -1.43
- 4 -1.00
- 5 -.74
- R -4.80

The transmission shall be equipped with a fluid level sensor (FLS) system, providing direct feedback of transmission oil level information to the operator.

The transmission shall have a lubricant capacity of 51 quarts.

A water-to-oil transmission oil cooler shall be provided to ensure proper cooling of the transmission when the vehicle is stationary (no air flow).

The transmission shall contain two engine driven PTO openings located at the 1 and 8 o'clock positions. The automatic transmission shall be equipped with a power lock-up device. The transmission lock-up shall prevent down shifting of transmission when engine speed is decreased during pump operations, thereby maintaining a constant gear ratio. Transmission lock-up shall be automatically activated when placing pump in gear. Transmission lock-up shall be automatically deactivated when disengaging pump for normal road operation.

A 5-year/unlimited miles parts and labor warranty shall be provided as standard by Allison Transmission.

### **3.82.00 AUTOMATIC SHIFT TO NEUTRAL**

The transmission shall be programmed to comply with NFPA 1901 and automatically shift to neutral upon application of the parking brake.

### **3.83.00 JACOBS ENGINE BRAKE**

One (1) Jacobs engine brake shall be installed to assist in slowing and controlling the vehicle as required by NFPA 1901 for vehicles with gross vehicle weight ratings (GVWR) of 36,000 lbs. or greater. An on-off control switch and a high-medium-low selector switch shall be mounted in the cab accessible to the driver.

When activated, the Jacobs engine brake shall cut off the flow of fuel to the cylinders and alter the timing of the exhaust valves. This shall transform the engine into a high-pressure air compressor, driven by the wheels, and the horsepower absorbed by the engine in this mode shall slow the vehicle. The selector switch allows the driver to select the amount of retarding power.

When the on-off switch is in the “on” position, the engine brake shall be automatically applied whenever the accelerator is in the idle position and the automatic transmission is in the lock-up mode. If the accelerator is depressed or if the on-off switch is placed in the “off” position, the engine brake shall immediately release and allow the engine to return to its normal function.

### **3.84.00 TRANSMISSION PROGRAMMING**

The transmission shall include the Allison 2nd gear Pre-Select feature. This option will direct the transmission to down shift to second gear when the throttle is released and the Jacobs engine brake (or Telma retarder wired to activate with release of throttle) is engaged. This feature is designed to increase brake life and aid vehicle braking.

### **3.85.00 RADIATOR (NO EXCEPTIONS)**

The cooling system shall include an aluminum tube-and-fin radiator with a minimum of 1,408 total square inches of frontal area to ensure adequate cooling under all operating conditions. There shall be a drain valve in the bottom tank to allow the radiator to be serviced. A sight glass shall be included for quick fluid level assessment. The radiator shall be installed at the prescribed angle in order to achieve the maximum operational effectiveness. This shall be accomplished according to established work instructions and properly calibrated angle measurement equipment.

### **3.86.00 SILICONE HOSES (NO EXCEPTIONS)**

All radiator and heater hoses shall be silicone. Pressure compensating band clamps shall be used to eliminate hose pinching on all hoses 3/4” diameter and larger. All radiator hoses shall be routed, loomed, and secured so as to provide maximum protection from chafing, crushing, or contact with other moving parts.

### **3.87.00 COOLANT**

The cooling system shall be filled with a 50/50 mixture of water and antifreeze/coolant conditioner to provide freezing protection to minus 40 (-40) degrees F for operation in severe winter temperatures.

### **3.88.00 COOLANT RECOVERY**

There shall be a coolant overflow recovery system provided.

### **3.89.00 CHARGE AIR COOLER SYSTEM**

The system shall include a charge air cooler to ensure adequate cooling of the turbocharged air for proper engine operation and maximum performance.

### **3.90.00 CHARGE AIR COOLER HOSES**

Charge air cooler hoses shall be made from high-temperature, wire-reinforced silicone to withstand the extremely high temperatures and pressures of the turbocharged air. The hoses shall incorporate a flexible hump section to allow motion and misalignment of the engine relative to the charge air cooler. Charge air cooler hose clamps shall be heavy-duty, constant-torque, T-bolt clamps to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

### **3.91.00 FAN/SHROUD**

The fan shall be 30” in diameter with eleven (11) blades for maximum airflow and dynamic balance. It shall be made of nylon for strength and corrosion resistance. The fan shall be installed with grade 8 hardware which has been treated with thread locker for additional security. A fan shroud attached to the radiator shall be provided to

prevent recirculation of engine compartment air around the fan in order to maximize the cooling airflow through the radiator. The fan shroud shall be constructed of fiber-reinforced high temperature plastic. The shroud shall be specifically formed with curved surfaces which improves air flow and cooling.

### **3.92.00 TRANSMISSION COOLER**

The cooling system shall include a liquid-to-liquid transmission cooler capable of cooling the heat generated from the transmission. When a transmission retarder is selected, the cooler shall have an increased capacity to handle the additional heat load.

### **3.93.00 FUEL SYSTEM**

One (1) 65 gallon fuel tank shall be provided. The tank shall be of an all-welded, aluminized-steel construction with anti-surge baffles and shall conform to all applicable Administration (FHWA) 393.65 and 393.67 standards. The tank shall be mounted below the frame rails at the rear of the chassis for maximum protection. The tank shall be secured with two (2) wrap-around T-bolt type stainless steel straps. Each strap shall be fitted with protective rubber insulation and shall be secured with Grade 8 hardware. This design allows for tank removal from below the chassis. The fuel tank shall be equipped with a 2" diameter filler neck. The filler neck shall extend to the rear of the vehicle behind the rear tires and away from the heat of the exhaust system as required by NFPA 1901 Standard for Automotive Fire Apparatus. The open end of the filler neck shall be equipped with a twist-off filler cap with a retaining chain.

The tank shall be plumbed with top-draw and top-return fuel lines in order to protect the lines from road debris. Bottom-draw and/or bottom-return fuel lines are not acceptable. A vent shall be provided at the top of the tank. The vent shall be connected to the filler neck to prevent splash-back during fueling operations. A .50" NPT drain plug shall be provided at the bottom of the tank.

The tank shall have a minimum useable capacity of 65 gallons of fuel with a sufficient additional volume to allow for thermal expansion of the fuel without overflowing the vent.

A fuel pump shall be provided and sized by the engine manufacturer as part of the engine.

### **3.94.00 FUEL RE-PRIME**

An auxiliary 12 volt fuel pump shall be included in the fuel system. The electric pump shall permit re-priming of the fuel lines and engine. The pump may be manually operated with a switch located accessible to driver. The electric pump shall also automatically operate in conjunction with the mechanical fuel pump as long as engine oil pressure is present. The system shall be plumbed to allow full flow to by-pass the pump.

### **3.95.00 FUEL SHUT-OFF**

A shut-off valve shall be supplied to prevent drain back of fuel into the main supply line during filter changes. The valve(s) shall be located: one (1) inlet side of OEM fuel filter.

### **3.96.00 FUEL LINE**

All fuel lines shall be rubber.

### **3.97.00 360 AMP ALTERNATOR**

A Niehoff model C527 360 amp SAE (J56) rated, 320 amp at 200 degrees F at 5000 RPM NFPA 1901 rated brush-less type alternator with rectifier shall be provided. It shall be self-energized and shall have a negative voltage compensating remote solid-state voltage regulator. The alternator shall be installed in accordance with the engine manufacturer's recommendations.

### **3.98.00 BATTERY SYSTEM**

The manufacturer shall supply five (5) heavy duty Group 31 12 volt maintenance-free batteries. Each battery shall be installed and positioned so as to allow easy replacement of any single battery. Each battery shall be equipped with carrying handles to facilitate ease of removal and replacement. There shall be two (2) steel frame-mounted battery boxes, one (1) on the left frame rail and one (1) on the right frame rail. Each battery box shall be secured to the frame rail with Grade 8 hardware. The boxes shall hold two (2) batteries on the left side and three (3) on the right side. The batteries shall have a minimum combined rating of 5,000 (5 x 1000) cold cranking amps (CCA) @ 0 degrees Fahrenheit and 1025 (5 x 205) minutes of reserve capacity for extended operation. The batteries shall have 3/8-16 threaded stud terminals to ensure tight cable connections. The battery stud terminals shall each be treated with concentrated industrial soft-seal after cable installation to promote corrosion prevention. The positive and negative battery stud terminals and the respective cables shall be clearly marked to ensure quick and mistake-proof identification.

Batteries shall be placed on non-corrosive rubber matting and secured with hold-down brackets to prevent movement, vibration, and road shock. The hold-down bracket J-hooks shall be cut to fit and shall have all sharp edges removed. The batteries shall be placed in plastic trays to provide preliminary containment should there be leakage of hazardous battery fluids. There shall be two (2) plastic trays, one (1) for each set of batteries. Each battery tray shall be equipped with a rubber hose to facilitate drainage. The rubber hose shall be routed to drain beneath the battery box. The batteries shall be positioned in well-ventilated areas.

One (1) positive and one (1) negative jumper stud shall be provided.

Batteries shall have a warranty of twelve (12) months that shall commence upon the date of delivery of the apparatus.

### **3.99.00 ENGINE FAN CLUTCH**

The engine shall be equipped with a thermostatically controlled engine cooling fan. The fan shall be belt driven and utilize a clutch to engage when the engine reaches a specified temperature and/or the water pump is engaged (if equipped).

When disengaged, the fan clutch shall allow for improved performance from optional floor heaters, reduced cab interior noise, increased acceleration and improved fuel economy. The fan shall be equipped with a fail-safe engagement so that if the clutch fails the fan shall engage to prevent engine overheating.

### **3.100.00 DRIVELINES**

Drivelines shall have a heavy duty metal tube and shall be equipped with Spicer 1810 series universal joints to allow full-transmitted torque to the axle(s). Drive shafts shall be axially straight, concentric with axis and dynamically balanced.

### **3.101.00 FRONT TOW EYES**

Two (2) 3/4" thick heavy duty steel tow eyes shall be securely attached to the chassis frame rails at the front of the apparatus. They shall be mounted down below the bumper/cab.

### **3.102.00 REAR TOW EYES**

Two (2) heavy duty tow eyes made of 3/4" (0.75") thick steel having 2.5" diameter holes shall be bolted directly to the rear of the frame to allow towing (not lifting) of the apparatus. The tow eyes shall be protruding into the rear compartment or out the rear of the body. The tow eyes shall be painted chassis black.

### **3.103.00 HOT SHIFT PTO**

Power take-off for the automatic transmission shall be a 6 bolt mounted hydraulic shift with a switch located in the cab. Hydraulic shift will allow the PTO to be shifted while the unit is in motion and without having to shut down the water pump.

### **3.104.00 BOTTOM PORT AERIAL HYDRAULICS**

The aerial hydraulics shall be provided off the bottom port of the Allison EVS4000/4500 transmission.

### **3.105.00 DEF TANK**

A diesel exhaust fluid (DEF) tank with a five (5) gallon capacity shall be provided.

The DEF tank shall include a heater fed by hot water directly from the engine block to prevent the DEF from becoming too cool to operate correctly per EPA requirements. The tank shall include a temperature sensor to control the heater control valve that controls the feed of hot water from the engine to the DEF tank heater.

A sender shall be provided in the DEF tank connected to a level gauge on the cab dash. The tank shall be located left side below rear of cab.

### **3.106.00 POWER STEERING COOLER**

A heat exchanger (cooler) shall be installed to maintain desired power steering fluid temperature. The cooler shall be a model DH-073-1-1 with air/oil design rated at 6300 BTU/HR @ 10 GPM. The cooler shall be mounted in front of the radiator and plumbed with #10 lines.

The vehicle shall be distinguished by an all-welded aluminum and fully enclosed tilt cab. The cab shall be designed exclusively for fire/rescue service and shall be pre-engineered to ensure long life. It shall incorporate an integral welded substructure of high-strength aluminum alloy extrusions that creates an occupant compartment that is essentially a protective perimeter. The end result is a distinctive structure that is aesthetically appealing, functionally durable, and characterized by increased personnel safety.

The cab shall be constructed from 3/16" (0.188") 3003 H14 aluminum alloy plate roof, floor, and outer skins welded to a high-strength 6063-T6 aluminum alloy extruded subframe. Wall supports and roof bows are 6061 T6 aluminum alloy. This combination of a high-strength, welded aluminum inner structure surrounded on all sides by load bearing, welded aluminum outer skins provides a cab that is strong, lightweight, corrosion-resistant, and durable.

The inner structure shall be designed to create an interlocking internal "roll-cage" effect by welding two (2) 3" x 3" x 0.188" wall-thickness 6063-T5 aluminum upright extrusions between the 3" x 3" x 0.375" wall-thickness 6061-T6 roof crossbeam and the 2.25" x 3" x 0.435" wall-thickness 6063-T6 subframe structure in the front. An additional two (2) aluminum upright extrusions within the back-of-cab structure shall be welded between the rear roof perimeter extrusion and the subframe structure in the rear to complete the interlocking framework. The four (4) upright extrusions--two (2) in the front and two (2) in the rear--shall be designed to effectively transmit roof loads downward into the subframe structure to help protect the occupant compartment from crushing in a serious accident. All joints shall be electrically seam welded internally using aluminum alloy welding wire.

The subframe structure shall be constructed from high-strength 6061-T6 aluminum extrusions welded together to provide a structural base for the cab. It shall include a side-to-side 3" x 1.5".375 thick C-channel extrusion across the front, with 3/4" x 2-3/4" (.75" x 2.75") full-width crossmember tubes spaced at critical points between the front and rear of the cab.

The cab floor shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate welded to the subframe structure to give the cab additional strength and to help protect the occupants from penetration by road debris and under-ride collision impacts.

The cab roof shall be constructed from 3/16" (0.188") 3003 H14 aluminum treadplate supported by a grid of fore-aft and side-to-side aluminum extrusions to help protect the occupants from penetration by falling debris and downward-projecting objects. Molded fiberglass or other molded fiber-reinforced plastic roof materials are not acceptable. The cab roof perimeter shall be constructed from 4" x 6-5/8" (4" x 6.625") 6063-T5 aluminum extrusions with integral drip rails. Cast aluminum corner joints shall be welded to the aluminum roof perimeter extrusions to ensure structural integrity. The roof perimeter shall be continuously welded to the cab roof plate to ensure a leak-free roof structure. The cab rear skin shall be constructed from 3/16" (0.188") 3003 H14 aluminum plate. Structural extrusions shall be used to reinforce the rear wall.

The left-hand and right-hand cab side skins shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate. The skins shall be welded to structural aluminum extrusions at the top, bottom, and sides for additional reinforcement.

The cab front skins shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate. The upper portion shall form the windshield mask, and the lower portion shall form the cab front. Each front corner shall have a full 9" outer radius for strength and appearance. The left-hand and right-hand sides of the windshield mask shall be welded to the left-hand and right-hand front door frames, and the upper edge of the windshield mask shall be welded to the cab roof perimeter extrusion for reinforcement. The cab front shall be welded to the subframe C-channel extrusion below the line of the headlights to provide protection against frontal impact.

### **3.107.00 CAB EXTERIOR**

The exterior of the cab shall be 94" wide x 130" long to allow sufficient room in the occupant compartment for up to eight (8) fire fighters. The cab roof shall be approximately 101" above the ground with the flat roof option. The back-of-cab to front axle length shall be a minimum of 58".

Front axle fenderette trim shall be brushed aluminum for appearance and corrosion resistance. Bolt-in front wheel well liners shall be constructed of 3/16" (0.188") composite material to provide a maintenance-free, damage-resistant surface that helps protect the underside of the cab structure and components from stones and road debris.

A large stainless-steel cooling air intake grille with an open area of no less than 81% shall be at the front of the cab.

The cab windshield shall be of a two-piece replaceable design for lowered cost of repair. The windshield shall be made from 1/4" (0.25") thick curved, laminated safety glass with a 75% light transmittance automotive tint. A combined minimum viewing area of 2,561-sq. in. shall be provided. Forward visibility to the ground for the average (50th percentile) male sitting in the driver's seat shall be no more than 11 feet 7 inches from the front of the cab to ensure good visibility in congested areas.

### **3.108.00 WINDSHIELD WIPERS**

Two (2) opposed radial style windshield wipers with two (2) separate electric motors shall be provided for positive operation. The wipers shall be tested beyond the minimum SAE requirement to a total of 3.3 million cycles. The wipers shall be a wet-arm type with a one (1) gallon washer fluid reservoir, an intermittent-wipe function, and an integral wash circuit. Wiper arm length shall be approximately 20", and the blade length approximately 21". Each arm shall have a 90-degree sweep for full coverage of the windshield. The wipers shall be synchronized so as to wipe each windshield simultaneously.

### **3.109.00 CAB MOUNTS AND CAB TILT SYSTEM**

The cab shall be independently mounted from the body and chassis to isolate the cab structure from stresses caused by chassis twisting and body movements. Mounting points shall consist of two (2) forward-pivoting points, one (1) on each side; two (2) intermediate rubber load-bearing cushions located midway along the length

of the cab, one on each side; and two (2) combination rubber shock mounts and cab latches located at the rear of the cab, one (1) on each side.

An electric-over-hydraulic cab tilt system shall be provided to provide easy access to the engine. It shall consist of two (2) large-diameter, telescoping, hydraulic lift cylinders, one (1) on each side of the cab, with a frame-mounted electric-over-hydraulic pump for cylinder actuation.

Safety flow fuses (velocity fuses) shall be provided in the hydraulic lift cylinders to prevent the raised cab from suddenly dropping in case of a burst hydraulic hose or other hydraulic failure. The safety flow fuses shall operate when the cab is in any position, not just the fully raised position.

The hydraulic pump shall have a manual override system as a backup in the event of an electrical failure. Lift controls shall be located in a compartment to the rear of the cab on the right side of the apparatus. A parking brake interlock shall be provided as a safety feature to prevent the cab from being tilted unless the parking brake is set.

The entire cab shall be tilted through a 42-45 degree arc to allow for easy maintenance of the engine, transmission and engine components. A positive-engagement safety latch shall be provided to lock the cab in the full tilt position to provide additional safety for personnel working under the raised cab.

In the lowered position, the cab shall be locked down by two (2) automatic, spring-loaded cab latches at the rear of the cab. A "cab ajar" indicator light shall be provided on the instrument panel to warn the driver when the cab is not completely locked into the lowered position.

### **3.110.00 CAB INTERIOR**

The interior of the cab shall be of the open design with an ergonomically designed driver area that provides ready access to all controls as well as a clear view of critical instrumentation.

The engine cover between the driver and the officer shall be a low-rise contoured design to provide sufficient seating and elbow room for the driver and the officer. The engine cover shall blend in smoothly with the interior dash and flooring of the cab. An all-aluminum subframe shall be provided for the engine cover for strength. The overall height of the engine enclosure shall not exceed 23" from the floor at each side and 27" in the center section. The engine cover shall not exceed 41" in width at its widest point.

The rear portion of the forward engine cover shall be provided with a lift-up door to provide easy access for checking and filling engine oil, transmission fluid and power steering fluid without raising the cab (a separate access panel shall be provided for the power steering when equipped with an X12 or X15 engine).

The engine cover insulation shall consist of 1/2" closed cell elastomeric compound foam with aluminum foil faced fiberglass fabric manufactured to specifically fit the engine cover. All edges and seams shall be sealed using aluminum foil faced fiberglass tape. The insulation shall meet or exceed DOT standard FMVSS 302-1 and V-0 (UI subject 94 Test).

All cab floors shall be covered with a black rubber floor mat that provides an aggressive slip resistant surface in accordance with current NFPA 1901.

The rear engine cover area shall be covered with molded 18lb/cu. ft. (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/-5.0) per ASTM F1957-99. The cover shall be approximately .5" thick with a minimum skin thickness of 0.0625 inches. The cover shall be provided to reduce the transmission of noise and heat from the engine. The cover shall be black with a pebble grain finish for slip resistance.

A minimum of 57.25" of floor-to-ceiling height shall be provided in the front seating area of the cab and a minimum of 55.25" floor-to-ceiling height shall be provided in the rear seating area. A minimum of 36" of seated headroom at the "H" point shall be provided over each fenderwell.

The interior side to side dimensions shall be 87" from wall padding to wall padding and 89.5" from door to door.

The floor area in front of the front seat pedestals shall be no less than 24" side to side by up to 25" front to rear for the driver and no less than 24" side to side by up to 27" front to rear for the officer to provide adequate legroom.

Battery jumper studs shall be provided to allow jump-starting of the apparatus without having to tilt the cab.

All exposed interior metal surfaces shall be pretreated using a corrosion prevention system.

The interior of the cab shall be insulated to ensure the sound (dbA) level for the cab interior is within the limits stated in the current edition of NFPA 1901. The insulation shall consist of 2 oz. wadding and 1/4" (0.25") foam padding. The padding board shall be backed with 1/4" (0.25") thick reflective insulation. The backing shall be spun-woven polyester. Interior cab padding shall consist of a rear cab headliner, a rear wall panel, and side panels between the front and rear cab doors.

The vehicle shall use a seven-position tilt and telescopic steering column to accommodate various size operators. An 18" padded steering wheel with a center horn button shall be provided.

The driver and officer seat risers shall be welded to the main cab floor structure. Depending on the make and model of the seats, a storage compartment with a hinged door shall be provided in the risers.

The lower front cab steps shall be a minimum of 11.5" deep x 24" wide. The lower rear cab steps shall be a minimum 16" deep x 21" wide. The first step at the front and rear cab doors shall be no more than 24.0" above the ground with standard tires in the unloaded condition per NFPA 1901 standards. The front and rear steps shall incorporate full width intermediate steps for easy access to the cab interior. The intermediate step at the front doors shall be approximately 6" deep (minimum). The intermediate step at the rear doors shall be approximately 10.75" deep (minimum). The step surfaces shall be aluminum diamond plate with a multi-directional, aggressive gripping surface incorporated into the aluminum diamond plate in accordance with current NFPA 1901.

A black grip handle shall be provided on the interior of each front door below the door window to ensure proper hand holds while entering and exiting the cab. An additional black grip handle shall be provided on the left and right side windshield post for additional handholds.

### **3.111.00 CAB DOORS**

Four (4) side-opening cab doors shall be provided. Doors shall be constructed of a 3/16" (0.188") aluminum plate outer material with an aluminum extruded inner framework to provide a structure that is as strong as the side skins.

Front cab door openings shall be approximately 36" wide x 72.5" high, and the rear cab door openings shall be approximately 33.75" wide x 72.5" high. The front doors shall open approximately 85 degrees, and the rear doors shall open approximately 80 degrees.

The doors shall be securely fastened to the doorframes with full-length, stainless steel piano hinges, with 3/8" (0.375") diameter pins for proper door alignment, long life, and corrosion resistance. Mounting hardware shall be treated with corrosion-resistant material prior to installation. For effective sealing, an extruded rubber gasket shall be provided around the entire perimeter of all doors.



The front door windows shall provide a minimum viewing area of 518 sq. in. each. The rear door windows shall provide a minimum viewing area of 554 sq. in. each. All windows shall have 75% light transmittance automotive safety tint.

The door handles on the exterior of the cab shall be a pull type with vertical orientation. The handles shall be made with corrosion free material and have a black finish. Each exterior door handle shall have an integral keyed lock.

Recessed paddle-style door latches shall be provided on the interiors of the doors. The latches shall be designed and installed to protect against accidental or inadvertent opening as required by NFPA 1901. The rear cab door handles shall have a vertical orientation making them easily accessible from forward or rearward outboard seating positions. Each cab door shall have a manually operated door lock actuated from the interior of each respective door.

### **3.112.00 CAB INSTRUMENTS AND CONSOLES**

Cab controls shall be located on the cab instrument panel in the dashboard on the driver's side where they are clearly visible and easily reachable. Chassis operation switches shall be installed in removable panels for ease of service. The following gauges and/or controls shall be provided:

- Speedometer/Odometer
- Tachometer
- Engine hour meter
- Engine oil pressure gauge with warning light and buzzer
- Engine water temperature gauge with warning light and buzzer
- Transmission oil temperature gauge
- Two (2) air pressure gauges with a warning light and buzzer (front air and rear air)
- Fuel gauge with low fuel indicator light
- Voltmeter
- Master battery/ignition switch (rocker with integral guard)
- Engine start switch (rocker)
- Heater and defroster controls with illumination
- Marker light/headlight control switch (rocker)
- Panel light dimmer switch (rocker)
- Self-canceling turn signal control with indicators
- Windshield wiper switch with variable speed and washer controls
- Pump shift control with green "pump in gear" and "o.k. to pump" indicator lights
- Parking brake controls with red indicator light on dash
- Automatic transmission shift console
- Electric horn button at center of steering wheel
- Master warning light switch
- Cab ajar warning indicator
- Air filter restriction indicator

Controls and switches shall be identified as to their function by backlit wording adjacent to each switch, or indirect panel lighting adjacent to the controls.

### **3.113.00 ELECTRICAL SYSTEM**

The cab and chassis system shall have designated electrical distribution areas. All electrical components shall be located such that standard operations shall not interfere with or disrupt vehicle operation. An access cover shall be provided for maintenance access to the electrical distribution area. Circuit protection shall be provided by fuses, thermal reset breakers and/or solid-state controls.

A 6 place, constantly hot, and 6 place ignition switched fuse panel and ground for customer-installed radios and chargers shall be provided at the electrical distribution area. Radio suppression shall be sufficient to allow radio equipment operation without interference.

All wiring shall be mounted in the chassis frame and protected from impact, abrasion, water, ice, and heat sources. The wiring shall be color-coded and functionally-labeled every 3" on the outer surface of the insulation for ease of identification and maintenance. The wiring harness shall conform to SAE 1127 with GXL temperature properties. Any wiring connections exposed to the outside environment shall be weather-resistant. All harnesses shall be covered in a loom that is rated at 280 degrees F to protect the wiring against heat and abrasion.

### **3.114.00 DAYTIME RUNNING LIGHTS**

Two (2) dual rectangular chrome plated headlight bezels shall be installed on the front of the cab. The low beam headlights shall activate with the release of the parking brake to provide daytime running lights (DRL) for additional vehicle conspicuity and safety. The headlight switch shall automatically override the DRL for normal low beam/high beam operation.

### **3.115.00 FAST IDLE SYSTEM**

A fast idle system shall be provided and controlled by a switch accessible by the driver. The system shall increase engine idle speed to a preset RPM for increased alternator output.

### **3.116.00 CAB CRASHWORTHINESS REQUIREMENT (NO EXCEPTIONS)**

The apparatus cab shall meet and/or exceed relevant NFPA 1901 load and impact tests required for compliance certification with the following:

Side Impact Dynamic Pre-Load per SAE J2422 (Section 5).

Testing shall meet and/or exceed defined test using 13,000 ft-lbs. of force as a requirement. The cab shall be subject to a side impact representing the force seen in a roll-over. The cab shall exhibit minimal to no intrusion into the cab's occupant survival space, doors shall remain closed and cab shall remain attached to frame.

Cab testing shall be completed using 13,776 ft-lbs. of force **exceeding** testing requirements.

Quasi-static Roof Strength (proof loads) per SAE J2422 (Section 6) /ECE R29, Annex 3, paragraph 5.

Testing shall meet and/or exceed defined test using 22,046 lbs. of mass as a requirement. Testing shall be completed using platen(s) distributed uniformly over all bearing members of the cab roof structure.

Cab testing shall be completed using 23,561 lbs. of mass **exceeding** testing requirements. The cab shall exhibit minimal to no intrusion into the cab's occupant survival space and doors shall remain closed.

Additional cab testing shall be conducted using 117,336 lbs. of mass **exceeding** testing requirements by **over five (5) times**. The cab shall exhibit minimal to no intrusion into the cab's occupant survival space and the doors shall remain closed.

Frontal Impact per SAE J2420.

Testing shall meet and/or exceed defined test using 32,549 ft-lbs. of force as a requirement. The cab shall be subject to a frontal impact as defined by the standard. The cab shall exhibit minimal to no intrusion into the cab's occupant survival space, doors shall remain closed and cab shall remain attached to frame.

Cab testing shall be completed using 34,844 ft-lbs. of force exceeding testing requirements.

Additional cab testing shall be conducted using 65,891 ft-lbs. of force **exceeding** testing requirements by **over two (2) times**.

The cab shall meet all requirements to the above cab crash worthiness; **NO EXCEPTIONS**.

A copy of a certificate or letter verifying compliance to the above performance by an independent, licensed, professional engineer shall be provided upon request.

For any or all of the above tests, the cab manufacturer shall provide either photographs or video footage of the procedure upon request.

### **3.117.00 SEAT MOUNTING STRENGTH**

The cab seat mounting surfaces shall be third party tested and in compliance with FMVSS 571.207.

### **3.118.00 SEAT BELT ANCHOR STRENGTH**

The cab seat belt mounting points shall be third party tested and in compliance with FMVSS 571.210.

### **3.119.00 ISO COMPLIANCE**

The manufacturer shall ensure that the construction of the apparatus cab shall be in conformance with the established ISO-compliant quality system. All written quality procedures and other procedures referenced within the pages of the manufacturer's Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts this process shall be strictly adhered to. By virtue of its ISO compliance the manufacturer shall provide an apparatus cab that is built to exacting standards, meets the customer's expectations, and satisfies the customer's requirements.

### **3.120.00 RAISED REAR CAB ROOF (SPLIT)**

The outboard roof of the rear crew area shall be raised 12" allowing the rear cab doors to be extended up providing improved egress. The forward end of the raised roof shall be tapered for a streamlined appearance. The interior of the raised cab roof areas shall be provided with padded headliner material to match the center cab ceiling. The center of the cab roof shall include a 1.5" deep waterway clearance notch from front to rear minimizing overall travel height of the vehicle. The center cab roof notch shall not affect the interior cab ceiling or cab structure.

### **3.121.00 LOGO PACKAGE**

The apparatus shall have manufacturer logos provided on the cab and body as applicable.

### **3.122.00 REAR CAB DOOR POSITION**

The cab rear doors shall be moved to the rear of the wheel opening. This door placement facilitates easier entry and egress by reducing the rear facing seat protrusion into the door opening.

Rear door position to the 58" or (medium cab).

### **3.123.00 CAB DOOR LOCKS**

The cab shall have 1250 keyed door locks provided on exterior doors to secure the apparatus.

### **3.124.00 CAB DOOR PANELS**

The inner door panels shall be made from 1/8" (.125") aluminum plate painted Zolatone (to match cab interior paint) for increased durability. The cab door panels shall be split just below the handrail and incorporate an easily removable panel for access to the latching mechanism and window regulator for maintenance or service.

### **3.125.00 CAB DOOR LOCKS**

Each cab door shall have a manually operated door lock actuated from the interior of each respective door. Exterior of each cab door shall be provided with a keyed lock integrated with the cab door handle.

### **3.126.00 CAB DOOR REFLECTIVE MATERIAL**

Reflexite V98 Red/Fluorescent Yellow Green striping shall be provided approximately 12" high on the lower cab door panels. The stripes shall run from the top outer corner to the bottom inside corner of the lower door area, forming a "A" shape when viewed from the rear. The reflective material shall meet NFPA 1901 requirements.

### **3.127.00 CAB FRONT DOOR WINDOWS**

Full roll-down windows shall be provided for the front cab doors with power operated heavy duty regulators. The regulators shall have worm gear drive cable operation for positive movement and long life. Scissors or gear-and-sector drives are not acceptable. Window switches shall be located at the center dash for access by the driver or officer.

### **3.128.00 CAB REAR DOOR WINDOWS**

Full roll-down windows shall be provided for the rear crew doors with power operated heavy duty regulators. The regulators shall have worm gear drive cable operation for positive movement and long life. Scissors or gear-and-sector drives are not acceptable. Window switches shall be located on each door with additional switches accessible by driver.

### **3.129.00 CAB DOOR STYLE**

The cab doors shall be barrier style with exposed lower steps.

### **3.130.00 CAB STEP**

An auxiliary step below the cab door shall be provided. The step shall be constructed of .188" aluminum tread brite. The step surface shall be provided with an aggressive skid-resistant surface and have an open back. The step shall be in accordance with current NFPA requirements and shall include a multi-directional aggressive gripping surface incorporated into the diamond plate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (0.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4".

The step shall be located driver's front door, officer's front door, driver side rear door, officer side rear door.

Steps under front cab doors shall not interfere with approach angle.

### **3.131.00 CAB STEPS**

The lower cab steps shall extend 3.5" past the side of the cab to provide increased surface area.

### **3.132.00 CAB MIRRORS**

There shall be two (2) Lang Mekra 300 Aero Series Technology Mirrors provided, one (1) driver's and one (1) officer's side. The mirrors shall be chrome-plated on the main head, be remote controlled with a four way power

system and be heated. There shall be LED marker lights with bezel on the main head, and LED arrow lights in the mirror glass. The main flat glass shall provide 120 square inches of viewable surface space. There shall be separate heads for the driver's and officer's side housing convex glass and provide 56 square inches of viewing surface.

The mirrors shall be mounted on the cab doors.

### **3.133.00 CAB WINDOWS REAR WALL**

Fixed glass windows shall be supplied on either side of the cab, providing visibility at the rear. The windows shall be approximately 4' wide and approximately the same height as the door windows.

### **3.134.00 CAB CANOPY WINDOW**

There shall be a fixed window provided between the front and rear doors on the driver's side of the cab.

Window dimensions shall be as follows:

- 44" C/A cab (short cab): 16"W x 24.5"H
- 58" -80" C/A cab (medium -extended): 26.69"W x 24.5"H

### **3.135.00 CAB CANOPY WINDOW**

There shall be a fixed window provided between the front and rear doors on the officer's side of the cab.

Window dimensions shall be as follows:

- 44" C/A cab (short cab): 16"W x 24.5"H
- 58" -80" C/A cab (medium -extended): 26.69"W x 24.5"H

### **3.136.00 FRONT MUD FLAPS**

Black linear low density polyethylene (proprietary blend) mud flaps shall be installed on the rear of the cab front wheel wells. The design of the mud flaps shall have corrugated ridges to distribute water evenly.

### **3.137.00 HANDRAILS**

Cab door assist handrails shall consist of two (2) 1.25" diameter x 18" long 6063-T5 anodized aluminum tubes mounted directly behind the driver and officer door openings one each side of the cab. The handrails shall be machine extruded with integral ribbed surfaces to assure a good grip for personnel safety. Handrails shall be installed between chrome end stanchions and shall be positioned at least 2" from the mounting surface to allow a positive grip with a gloved hand.

### **3.138.00 HANDRAILS**

Cab door assist handrails shall consist of two (2) 1.25" diameter x 36" long 6063-T5 anodized aluminum tubes mounted directly behind the driver and officer rear door openings one each side of the cab. The handrails shall be machine extruded with integral ribbed surfaces to assure a good grip for personnel safety. Handrails shall be installed between chrome end stanchions and shall be positioned at least 2" from the mounting surface to allow a positive grip with a gloved hand.

### **3.139.00 REAR CAB WALL CONSTRUCTION**

The rear cab wall shall be constructed with the use of 3/16" aluminum diamond plate interlocking in aluminum extrusions.

### **3.140.00 CAB WHEEL WELL**

The cab wheel well shall be increased in size to provide additional clearance for larger tires. The fender trim shall be adjustable in and out to better accommodate various wheel /tire offsets.

### **3.141.00 RECEPTACLE MOUNTING PLATE**

A mounting plate shall be provided for the battery charger receptacle, battery charger indicator and if applicable the air inlet, etc. The plate shall be constructed of 14 gauge brushed finish stainless steel and be removable for service access to the receptacle(s) and indicator.

### **3.142.00 HEAT, SUPPLEMENTAL**

A single 40,000 BTU water heater shall be supplied in the front area of the cab. The unit shall heat the lower section of the driver's and officer's footwell.

Dual 23,000 BTU water heaters with diamond plate covers shall be supplied in the rear of the cab to heat the rear cab lower section.

Dual climate control will be achieved via dual switches installed on a front instrument panel. On units with optional multiplex display climate control, the floor heaters shall be controlled through the HVAC screen in the display.

### **3.143.00 HVAC CONTROL LOCATION**

Heating and air conditioning controls shall be located in the center dash area.

### **3.144.00 AIR CONDITIONING**

An overhead air-conditioner /heater system with a roof mounted condenser shall be supplied.

The unit shall be mounted to the cab interior headliner in a mid-cab position, away from all seating positions. The unit shall provide fourteen (14) comfort discharge louvers, eight (8) to the back area of the cab, six (6) to the front area of the cab including one (1) each side outboard in the forward overhead console. These louvers will be used for both AC and heated air delivery. Two (2) additional large front louvers shall be damper controlled to provide defogging and defrosting capabilities to the front windshield as necessary.

The unit shall consist of a high output evaporator coil and heater core with one (1) high output dual blower for front air delivery, and two (2) high performance single wheel blowers for rear air delivery. For improved corrosion resistance the evaporator shall have a hydrophilic blue fin coating.

The control panel shall actuate the air-distribution system using electric actuators. The control panel shall allow blended airflow to both the comfort air vents and defrost vents.

Separate three-speed blower switches shall be provided to independently control air speed for the front and rear blowers.

The condenser shall be roof mounted and have a minimum capacity of 65,000 BTU's and have dual fans with a built in receiver drier.

Performance Data: (Unit only, no ducting or louvers) AC

- BTU: 55,000
- Heat BTU: 65,000
- CFM : 1300 @ 13.SV (All blowers)

The compressor shall be a ten-cylinder swash plate type Seltec model TM-31HD with a capacity of 19.1 cu.in. per revolution.

The system shall be capable of cooling the interior of the cab from 100 degrees ambient to 75 degrees or less with 50% relative humidity in 30 minutes or less.

### **3.145.00 SEATING CAPACITY TAG**

A tag that is in view of the driver stating seating capacity of four (4) personnel shall be provided.

### **3.146.00 SCBA BRACKET SMARTDOCK**

A IMMI SmartDock Gen2 SCBA storage bracket shall be provided. The SmartDock is a strap-free docking station that offers single-motion SCBA insertion and hands-free release when the firefighter stands up to exit the seat. SmartDock has undergone extensive testing to ensure that it meets or exceeds industry standards. When evaluated to the NFPA 1901 Standard for Automotive Fire Apparatus, SmartDock met requirements for retaining both the cylinder and the pack in dynamic testing.

Location: officer's seat, rear facing driver's side, rear facing officer's side.

### **3.147.00 SEAT BELT EXTENDER**

ReadyReach seat belt extenders shall be provided. The extender shall include an arm that places the shoulder belt O-loop in a closer, easier to reach location.

The extenders shall be provided for the driver's seat, officer's seat, rear facing driver's side, rear facing officer's side seat.

### **3.148.00 CAB SEATS (NO EXCEPTIONS)**

All cab seats shall be Valor brand.

### **3.149.00 SEAT COVER MATERIAL**

All seats shall have Valor Tech XO military grade upholstery material.

### **3.150.00 SEAT FABRIC COLOR**

The color of all seats shall be black with red top stitching.

### **3.151.00 SEAT, DRIVER**

A USSC Valor P1A air suspension seat shall be supplied for the driver's position. Features shall include:

- Dymetrol® Active suspension Low-profile air suspension
- 2.75 Suspension stroke 350 lb. capacity
- Fore and aft adjustable tracks with 6-inches of travel Rotational knob for infinitely adjustable lumbar Adjustable seat backrest
- Integral headrest

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped, and the female end easily located while sitting in a normal position.

### **3.152.00 SEAT, OFFICER**

A USSC Valor fixed SCBA seat shall be supplied for the officer's position in front of the cab. Features shall include:

- 95-Degree back angle Fixed headrest
- Magnetic SCBA harness securement

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped, and the female end easily located while sitting in a normal position.

### **3.153.00 SEAT, REAR FACING**

Rear facing USSC Valor fixed SCBA seat driver's side. Features shall include:

- 95-Degree back angle Fixed headrest
- Magnetic SCBA harness securement

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped, and the female end easily located while sitting in a normal position.

### **3.154.00 SEAT, REAR FACING**

Rear facing USSC Valor fixed SCBA seat officer's side. Features shall include:

- 95-Degree back angle Fixed headrest
- Magnetic SCBA harness securement

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped, and the female end easily located while sitting in a normal position.

### **3.155.00 CAB INTERIOR COLOR**

Cab instrument panel, overhead console, trim panels, headliner, and door panels shall be gray.

### **3.156.00 SUN VISORS**

Lexan sun visors shall be provided for the driver and officer matching the interior trim of the cab and shall be flush mounted into the underside of the overhead console.

### **3.157.00 AIR HORN LANYARD**

There shall be a "Y" style lanyard mounted in the center of the cab that allows the driver and officer to operate the air horns. The lanyard shall activate an electrical air switch.

### **3.158.00 ENGINE COVER**



The engine cover shall blend in smoothly with the interior dash and flooring of the cab. The upper left and right sides shall have a sloped transition surface running front to rear providing increased space for the driver and officer.

The engine cover and engine service access door cover shall be molded 18 lb/cu. ft. (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/-5.0) per ASTM F1957-99. The cover shall be approximately .5" thick with a minimum skin thickness of 0.0625 inches. The cover shall be provided to reduce the transmission of noise and heat from the engine. The cover shall be black and feature a pebble grain finish for slip resistance.

### **3.159.00 CUP HOLDER/STORAGE TRAY**

A cup holder and tray assembly shall be provided on the cab engine cover between the driver and officer. The tray shall be approximately 14" wide x 10" long x 1.5" tall and constructed from .125" aluminum plate. The top edge of the tray sides shall have a .5" lip and the front corners of the tray shall be tapered for dash access. The two (2) cup holders shall be constructed from 3.5" diameter pipe approximately 2.5" tall and be located one each side at the rear corners of the tray. The assembly shall be painted to match the cab interior color.

### **3.160.00 OVERHEAD CONSOLE**

An overhead console shall be provided in the front of the cab for the driver and officer. The areas in front of the driver and officer shall be removable panels that can be used for switches and other electrical items. The entire overhead console shall be hinged for service access.

The center of the overhead console shall have a lowered area for mounting of up to three (3) electrical components like siren heads, directional bar controllers, etc.

The overhead console shall be constructed of aluminum smooth plate painted to match the cab interior. The console shall be installed using stainless steel fasteners.

### **3.161.00 REAR ENGINE COVER**

The rear engine cover shall be provided with a reduced profile for increased legroom on the forward facing rear inboard seats.

### **3.162.00 CAB DASH-LOW PROFILE SEVERE DUTY**

The driver side and center dash shall be constructed from cast aluminum for durability and long life.

The driver side cast aluminum dash shall enclose the instrument cluster.

The center dash area shall be a low profile design to provide optimal forward visibility. The driver and officer sides shall be angled for ergonomic access and designed for either a color display or switches. Access panels shall be provided on the top, front and officer side for easy service access.

The officer side dash shall be low profile and constructed from .125" smooth aluminum plate. A service access panel shall be provided in the top surface.

The driver, center and officer side dash shall be painted to match the cab interior.

The lower kick panels below the dash to be constructed from .125 aluminum plate painted to match the cab interior. The panels shall be removable to allow for servicing components that may be located behind the panels.

### **3.163.00 CAB INSULATION PACKAGE**

The cab shall be insulated to mitigate noise and ensure maximum cooling/heating capacity. The insulation package shall include 1” Polyester foam with Mylar facing for the front wall, rear wall, side walls, and ceiling, Reflectex (or equal) inside each cab door and 1” closed cell foam insulation below the front and rear facing seat risers.

### **3.164.00 CAB MEDICAL CABINET**

There shall be a 36 x 40 x 24 Cabinet installed on the rear wall. There shall be 1 adjustable shelf inside the cabinet. A cargo net with clips shall be used to secure contents. Compartment shall be painted zolatone Gray to include interior shelving. Amdor LED compartment lighting shall be used for illumination.

### **3.165.00 CAB DOME LIGHTS**

A Weldon LED dome light assembly with one (1) white lens and one (1) red lens and plastic housing shall be installed. The white light activates with appropriate cab door and light assembly switch, the red light activates with light assembly mounted switch only.

There shall be two (2) mounted in the front of the cab, one (1) in the driver and one (1) in the officer ceiling.

There shall be two (2) mounted in the rear of the cab, one (1) in the driver side and one (1) in the officer side ceiling.

### **3.166.00 PUSH-BUTTON SWITCH**

A heavy duty metal push-button switch shall be installed on the officer’s side switch panel to operate the Q2B siren.

### **3.167.00 PUSH-BUTTON SWITCH**

A heavy duty metal push-button switch shall be installed on the officer’s side switch panel to operate the Q2B siren brake.

### **3.168.00 AUTO-EJECT BATTERY CHARGER RECEPTACLE**

The battery charger receptacle shall be a Kussmaul 20 amp NEMA 5-20 Super Auto-Eject #091-55-20-120 with a cover. The Super Auto-Eject receptacle shall be completely sealed and have an automatic power line disconnect.

The receptacle shall be located outside driver’s door next to handrail and the cover color shall be Yellow.

### **3.169.00 HORN BUTTON SWITCH**

A three (3) position rocker switch shall be installed in the cab accessible to driver and properly labeled to enable the operator to activate the OEM traffic horn, air horn or Federal Signal Q2B siren from the steering wheel horn button.

### **3.170.00 ATC OVERRIDE**

An Automatic Traction Control (ATC) override switch shall be provided. The switch shall be located within reach of the driver and allow for momentary disabling of the ATC system due to mud or snow conditions.

### **3.171.00 ENGLISH DOMINANT GAUGE CLUSTER**

The cab operational instruments shall be located in the dashboard on the driver side of the cab and shall be clearly visible. The gauges in this panel shall be English dominant and shall be the following:

- Speedometer/Odometer
- Tachometer with integral hour meter
- Engine oil pressure gauge with warning light and buzzer Engine water temperature gauge with warning light and buzzer
- Two (2) air pressure gauges with a warning light and buzzer (front air and rear air) Fuel gauge
- Voltmeter
- Transmission oil temperature gauge

This panel shall be backlit for increased visibility during day and nighttime operations.

### **3.172.00 HEADLIGHTS**

The front of the cab shall have four (4) headlights. The headlights shall be mounted on the front of the cab in the lower position. The headlights shall be daytime operational.

### **3.173.00 12 VOLT (or 24 VOLT) OUTLET**

A plug-in type receptacle for handheld spotlights, cell phones, chargers, etc. shall be installed driver side dash, officer side dash. The receptacle shall be wired battery hot.

### **3.174.00 BATTERY CHARGER LOCATION**

The battery charger shall be located behind driver's seat.

### **3.175.00 BATTERY CHARGER**

An LPC 40 battery charger with remote mounted LED display shall be installed.

A fully automatic charging system shall be installed on the apparatus. The system shall have a 120 volt, 60 hertz, 7 amp AC input with an output of 40 amps 12 volts DC. The battery charging system shall be connected directly to the shoreline to ensure the batteries remain fully charged while the vehicle is in the fire station or firehouse.

The system shall include a remote charging status indicator panel. The panel shall consist of two (2) LED lights to provide a visual signal if battery voltage is good or drops below 11.5 volts. The microprocessor shall be continuously powered from the battery to provide the charge status.

### **3.176.00 CAB USB CHARGING PORT**

A dual USB charging port with 2.1A total power for cell phones, chargers, etc. shall be installed driver side dash, officer side dash and officer side 3x3 post rear facing. The receptacles shall be wired battery hot.

### **3.177.00 DPF REGENERATION OVERRIDE**

A momentary override switch shall be provided for the Diesel Particulate Filter (DPF) regeneration. The switch will inhibit the regeneration process until the switch is reset or the engine is shut down and restarted. The switch shall be located within reach of the driver.

### **3.178.00 LED CAB HEADLIGHTS**

Peterson LED headlights shall be provided. LED lights shall be provided in the low and high beam position of the head lamp assembly.

### **3.179.00 CAB DOORSTEP AREA LIGHTING**

There shall be eight (8) clear TecNiq model DO? LED lights provided to illuminate the cab step well areas. Two (2) lights shall be located at each door area, one (1) above each step. The lights shall have polished stainless steel housings. The lights shall be activated by the cab door ajar circuit.

### **3.180.00 CAB TURN SIGNALS**

A pair of TecNiq LED (light Emitting Diode) turn signal lights with clear lens shall be installed on the front of the cab. The strip type lights shall be 1.25" high x 15" long and be mounted in a polished cast aluminum housing between the quad bezels.

### **3.181.00 AERIAL BODY PERFORMANCE**

The aerial body shall be designed to permit the reloading of fire hose without raising the aerial from the stored position. This requirement is essential to the effective operation of the apparatus when pumper operations are required. **NO EXCEPTIONS.**

The apparatus body shall be constructed entirely of aluminum extrusions with interlocking aluminum plates. An extruded modular aluminum body is required due to the high strength-to-weight ratio of aluminum, corrosion-resistant body structure, easy damage repair, and lighter overall body weight to allow for increased equipment carrying capacity.

The apparatus shall incorporate a rescue style body design to maximize compartment space. The rescue style left and right side body shall combine upper and lower compartments to provide more efficient use of body storage capacity.

The entire vehicle shall be constructed of aluminum extrusions. Body designs that incorporate steel sub-frames connected to aluminum compartments are not as corrosion-resistant and not acceptable.

### **3.182.00 BODY MAINFRAME (NO EXCEPTIONS)**

The body mainframe shall be entirely constructed of aluminum. The complete framework shall be constructed of 6061T6 and 6063T5 aluminum alloy extrusions welded together using 5356 aluminum alloy welding wire.

The mainframe shall incorporate a series of vertical frame components connected in series. Each vertical frame assembly shall be constructed with 3" x 3" extrusions welded together in a square frame configuration. The open center shall permit the installation of a tunnel for ground ladder storage. The mainframe shall be held together from front to rear by two (2) solid 1/2" x 3" aluminum braces on each side of the vertical frame components. The braces shall also serve as the connection point between the torque box and body frame. The body side compartments shall be connected and supported by the extruded aluminum mainframe assembly.

### **3.183.00 BODY SIDE ASSEMBLIES**

The left and right side body assemblies shall be framed with 6063T5 1 1/2" x 4" 3/16" wall extrusions. The left side body compartments shall be framed to make full height compartments ahead and behind the wheel well opening. The body side assemblies shall be designed so that the compartment walls are not required to support the body. The compartments shall be interlocked and welded to the side assembly extrusions.

The top of the body side assemblies shall be supplied with embossed diamond plate covers with polished corners

to minimize maintenance and provide service access to electrical components.

### **3.184.00 STABILIZER OPENINGS**

The body shall be designed to accommodate a four (4) stabilizer aerial system. One (1) opening shall be supplied behind the rear axle as close to the wheel well opening as possible to maximize rear angle of departure and to prevent the stabilizer pads from contacting the ground during driving. The second set shall be mounted just behind the pump compartment. The openings shall be framed in aluminum extrusions. A stabilizer cover made from treadplate shall be supplied on the extendable stabilizer. The cover shall provide a pleasing appearance and mounting location for a red stabilizer warning light as outlined in NFPA 1901.

The stabilizer openings shall be supplied with clear lights to illuminate the stabilizers and the ground surrounding the openings. The lights shall illuminate when any stabilizer is moved from the stored position.

### **3.185.00 BODY MOUNTING SYSTEM**

The body shall attach to the integral torque box with grade 8 bolts connected through steel mounts welded on the side of the torque box. To isolate dissimilar metals a 1/4" fiber-reinforced rubber dielectric barrier between the aluminum body and steel torque box shall be supplied. Body designs that weld to the aerial torque box or chassis frame rails shall not be acceptable due to the stress imposed on the vehicle during road travel and aerial operations.

### **3.186.00 REAR BODY DESIGN**

The rear body shall be designed to provide ground ladder storage, hose deployment, and service access to aerial components. The center rear of the body shall be open for ground ladder storage. The area below the ground ladder storage shall be for a waterway inlet (if applicable), the stabilizer control panel and have access doors to hydraulic components.

The aerial master control panel that is located on the rear of the body shall consist of a master switch, interlock light, and indicators that illuminate when each stabilizer is deployed. The stabilizer controls shall be divided into two (2) boxes located one (1) each side on the rear body so the operator may observe the stabilizers being deployed on each side of the apparatus as outlined in NFPA 1901.

### **3.187.00 SIDE AERIAL ACCESS STAIRCASE**

A single access staircase shall be supplied on the driver's side of the apparatus to the aerial turntable. The staircase shall incorporate a pocket-style drop-down step in the body rubrail to reduce ground to staircase step height when the unit is up on jacks. The angled staircase shall be supplied with extruded aluminum handrails on both sides of the staircase frame.

### **3.188.00 WATER TANK MOUNTING SYSTEM**

The body design shall allow the booster tank to be completely removable without disturbing or dismantling the apparatus body structure. The water tank shall rest on top of a 3" x 3" frame assembly covered with rubber shock pads and corner braces formed from 3/16" angled plate to support the tank.

The booster tank mounting system shall utilize a floating design to reduce stress from road travel and vibration. To maintain low vehicle center of gravity, the water tank bottom shall be mounted within 5" of the frame rail top. Designs that store ground ladders under the water tank and raise center of gravity shall not be acceptable.

### **3.189.00 COMPARTMENTS**

All body compartment walls and ceilings shall be constructed from 1/8" formed aluminum 3003 H14 alloy plate. Each compartment shall be modular in design and shall not be part of the body support structure.

Compartment floors shall be constructed of 1/8" aluminum diamond plate welded in place. Compartment floors that are over 15" deep shall be supported by a minimum 1.5" x 3" x 1/8" walled aluminum extrusions. The compartment seams shall be sealed using a permanent pliable silicone caulk. A series of louvers shall be supplied to facilitate ventilation of each compartment. Each louver shall be 3" wide by 3/4" tall and 1/2" deep.

### **3.190.00 HANDRAILS**

Access handrails shall be provided at all step positions, including, but not limited to, the rear corner tailboard and installed to NFPA 1901 15.8. All body handrails shall be constructed of maintenance- free, corrosion-resistant, extruded aluminum. Handrails shall be a minimum of 1.25" OD and shall be installed between chrome end stanchions at least 2" from the mounting surface to allow for access with a gloved hand. The extruded aluminum shall be ribbed to assure a good grip for personnel safety.

The handrails shall be installed as follows:

Two (2) 48" handrails, one (1) each side, located on the aerial access staircase.

### **3.191.00 STEPS, STANDING, AND WALKING SURFACES**

The maximum stepping distance shall not exceed 18", with the exception of the ground to first step. The ground to first step shall not exceed 24". The ground to first step shall be maintained when the stabilizers are deployed by an auxiliary set of steps installed at the aerial access staircase. All steps or ladders shall sustain a minimum static load of 500 lbs. without deformation as outlined in NFPA 15.7.2.

All exterior steps shall be designed with a minimum slip resistance of 0.52 when tested wet using the Brungraber Mark II tester in accordance with the manufacturer's instructions.

### **3.192.00 APPARATUS WARNING LABELS**

A label shall be supplied on the rear body to warn personnel that riding in or on the rear step is prohibited as outlined in NFPA 1901 15.7.5. A label shall be applied to both sides of the apparatus and the rear to warn operators that the aerial is not insulated.

### **3.193.00 RUBRAIL**

The body shall have a rubrail along the length of the body on each side and at the rear. The rubrail shall be constructed of minimum 3/16" thick anodized aluminum 6463T6 extrusion. The rubrail shall be a minimum of 2.75" high x 1.25" deep and shall extend beyond the body width to protect compartment doors and the body side.

The rubrail shall be of a C-channel design to allow marker and warning lights to be recessed inside for protection. The top surface of the rubrail shall have a minimum of five (5) serrations raised .1" high with cross grooves to provide a slip-resistant edge for the rear step and running boards. The rubrail shall be spaced away from the body using 3/16 " nylon spacers. The ends of each section shall be provided with a rounded corner piece. The area inside the rubrail C-channel shall be inset with a reflective material for increased side and rear visibility.

### **3.194.00 PUMP COMPARTMENT**

The pump operator's control panel and pump compartment shall be located at the front of the body. The operator's controls and gauges shall be located on the left side (street side) of the apparatus. The compartment shall be designed following NFPA 1901 15.6.

A side running board formed from 1/8" aluminum diamond plate shall be provided and shall extend the full

length of the pump module on each side of the apparatus. The running board shall be bolted to the pump compartment for rigidity and to provide easy removal for replacement in the case of damage.

### **3.195.00 ISO COMPLIANCE**

The manufacturer shall ensure that the construction of the apparatus aerial body shall be in conformance with the established ISO-compliant quality system. All written quality procedures and other procedures referenced within the pages of the manufacturer's Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts this process shall be strictly adhered to. By virtue of its ISO compliance the manufacturer shall provide an apparatus aerial device that is built to exacting standards, meets the customer's expectations, and satisfies the customer's requirements.

### **3.196.00 REAR BODY PANELS**

The rear body panels shall be smooth 1/8" un-painted aluminum plate to facilitate rear body striping. The panels shall be bolt-on for a clean appearance and easier repair in the event of damage.

### **3.197.00 DRIVER SIDE COMPARTMENTS**

The driver's side of the body shall have extended height rescue style compartments and provide 120.7 cubic feet of storage, which exceeds the minimum NFPA 1901 Chapter 8.5 requirement of 40 cubic feet.

There shall be one (1) compartment (L1) over the forward stabilizers. The compartment shall be approximately 31" wide x 28" high x 17" deep (upper) and 31" wide x 29" high x 14" deep (lower) and contain approximately 15.82 cubic feet of storage space. The door opening shall be approximately 31" wide x 57" high.

There shall be one (1) compartment (L2) behind the forward stabilizers. The compartment shall be approximately 48" wide x 14.5" high x 17" deep (upper) and 48" wide x 54.5" high x 25.5" deep (lower) and contain approximately 45.45 cubic feet of storage space. The door opening shall be approximately 48" wide x 69" high.

There shall be one (1) compartment (L3) over rear wheels. The compartment shall be approximately 50.5" wide x 18" high x 26" deep and contain approximately 13.68 cubic feet of storage space. The door opening shall be approximately 50.5" wide x 18" high.

There shall be one (1) compartment (L4) over rear wheels. The compartment shall be approximately 52.5" wide x 18" high x 20" deep and contain approximately 10.94 cubic feet of storage space. The door opening shall be approximately 52.5" wide x 18" high.

There shall be one (1) compartment (LS) over the rear stabilizer. The compartment shall be approximately 69.5" wide x 15" high x 18" deep (upper), 19.25" wide x 27.5" high x 23" deep (lower forward), 33.5" wide x 27.5" high x 14" deep (lower center), 16.75" wide x 27.5" high x 23" deep (lower rearward) and contain approximately 31.50 cubic feet of storage space. The door opening shall be approximately 69.5" wide x 42.5" high.

There shall be one (1) compartment (L6) down low ahead of the rear stabilizer with a horizontally-hinged single pan door constructed of the same material/finish as the body wheel wells. The compartment shall be approximately 15.5" wide x 8" high x 23" deep and contain approximately 1.65 cubic feet of storage space. The door opening shall be approximately 15.5" wide x 8" high.

There shall be one (1) compartment (L7) down low behind the rear stabilizer with a horizontally-hinged single pan door constructed of the same material /finish as the body wheel wells. The compartment shall be approximately 15" wide x 8" high x 23" deep and contain approximately 1.60 cubic feet of storage space. The door opening shall be approximately 15" wide x 8" high.

### **3.198.00 OFFICER SIDE COMPARTMENTS**

The officer's side of the body shall have extended height rescue style compartments ahead of the rear wheel and provide 88.55 cubic feet of storage.

There shall be one (1) compartment (R1) over the forward stabilizers. The compartment shall be approximately 31" wide x 28" high x 16" deep (upper) and 31" wide x 29" high x 14" deep (lower) and contain approximately 15.32 cubic feet of storage space. The door opening shall be approximately 31" wide x 57" high.

There shall be one (1) compartment (R2) behind the forward stabilizers. The compartment shall be approximately 48" wide x 14.5" high x 16" deep (upper) and 48" wide x 54.5" high x 26" deep (lower) and contain approximately 45.80 cubic feet of storage space. The door opening shall be approximately 48" wide x 69" high.

There shall be one (1) compartment (R3), ahead of the rear stabilizer. The compartment shall be approximately 15.5" wide x 32.5" high x 23" deep and contain approximately 6.71 Cubic feet of storage space. The door opening shall be approximately 15.5" wide x 32.5" high.

There shall be one (1) compartment (R4), over the rear stabilizer. The compartment shall be approximately 31" wide x 20.5" high x 14" deep and contain approximately 5.15 Cubic feet of storage space. The door opening shall be approximately 31" wide x 20.5" high.

There shall be one (1) compartment (R5), behind the rear stabilizer. The compartment shall be approximately 36" wide x 32.5" high x 23" deep and contain approximately 15.57 Cubic feet of storage space. The door opening shall be approximately 36" wide x 32.5" high.

The hosebed shall be located on the right side of the apparatus and contain 44.59 cubic feet. The hosebed shall measure 22" deep by 17" wide and 206" long.

The hosebed compartment deck shall be constructed entirely from maintenance free, extruded aluminum. Extrusions shall have an anodized ribbed top surface for maintenance free service life. The aluminum slats shall be a combination of three (3) 3/4" x 2-3/4" and one (1) 3/4" x 7-1/2" extrusion riveted into a one-piece grid system to prevent the accumulation of water and allow ventilation to assist in drying hose. The hosebed compartment shall be free of sharp edges and projections to prevent hose damage. The compartment deck design shall incorporate a track for the installation of adjustable hosebed dividers. The track shall hold the nut straight, so only a Philip's head screwdriver is required to adjust the divider from side to side.

The inboard hosebed side shall consist of 3/16" aluminum plate welded, from the backside, into a framework of 3" x 3" x 3/16" and 1-1/2" x 3" x 3/16" aluminum slotted extrusions. The plate shall be welded both vertically and horizontally for high rigidity. The outboard hosebed side shall be double wall construction. The outer body wall shall be constructed of 1-1/2" x 4" x 3/16" aluminum extrusions with 3/16" aluminum plate welded flush with the outer surface. The 3/16" outer plate shall be re-enforced with 1" x 1-1/2" x 3/16" aluminum extrusions for rigidity. An .090 aluminum plate liner shall be installed to prevent damage to the outer painted body side from hose couplings.

### **3.199.00 TRIPLE CROSSLAY HOSEBED**

Three (3) crosslay hosebeds shall be provided at the front area of the body. Two (2) crosslay sections shall have a capacity for up to 200' of 2.0" double-jacket fire hose single stacked and preconnected to the pump discharge. One (1) crosslay section shall have a capacity for up to 150-200' of 2.5" double-jacket fire hose single stacked and preconnected to the pump discharge. The crosslay decking shall be constructed entirely of maintenance-free 3/4" x 2-3/4" hollow aluminum extrusions.

Stainless steel rollers with nylon guides set in aluminum extrusions shall be installed horizontally and vertically on each end of the crosslay to allow easy deployment of the hose and help protect the body paint.

### **3.200.00 DUNNAGE PLAN**



A dunnage pan constructed of 3/16" (.188") aluminum treadplate shall be located rearward of the crosslays. The dunnage pan shall be sized to maximize available storage space.

### **3.201.00 REAR PIKE POLE STORAGE**

Pike poles storage shall be provided at the rear of the body for six (6) pike poles. The storage area shall be labeled for two (2) 6' poles, two (2) 8' poles, and two (2) 12' poles. The pike poles shall be secured by either "J" slotted locking tubes and/or hinged door(s) that matches the rear body finish.

### **3.202.00 UPPER DUNNAGE AREA EXTENSION**

The upper dunnage area shall be provided with an extension to increase its storage capacity. The extension shall be approximately 34" long x 58" wide tapering in height from 12.75" at the front to 8" high across the rear.

Coupled with the body's integral open storage area of 36" long x 55" wide x 14" deep, the upper dunnage area contains approximately 27 cu. ft. of open storage space. The walls of the dunnage area extension shall be constructed of aluminum diamond plate.

### **3.203.00 LADDER TUNNEL DOORS**

A pair of 3/16" (.188) aluminum smooth plate doors with D-ring style handles shall be installed for access to the rear ladder tunnel. Each door shall open a full 90 degrees to allow easy removal of ground ladders. The doors shall match the rear body finish.

### **3.204.00 REAR CONTROL DOORS**

The driver/officer jack and master control switch panels at the rear of the body shall be provided with access doors. The doors shall have the same finish as the rear of the body.

### **3.205.00 OUTRIGGER COVERS**

Two (2) piece outrigger covers constructed of .187" aluminum smooth plate painted job color shall be provided for the jack leg openings. One piece of the cover shall be sized to cover just the extending outrigger in order to require a minimal amount of set-up space. The second piece of the cover shall be fixed and mounted to the body to cover the remaining outrigger opening.

### **3.206.00 AUXILIARY GROUND PADS**

Four (4) auxiliary ground pads shall be provided. The pads shall be 26" x 26" x 1/2" thick aluminum plate with a 20 degree formed handle with cutout for hand hold. The pads shall be stored in double brackets holding two (2) pads each that are welded below the body.

### **3.207.00 OUTRIGGER CONTROL STORAGE BOX**

A storage box shall be provided for the handheld aerial outrigger control. The box shall be approximately 14" wide x 8" high x 12" deep. The box shall include a hinged diamond plate door with push button latch. The box shall be located in the driver side rear staircase above second step from the bottom recessed in the back wall.

### **3.208.00 SINGLE COMPARTMENT DOOR**

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall bevel and shall be constructed from 3/16" (0.188") aluminum plate. The inner door pan shall be constructed from 3/32" (0.090") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail.

The compartment door shall have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle with #459 latch shall be provided on the door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The compartment door shall be securely attached to the apparatus body with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the body and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe. The door shall have a gas shock-style hold-open device.

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): R3, R4, R5

### **3.209.00 SINGLE COMPARTMENT DOOR**

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall beveled and shall be constructed from 3/16" (0.188") aluminum plate. The inner door pan shall be constructed from 3/32" (0.090") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail.

The compartment door shall have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle with #459 latch shall be provided on the door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The compartment door shall be securely attached to the apparatus body with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the body and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe. The door shall have gas shock-style hold-open devices.

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s) : L3, L4

### **3.210.00 PAINTED ROLL UP COMPARTMENT DOOR**

A ROM brand roll up door painted job color shall be provided on a compartment up to 45" tall. The door(s) shall be installed in the following location(s): L5.

The Robinson door slats shall be double wall box frame and manufactured from anodized aluminum. The slats shall have interlocking end shoes on each slat. The slats shall have interlocking joints with a PVC/vinyl inner

seal to prevent any metal to metal contact and inhibit moisture and dust penetration.

The track shall be painted aluminum with a finishing flange incorporated to provide a finished look around the perimeter of the door without additional trim or caulking. The track shall have a replaceable side seal to prevent water and dust from entering the compartment.

The doors shall be counterbalanced for ease in operation. A full width latch bar shall be operable with one hand, even with heavy gloves. Securing method shall be a positive latch device.

A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation.

The door opening shall be reduced by 2” in width and approximately 8-9” in height depending on door height.

### **3.211.00 PAINTED ROLL UP COMPARTMENT DOOR**

A ROM brand roll up door painted job color shall be provided on a compartment greater than 45” tall. The door(s) shall be installed in the following location(s): L1, L2, R1, R2.

The Robinson door slats shall be double wall box frame and manufactured from anodized aluminum. The slats shall have interlocking end shoes on each slat. The slats shall have interlocking joints with a PVC/vinyl inner seal to prevent any metal to metal contact and inhibit moisture and dust penetration.

The track shall be painted aluminum with a finishing flange incorporated to provide a finished look around the perimeter of the door without additional trim or caulking. The track shall have a replaceable side seal to prevent water and dust from entering the compartment.

The doors shall be counterbalanced for ease in operation. A full width latch bar shall be operable with one hand, even with heavy gloves. Securing method shall be a positive latch device.

A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation.

The door opening shall be reduced by 2” in width and approximately 8-9” in height depending on door height.

### **3.212.00 STRAP FOR ROLL-UP DOOR**

A bungee type strap shall be provided on the roll-up doors to assist in closing the door. The strap shall be affixed to both the door and the interior, so the strap stays inside the compartment when lowering. The strap shall be provided on full height and high side (upper) compartments.

### **3.213.00 ALUMINUM COVER HOSE BED**

An aluminum cover shall be provided to protect fire hose stored in the hose bed.

The hose bed cover shall be constructed of 1/8” aluminum tread brite and shall be two piece in design. Cover shall be hinged with full-length stainless steel knuckle hinges. For ease of use a pneumatic cylinder (gas shock) shall be used on each cover. Each cover shall also have a recessed handle.

Each cover shall have a single water and corrosion resistant switch that will activate the 2” red flashing door ajar light in the cab to alert the driver that a cover is open.

### **3.214.00 ZOLATONE PUMP PANELS**

The driver and officer side pump panels shall have a black zolatone painted finish.

### **3.215.00 HINGED GAUGE PANEL**

The driver side upper gauge panel(s) shall be hinged to provide access to panel mounted electrical connections.

The gauge panel(s) shall be hinged to open upward with a full-length stainless steel piano type hinge with 1/4" pins. The hinge shall be "staked" on every other knuckle to prevent the pin from sliding.

The gauge panel(s) shall include latches to secure the panel in the closed position and two (2) mechanical/pneumatic (as applicable with the panel size) hold-opens for the open position.

### **3.216.00 PUMP ACCESS DOOR**

The officer side pump module shall include an upper horizontally-hinged pump access door.

The door shall be constructed of 3/16" (.187") aluminum smooth plate. The compartment door shall be securely attached with a full-length stainless steel piano type hinge with 1/4" pins.

The hinge shall be "staked" on every other knuckle to prevent the pin from sliding. The door shall include two (2) push-button style latches to secure the door in the closed position and one hold-open device to hold the door in the open position. The door shall have the same finish as the pump panels.

### **3.217.00 PUMP PANEL TAGS**

Color coded pump panel labels shall be supplied to be in accordance with NFPA 1901 compliance.

### **3.218.00 AIR HORN SWITCH**

A heavy duty weatherproof push-button switch shall be installed at the pump operator's panel to operate the air horns.

The switch shall be labeled "Evacuation Alert". Location: driver side pump panel.

### **3.219.00 BOOSTER TANK**

The booster tank shall be T-shaped in configuration and shall have a capacity of 300 gallons. The booster tank shall be constructed of polypropylene material. The booster tank shall be completely removable without disturbing or dismounting the apparatus body structure. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal.

The booster tank top, sides, and bottom shall be constructed of a minimum 1/2" (0.50") thick black UV-stabilized copolymer polypropylene. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The tank cover shall be constructed of 1/2" thick polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions.

The tank shall have a combination vent and manual fill tower with a hinged lid. The fill tower shall be constructed of 1/2" polypropylene and shall be a typical dimension of 8" x 8" outer perimeter (subject to change for specific design applications). The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid.

The booster tank shall have two (2) tank plumbing openings. One (1) for a tank-to-pump suction line with an anti-swirl plate, and one (1) for a tank fill line. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank and be capable of withstanding sustained fill rates per the tank fill inlet size.

The sump shall be constructed of a minimum of 1/2" polypropylene. The sump shall have a minimum 3" N.P.T. threaded outlet for a drain plug per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3" above the inside floor.

The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength.

Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with an I.D. of 3" or larger that is designed to run through the tank. This outlet shall direct the draining of overflow water past the rear axle, thus reducing the possibility of freeze-up of these components in cold environments.

This drain configuration shall also assure that rear axle tire traction shall not be affected when moving forward.

The booster tank shall undergo extensive testing prior to installation in the truck. All water tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale.

Each tank shall be weighed empty and full to provide precise fluid capacity. Each tank shall be delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. Engineering estimates for capacity calculations shall not be permitted for capacity certification. The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

A tag shall be installed on the apparatus in a convenient location and contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag shall include the capacity of the water and foam (s), the maximum fill and pressure rates, the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information. The QR code will allow the user to connect with the tank manufacturer for additional information and assistance.

The tank shall have a limited Lifetime warranty that provides warranty service for the life of the fire apparatus in which the tank is installed. Warranties are transferable if the apparatus ownership changes by requesting the transfer from the tank manufacturer.

### **3.220.00 2" TANK FILL**

One (1) 2" pump-to-tank fill line having a 2" manually operated full flow valve. The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times. The fill line shall be controlled using a chrome handle with an integral tag.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

### **3.221.00 3" TANK TO PUMP**

One (1) manually operated 3" Akron valve shall be installed between the pump suction and the booster tank in order to pump water from the tank. The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

### **3.222.00 REAR LADDER STORAGE**

A ladder storage tunnel shall be provided beneath the aerial device framework. There shall be access to the ladders via an opening at the rear.

The ladders will be held captive top and bottom by aluminum tracks and slide on friction reducing material. All ladders shall be removable individually without having to remove any other ladder.

The ladder tunnel shall hold: (2) PEL-35, PEL-28, PEL-24, PRL-20, PRL-16 and FL-10 (with rubber block feet and no handles).

### **3.223.00 SLIDE-OUT PLATFORM**

The slide-out platform shall be approximately 21" deep and shall be constructed of 1/8" aluminum treadplate. The platform shall be mounted under the apparatus body. The platform shall utilize a maintenance-free slide system incorporating stainless steel shoulder bolts that slide in slotted heavy wall aluminum angles. Notches shall be provided at each end of the slots to hold the platform in both the extended and retracted positions.

A chrome grab handle shall be provided on the front face of the platform for ease of operation.

Non-slip aluminum handrail(s) with chrome plated stanchions shall be provided as best suited for use with the platform operation.

If applicable, NFPA pump throttle height requirement shall be measured from the top of the slide-out platform on all aerials and from the ground on side mounted pump operator panels on non-aerial apparatus.

Location: below driver side pump panel.

### **3.224.00 REAR SLIDE-OUT PLATFORM**

The slide-out platform shall be 18" deep and shall be constructed of 1/8" aluminum tread brite. The stepping surface shall consist of a multi-directional, aggressive gripping surface incorporated into the tread plate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4". The platform shall be recessed

into the rear of the apparatus body below the hosebed. The platform shall utilize a maintenance free slide system incorporating formed aluminum plate(s) and nylatron slide pads. A gas shock shall be provided to hold the platform in both the extended and retracted positions.

An assist handrail shall consist of one (1) 1-1/4" OD 6063T5 anodized aluminum tube mounted between chrome stanchions. The handrail shall be machine extruded with an integral ribbed surface to assure a good grip for personnel safety.

### **3.225.00 RIGHT SIDE PUMP PANEL STEP PACKAGE**

An intermediate pump panel step with three (3) folding step and a minimum of one (1) handrail shall be provided at the right side pump panel.

### **3.226.00 INTERMEDIATE PUMP PANEL STEP**

The intermediate step shall be constructed of 3/16" (.187") aluminum treadplate. The step shall include a multi-directional, aggressive gripping surface incorporated into the treadplate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4". The step shall be bolted onto the pump module and be easily removable for replacement in the case of damage.

### **3.227.00 FOLDING STEP**

Innovative Controls dual lighted LED folding steps shall be located one (1) above and two (2) below the intermediate step. The folding steps shall meet current NFPA in step height and surface area.

Innovative Controls dual lighted LED folding step with LED lights integral to the step on the top to provide NFPA requirements of 2 fc (20 lx) on the stepping surface. Folding step shall also have a LED light integral to the bottom of the step to meet NFPA requirements of a stepping surface up to 18" below the step. The folding step shall sustain a minimum static load of 500 lb with a 3 to 1 safety factor. The folding step shall also meet NFPA slip resistance qualifications. Corrosion resistance shall be demonstrated by a 1000 hr salt spray test with no visible signs of deterioration of the step body or hardware.

### **3.228.00 HANDRAIL**

A minimum of one (1) handrail shall be installed for the step package in compliance with current NFPA. The handrail shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

### **3.229.00 MUD FLAPS**

Black mud flaps shall be provided for the body wheel wells.

### **3.230.00 FUEL FILLS**

A recessed fuel fill shall be provided at the driver side rear wheel well area.

### **3.231.00 SWIRLED FINISH (NO EXCEPTIONS)**

The body compartment interior (ceilings and walls) shall have a swirl finish. The swirl finish shall also be included on the inner pan of hinged doors and compartment floors (if smooth plate) and tool compartments (as applicable). Compartment floors shall remain diamond plate if so equipped.

### **3.232.00 SIDE BODY PLATEWORK**

The painted aluminum smooth plate body side panels shall be flush with the supporting extrusions.

### **3.233.00 ANODIZE ALUMINUM TRIM**

An anodize aluminum trim shall be located at the bottom edge of all body compartment openings including pump enclosure with painted edge (as applicable). The trim shall provide added protection of the painted surface of the body when equipment is removed from the compartment.

### **3.234.00 BODY WHEEL WELL**

The body wheel well frame shall be constructed from 6063-T5 aluminum extrusion with a slot the full length to permit an internal fit of 3/16" (0.188") aluminum smooth plate supports. The outer body side wheel well plate shall be 3/16" (0.188") aluminum smooth plate welded flush with the body side and painted job color.

The fenderettes shall be bolt-on and shall be easily removable. The fenderette shall be constructed from .080" aluminum with a mirror finish. The fenderette shall be 2 1/2" (2.5") wide x 2 1/4" (2.25") tall with a 26 1/8" (26.125") radius. A "P" shaped rubber gasket shall be provided between the fenderette and wheel well body panel.

The wheel well liners shall be constructed of a 3/16" (.187") composite material. The liners shall be bolt-on and shall provide a maintenance-free and damage-resistant surface.

### **3.235.00 CORNER GUARD**

Diamond plate corner guard for the rear compartment face forward of the side facing staircase(s) constructed of (.063") aluminum treadplate. Guard shall wrap around corner.

### **3.236.00 SCBA STRAP**

Straps shall be provided in each exterior storage compartment to provide secondary means to hold each SCBA bottle in the compartment. The straps shall be constructed from 1" nylon webbing formed in a loop. The strap(s) shall be mounted to the storage compartment ceiling directly inside the door opening at each bottle location.

### **3.237.00 WHEEL WELL SCBA STORAGE**

SCBA/Fire Extinguisher Storage. SCBA bottle and Fire Extinguisher storage with hinged doors (doors to match wheel well material) with push button latches. Note one aluminum tray for each SCBA bottle in double storage compartments. Each side of body to have (2) Double SCBA bottle storage compartments (1) offset forward over each tandem wheel and (1) single storage compartment offset rearward over forward tandem wheel and Fire Extinguisher storage compartment offset to rear over rearward tandem wheel.

### **3.238.00 SPEEDY DRY STORAGE WELL (NO EXCEPTIONS)**

A Speedy Dry storage compartment with hinged door and push button latch shall be provided in the body wheel well area.

The door shall match wheel well area material and finish and be wired to door ajar.

The storage area shall include a slide out bin (sanded finish) with a grab handle on the front for easy deployment on scene.

The bin shall be designed with a hinged door on top for replenishing the Speedy Dry absorbent material and a gated 2" valve at the bottom for dispensing.



Capacity: 50 lbs

Location: Officer Side Rear Wheel Well

### **3.239.00 PUMP RATING**

The fire pump shall be rated at 2000 GPM.

### **3.240.00 FIRE PUMP SYSTEM (NO EXCEPTIONS)**

The pump shall be a midship-mounted Hale QMAX single stage centrifugal pump. The pump shall be mounted on the chassis frame rails of commercial or custom truck chassis and have the capacity of 1,250 to 2,250 gallons per minute (U.S. GPM) NFPA 1901 rated performance and shall be split-shaft driven from the truck transmission.

The entire pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 psi (207 MPa). All metal moving parts in contact with water shall be of high quality bronze or stainless steel. Pump body shall be horizontally split in two sections, for easy removal of impeller assembly including wear rings and bearings from beneath the pump without disturbing pump mounting or piping.

The pump impeller shall be hard, fine grain bronze of the mixed flow design and shall be individually ground and hand balanced. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency.

The pump shaft shall be heat-treated, corrosion-resistant stainless steel and shall be rigidly supported by three (3) bearings for minimum deflection. The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure-balanced to exclude foreign material. The remaining bearings shall be heavy-duty, deep groove ball bearings in the gearbox and shall be splash-lubricated. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of the gearbox.

Two (2) 6" diameter suction ports with 6" NST male threads and removable screens shall be provided, one each side. The ports shall be mounted one (1) on each side of the midship pump and shall extend through the side pump panels. Inlets shall come equipped with long handle chrome caps.

### **3.241.00 DISCHARGE MANIFOLD**

The pump system shall utilize a stainless steel discharge manifold system that allows a direct flow of water to discharge valves. The manifold and fabricated piping systems shall be constructed of a minimum of Schedule 10 stainless steel to reduce corrosion.

### **3.242.00 PUMP SHIFT**

The pump shift shall be pneumatically-controlled using a power shifting cylinder.

The power shift control valve shall be mounted in the cab and be labeled "PUMP SHIFT". The apparatus transmission shift control shall be furnished with a positive lever, preventing accidental shifting of the chassis transmission.

A green indicator light shall be located in the cab and be labeled "PUMP ENGAGED". The light shall not activate until the pump shift has completed its full travel into pump engagement position.

A second green indicator light shall be located in the cab and be labeled "OK TO PUMP". This light shall be energized when both the pump shift has been completed and the chassis automatic transmission has obtained

converter lock-up (4th gear lock-up).

### **3.243.00 TEST PORTS**

Two (2) test plugs shall be pump panel mounted for third party testing of vacuum and pressures of the pump.

### **3.244.00 GEARBOX COOLER**

A gearbox cooler shall be provided to maintain safe operating temperatures during prolonged pumping operations for pump rating 1500 GPM and over.

### **3.245.00 PUMP CERTIFICATION**

The pump, when dry, shall be capable of taking suction and discharging water in accordance with current NFPA 1901. The pump shall be tested at the manufacturer's facility by an independent, third-party testing service. The conditions of the pump test shall be as outlined in current NFPA 1901.

The tests shall include, at a minimum, the pump test, the pumping engine overload test, the pressure control system test, the priming device tests, the vacuum test, and the water tank to pump flow test as outlined in current NFPA 1901.

A piping hydrostatic test shall be performed as outlined in current NFPA 1901.

The pump shall deliver the percentage of rated capacities at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure
- 100% of rated capacity at 165 psi net pump pressure
- 70% of rated capacity at 200 psi net pump pressure
- 50% of rated capacity at 250 psi net pump pressure

A test plate, installed at the pump panel, shall provide the rated discharges and pressures together with the speed of the engine as determined by the certification test, and the no-load governed speed of the engine.

A Certificate of Inspection certifying performance of the pump and all related components shall be provided at time of delivery. Additional certification documents shall include, but not limited to, Certificate of Hydrostatic Test, Electrical System Performance Test, Manufacturer's Record of Pumper Construction, and Certificate of Pump Performance from the pump manufacturer.

### **3.246.00 SPEED COUNTER**

The test connection shall be installed on the pump panel to manually verify the vehicle engine speed displayed on the electronic tachometer.

### **3.247.00 STEAMERS, FLUSH+1**

The pump 6" steamer intake(s) shall be mounted approximately 1" from the pump panel to back of cap when installed. The "Flush+1" dimension can vary + or - 1-1/4" or as practicable depending on the pump module width and options selected. (Example 72" or 76" modules.)

Location: driver's side, officer's side.

### **3.248.00 MECHANICAL PUMP SEAL**

The midship pump shall be equipped with a high quality, spring loaded, self-adjusting mechanical seal capable of

providing a positive seal to atmosphere under all pumping conditions. This positive seal to atmosphere must be achievable under vacuum conditions up to 26 Hg (draft) or positive suction pressures up to 250 psi.

The mechanical seal assembly shall be 2 inches in diameter and consist of a carbon sealing ring, stainless steel coil spring, Viton rubber boot, and a tungsten carbide seat, with a Teflon back-up seal provided.

Only one mechanical seal shall be required, located on the first stage suction (inboard) side of the pump and be designed to be compatible with a one piece pump shaft (no exceptions). A continuous cooling flow of water from the pump shall be directed through the seal chamber when the pump is in operation.

### **3.249.00 MANUAL MASTER DRAIN**

A manual master drain valve shall be installed and operated from the driver side. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal.

The manual master drain valve shall have twelve (12) individually-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines. It shall be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 PSI.

The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices.

### **3.250.00 PUMP COOLER**

The pump shall have a 3/8" line installed from the pump discharge to the booster tank to allow a small amount of water to circulate through the pump casing in order to cool the pump during sustained periods of pump operation when water is not being discharged. The pump cooler line shall be controlled from the pump operator's panel by a Innovative Controls 1/4 turn valve with "T" handle. Each 1/4 turn handle grip shall feature built-in color-coding labels and a verbiage tag

### **3.251.00 PRIMING SYSTEM**

An electrically-driven Hale ESP priming pump shall be provided for the water pump. The primer shall be positive displacement rotary vane type that requires no lubricant. The primer motor shall be heat-treated, anodized aluminum specially coated for wear and corrosion resistance.

One (1) priming control, located at the pump operator's position, shall open the priming valve and start the priming motor. The priming valve shall be electronically interlocked to the "Park Brake" circuit to allow priming of the pump before the pump is placed in gear.

### **3.252.00 2.5" LEFT INTAKE**

One (1) 2-1/2" suction inlet with a manually operated 2-1/2" Akron valve shall be provided on the left side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The outlet of the valve shall be connected to the suction side of the pump with the valve body located behind the pump panel. The valve shall come equipped with a brass inlet strainer, 2-1/2" NST female chrome inlet swivel, and shall be equipped with a chrome plated rockerlug plug with a retainer device.

The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance, and decreased friction loss.

A 3/4" bleeder valve assembly will be installed on the left side pump panel.

### **3.253.00 INLET VALVE (NO EXCEPTIONS)**

A Hale Master Intake Valve (MIV-E) shall be provided for the specified intake. The large diameter inlet valve shall be capable of achieving an NFPA test rating of 1500 GPM through a single 6" suction hose.

The inlet valve shall be operated by a 12 VDC electric motor with a remote switch provided at the pump operator's position. The 12 VDC motor shall be provided with an automatic resetting, thermally-compensated over-current protection circuit breaker to protect the 12 VDC motor and apparatus electrical system. The gear actuator on the valve will cycle from full closed to full open in not less than three (3) seconds. A hand controlled pump panel mounted manual override (knob style) shall be provided.

An indicator light panel shall be located at the pump operator's position to show valve open, closed, or traversing from open to closed.

A built-in adjustable pressure relief valve shall be provided. The pressure relief valve shall be factory set to 125 psi. The pressure relief valve shall provide overpressure protection for the suction hose even when the intake valve is closed.

A 3/4" air bleeder valve shall be provided and controlled at the pump operator's position. A 1/4" water bleeder shall be supplied and controlled at the pump operator's position.

Location: Officer Side Pump Panel.

### **3.254.00 INLET VALVE (NO EXCEPTIONS)**

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A built-in adjustable pressure relief valve shall be provided. The pressure relief valve shall be factory set to 125 psi. The pressure relief valve shall provide overpressure protection for the suction hose even when the intake valve is closed.

A 3/4" air bleeder valve shall be provided and controlled at the pump operator's position.

A 1/4" water bleeder shall be supplied and controlled at the pump operator's position.

Location: Driver Side Pump Panel.

### **3.255.00 1.5" FRONT JUMP LINE**

One (1) 1-1/2" preconnect outlet with a manually operated Akron valve shall be supplied to the extended front bumper. The preconnect shall consist of a 2" heavy duty hose coming from the pump discharge manifold to a 2" FNPT x 1-1/2" MNST mechanical swivel hose connection to permit the use of the hose from either side of the apparatus.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

An air blow-out valve shall be installed between the chassis air reservoir and the front jump line. The control shall be installed on the pump operator's panel.

The discharge shall be supplied with a Class 1 automatic 3/4" drain valve assembly. The automatic drain shall have an all-brass body with stainless steel check assembly. The drain shall normally be open and automatically close when the pressure is greater than 6 psi.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

### **3.256.00 FRONT BUMPER DISCHARGE SWIVEL, BRASS IN TRAY**

There shall be a brass swivel provided for the front bumper discharge located in hose tray center front bumper on lower back wall.

### **3.257.00 1.5" SINGLE CROSSLAYS (QTY 2)**

One (1) single crosslay discharge shall be provided at the front area of the body. The crosslay shall include one (1) 2" brass swivel with a 1-1/2" hose connection to permit the use of hose from either side of the apparatus.

The crosslay hose bed shall consist of a 2" heavy-duty hose coming from the pump discharge manifold to the 2" swivel. The hose shall be connected to a manually operated 2" Akron valve. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: crosslay 1 & 2.

### **3.258.00 2.5" SINGLE CROSSLAY**

One (1) single crosslay discharge shall be provided at the front area of the body. The crosslay shall have one (1) 2-1/2" mechanical swivel hose connection to permit the use of the hose from either side of the apparatus.

The crosslay hose bed shall consist of a 2-1/2" heavy-duty hose coming from the pump discharge manifold to the 2-1/2" swivel. The hose shall be connected to a manually operated 2-1/2" Akron valve. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: crosslay 3.

### **3.259.00 2.5" DISCHARGE LEFT PANEL 2.5**

One (1) 2-1/2" discharge outlet with a manually operated Akron valve shall be provided at the left hand side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it. The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

The discharge shall extend out beyond the pump panel with a 30 degree downward angle with 2-1/2" NST threads to help prevent kinking of the discharge hose. The 30 degree chrome droop shall be an integral part of the discharge valve and shall be equipped with a chrome plated rocker lug cap with a retainer chain.

The discharge shall be supplied with a 3/4" bleeder valve assembly. The bleeder valve shall be installed to drain water from the gauge pressure line to prevent freezing of the line. The drain shall be controlled with a quarter-turn valve on the pump panel.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location : left side discharge 1, left side discharge 2.

### **3.260.00 2.5" DISCHARGE RIGHT PANEL**

One (1) 2-1/2" discharge outlet with a manually operated Akron valve shall be provided at the right side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

The discharge shall extend out beyond the pump panel with a 30 degree downward angle with chrome plated 2-1/2" NST threads to help prevent kinking of the discharge hose. The 30 degree chrome droop shall be an integral part of the discharge valve and shall be equipped with a chrome plated rocker lug cap with a retainer chain.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: right side discharge 2.

### **3.261.00" PANEL DISCHARGE ELECTRIC**

One (1) 4" panel discharge with an Akron electric actuated valve shall be provided.

The valve shall be 4" Akron 8800HD series with bronze flat ball and polymer seals for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the brass ball when in a throttle position with water flowing. The valve shall be of the unique Akron Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. The end of the discharge outlet shall be equipped with a chrome-plated, rocker-lug cap with a retainer.

The valve shall utilize an electric driven worm gear actuator. The valve may also be operated manually in case of electrical system failure.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: right side discharge 1.

### **3.262.00 4" WATERWAY DISCHARGE ELECTRIC**

A 4" diameter discharge with an electrically actuated Akron valve shall be provided from the pump to the aerial waterway.

The valve shall be 4" Akron 8800HD series with bronze flat ball and polymer seals for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the brass ball when in a throttle position with water flowing. The valve shall be of the unique Akron Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve shall utilize an electric driven worm gear actuator. The valve may also be operated manually in case of electrical system failure.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

### **3.263.00 IC PUSH/PULL CONTROL**

The apparatus pump panel shall be equipped with Innovative Controls Side Mount Valve Controls. The ergonomically designed ¼ turn push-pull T-handle shall be chrome-plated zinc with recessed labels for color-coding and verbiage. An anodized aluminum control rod and housing shall, together with a stainless spring steel locking mechanism, eliminate valve drift. Teflon impregnated bronze bushings in both ends of the rod housing shall minimize rod deflection, never need lubrication, and ensure consistent long-term operation. The control assembly shall include a decorative chrome-plated zinc panel-mounting bezel with areas for color-coding and/or FOAM and CAFS identification labels.

### **3.264.00 BLEEDER DRAIN VALVE (QTY 9)**

The bleeder/drain valves shall be Innovative Controls ¾” ball brass drain valves with chrome plated lift lever handles and ergonomic grips. Each lift handle grip shall feature built-in color-coding labels and a verbiage tag identifying each valve, also supplied by Innovative Controls. The color labels shall also include valve open and close verbiage.

### **3.265.00 DISCHARGE/INTAKE BEZEL**

Innovative Controls intake and/or discharge swing handle bezels shall be installed to the apparatus with mounting bolts. These bezel assemblies will be used to identify intake and/or discharge ports with color and verbiage. These bezels are designed and manufactured to withstand the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The specified assemblies feature a chrome-plated panel-mount bezel with durable UV resistant polycarbonate inserts. These UV resistant polycarbonate graphic inserts shall be sub- surface screen printed to eliminate the possibility of wear and protect the inks from fading. All insert labels shall be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards.

### **3.266.00 AKRON ELECTRIC VALVE 9333 CONTROLLER**

An Akron Brass Style 9333 Valve Controller shall be provided with a five year manufacturer warranty. The display shall be a full color LCD display with a backlight and manual adjustment of the brightness as well as an auto-dimming option. The electric controls shall provide true position feedback, requiring no clutches in the motor or current limiting. The unit shall be sealed with momentary open, close as well as an optional one touch full open feature to operate the actuator. The controller will provide an LCD display showing valve position indication and have up to three preset locations that can be user set and easily recalled upon each use. Valve position indication will be determined from true position feedback and indicate the exact position of the valve.

Two additional buttons shall be available to be used for preset selection, preset activation and menu navigation.

Locate on pump operator panel to control waterway discharge, right side discharge 1.

### **3.267.00 PUMP PRESSURE GOVERNOR (NO EXCEPTIONS)**

The apparatus shall be equipped with a Class 1 “TOTAL PRESSURE GOVERNOR” (TPG) Integrated pump control system. The TPG shall have a weatherproof color display. The TPG will operate as an engine/pump pressure governor/throttle system that is connected directly to the Electronic Control Module (ECM) mounted on the engine. The TPG is to operate as a pressure sensor (regulating) governor (PSG).

The TPG shall display engine RPM, oil pressure, engine temperature and voltage along with providing critical warnings. The warning levels for oil pressure, high engine temperature, low voltage and high voltage shall be independently programmable.

### **3.268.00 2.5” DISCHARGE GAUGES (QTY: 9)**



The valve discharge gauges shall be 2 ½” (63mm) diameter Innovative Controls pressure gauges. Each gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and 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 -40F to +160F. 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 stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauges shall be installed into decorative chrome-plated mounting bezels that incorporate valve-identifying verbiage and/or color labels. The gauges shall display a range from 0 to 400 psi with black graphics on a white background.

### **3.269.00 4” MASTER PRESSURE GAUGES W/BEZEL**

The master intake and master discharge gauges shall be 4” (101mm) diameter IC pressure gauges. Each gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and 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 -40F to +160F. Each gauge shall meet ANSI B40. 1 Grade A requirements with an accuracy of +/- 1% 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.

The two master gauges shall be installed into decorative chrome-plated zinc mounting bezel that also incorporates a test port manifold and a graphic overlay that identifies the master intake and discharge gauges, the vacuum test port, and the pressure test port. The test port manifold is solid cast brass with chrome plated plugs. The master gauges shall be installed on the pump panel no more than 6 inches apart. The gauge on the left shall be the master pump intake gauge and display a range from 30” vac to 400 psi with black graphics on a white background. The gauge on the right shall be the master pump discharge gauge and display a range from 0 to 400 psi with black graphics on a white background.

### **3.270.00 IC SL PLUS LED WATER TANK LEVEL GAUGE**

An Innovative Controls SL Plus Tank Level Monitor System shall be installed. The system shall include (1) electronic display module(s), a stainless steel pressure transducer sender unit, and the necessary wiring with water-tight plug terminations that do not require sealing grease. The master display module shall show the tank level using 16 super-bright easy-to-see LEDs. Tank level indication shall be achieved by the appropriate illumination of 4 horizontal rows of LEDs, with 4 LEDs per row. Full and near-full levels shall be indicated with the illumination of all 4 rows of LEDs, including the illumination of the top row of 4 green LEDs. Tank levels between ½ and ¾ full shall be indicated with the illumination of the bottom 3 rows of LEDs, including the illumination of the top row of 4 blue LEDs. Tank levels between ¼ and ½ full shall be indicated with the illumination of the bottom 2 rows of LEDs, including the illumination of the top row of 4 amber LEDs. Tank levels between ¼ full and near empty shall be indicated with the illumination of the bottom row of 4 red LEDs only. Tank levels between near empty and empty shall be indicated by flashing the bottom row of 4 red LEDs.

The master display shall have a backlit area above at the top with illuminated (water icon/foam icon /foam A icon /foam B icon /WATER LEVEL text/FOAM LEVEL text/FOAM A text/FOAM B text) and a backlit area at the bottom with illuminated (tank capacity/IC logo/OEM logo).

A wide-angle polycarbonate diffusion lens in front of the LEDs shall produce a 180° viewing angle. The electronic display module shall be waterproof and shock resistant being encapsulated in a urethane-based potting compound. The potted display electronics shall be integral to a chrome-plated panel-mount reflector that is secured to the apparatus panel with 4 screws installed from the inside of the panel or optional decorative bezel, through the reflector, and into 4 threaded inserts in the outer diffusion lens.

### **3.271.00 MULTIPLEX ELECTRICAL SYSTEM**

The apparatus shall incorporate a Weldon V-MUX multiplex 12 volt electrical system. The system shall have the capability of delivering multiple signals via a CAN bus. The electrical system installed by the apparatus manufacturer shall conform to current SAE standards, the latest FMVSS standards, and the requirements of the applicable NFPA 1901 standards.

The electrical system shall be pre-wired for optional computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics.

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 automatic reset type and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of maximum current for which the circuit is protected. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards.

Any electrical junction or terminal boxes shall be weather-resistant and located away from water spray conditions.

### **3.272.00 MULTIPLEX SYSTEM**

For superior system integrity, the networked multiplex system shall meet the following minimum component requirements:

- The network system must be Peer to Peer technology based on RS485 protocol. No one module shall hold the programming for other modules. One or two modules on a network referred to as Peer to Peer, while the rest of the network consists of a one master and several slaves is not considered Peer to Peer for this application.
- Modules shall be IP67 rated to handle the extreme operating environment found in the fire service industry.
- All modules shall be solid state circuitry utilizing MOS-FET technology and utilize Deutsch series input/output connectors.
- Each module that controls the device shall hold its own configuration program.
- Each module should be able to function as a standalone module. No “add-on” module will be acceptable to achieve this form of operation.
- Load shedding power management (8 levels).
- Switch input capability for chassis functions.
- Responsible for lighting device activation.
- Self-contained diagnostic indicators.
- Wire harness needed to interface electrical devices with multiplex modules.
- The grounds from each device should return to main trunk in each sub harness by the use of ultrasonic splices.

### **3.273.00 WIRING**

All harnessing, wiring and connectors shall be manufactured to the following standards/guidelines. No exceptions.

- NFPA 1901-Standard for Automotive Fire Apparatus
- SAE J1127 and J1127
- IPC/WHMA-A-620-Requirements and Acceptance for Cable and Wire Harness Assemblies. (Class 3-High Performance Electronic Products)

All wiring shall be copper or copper alloys of a gauge rated to carry 125 of the maximum current for which the circuit is protected. Insulated wire and cable 8ga and smaller shall be SXL, GXL, or TXL per SAE J1128. Conductors 6ga and larger shall be SXL or SGT per SAE J1127.

All wiring shall be colored coded and imprinted with the circuit's function. Minimum height of imprinted characters shall not be less than .082" plus or minus .01". The imprinted characters shall repeat at a distance not greater than 3".

A coil of wire shall be provided behind electrical appliances to allow them to be pulled away from mounting area for inspection and service work.

### **3.274.00 WIRING PROTECTION**

The overall covering of the conductors shall be loom or braid.

Braid style wiring covers shall be constructed using a woven PVC-coated nylon multifilament braiding yarn. The yarn shall have a diameter of no less than .04" and a tensile strength of 22Ibs. The yarn shall have a service temperature rating of -65 F to 194 F. The braid shall consist of 24 strands of yarn with 21 black and 3 yellow. The yellow shall be oriented the same and be next to each other.

Wiring loom shall be flame retardant black nylon. The loom shall have a service temperature of -40 F to 300 F and be secured to the wire bundle with adhesive-backed vinyl tape.

### **3.275.00 WIRING CONNECTORS**

All connectors shall be Deutsch series unless a different series of connector is needed to mate to a supplier's component. The connectors and terminals shall be assembled per the connector/terminal manufacturer's specification. Crimble/Solderless terminals shall be acceptable. Heat shrink style shall be utilized unless used within the confines of the cab.

### **3.276.00 NFPA REQUIRED TESTING OF ELECTRICAL SYSTEM**

The apparatus shall be electrical tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with delivery documentation per requirements of NFPA 1901. 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 test fail.

#### **2. ALTERNATOR PERFORMANCE TEST AT IDLE**

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

#### **3. ALTERNATOR PERFORMANCE TEST AT FULL LOAD**

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management

system shall be permitted during this test. However, an alarm sounded by excessive battery discharge, as detected by the system required in NFPA 1901 Standard, or a system voltage of less than 11.7 volts dc for a 12 volt nominal system, for more than 120 seconds, shall be considered a test failure.

#### **4. LOW VOLATE 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 nominal 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.

#### **3.277.00 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:
  - a. The nameplate rating of the alternator
  - b. The alternator rating under the conditions
  - c. Each specified component load
  - d. Individual intermittent loads

#### **3.278.00 VEHICLE DATA RECORDER**

A vehicle data recorder system shall be provided to comply with the 2009 and 2016 editions of NFPA 1901. The following data shall be monitored:

- Vehicle speed MPH
- Acceleration (from speedometer) MPH/Sec.
- Deceleration (from speedometer) MPH/Sec.
- Engine speed RPM
- Engine throttle position % of full throttle
- ABS Event On/Off
- Seat occupied status
- Occupied Yes/No by position
- Seat belt status
- Buckled Yes/No by position
- Master Optical Warning
- Device Switch On/Off Time: 24 hour time
- Date: Year /Month/Day

#### **3.279.00 OCCUPANT DETECTION SYSTEM**

There shall be a visual and audible warning system installed in the cab that indicates the occupant buckle status of all cab seating positions that are designed to be occupied during vehicle movement.

The audible warning shall activate when the vehicle's park brake is released, and a seat position is not in a valid state. A valid state is defined as a seat that is unoccupied and the seat belt is unbuckled, or one that has the seat belt buckled after the seat has been occupied.

The visual warning shall consist of a graphical representation of each cab seat in the multiplex display screen that

will continuously indicate the validity of each seat position.

The system shall include a seat sensor and safety belt latch switch for each cab seating position, audible alarm and braided wiring harness.

### **3.280.00 MULTIPLEX DISPLAY**

The V-MUX multiplex electrical system shall include a Vista IV color display. The display shall have the following features:

- Aspect ratio of 16:9 (Wide Screen) Diagonal measurement of no less than 7" Master warning switch
- Engine high idle switch
- Five (5) tactile switches to access secondary menus Eight (8) multi-function programmable tactile switches Specific door ajar indication
- Real time clock
- Provides access to the multiplex system diagnostics
- Video capability for optional back-up camera(s) and GPS display

The display shall be located driver's side engine cover.

### **3.281.00 ELECTRICAL CONNECTION PROTECTION**

The vehicle electrical system shall be made more robust by the application of a corrosion inhibiting spray coating on all exposed electrical connections on the chassis and body. If equipped with an aerial device, the exposed connections on the aerial components shall also be protected.

The coating shall use nanotechnology to penetrate at the molecular level into uneven surfaces to create a protective water repellant film. The coating shall protect electrical connections against the environmental conditions apparatus are commonly exposed to.

### **3.282.00 TECHNOLOGY USER INTERFACE**

The apparatus shall be equipped with a smart truck technology system designed specifically for first responder apparatus. The system shall interconnect major apparatus CAN networks including but not limited to the chassis J1939/OBD2 data, vehicle multiplex system, water pump pressure governor, electric valves and electric actuated deck gun. The system shall securely report real-time vehicle information from these systems via cellular data to a globally supported cloud computing service for storage and real time access via web dashboards. The dashboards shall be accessible by the department's computers, tablets and smartphones.

The smart truck technology installed on the apparatus shall provide real-time notification via text or e-mail when a check engine light is displayed. The notification shall include the fault code and brief explanation for the code to reduce down-time.

The system shall feature a truck down feature on the web-based user interface to allow instant notification of needed apparatus service to both the authorized dealership and OEM via text or e-mail.

The system shall provide remote diagnostics of vehicle subsystems such as VMUX, pressure governors, electric monitors and electric valves.

By use of the web based user interface, the system shall allow for over the air programming updates to various subsystems should the need arise.

The web-based user interface shall also provide the following:

- Fuel and DEF levels
- GPS tracking
- Data logging for apparatus multiplex system
- Easy access to the NFPA VDR data

The smart truck technology shall also feature seamless integration to the HAAS ALERT Safety Cloud providing Responder to Vehicle (R2V) alerts to motorists using navigation apps such as WAZE.

The system shall be designed with an open architecture to incorporate future growth with new technology partners designed to enhance fireground operations

### **3.283.00 HARDWARE VEHICLE GATEWAY**

The vehicle gateway module shall be rugged in construction using a durable cast aluminum enclosure designed for emergency vehicle applications. The module shall have sealed Deutsch connectors providing four (4) CAN network ports, one (1) RS-485 port, one (1) Ethernet RJ45 port, embedded cellular modem, Bluetooth and GPS capability. The IoT Core Vehicle Gateway shall be capable of 2 way vehicle telemetry, supporting both remote diagnostics and remote over-the-air software updates.

### **3.284.00 ANTENNA**

A low profile cellular antenna shall be installed on the cab roof.

### **3.285.00 DATA PLAN**

A 5 year data plan shall be provided with the initial vehicle purchase. At the end of the 5 year period the department shall be given the option to extend service.

### **3.286.00 FRONT LIGHT BAR COLOR(S)**

The front light bar shall be provided with the following color LED modules: Red/White with clear lenses.

If applicable, includes side facing light bars when colors are the same.

### **3.287.00 LIGHT BAR MOUNT**

One (1) pair of Whelen 1.5” tall (model MKEZ7) mounts shall be provided on each front mini light bars.

### **3.288.00 LIGHT BARS**

A pair of Whelen Mini Freedom IV Series 21.5” LED light bars shall be provided. The light bars shall be installed side facing at the front cab corners. Each light bar shall contain two (2) corner LED modules forward facing, one (1) forward facing short LED module, two (2) side facing long LED modules and one (1) outboard rearward facing corner LED module.

The white LEDs (if equipped) shall be switched off in blocking right of way mode.

### **3.289.00 LOWER LEVEL WARNING LIGHT PACKAGE**

Eight (8) Whelen C-Series Super LED model C6L light heads and two (2) Whelen ION-T Series Super LED model TLI light heads shall be provided. The lights shall be Red with clear lenses.

The rectangular lights shall include chrome flanges where applicable. The lights shall be wired with weatherproof connectors and shall be mounted as close to the corner points of the apparatus as is practical as

follows:

- Two (2) C6L lights on the front of the apparatus facing forward.
- Two (2) C6L lights on the rear of the apparatus facing rearward.
- Two (2) lights each side of the apparatus, one (1) C6L each side at the forward most point (as practical), and one (1) TLI each side at the rearward most point (as practical).
- One (1) C6L light each side of the apparatus centrally located to provide mid ship warning light.

The side facing lights shall be located at forward most position, centered in rear wheel well, and side facing at rear of body in rubrail if equipped.

All warning devices shall be surface mounted in compliance with NFPA standards.

### **3.290.00 HAZARD (DOOR AJAR) LIGHT**

There shall be a 2” red LED hazard light installed as specified.

The light shall be located center overhead.

### **3.291.00 UPPER REAR WARNING LIGHTS**

Two (2) Whelen model L31H Super LED beacons with Red LED with Clear lens, Red LED with Clear lens domes shall be supplied.

The lights shall be located above L2/R2 compartments offset rearward to supplement upper rear warnings, rear upper body on aerial style brackets to meet Zone C upper requirements.

### **3.292.00 WARNING LIGHTS**

Two (2) Whelen C-Series model C6L Super LED light heads shall be provided. The lights shall be Red with clear lenses, Red with clear lenses. The rectangular lights shall include chrome flanges where applicable.

Location: (1) each side in front quad inboard of NFPA warning light, (1) each side of cab down low just ahead of rear doors.

### **3.293.00 ELECTRONIC SIREN**

A Whelen 295SLSA1 electronic siren shall be installed in the cab. The siren amplifier and control panel module shall include a rotary selector for six (6) functions, on/off switch, push button switch for manual siren or air horn tones, and noise canceling microphone.

### **3.294.00 ELECTRONIC SIREN CONTROL LOCATION**

The electronic siren control shall be located in the center overhead.

### **3.295.00 MECHANICAL SIREN**

A chrome plated and pedestal mounted Federal Q2B-P coaster siren shall be installed on top of the front bumper extension. An electric siren brake switch shall be located in the cab accessible to the driver.

The siren shall be located driver side front bumper.

### **3.296.00 SIREN SPEAKER**

One (1) Whelen model SP123BMC, 100 watt speaker with chrome grill shall be recessed in the front bumper.

The speaker shall produce a minimum sound output of 120 dB at 10 feet to meet current NFPA 1901 requirements.

The speaker shall be located driver side front bumper, officer side front bumper.

### **3.297.00 LICENSE PLATE LIGHT**

One (1) Truck-Lite model 15905 white LED license plate light mounted in a Truck-Lite model 15732 chrome plated plastic license plate housing shall be mounted at the rear of the body.

### **3.298.00 TAIL LIGHTS**

Three (3) Whelen model C6 series LED (Light Emitting Diode) lights shall be installed each side at rear with weatherproof connectors.

Light functions shall be as follows:

- LED red running light with red brake light in outboard position.
- LED amber populated arrow pattern turn signal in middle position.
- LED clear back-up light in inner position.

Individual chrome bezels shall be provided for the three (3) individual lights in a horizontal position.

### **3.299.00 LED MARKER LIGHTS**

LED clearance/marker lights shall be installed on the cab. The body marker lights shall be TecNiq 3/4" grommet mounted LED.

### **3.300.00 UPPER CAB**

- Five (5) amber LED clearance lights on the cab roof.

### **3.301.00 LOWER CAB**

- One (1) amber LED side turn/marker each side of cab ahead of the front door hinge.

### **3.302.00 UPPER BODY**

- One (1) red LED clearance light each side, rear of body to the side.

### **3.303.00 LOWER BODY**

- Three (3) red LED clearance lights centered at rear, recessed in the rubrail.
- One (1) red LED clearance light each side at the trailing edge of the apparatus body, recessed in the rubrail.
- One (1) amber LED clearance light each side front of body just in front of rear wheels, recessed in the rubrail.
- Two (2) amber LED (one (1) clearance; one (1) auxiliary turn) lights each side front of body, recessed in the rubrail.

### **3.304.00 AERIAL PLATFORM**



- Three (3) TecNiq amber LED clearance lights centered on the front lower section of the aerial platform.

### **3.305.00 COMPARTMENT LIGHT PACKAGE**

One (1) Amdor Luma-Bar compartment light strip shall be mounted in each body compartment greater than 4 cu. ft. Transverse compartments shall have two (2) lights, located one (1) each side of truck.

Compartment lights shall be wired to a master on/off rocker switch on the cab switch panel.

### **3.306.00 GROUND LIGHTS**

The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the ground areas around the apparatus in accordance with current NFPA requirements. The lights shall be TecNiq model T440 4” circular LED (Light Emitting Diode) with clear lenses mounted in a resilient shock absorbent mount for improved bulb life. The wiring connections shall be made with a weather resistant plug in style connector.

Ground area lights shall be switched from the cab dash with the work light switch.

One (1) ground light shall be supplied under each side of the front bumper extension if equipped.

Lights in areas under the driver and crew area exits shall be activated automatically when the exit doors are opened.

### **3.307.00 STEP LIGHTS**

The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the steps around the apparatus in accordance with current NFPA requirements. The lights shall be TecNiq model T440 4” circular LED (Light Emitting Diode) with clear lenses mounted in a resilient shock absorbent mount for improved bulb life (a smaller light may be used if space is limited). The wiring connections shall be made with a weather resistant plug in style connector.

The step lights shall be switched from the cab dash with the work light switch.

### **3.308.00 CAB GROUND/AUXILIARY STEP LIGHTS**

The cab shall be equipped with a sufficient quantity of lights to properly illuminate the auxiliary steps and the ground areas below them in accordance with current NFPA requirements. The lights shall be EON LED (Light Emitting Diode) with clear lenses. The wiring connections shall be made with a weather resistant plug in style connector.

The lights shall be switched from the cab dash with the work light switch. The lights shall also be activated automatically when the exit doors are opened.

### **3.309.00 LADDER TUNNEL LIGHT (QTY 2)**

An EON LED light shall be provided to illuminate the ladder tunnel at the opening. The light shall be wired through the door ajar circuit on the ladder tunnel door.

### **3.310.00 DECK SCENE/LIGHT WIRED TO BACK-UP LIGHTS**

The rear deck or scene lights shall be activated when the chassis is placed in reverse to provide additional lighting, in addition to the back-up lights, when backing the vehicle.

### **3.311.00 DECK LIGHTS**

Two (2) Whelen round 12 Super LED model PFBP12C floodlights with black housing and chrome rear covers

shall be installed at the rear of the apparatus. The rear deck lights shall be switched with the work light switch in the cab.

Location: (1) each side over rear ladder tunnel.

### **3.312.00 CROSSLAY LIGHT**

A Whelen LED light model PFBP12C shall be installed at the rear area of the crosslay to provide crosslay lighting per current NFPA 1901. The crosslay light shall be switched with work light switch in the cab.

### **3.313.00 SCENE LIGHT**

One (1) Whelen model C6SL SurfaceMax series surface mounted Super LED clear scene light shall be provided. Shall have 6 Super LED diodes, a clear non optic hard coated polycarbonate lens and utilize a metalized SurfaceMax reflector with integrated optic collimators for maximum output. The C6SL shall have 1200 useable lumens.

The light shall be located front area of hosebed, facing rearward and be controlled by a switch in cab accessible to driver (lights on sides of apparatus to be switched separately).

### **3.314.00 LED PUMP PANEL LIGHT PACKAGE**

Three (3) TecNiq model E10 LED lights shall be mounted under a light shield directly above each side pump panel. The work light switch in the cab shall activate the lights when the park brake is set.

### **3.315.00 PUMP COMPARTMENT LIGHT**

An LED light shall be provided in the pump compartment area for NFPA compliance. The light shall be an Optronics ILL22 Series that has a polycarbonate lense and sealed/waterproof housing. The light shall be wired through a switch inside the pump compartment access door/panel.

### **3.316.00 ENGINE COMPARTMENT LIGHT**

There shall be lighting provided to illuminate the engine compartment area in compliance with NFPA 1901. The light shall be an Optronics ILL22 Series LED that has a polycarbonate lens, sealed/waterproof housing and integral switch. The light wiring circuit shall activate when the cab is tilted and master power is switched on.

### **3.317.00 DOOR AJAR ALARM**

An audible alarm shall be provided through the multiplex display(s) in the cab wired into the door ajar or indicator.

### **3.318.00 CAMERA SHIELD**

A diamond plate protective shield shall be provided for the top and sides of a camera. The shield shall be designed not to impede in the operational envelope of the camera.

### **3.319.00 CAMERA BACK-UP**

There shall be a Voyager camera model number VCCS150B provided mounted on the rear of the apparatus. The camera shall feature a wide angle lens, IR LED assisted illumination for enhanced low-light performance, non-corrosive mounting bracket, and stainless steel hardware. The camera shall be interlocked with the chassis transmission. When the apparatus is placed in reverse the camera shall automatically be activated and when the transmission is placed in any other gear the screen shall return to the previously displayed screen.

The camera shall have the following specifications:

- NTSC/PAL Video output signal format
- 150° Viewing angle
- Housing: Aluminum Waterproof: IPX7
- Built-in microphone
- Dimensions: 2.7” W x 1.7” H x 2.5” D

The camera shall be located at the rear of the truck, up as high as possible. Optimize mounting position using space not allocated by other equipment options unless otherwise specified.

### **3.320.00 TWO-WAY INTERCOM**

A Fire Research ACT two-way intercom system shall be installed to provide communications between the turntable control station and the aerial tip. The intercom system shall include two (1) speakers and two (2) control modules; one (1) with a push-to-talk button at the turntable control station and one (1) hands free at the aerial tip.

The control modules shall have push-button volume control and a LED volume display. The hands free module shall constantly transmit to the other module unless the push-to-talk button is pressed.

The intercom shall have active noise cancellation and be designed for exterior use.

### **3.321.00 BACK-UP ALARM**

An electronic back-up alarm shall be supplied. The 97 dB alarm shall be wired into the chassis back-up lights to signal when the vehicle is in reverse gear.

### **3.322.00 HYDRAULIC GENERATOR (NO EXCEPTIONS)**

A Harrison model LPG 10KW hydraulic generator system shall be supplied and installed officer side of open storage area. The generator shall come with an axial piston hydraulic pump, reservoir, cooler, voltage regulator and a gauge panel.

The gauge panel shall display voltage, hour meter, frequency, and amperage.

The hydraulic motor-generator system shall be modular design with dimensions of approximately 40” long x 18.6” wide x 14.1” high and shall be permanently mounted on the apparatus.

The hydraulic pump shall be driven by a chassis transmission mounted power take off (PTO).

A generator control/PTO engage switch shall be mounted on the cab instrument panel to engage the PTO and start the generator.

### **3.323.00 RATINGS & CAPACITY**

Rating: 10,000 watts continuous

Volts: 120/240 volts

Phase: Single, 4-wire

Frequency: 60 Hz

Amps: 42 amps at 240 volts, 80 amps at 120 volts Engine Speed at Engagement: Idle

Pump Speed Operating Range: 950 to 3300 RPM

Weight: Approximately 250 lbs.

### **3.324.00 TESTING**

The generator shall be tested in accordance with current NFPA 1901 standards.

Notes:

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

\*Extreme ambient temperatures could affect generator performance.

### **3.325.00 3<sup>RD</sup> PARTY GENERATOR TESTING**

The generator shall be tested at the manufacturer's facility by an independent, third-party testing service. The conditions and testing of the generator shall be as outlined in current NFPA 1901.

The test shall include operating the generator for two hours at 100% of the rated load. Power source voltage, amps, frequency shall be monitored. The prime mover's oil pressure, water temperature, transmission temperature (if applicable) and power source hydraulic fluid temperature (if applicable) shall be monitored during testing.

The results of the test shall be recorded and provided with delivery documentation.

### **3.326.00 CIRCUIT BREAKER PANEL**

A twelve (12) place breaker box with up to twelve (12) appropriately sized ground-fault interrupter circuit breakers shall be supplied. The breaker box will include a master breaker sized according to the generator output. The breaker box will be located in the specified compartment, not to exceed 12' run of wire.

Note: If generator is 6KW or less, the main breaker will occupy 2 places, leaving 10 available.

Dimensions: 17.92" high x 14.25" wide x 3.75" deep.

Location : L1 back wall horizontally mounted above offset.

### **3.327.00 CAB BROW LIGHT**

One (1) FireTech 12V LED mini-brow flood light model FT-MB-27-W 35" long shall be provided. The light shall feature 27 LEDs producing 9,317 usable lumens. The 135W 12V light shall draw 11.25 amps. A switch shall be provided, accessible to driver, for activation of light.

The light assembly shall be located compartment top centered over L1/L2, compartment top centered over R1/R2, driver and officer side over rear cab door.

### **3.328.00 RECEPTACLE**

A 20 amp, 110 volt NEMA L5-20 twist lock receptacle with a weatherproof cover plate shall be installed as specified by the department.

Location: driver side rear wheel well offset forward officer side rear wheel well offset forward.

### **3.329.00 ELECTRIC CORD REEL**

Hannay electric rewind cord reel(s) (ECR 1616-17-18) shall be installed and located pump module storage pan officer side.

The reel(s) shall include 200' of yellow 10 gauge 3 conductor type SOWA cord. The cord shall be rated at

20 amps @ 110 volts. The end of the cord shall be terminated for the installation of a department required connector.

### **3.330.00 ROLLERS, CORD REEL**

Rollers, stainless steel cord reel rollers shall be installed and located through a panel.

The rollers shall be located officer side pump module in line with reel.

The rollers shall facilitate smooth removal of the electric cord.

### **3.331.00 CORD REEL REWIND SWITCH**

A heavy duty rubber covered electric reel rewind button shall be installed officer side pump panel.

### **3.332.00 100 Ft. REAR MOUNT ELEVATING PLATFORM (NO EXCEPTIONS)**

100 Ft. Rear Mount Elevating Platform (NO EXCEPTIONS)

### **3.333.00 ELEVATING PLATFORM REQUIREMENTS**

It is the intent of these specifications to describe a telescopic elevating platform of the open truss design that is compliant with NFPA 1901 (2016 edition) chapter 19 sections 19.7 through 19.12 and sections 19.17 through 19.25. Some portions of this specification exceed minimum NFPA recommendations and are to be considered a minimum requirement to be met. The elevating platform shall consist of three (3) extruded aluminum telescopic ladder sections operating from approximately -10 degrees to 80 degrees and designed to provide continuous egress for firefighters and civilians from an elevated position to the turntable.

The elevating platform shall have a vertical height of not less than 100' at full extension and elevation. The measurement of height shall be consistent with NFPA 1901 section 19.7.2.

The rated horizontal reach shall be 91'-6". The measurement of horizontal reach shall be consistent with NFPA 1901 19.7.3. The measurement shall be from the outer edge of the platform handrail at full extension to the centerline of turntable rotation.

The aerial shall be able to rotate 270 degrees at -6 degrees elevation, 300 degrees at -3 degrees elevation and a full 360 degrees at as low as 5 degrees of elevation (based on optional body equipment).

The aerial shall have a maximum stabilizer spread of 15'-6" from pin to pin with the stabilizers deployed to maximum extension. The aerial platform shall be rated to provide full operating capacities in up to 35 mph wind conditions.

### **3.334.00 ALUMINUM ELEVATING PLATFORM**

The aerial ladder shall exceed the requirements of NFPA 1901 19.7 Elevating Platform Requirements as detailed in these specifications. To ensure a high strength-to-weight ratio and an inherent corrosion resistance, the aerial device shall be completely constructed of high strength aluminum. All side rails, rungs, handrails, uprights, and K-braces shall be made of structural 6061T6 aluminum alloy extrusions. All material shall be tested and certified by the material supplier. All ladder sections shall be semi-automatically welded by inert gas shielded arc welding methods using 5356 aluminum alloy welding wire. Structural rivets or bolts shall not be utilized in the ladder weldment sections.

Due to the unpredictable nature of fire-ground operations, a minimum safety factor of 2.5 to 1 is desired. This structural safety factor shall apply to all structural aerial components including turntable and torque box stabilizer components. Definition of the structural safety factor shall be as outlined in NFPA 1901 A.19.20.1:

**DL** = Dead load stress. Stress produced by the weight of the aerial device and all permanently attached components.

**RL** = Rated capacity stress. Stress produced by the rated capacity load of the ladder.

**WL** = Water load stress. Stress produced by nozzle reaction force and the weight of water in the water delivery system.

**FY**= Material yield strength. The stress at which material exhibits permanent deformation.

$$2.5 \times \mathbf{DL} + 2.5 \times \mathbf{RL} + \mathbf{WL} \text{ equal to/less than } \mathbf{FY}$$

The minimum NFPA specification is exceeded in this paragraph by requiring safety margin above 2 to 1 while flowing water.

The stability factor or tip over safety margin shall be a minimum of 1.5 to 1 as defined by NFPA 1901 19.21.

An independent engineering firm shall verify the aerial safety factor. Design verification shall include computer modeling and analysis performed by an independent registered professional engineer. Verification shall include written certification from the independent engineering firm made available by the manufacturer upon request from the purchaser.

All welding of aerial components, including the aerial ladder sections, turntable, torque box and outriggers shall be performed by welders who are certified to American Welding Society Standards D1.1, D1.2 and D1.3 as outlined in NFPA 1901 19.22.3.1.

The weldment assemblies of each production unit shall be tested visually and mechanically by an ASNT certified level II non-destructive test technician to comply with NFPA 1901 19.22.2. Testing procedures shall conform to the American Welding Society Standard B1. 10 Guide for non-destructive testing. Test methods may include dye penetrate, ultrasound, and magnetic particle where applicable.

Each ladder section shall consist of two (2) heavy extruded aluminum side rails and a combination of aluminum rungs, tubular diagonals, and two (2) full-length handrails. The rungs on all sections shall be K-braced for maximum lateral stability. This K-bracing shall extend to the center of each rung to minimize ladder side deflection.

The ladder rungs shall be designed to eliminate the need for rubber rung covers. The rungs shall be spaced on 14 inch centers and have integral skid-resistant surfaces as outlined in NFPA 1901 19.2.5. An oval-shaped rung shall be utilized to provide a larger step surface at low angles and more comfortable grip at elevated positions. The minimum design load shall be 500 pounds distributed over a 3-1/2" wide area per rung as outlined in NFPA 1901 19.2.5.4.

The aerial ladder shall exceed NFPA 1901 sections 19.2.6 and 19.2.8 governing the minimum ladder section width and handrail height. The following minimum dimensions shall be used in the construction of the aerial device:

<b>SECTION</b>	<b>WIDTH</b>	<b>HEIGHT</b>
Base Section	45-1/4"	34-5/8"
Second Section	36-1/4"	30-3/8"
Fly Section	28-1/2"	26-9/16"

### **3.335.00 FIREFIGHTING PLATFORM**

The platform shall be entirely constructed of aluminum and mounted to the end of the fly section. The inside of the platform shall measure 37-1/4" long x 74-3/4" wide and contain 18.9 square feet of floor space. This exceeds the minimum NFPA 1901 19.7.6 requirement of 14 square feet. A continuous railing with 42" high side rails shall be supplied on all sides of the platform. There shall be no openings below the handrail larger than 24" in

either direction.

The platform shall be constructed using a perimeter pipe system to carry water and serve as a structural component of the platform. The design of the platform shall minimize the distance between ladder center line and platform bottom heat shield. This requirement is to provide maximum visibility for the driver. A 4" high kick plate and grated floor assembly shall be supplied on the platform floor. The grated floor shall prevent water accumulation in the platform. These requirements are detailed in NFPA 1901 19.7.6.3 through 19.7.6.5.

A reflective aluminum heat shield shall be supplied on the front, bottom, sides, and rear of the platform as outlined in NFPA 1901 19.7.6.6.

A step shall be supplied over the pipe system around the front and sides of the platform for easy egress. This step shall be 8" deep and provide an additional 6.5 square feet of platform floor space.

The platform shall have three (3) gates for entry and exit, exceeding the two (2) required by NFPA 1901 19.7.6.2.2 through 19.7.6.2.3. Two (2) of the gates shall be mounted on the front corners of the platform. The front gates shall be 20-1/2" wide with inward swinging spring-loaded doors. Each front door shall have an exterior mounted self-latching handle. The third platform access shall be at the rear of the platform to enter from the ladder. A Fire Research Aerial Saver shall be mounted in the opening with a loop that extends under the bar. The bar shall slide up or in, but not out toward the base.

### **3.336.00 FALL PROTECTOR ANCHORS**

There shall be six (6) anchorage points for fall protection provided in the platform. Four (4) anchors shall be rated at 450 pounds each for use with Class 1 travel restraint systems and two (2) anchors located on the rear wall rated at 900 pounds each for use with Class 2 fall restraints.

### **3.337.00 PLATFORM LIFTING EYES**

A pair of lifting eyes shall be provided below the rear of the platform. The lifting eyes shall allow for a load of 375 pounds each (750 pounds total).

### **3.338.00 PLATFORM WATER CURTAIN**

A water curtain system shall be installed under the platform to provide a 75 GPM cooling stream beneath the platform as outlined in NFPA 1901 19.7.6.7. The nozzle shall be controlled from the base and tip control stations.

### **3.339.00 PLATFORM LEVELING SYSTEM**

An automatic platform leveling system shall be supplied as outlined in NFPA 1901 19.10.2. The system shall provide automatic leveling through a dual redundant hydraulic cylinder system. The system shall incorporate (4) hydraulic cylinders to level the platform. The lower cylinders shall be mounted between the aerial turntable and base section and the upper cylinders shall be mounted between the fly section and the platform. The system shall utilize oil exchange between the cylinders to provide smooth leveling at all operating positions. In addition to the automatic controls, the system shall include manual controls located at both the base and the platform to adjust platform pitch if needed. The system shall be supplied with load holding valves on the upper cylinders to prevent movement of the platform in the event of a ruptured hydraulic hose.

### **3.340.00 AERIAL FINISH (NO EXCEPTIONS)**

To reduce maintenance expense the aerial shall have a natural aluminum swirled finish. Visible inspection of all ladder weld joints shall be possible without having to remove paint or body filler to reveal the weld bead.

### **3.341.00 LADDER EXTENSION MECHANISM**

Both power extension and retraction shall be furnished and meet the requirements of NFPA 1901 section 19.19, 19.20.3, and 19.5.3. Extension shall be by way of two (2) extending cylinders mounted on the side of the base section of the ladder.

Extension Cylinder Size:

Bore: 5"  
Stroke: 77"

The cylinders shall operate through a block and tackle cable arrangement to extend and retract the ladder. Maximum extension of the ladder is to be automatically limited by the stroke of the cylinders. The normal operating cable safety factor shall be 5:1 and the stall safety factor shall be 2:1 based on the breaking strength of the cables. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used shall be 1 to 12. The cables shall be treated with Pre-Lube 6 for increased service life.

Ladder Cable Size:

1st section (4 cables 2 extend, 2 retract): 3/4" 6 x 19 galvanized cable  
2nd section (4 cables 2 extend, 2 retract): 1/2" 6 x 19 galvanized cable

### **3.342.00 LADDER SLIDE SYSTEM**

The ladder assembly shall consist of three (3) separate weldments that shall extend and retract within each other. Polymer slide pads shall be utilized between each section to minimize friction. Four (4) interlocking load transfer stations shall be utilized at the end of each of the two (2) base ladder sections. The interlocking load transfer stations shall handle load transfer between ladder sections and encapsulate the slide pads.

The two (2) base ladder sections shall each be provided with six (6) slide cushions. The cushions are designed to limit movement between the ladder sections resulting in smoother operation and less wear on the ladder sections.

### **3.343.00 AERIAL EXTENSION INDICATOR**

Reflective tape stripes shall be installed on the ladder top handrail of the base section to indicate extension in 5 foot increments. Numbers shall be supplied at 10 foot increments. A reflective dot on the base of the 2nd section shall provide a visual reference for the operator to estimate aerial elevation.

### **3.344.00 ELEVATING PLATFORM OPERATING POSITIONS**

The elevating platform shall have two (2) control stations as outlined in NFPA 1901 19.9 with the lower controls capable of overriding the platform controls. The operator's lower position shall be located on the left side of the aerial turntable. The upper control console shall be located in the front center of the platform and shall include all of the operational, aerial functions, and control switches (less the Intercom controls) as in the lower console. The centered console location shall allow easy access in and out of the left and right corner gates.

The consoles shall include lighting for night operations and controls shall all be labeled for easy identification of operation.

### **3.345.00 LOAD INDICATION SYSTEM**

Two (2) lighted elevation/safe load indicator diagrams shall be provided on the aerial ladder to indicate safe load capacity at any angle of elevation. One (1) shall be located on the lower right side of the base section, and one (1) shall be located upper left side of the fly section. The safe load indicators shall be 15" x 15" in size and clearly communicate aerial capacity in any one of the following conditions: tip load, tip load with water flowing, and



distributed load at full extension. The charts shall identify capacity using graphic characters to indicate each 250 lb. increment. The charts shall be illuminated and contain warnings for electrocution hazards from power lines and lightning.

**3.346.00 OPERATION TIMES**

The aerial shall complete the NFPA 1901 19.7.5 time test in no more than 100 seconds, exceeding the NFPA minimum requirement of 150 seconds. This test involves raising the aerial from the bedded position to full elevation and extension and rotating to 90 degrees. This test is to begin with the stabilizers deployed.

Time to extend ladder (@60 degree elevation):	Maximum 45 seconds
Time to retract ladder (@60 degree elevation):	Maximum 45 seconds
Time to raise ladder (fully retracted, 0 to 75 degrees elevation):	Maximum 55 seconds
Time to raise ladder (fully extended, 0 to 75 degrees elevation):	Maximum 80 seconds
Time to lower ladder (fully retracted, 75 to 0 degrees elevation):	Maximum 50 seconds
Time to lower ladder (fully extended, 75 to 0 degrees elevation):	Maximum 75 seconds

Time to rotate 180 degrees (fully retracted at 10 degrees elevation):	Maximum 60 seconds
Time to rotate 180 degrees (fully extended at 10 degrees elevation):	Maximum 120 seconds

**3.347.00 ELEVATING PLATFORM RATED CAPACITY (NO EXCEPTIONS)**

The aerial device shall have a rated capacity of 1305 lbs. consistent with NFPA 1901 19.8.1 and 19.8.2. The rated capacity shall include 1000 lbs. in personnel allowance and 305 lbs. for equipment mounted at the tip of the aerial. The aerial device shall be rated in multiple configurations as outlined in 19.8.6.

The elevating platform shall be capable of delivering a 1250 GPM master stream from the platform while carrying a minimum of 500 lbs. as outlined in 19.8.4. A sign mounted at the base of the aerial shall communicate the following ratings in the unsupported fully extended configuration while maintaining a 2.5 to 1 safety margin as defined in NFPA 1901. The loads in each configuration are in addition to 305 lbs. of equipment mounted at the tip.

Condition #1-Tip load only, no water flowing

<b>Elevation</b>	<b>Capacity</b>	<b>Pounds</b>
-10 to 80 degrees	4 people	1000 lbs.

Condition #2-Distributed loads no water flowing (These include two people in the platform from -6 to 44 degrees and four people in the platform from 45 to 80 degrees)

<b>Elevation</b>	<b>Capacity</b>	<b>Pounds</b>
-10 to 20 degrees	5 people	1250 lbs.
21 to 30 degrees	6 people	1500 lbs.
31 to 45 degrees	10 people	2500 lbs.
46 to 80 degrees	12 people	3000 lbs.

Condition #3-Platform tip load while flowing 1250 gpm with pre-piped waterway

<b>Elevation</b>	<b>Capacity</b>	<b>Pounds</b>
-10 to 80 degrees	2 people	500 lbs.

**3.348.00 HYDRAULIC SYSTEM**

Hydraulic power for all operations shall be supplied by a chassis-mounted variable displacement pressure compensated pump for consistent and rapid response. The variable displacement piston pump shall be able to

supply 30 GPM at a maximum pressure of 3000 PSI. The system shall operate between 1000 and 2500 PSI with flow controls to protect hydraulic components and incorporate a relief valve set at 2800 PSI to prevent over-pressurization.

An interlock device shall be provided to prevent activation of the aerial ladder hydraulic pump until either the transmission is placed in neutral and the parking brake is set, or the transmission is placed in drive and the rear driveline is disengaged as outlined in NFPA 19.17.3.

The hydraulic system shall be of the latest design and incorporate features to minimize heat buildup and provide smooth control of the aerial ladder. The system shall meet the performance requirement in NFPA 19.19.6 and 19.19.7, which requires adequate cooling under 2 ½ hours of operations. To control operating system temperature, a hydraulic oil cooler shall be supplied. The air to oil cooler shall be mounted on the turntable so as not to reduce the cooling capacity of the engine. A 12-volt fan shall move air across a tube and fin radiator system. The cooler shall be mounted on the turntable ahead of the operator's console.

All hydraulic components that are non-sealing whose failure could result in the movement of the aerial shall comply with NFPA 19.19.1 and have burst strength of 4 to 1. Dynamic sealing components whose failure could cause aerial movement shall have a margin of 2 to 1 on maximum operating pressure per NFPA 19.19.1.1. All hydraulic hoses, tubes, and connections shall have minimum burst strength of 3 to 1 per NFPA 19.19.2.

The hydraulic system shall consist of a 60 gallon reservoir mounted to the torque box and plumbed to the hydraulic pump. The tank shall be supplied with a removable top to access the tank strainer filter. There shall be plumbing for a supply and return line and a tank drain on the reservoir. The reservoir cap shall be marked per NFPA 19.19.5.2. Gated valves under the tank shall facilitate filter changes. Connections on the bottom of the tank shall utilize flange fittings for ease of service.

The hydraulic system shall use 5w-20 multi-weight, SAE 32 grade oil and incorporate the following filters to provide dependable service:

Reservoir Breather: (Torque Box):	10-micron Magnetic Reservoir Strainer: 3-micron Return Filter:	125-mesh Pressure Filter 10-micron
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The aerial hydraulic system shall be designed in such a manner that a hydraulic pump failure or line rupture shall not allow the aerial or outriggers to lose position. Hydraulic holding valves shall be mounted directly on cylinders. To ensure reliable performance of holding valves, no hoses shall be permitted between a holding valve and cylinder.

The hydraulic system shall be designed with an auxiliary power unit meeting the guidelines of NFPA 1901 19.18.6. The auxiliary power unit shall be two (2) 12 volt pumps connected to the chassis electrical system. The pumps shall provide operation at reduced speeds to store the aerial device and stabilizers for road transportation. Self-centering switches shall be provided at the turntable and each stabilizer control station to activate the system. The system shall be designed to provide a minimum of five (5) minutes of hydraulic power to operate functions.

Hydraulic power to the ladder shall be transferred from the torque box by a hydraulic swivel.

### **3.349.00 AERIAL TORQUE BOX (NO EXCEPTIONS)**

The aerial shall utilize an integral torque box chassis design. The integral torque box design shall serve to carry the chassis, body, and aerial device as an integrated system. The system design shall provide a lower center of gravity to enhance road performance, a mounting location for under-slung stabilizers, and additional space for body compartments. The strength of the torque box shall be a minimum 19 million-inch pounds resistance to bending moment. The stabilizers and turntable supports shall be welded directly to the torque box.

### **3.350.00 STABILIZATION (NO EXCEPTIONS)**

The unit shall be equipped with two sets of extendable crisscross under-slung stabilizers. The stabilizers shall have a spread of 15'-6" centerline to centerline of the stabilizer pads when fully extended. One set of stabilizers shall be mounted in the forward body area and a second set close to the rear axle to minimize impact on departure angle.

The stabilizers shall have a tip over safety margin of 1-1/2 times the rated load imposed by the aerial in any position the aerial device can be placed as outlined in NFPA 1901 19.21.2. The apparatus stabilization shall be accomplished without the assistance of the chassis suspension or tires in contact with the ground.

The aerial shall be able to sustain a 1-1/3 to 1 rated load on a 5 degree slope downward in the position most likely to cause overturning as outlined in NFPA 1901 19.21.3. The maximum ground slope the apparatus can be set up on is 14 percent. On the 14 percent slope the apparatus can be leveled within a 6 percent operating range for the apparatus.

The cylinders shall be supplied with dual pilot-operated check valves on each stabilizer cylinder to hold the cylinder in the stowed or working position should a charged line be severed at any point in the hydraulic system. The stabilizers shall level side to side, corner to corner and front to rear on uneven terrain. Stabilizers shall contain safety lock valves. This assures there will be no "leak down" of stabilizer legs. Mechanical pins are not required. This feature contributes to efficient set-up and field operation.

The stabilizer lift cylinders shall be sized to maximize ground penetration. The lift cylinders shall be mounted on the side of the torque box for protection and shall have the following dimensions:

Bore: 7"  
Stroke: 12-1/2"

The stabilizer extension cylinders shall have the following dimensions:

Bore: 2"  
Stroke: 54-3/4"

Each stabilizer that can be extended from the body shall be supplied with a red warning light as outlined in NFPA 19.21.4.4. A stabilizer extended warning light shall be supplied in the cab to warn the driver of an extended stabilizer condition as outlined in NFPA 1901 13.11. A floodlight shall be supplied in each stabilizer location to illuminate the stabilizer and ground. The light shall automatically turn on with the deployment of a stabilizer.

The stabilizer ground contact area for each foot pad shall be 10" x 14" without auxiliary pads and 26" x 26" with auxiliary pads deployed. The ground pressure shall not exceed 75 psi with auxiliary pads deployed when the apparatus is fully loaded, and the aerial device is carrying its rated capacity in every position. This shall be accomplished with the stabilizer pads deployed, as outlined in NFPA 19.21.4.2.

### **3.351.00 STABILIZER CONTROLS**

Eight (8) electric solenoid valves shall control the stabilizers. The control switches shall be located at the rear of the apparatus so the operator may observe the stabilizers during deployment. An audible alarm with a minimum 87 dbA shall also sound while the stabilizers are in motion as required by NFPA 19.21.4.1. Stabilizer deployment shall be completed in less than 45 seconds.

There shall be an interlock that prevents the operation of the ladder until the stabilizers are down and properly set as outlined in NFPA 19.17.5. Four (4) micro-switches, one (1) on each jackleg, shall sense when all four (4) jack feet are in contact with the ground. This condition shall be indicated when all four (4) yellow jacks-down indicator lights are on and the green interlock light is on. When the apparatus has been leveled, a manual

transfer switch shall be used to shift hydraulic power to ladder operations. The interlock system shall have a manual override with access through a door on the rear control panel.

To simplify leveling the apparatus, two (2) color-coded level indicators shall be supplied at the rear of the apparatus. One (1) indicator shall be for front to rear level and one (1) for side to side level.

### **3.352.00 FORWARD AERIAL SUPPORT**

The aerial ladder support shall be fabricated from steel components and be welded directly to the torque box chassis. The ladder support uprights shall be constructed from 7/8" thick steel plate. Bolt-in diagonal bracing shall be installed on the support structure in an "X" pattern to restrict to side movement. This design shall allow for a pre-determined amount of flex preventing premature failure that can be found in an overly rigid structure. The support shall be located behind the rear wall of the cab.

### **3.353.00 TURNTABLE SUPPORT ASSEMBLY**

The aerial ladder turntable assembly shall be mounted at the rear of the apparatus. The turntable support assembly shall be welded to the integral torque box for efficient transfer of aerial loads to the stabilizers and shall permit storage of ground ladders in the center rear of the apparatus. The complete turntable support assembly shall be multi-pass welded to the sides of the combination chassis frame torque box.

The turntable support assembly shall be a steel weldment constructed of four (4) vertical 1/2" x 6" x 6" square tubes with 1/2" x 5" x 5" square tubes welded around the top ends of the verticals.

A bearing mounting plate shall be welded to the top of the verticals and sides of the horizontals. The bearing mounting plate shall be 55-5/8" x 55-5/8" and shall have a 1-1/2" thickness. This bearing mounting plate shall be bulk-headed to a 3/4" steel plate that is welded to the bottoms of the horizontal tubing. The use of multi-pass welding shall be utilized wherever possible.

A 46-1/2" pitch diameter rotation bearing with a 3" face drive gear shall be bolted to the top of the bearing mounting plate with thirty (30) 7/8" grade 8 plated bolts. The gear tooth shall be involute stub tooth form.

### **3.354.00 UPPER TURNTABLE**

The upper turntable assembly shall attach to the rotation bearing and the base of the ladder.

The turntable working platform shall be a fabricated steel structure covered with a non-skid 3/16" thick aluminum material for operator safety. The right side of the turntable shall be modified to allow full access to the body's SideStacker hosebed (if equipped).

Two (2) railings 42' high shall be provided along the outside of the turntable disc as outlined in NFPA1901 19.18.1.

Two (2) padded Fire Research brand ManSaver safety bars shall be mounted to the turntable handrails. The bars shall lift up and inward (towards the ladder) permitting easy entrance to the ladder and control console.

The turntable assembly shall provide a mounting base for the ladder and elevating cylinders. The turntable assembly shall be bolted to the turntable bearing by thirty (30) 7/8" grade 8 plated bolts.

The ladder pivot point shall connect to the upper turntable assembly by two (2) 3" high strength pivot pins in heavy wall composite Teflon-lined bearings.

### **3.355.00 ELEVATION MECHANISM**

The aerial shall utilize dual 7" diameter elevating cylinders and shall attach to the upper turntable assembly and

the base section of the ladder by 3" ID spherical bearings. The elevation system shall be designed following NFPA 1901 19.10.3. The elevation hydraulic cylinders shall be electronically controlled to come to a smooth, controlled stop at each end of travel. The elevation cylinders shall incorporate integral load holding valves which shall prevent aerial movement in the case of ruptured hydraulic lines to the cylinders. The hydraulic elevation cylinders shall also serve as a locking device to hold the aerial in the stored position for road travel.

### **3.356.00 ROTATION MECHANISM**

The aerial shall be supplied with a hydraulically powered rotation system as outlined in NFPA 1901 19.10.3. The two (2) high-torque hydraulic rotation motors shall provide continuous rotation under all rated conditions and be supplied with a spring-applied brake to prevent unintentional rotation. The high torque rotation drives shall operate through a dual reduction planetary gear box that drives a spur gear mated with the ring gear on the rotation bearing. The rotation gearboxes shall be rated at 120,000 in. lbs. each.

### **3.357.00 AERIAL ELECTRIC POWER**

A hydraulic swivel shall be installed to provide hydraulic fluid transfer to the aerial ladder cylinders, electrical power to the aerial ladder, and water delivery to the pre-plumbed waterway while permitting continuous 360-degree rotation.

The swivel shall provide three (3) hydraulic circuits, twenty eight (28) electrical circuits, and one (1) 4" passage for water flow. Nine (9) of the electrical circuits shall be CAN bus capable. The swivel shall also be equipped with a rotary encoder to provide aerial position data to the microprocessor based control system.

The swivel shall be environmentally-sealed to prevent contamination of the hydraulic fluid.

### **3.358.00 ELEVATING PLATFORM WATER DELIVERY SYSTEM**

A 1250 GPM pre-piped waterway shall be supplied as outlined in NFPA 1901 19.12. The waterway shall telescope to the end of the third section to the platform water system. A waterway of 4" internal diameter shall run through the turntable and a swivel joint to connect to the tubular aerial waterway. The tubular waterway shall run under the aerial ladder. The waterway tubes shall have the following sizes:

Base Section:	5" 0 0
2nd Section:	4-1/2" OD
Fly Section:	4" 0 0

The tubes shall be constructed of 6063T6 anodized aluminum and shall be telescopic with the aerial ladder through sealed slip joints. The fly section waterway tubes shall be hard coated for wear resistance. The slip joints shall be designed with grease zerks fittings to facilitate lubrication.

A 1-1/2" drain valve shall be installed and operated from the rear of the apparatus.

The water system shall be capable of flowing 1250 GPM at 100 PSI nozzle pressure at full elevation and extension. The friction loss between the tip and below the swivel shall not exceed 100 PSI while flowing 1000 GPM as outlined in NFPA 1901 19.12.1 and 19.12.2.

### **3.359.00 WATERWAY RELIEF VALVE**

An automatic relief valve present at 250 PSI shall be installed in the aerial waterway to prevent over-pressurization of waterway system as outlined in NFPA 1901 19.12.8. The relief valve shall be mounted in the lower portion of the waterway where it enters the aerial torque box frame and dumps under the apparatus.

### **3.360.00 ISO COMPLIANCE**

The manufacturer shall operate a Quality Management System meeting the requirements of ISO 9001:2000.

The International Organization for Standardization (ISO) is a recognized world leader in establishing and maintaining stringent manufacturing standards and values. The manufacturer's certificate of compliance affirms that these principles form the basis for a quality system that unswervingly controls design, manufacture, installation, and service.

The manufacturer's quality systems shall consist of, but not be limited to, all written quality procedures (aka QOP) and other procedures referenced within the pages of the manufacturer's Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts products or processes. In addition, all apparatus assembly processes shall be documented for traceability and reference. The manufacturer shall also engage the services of a certified third party for testing purposes where required.

If the manufacturer operates more than one manufacturing facility each facility must be ISO certified. By virtue of its ISO compliance the manufacturer shall provide an apparatus that is built to exacting standards, meets the customer's expectations, and satisfies the customer's requirements.

A copy of the manufacturer's certificate of ISO compliance for each manufacturing facility shall be provided with the proposal.

### **3.361.00 SHORT JACKING SYSTEM (NO EXCEPTIONS)**

The aerial stabilizers shall be capable of short jack operation with one or both sides fully retracted. When set up in the short jack mode with one side retracted and the other side fully deployed the outrigger spread shall be 11'-2" from centerline to centerline of the stabilizer pads. The short jacking operation will allow for rapid set-up in congested/restricted areas. The ability to set-up in congested areas is further enhanced in that mechanical safety pins are not required thus permitting the short side stabilizer to be deployed without having to be extended. The double short jacked mode is also useful in maintenance/servicing situations which may occur in extremely tight areas. This configuration shall allow the aerial to be raised and the cab to be tilted without having to extend the outriggers.

To provided additional ground penetration the crisscross underslung stabilizers shall have an additional lift cylinder mounted at the outward end of the extending beams with the following dimensions:

Bore: 5"  
Stroke: 14"

The stabilizer hydraulic system shall have sequencing valves that allow the inward lift cylinders to extend first followed by the outward lift cylinders.

With the short jack option the stabilizer pads shall be 13.38" diameter.

The system electronics shall be configured so as to restrict rotation to the short jack side using a CAN based rotation encoder. When the aerial is fully retracted it shall be capable of being elevated fully and rotated around on the short jack side. The system electronics shall also allow the aerial to rotate at any extension or elevation angle 5 degrees to the short jack side of center over the front of the apparatus or 10 degrees to the short jack side of center off the rear of the apparatus. This extended travel range is desired to provide a larger scrub zone.

Switches shall be provided to select the desired side(s) to have the stabilizer(s) short set. The system electronics shall be configured so as to eliminate the requirement for a momentary switch to be engaged for operation in short jack mode. This function allows for normal aerial control operation when set up in a short jack mode.

There shall be short jack indicators on the aerial turntable control console when the respective stabilizer is not

fully deployed.

### **3.362.00 AERIAL HYDRAULIC OIL LEVEL GAUGE**

A hydraulic oil level gauge shall be supplied for easy fluid level verification. The three-light system shall indicate full oil level with a green light, acceptable oil level with yellow light, and low oil level with a red light. The display shall be located on pump operator's panel.

### **3.363.00 AERIAL HYDRAULIC PUMP**

The aerial hydraulic pump shall have a drive-through provision. This feature shall provide power to an additional hydraulic system from a common transmission power take-off port.

### **3.364.00 TURNTABLE CONSOLE**

The turntable console shall be formed from 1/8" (.125) aluminum diamond plate and be mounted to a tubular steel support. The console shall be a single-level design and include a side hinged diamond plate cover to protect all controls from the elements. The console shall include lighting for night operations and controls shall all be labeled for easy identification of operation.

### **3.365.00 AUTOMATIC LEVELING SYSTEM**

The aerial stabilizers shall include an automatic leveling system. The stabilizers shall be semi-automatically controlled by a microprocessor leveling system which can level the chassis within operating range as long as the grade is within the capabilities of the stabilizer system.

The stabilizer leveling system shall be operated by a tethered handheld controller. The controller shall have buttons for individual stabilizer control as well as auto level and auto retract. The system shall require the operator to hold the Auto Level button as it runs through its process. Releasing the button will cease operations if needed. This controller shall be in addition to standard stabilizer switch panels on the apparatus body. The tethered control shall be located in storage box for handheld jack control.

### **3.366.00 PLATFORM PIVOT CONTROL**

The platform leveling system shall be designed to tilt the aerial platform up or down from within the cab. The system shall include a platform level assist feature.

The system shall include a momentary switch accessible by the driver to allow pivoting of the platform up or down. The switch shall have an integral light with two (2) colors. Green illumination shall indicate the platform is in alignment with the ladder sections and red shall indicate the platform is out of alignment. A second momentary switch shall be provided that activates the system to automatically align the platform with the aerial ladder sections.

### **3.367.00 AERIAL CONTROL SYSTEM (NO EXCEPTIONS)**

The aerial hydraulic system shall be equipped with a microprocessor based electric over hydraulic control system. The system shall utilize six (6) proportional control valves for aerial device movements. The electro-hydraulic valves shall permit the use of base and tip controllers and minimize hydraulic connections. The hydraulic system valve body shall be located under the ladder base step to provide as much turntable workspace as possible.

The switch modules on the console shall be CAN based for reliable operation. The system shall utilize 32-bit control module(s) rated for mobile applications.

The control system shall have manual overrides in the event of a system failure. The overrides shall be located on the turntable accessible by a door on the turntable step. The manual system shall be organized to match the base

controllers and is function labeled.

### **3.368.00 AERIAL LADDER CONTROL LEVERS**

The control system shall incorporate two (2) joysticks at each control console. One (1) shall be a single axis joystick and one (1) a multi-axis. The extension control shall be with the left joystick and the rotation and elevation shall be with the right joystick in accordance with NFPA 1901. A ring shall be provided around each joystick to prevent unintentional movement as outlined in NFPA 19.17.6.2.

### **3.369.00 AUTOMATIC VARIABLE SPEED CONTROL**

The aerial hydraulic system shall deliver variable rotation and elevation speeds based on platform position. The system shall allow the aerial to proportionately operate quicker, either through elevation or retraction, as the platform is brought in closer to the turntable centerline. This feature provides quicker ladder movement when not fully extended and/or elevated. The variable speed system also offers the operator more consistent platform movement speed (distance per second) regardless of platform location, equating to more predictable aerial control.

The aerial control system shall include electronic ramping to provide smooth acceleration and deceleration of aerial functions during sudden movements of the operator control levers. The control system shall also monitor the end of the stroke position of both the elevation and extension cylinders to bring the aerial to a smooth and controlled stop at the end of the cylinder stroke. The sensors shall be CAN based for accurate and reliable performance.

### **3.370.00 AERIAL SPEED SWITCH**

The control system shall be provided with a slow speed (Creep) switch. This switch, when activated, shall reduce aerial operating speeds, allowing for pin-point platform placement. When in the creep mode, the ramping feature of the controls system shall be disabled allowing for precise aerial placement. When the creep speed switch is activated the chassis engine shall remain at idle speed.

### **3.371.00 TETHERED CONTROL**

A tethered control shall be provided in the platform to allow the operator to move the aerial from anywhere in the platform.

The control shall have a nylon housing to withstand shock and be IP66 rated to withstand harsh environments. The control shall have tactile buttons for full control over extension, rotation and elevation.

The controller shall also have switching to select between four (4) speeds with the maximum being approximately 60% of normal aerial speed. The controller shall have LED lights to indicate the selected speed.

The platform operator's console shall be fitted with a switch to disable the tethered control. The tethered control shall be stored in a recessed box integral to the platform control console.

### **3.372.00 VARIABLE RAMPING**

A three (3) position switch shall be provided to select system ramping (ladder movement when initiating or ceasing movement of a control lever). The switch shall allow selection of normal (1/2 second), firm (1/4 second) or soft (3/4 second) ramping based on operator preference.

### **3.373.00 CAB/BODY PROTECTION**

The aerial control system shall feature programming to prevent the aerial from contacting the cab and/or body.



The system shall feature multiple zones to optimize operational envelop based on a specific apparatus configuration. When approaching a protected zone the aerial shall automatically ramp down in speed to come to a soft stop. An indicator shall be provided on the control system's display when the aerial reaches a protected zone. A momentary switch shall be provided to allow the aerial operator to by-pass the cab/body protection zone.

### **3.374.00 AERIAL INFORMATION SYSTEM DISPLAY-TURNTABLE**

The aerial device shall be equipped with a 7" color display at the turntable console that provide critical information to the aerial operator for added safety.

Information shall be conveyed to the operator using J1939 protocol through multiple mission- specific screens, each tailored for a specific fireground activity. The screens display shall include available tip load, distributed load, master stream and aerial systems data.

The available tip load shall be represented in simple "Stick-Figure" type symbols that show the allowable quantity of people at the tip based on ladder position. The screen layouts shall be uncluttered allowing the symbols to be easily read at a glance. The system shall also feature programming that calculates the allowable tip load based on elevation and extension, allowing for increased tip capacity when possible. Systems that rely on hydraulic pressure to determine load shall not be acceptable.

In addition to available tip load, the display shall provide the following information:

- Ladder extension (%)
- Ladder inclination in degrees
- Ladder rotation position
- Rated distributed load
- Waterway flow (if equipped with a pre-piped waterway)
- Total waterway flow (with reset button)
- Waterway pressure (if equipped with a pre-piped waterway)
- Tip temperature
- Hydraulic oil pressure Hydraulic oil temperature
- Hydraulic oil level
- Aerial hour meter
- Rung alignment status
- Cradle alignment status
- Aerial PTO status
- Aerial PTO engage
- Breathing air status (if equipped with breathing air)
- Fuel Level
- Transmission temperature Engine RPM
- Coolant temperature
- Engine oil pressure
- Battery voltage
- Pump in gear status (if equipped with a pump)
- OK to pump status (if equipped with a pump)
- Chassis engine start/stop
- Chassis air horn switch

The display shall be capable of showing system units in standard or metric values.

### **3.375.00 DISPLAY SCREEN**

- 7" bonded Transflective LCD screen (Sunlight viewable), 16-bit color format.

- 800 x 480 resolution
- LED backlighted switches, environmentally sealed housing
- Fourteen (14) integrated tactile navigation buttons

### **3.376.00 AERIAL INFORMATION SYSTEM DISPLAY-PLATFORM**

The aerial device shall be equipped with a 4.3” color display at the control console in the aerial platform. Information shall be conveyed to the operator using J1939 protocol through multiple mission-specific screens, each tailored for a specific fireground activity. The screens display shall include available tip load, distributed load, master stream and aerial systems data.

The available tip load shall be represented in simple “Stick-Figure” type symbols that show the allowable quantity of people at the tip based on ladder position. The screen layouts shall be uncluttered allowing the symbols to be easily read at a glance. The system shall also feature programming that calculates the allowable tip load based on elevation and extension, allowing for increased tip capacity when possible. Systems that rely on hydraulic pressure to determine load shall not be acceptable.

In addition to available tip load, the display shall provide the following information:

- Ladder extension (%)
- Ladder inclination in degrees
- Ladder rotation position
- Rated distributed load
- Waterway flow (if equipped with a pre-piped waterway)
- Total waterway flow (with reset button)
- Waterway pressure (if equipped with a pre-piped waterway)
- Tip temperature
- Rung alignment status
- Cradle alignment status
- Breathing air status
- Fuel level
- Chassis horn switch.

The display shall be capable of showing system units and standard or metric values.

### **3.377.00 DISPLAY SCREEN**

- 4.3” bonded Transflective LCD screen (Sunlight viewable), 16-bit color format.
- 480 x 272 resolution
- LED backlighted switches, environmentally sealed housing.
- Eight (8) integrated tactile navigation buttons.

### **3.378.00 AUDIBLE WARNINGS**

The system shall include alarms to indicate when tip temperature is greater than 300°F, tip temp below 32°F, hydraulic oil temperature is above 190°F and when breathing air is below 20% and 5% volume (if equipped).

### **3.379.00 VISUAL WARNINGS**

In addition to the audible warnings, the system shall include visual warning indicators for high tip temperature, low tip temperature, high hydraulic oil temperature and low breathing air (if equipped).

### **3.380.00 SENSORS**

- Ladder extension Ladder inclination Turntable rotation
- Waterway pressure (if equipped with a pre-piped waterway) Waterway flow (if equipped with a pre-piped waterway) Tip temperature
- Hydraulic oil pressure Hydraulic oil temperature Hydraulic oil level Cradle alignment
- Rung alignment
- Breathing air pressure (If equipped with breathing air)

### **3.381.00 CRADLE ASSIST SWITCH**

The control system shall also include a momentary switch to assist in stowing the aerial. The switch, in conjunction with moving the “down” aerial control lever shall cause the aerial to rotate to center and lower into the cradle. The system shall be operational when the aerial is below 30 degrees in elevation and 30 degrees left or right of center.

### **3.382.00 CRADLE ALIGNMENT LIGHT**

A green light shall be provided at the turntable control console to indicate when the aerial is aligned for bedding.

### **3.383.00 MONITOR STOW SWITCH**

The control system shall also include a switch to deploy and stow the waterway monitor (if equipped with a pre-piped waterway).

### **3.384.00 EMERGENCY STOP SWITCH**

An emergency stop switch shall be provided on the console that turns off the controllers and de-energizes the PTO in the event the aerial must be stopped immediately. The system shall include both visual and audible indicators that the switch has been activated.

### **3.385.00 DURABILITY**

The components shall be thoroughly tested and have a proven reliability in severe environments to ensure long life on the fireground. The system shall be capable of operating in a temperature range of -40°C through +85°C.

### **3.386.00 DIAGNOSTICS**

The system shall feature diagnostic capabilities that includes an I/O status screen separated by component.

### **3.387.00 MONITOR FINISH**

The aerial monitor(s) shall be ordered from the OEM manufacturer painted silver.

### **3.388.00 ELECTRONIC MONITOR**

The aerial platform shall come equipped with an Akron 3480 StreamMaster II electrically controlled monitor with a SabreMaster 1578 straight bore/fog flow multi-purpose nozzle.

The platform waterway monitor shall have a horizontal sweep of 180 degrees (90 degrees either side of center) and a vertical sweep of 90 degrees (45 degrees above and below horizontal).

The monitor relay box shall include electronic control system that is attached to the inlet base of the monitor and be totally encapsulated to prevent moisture intrusion. The monitor shall have fully enclosed motors and gears with built in manual override capability and quick attach handles. The monitor shall be able to operate in the horizontal and vertical axis simultaneously.

Control switches for horizontal movement, vertical movement and pattern selection shall be located at the turntable operator console.

The electric monitor and nozzle shall be capable of discharging up to 1250 gpm at 80 psi nozzle pressure.

The monitor shall be installed on the center front of the platform.

**3.389.00 MONITOR TIP CONTROLS**

In addition to the controls at the operator console, electric monitor directional and stream controls shall be installed on the operator console in the platform.

**3.390.00 SHUT-OFF VALVE**

A TFT model# AKM132112D manual Valve Under Monitor (VUM) valve shall be provided at the base of the monitor. The valve body shall be constructed from cast aluminum with a pivoting cast stainless steel shut-off assembly. The valve shall allow the monitor to be shut off when using the 2.5” auxiliary discharges.

**3.391.00 2.5” Valve**

(2) Two auxiliary 2.5” discharge valves shall be provided from the VUM at the base of the monitor.

**3.392.00 FLOW RATINGS**

The monitor when installed on a 95-Platform shall have a flow rating of up to 1250 gpm based on the following positions:

<b>Total GPM Sweep</b>	<b>Horizontal Sweep</b>	<b>Vertical</b>
0-1000	180 (90 Left from center/90 Right from center)	45 Up /45 Down
1001-1250	90 (45 Left from center/45 Right from center)	30 Up /45 Down

The monitor when installed on a HP95/HPS100 Mid-Mount or HP100/HPS100 Rear-Mount Platform shall have a flow rating of up to 1250 gpm based on the following positions:

<b>Total GPM Sweep</b>	<b>Horizontal Sweep</b>	<b>Vertical</b>
0-1250	180 (90 Left from center/90 Right from center)	45 Up/45 Down

**3.393.00 WATERWAY INLET**

One (1) 4” inlet shall be provided at the rear of the apparatus and shall be connected to the vertical pedestal waterway piping to supply water to the aerial waterway from an outside source. All fabricated piping shall be constructed of a minimum of Schedule 10 stainless steel piping to help prevent corrosion. The threads shall be NST. A long handle chrome plated 4” NST cap shall be installed on the inlet.

**3.394.00 WATERWAY PRESSURE GAUGE**

The waterway gauges shall be 4” (101mm) diameter Innovative Controls pressure gauges. Each gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and 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 -40F to +160F.

Each gauge shall exceed ANSI 840.1 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 stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauges shall be installed into decorative chrome-plated mounting bezels that incorporate valve - identifying verbiage and/or color labels.

The gauges shall display a range from 0 to 400 psi with black graphics on a white background.

### **3.395.00 LED OUTRIGGER LIGHTS (4)**

Four (4) Whelen M6V2R Super LED red light heads with red lens shall be provided. The rectangular lights shall include chrome flanges. The lights shall be surface mounted on the outrigger covers in compliance with current NFPA 1901. Warning and ground lights shall be activated with aerial master switch.

### **3.396.00 WARNING LIGHTS ON FRONT OF PLATFORM**

Four (4) Whelen C-Series model C6L Super LED light heads shall be provided. The lights shall be Red with clear lenses. The rectangular flashing lights shall be surface mounted low across the aerial platform and be wired to the upper level warning light package.

### **3.397.00 WARNING LIGHT ON SIDES OF PLATFORM**

Two (2) Whelen C-Series model C6L Super LED light heads shall be provided on the aerial platform. The lights shall be Red with red lenses wired to activate through aerial master switch. The rectangular lights shall include chrome flanges where applicable.

Location: on the side of the ground pad brackets.

### **3.398.00 LADDER BASE LIGHTING**

Two (2) Whelen round 12 Super LED model PFBP12C floodlights with black housing and chrome rear cover shall be mounted one on each side at the bottom of the ladder base section. They shall be controlled from the turntable operating pedestal.

### **3.399.00 QUARTZ LIGHT**

A Whelen Pioneer Plus series 120V LED light fixture model PFP2AC dual panel light head shall be provided on a PBA203 recess mount. The rectangular extruded light fixture with die cast end caps shall measure 14" wide by 4-5/8" high by 3" deep and have a white powder coat finish. The light fixture shall have a dual panel (4) clusters of LED lamps with molded vacuum metalized reflector that draws 1.25 amps and produce 11,000 usable lumens.

The light shall be located center front of platform.

A weather-resistant switch shall be provided on the platform control panel to control the light when the aerial power circuit is activated.

### **3.400.00 LADDER CLIMBING LIGHTS (NO EXCEPTIONS)**

A Luma-Bar Pathfinder LED lighting system shall be provided to illuminate the climbing area inside each ladder section. The strip type lights shall be located above ladder rung level and directed toward the centerline of the ladder to reduce glare. The lights shall be mounted to a 1.25" x .5" x .125" extruded aluminum channel and wired to not be an obstruction during climbing. The lights shall be controlled with the ladder lights switch at the

operator's control console.

The LED lights shall be Blue.

### **3.401.00 LED FLOOD LIGHT**

Whelen Pioneer Plus, 150W 120V LED light fixture shall be supplied. The rectangular extruded light fixture with die cast end caps shall measure 14" wide by 4-5/8" high by 3" deep and have a white powder coat finish. The light fixture shall have a dual panel (4) clusters of LED lamps with molded vacuum metalized reflector that draws 1.25 amps and produces 11,000 usable lumens. The light shall be mounted on a Whelen top raising aluminum telescopic pole with up indicator switch. The light shall be fitted with a weather-resistant switch and hard-wired to the aerial tip power circuit. The pole shall allow for 360-degree rotation of the light. A locking knob shall hold the pole at the desired height.

The light shall be located left rear of platform, right rear of platform.

### **3.402.00 AERIAL TIP RECEPTACLE**

A 110 volt twist lock 20 amp receptacle outlet shall be installed at the tip of the aerial device and wired into an apparatus breaker box with a 30 amp breaker. The breaker shall be fitted with a GFI protection feature. The receptacle box shall be fitted with a weather-resistant cover.

### **3.403.00 AERIAL BREATHING AIR SYSTEM (NO EXCEPTIONS)**

The aerial device shall be supplied with a breathing air system as outlined in NFPA 1901 19.7.7 and section 24.5. The air system shall hold a total of 444 cubic feet of air carried in single DOT 444 cubic foot cylinder rated at 4500 psi. The air tank shall be painted yellow and marked with a label that reads "High Pressure 4500 psi Breathing Air". The tank shall be mounted in accordance with NFPA 1901 24.5.7 and include a guard to protect the valve on the cylinder end.

All components of the piping system shall have a 3 to 1 safety margin. There shall be a high pressure regulator supplied at the base of the aerial to reduce the air pressure to no more than 125 psi up the aerial. All valves fittings and hoses shall be constructed of corrosion-resistant material. A pressure relief valve set at 1 1/2 times working pressure shall be supplied to relieve the airlines in the event of a pressure regulator failure. Two (2) 1/4" NPT outlets shall be provided in the platform for dealer/customer installed quick-connects.

An air mask box shall be provided to store breathing air masks at the tip as outlined in NFPA 1901 19.7.7.4.

A low air breathing alarm shall be provided as outlined in NFPA 1901 section 19.7.7.5. The low air warning system shall provide an audible and visual warning when the air volume is at or below 20 percent.

### **3.404.00 AXE BRACKET**

An axe bracket shall be provided on the aerial ladder. The bracket shall be Zico model# H-AB blade guard and PAC TRAC model# 1004 clamp for the handle. The bracket shall be designed to hold a 6 lb. axe.

Location: left side fly section.

### **3.405.00 PIKE POLE MOUNT**

There shall be an aluminum tube mounted directly on the ladder for storage of an 8' pike pole. The tube shall be located left side fly section.

### **3.406.00 LIFTING EYE/TIE-OFF PACKAGE**

A lifting eye/tie-off package shall be provided on the aerial. The package shall consist of a pair of lifting eyes located one each side at the tip of the base section (below main rail) and a pair of tie-off points located one each side at the base of the aerial.

The lifting eyes shall be welded one each side to the tip of the aerial's base section. The hole in the eye shall have chamfered edges and be designed to allow attachment of 2" webbing. The lifting eyes shall have a capacity of 2000 lbs. each /4000 lbs. total (with the aerial fully retracted and no personnel in the platform or on the ladder).

The tie-off points shall be constructed of structural steel and be welded to the aerial's upper turntable trunnions. The tie-offs shall be designed to allow attachment of 2" webbing. The tie-off points shall have a capacity of 375 lbs. each/750 lbs. total.

### **3.407.00 HOSE BOX**

A hinged covered hose box shall be mounted at the platform. The box shall have sufficient capacity to hold 50' of 1-1/2" double jacket coupled fire hose and pistol type automatic nozzle. The box shall be located left side of platform.

### **3.408.00 RAPPELLING ROPE GUIDES**

Rope guides shall be provided on the platform for use when rappelling. The guides shall be constructed of polished stainless steel and be located one each side on the upper front handrail. Anchor points shall be provided each side down low on the rear of the platform for tying off the rappelling ropes. Load rating for each tie-off point shall be 375 pounds.

### **3.409.00 STOKES BASKET BRACKETS**

Brackets shall be provided to mount a stokes basket to the aerial base section while not in use. Brackets shall hold a Ferne Model 71 stokes. The stokes basket shall mount on the base section on the right side toward front. Stokes not included.

### **3.410.00 STOKES BASKET RECEIVER (NO EXCEPTIONS)**

The platform shall have the capacity to receive a stokes basket at tip for rescue operations. Two welded removable structures shall be provided which shall fasten to the basket utilizing T-handle stainless steel locking pins. The locking pins shall be attached by stainless steel cables to the stokes frame assembly. Each welded assembly shall be supplied with a carabineer hook and Velcro straps to secure the stokes basket to the receiver.

The stokes receivers shall be able to be mounted in three (3) locations:

- Left side of platform with basket positioned front to rear
- Right side of platform with basket positioned front to rear
- Rear of platform with basket positioned side to side

### **3.411.00 ROOF LADDER BRACKET**

A lift-out style roof ladder mounting bracket shall be installed on the outside of the ladder base section. The bracket shall be designed to hold a PRL-14 on left side of base section.

### **3.412.00 PARAPET ROOF LADDER BRACKET**

A bracket shall be provided on the aerial platform for attaching a ground ladder allowing roof access over a parapet.

### **3.413.00 AERIAL SIGN PLATE**

Two (2) 12" x 144" x 1/8 " (0.125") thick smooth aluminum plates shall be provided. The plates shall have 1" lips top and bottom for rigidity. Each sign plate shall be bolted on either side of the base section, approximately at the midpoint. The plates shall be provided to display the departments name or other information. The plates shall be painted job color as specified by the customer.

### **3.414.00 THIRD-PARTY FLOW TEST**

A flow test shall be conducted to determine that the water system is capable of flowing 1,000 gpm at 100 psi nozzle pressure with the aerial device at full extension and elevation. When the aerial apparatus is equipped with a fire pump, the test shall be conducted using the onboard pump. Intake pressure for the onboard pump shall not exceed 20 psi.

In addition to the flow test, a hydrostatic test shall be done on the waterway system. The permanent water system, piping, and monitor shall be hydrostatically tested at the maximum operating pressure required to flow 1,000 gpm at 100 psi nozzle pressure at maximum elevation and extension.

These results shall be certified by an independent, third-party testing organization, per NFPA 16.13.1 through 16.13.1.3.

### **3.415.00 AERIAL CERTIFICATION**

All certification shall be performed by a certification organization that is accredited for inspection and testing systems on fire apparatus in accordance with ISO/IEC 17020.

The aerial ladder shall be tested in compliance with the current editions of NFPA 1901 and NFPA 1911. All critical structural components of the aerial shall include 100% nondestructive testing (NDT) before assembly and body mounting. All NDT testing shall be performed by Level II or Level III technicians who have been certified in the test methods used in accordance with ANSI/ASNT CP-189.

Welds for structural load-supporting elements shall be performed by certified welders under the guidelines of AWS. Each aluminum ladder section shall be subjected to 100% NDT visual weld inspection followed by Liquid Penetrant NDT inspection as required to qualify suspected weld defect indications. Each steel ladder section shall be subjected to 100% Magnetic Particle NDT weld inspection to assure the structural integrity of the welds.

A 100% Magnetic Particle weld inspection shall be conducted on the torque box, aerial support structure, outriggers, outrigger support structure and all other structural ferrous aerial components. This test shall be performed to assure the structural integrity of the weldment.

After the aerial is assembled and installed on the vehicle, an operational inspection shall be made, and the aerial shall be tested to comply with the applicable standards in the current editions of NFPA 1901 and NFPA 1911.

In addition to the above tests, the aerial shall successfully complete the following operational tests:

- 1.) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. The aerial shall lift a test weight equal to the rated tip load capacity, as specified herein, with the aerial at full extension, 0 degrees elevation, and rotated 90 degrees to either side of the truck chassis. The test weight shall be lifted from 0 degrees to 15-20 degrees. The test weight shall be suspended from a position equal to the position of the outermost rung of the fly section or the center of the platform when so equipped. The aerial shall lift the test weight smoothly and evenly with no twisting or jerking. This test shall be performed at the normal hydraulic system relief valve setting. No temporary adjustments to the relief valve shall be allowed.



- 2.) The completed apparatus shall be placed on a firm, level surface with the aerial ladder stabilizers extended and down. A test weight equal to 1.5 times the aerial's rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center of the platform when so equipped), with the aerial in the straight-ahead position. The aerial shall then be rotated a full 360 degrees around the vehicle with the aerial at full extension and at 0 degrees elevation (or high enough to clear vehicle-mounted equipment). The aerial and vehicle shall show no signs of instability. This test shall be performed with no water in the tank, or hose, ladders, or removable equipment that would act as a counterbalance in order to simulate a worst-case condition.
- 3.) The completed apparatus shall be placed on a firm surface having a minimum 5 degrees side slope with the aerial stabilizers extended and down. A test weight equal to 1.5 times the aerial's rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center of the platform when so equipped), with the aerial in the straight-ahead position. The aerial shall then be rotated 90 degrees to the downhill side with the aerial at full extension, 0 degrees elevation (or high enough to clear vehicle-mounted equipment). The aerial and vehicle shall show no signs of instability, and all of the stabilizers shall remain firmly on the ground. This test shall be performed with no water in the tank, or hose, ladders, or removable equipment that would act as a counterbalance in order to simulate a worst-case condition.
- 4.) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. A test weight equal to 2.0 times the aerial's rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center of the platform when so equipped), with the aerial in the straight-ahead position at full extension and at 8 degrees elevation (or high enough to clear vehicle-mounted equipment). After ten (10) minutes, the weight shall be removed, and the aerial shall be inspected for any abnormal twist or deflection.
- 5.) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. The aerial will be positioned at full extension at 0 degrees elevation at some position out of the travel rest and off the side or rear of the truck. For units without a pre-piped waterway to the tip, a test weight of 220# shall be applied horizontally and perpendicular to the tip of the aerial at the location of the outermost rung. The rotation brake shall not release nor shall the aerial's deflection exceed the manufacturer's accepted tolerances. For aerials with pre-piped waterways, a test weight of 350# will be applied at the location of water nozzle.

Upon satisfactory completion of all inspections and tests, an independent third-party inspection firm shall submit a certificate indicating that all specified standards have been met.

### **3.416.00 DUO SAFETY ROOF LADDER**

A 14' Duo Safety aluminum roof ladder shall be provided. Folding steel roof hooks shall be attached to both ends. Series 775-DR

### **3.417.00 DUO SAFETY ROOF LADDER**

A Duo Safety 16' aluminum roof ladder shall be provided. A pair of folding 3/4" (0.75") steel roof hooks shall be attached to both ends. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931. Series 875-DR

### **3.418.00 DUO SAFETY EXTENSION LADDER**

One (1) Duo Safety, 24 aluminum 2-section extension ladder shall be provided. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931. Series 900-A 2-Section

### **3.419.00 DUO SAFETY EXTENSION LADDER**

A Duo Safety 28' aluminum two-section extension ladder shall be provided. Series 1200-A

### **3.420.00 DUO SAFETY EXTENSION LADDERS (QTY 2)**

Two Duo Safety 35' two-section extension ladders shall be provided. Series 1200-A

### **3.421.00 DUO SAFETY ROOF LADDER**

A Duo Safety 20' aluminum roof ladder shall be provided. A pair of folding 3/4" (0.75") steel roof hooks shall be attached to both ends. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931. Series 875-DR

### **3.422.00 DUO SAFETY FOLDING LADDER**

One (1) Duo Safety 10' aluminum folding ladder shall be provided. Both ends shall be equipped with molded rubber feet. For a more compact storage profile, the ladder shall be supplied without handles. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931. Series 585-A

### **3.423.00 DOT REQUIRED DRIVE AWAY KIT**

Three (3) triangular warning reflectors with carrying case shall be supplied to satisfy the DOT requirement.

### **3.424.00 PAINT BREAK WITH DIP TO GRILLE**

The cab shall have a two-tone paint break. The break line shall be approximately 31.5 inches below the cab roof drip rail. The paint break shall include a dip down to the corners of the cab grille.

### **3.425.00 PAINTED PUMP/PRE-CONNECT MODULE(S)**

The apparatus pump/pre-connect module(s) shall be painted job color. The paint process shall match what is applied to the body.

### **3.426.00 PAINTED HEADER PLATE**

The roll up door header plates shall be painted job color for all painted roll-up doors.

### **3.427.00 PAINT CUSTOM CAB**

The apparatus cab shall be painted Sikkens FLNA3225 Red. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum cab exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces. Cab doors and any hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on cab, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention -all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV -acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.

- Sikkens High Solid LVBT650 (Base coat) -a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat)-high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, handrails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, handrails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

### **3.428.00 PAINT CAB TWO-TONE COLOR**

The upper section of the cab shall be painted FLNA4145 Black.

The paint process of the secondary cab color shall be the same as the primary color.

### **3.429.00 PAINT BODY LARGE**

The apparatus body shall be painted Sikkens FLNA3225 Red. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention -all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV -acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Sikkens High Solid LVBT650 (Base coat) -a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat) -high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two
- (2) coats shall be applied.

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, handrails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, handrails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

### **3.430.00 AERIAL PAINT**

The lift cylinders, extension cylinders and upper turntable steelwork (less turntable) shall be painted to match the primary job color.

### **3.431.00 CAB INTERIOR PAINT**

The interior of the cab shall be painted Zolatone gray #20-64. Prior to painting, all exposed interior metal surfaces shall be pretreated using a corrosion prevention system.

### **3.432.00 REFLECTIVE STRIPES ON STABILIZERS**

Aerial ladder stabilizers which protrude beyond the side of the body shall be striped with alternating color Reflexite V98 film. The stripes shall run at a 45 degree angle sloping down and away from the center, forming an "A" shape when viewed from the front or rear of the unit. The reflective material shall meet NFPA 1901 requirements.

### **3.433.00 REFLECTIVE STRIPE IN RUBRAIL**

The reflective stripe in the body rubrail shall be Black.

### **3.434.00 CAB AND BODY STRIPE**

A single Scotchlite stripe, up to 6 inches in width shall be installed on the cab and body. The stripe shall have a hockey style, Z or S style or any other customer specific design style.

The stripe shall be NFPA compliant and the size, color and location shall be as specified by the customer.

### **3.435.00 CAB AND BODY STRIPE (Qty 2)**

An additional Scotchlite stripe, up to 3 inches in width shall be installed on the cab and body.

The stripe shall be NFPA compliant and the design, size, color and location shall be as specified by the customer.

### **3.436.00 SCOTCHLITE CAB STRIPE**

Scotchlite cab stripe shall be 3/4" in width total, 1/2" gold stripe with a 1/8" customer specified color outline on both sides and a clear polyurethane coating. Stripe shall be centrally located and shall contour with the cab, following the paint break.

### **3.437.00 REAR BODY REFLECTIVE STRIPING**

Chevron style Reflexite V98 striping shall be provided on the rear of the apparatus. The stripes shall consist of 6" Red/Fluorescent Yellow Green alternating stripes in an "A" pattern. The striping shall be located on the rear facing extrusions, panels and doors inboard and outboard of the beavertails if applicable.

### **3.438.00 DESIGNATED STANDING/WALKING AREA INDICATION**

1" wide yellow perimeter marking consisting of individual Reflexite diamonds shall be applied to indicate the outside edge of designated standing and walking areas above 48" from the ground in compliance with 2016 NFPA 1901. Steps, ladders and areas with a railing or structure at least 12" high are excluded from this requirement.

### **3.439.00 GRAPHICS DRAWING**

A graphics drawing shall be provided for the apparatus. The drawing shall include striping, lettering and logos meeting NFPA guidelines. The drawing shall be presented for review and approval by the end user prior to application of the graphics.

### **3.440.00 STANDARD 1 YEAR WARRANTY**

The apparatus manufacturer shall provide a full 1-year standard warranty. All components manufactured by the apparatus manufacturer shall be covered against defects in materials or workmanship for a 1-year period. All components covered by separate suppliers such as engines, transmissions, tires, and batteries shall maintain the warranty as provided by the component supplier. A copy of the warranty document shall be provided with the proposal.

### **3.441.00 LIFETIME FRAME WARRANTY**

The apparatus manufacturer shall provide a full lifetime frame structural warranty. This warranty shall cover all apparatus manufacturer designed frame, frame members, and cross-members against defects in materials or workmanship for the lifetime of the covered apparatus. A copy of the warranty document shall be provided with the proposal. Frame warranties that do not cover cross-members for the life of the vehicle shall not be acceptable.

### **3.442.00 10 YEAR 100,000 MILE STRUCTURAL WARRANTY**

The apparatus manufacturer shall provide a comprehensive 10 year/100,000 mile structural warranty. This warranty shall cover all structural components of the cab and/or body manufactured by the apparatus manufacturer against defects in materials or workmanship for 10 years or 100,000 miles, whichever occurs first. Excluded from this warranty are all hardware, mechanical items, electrical items, or paint finishes. A copy of the warranty document shall be provided with the proposal.

### **3.443.00 10 YEAR STAINLESS STEEL PLUMBING WARRANTY**

The apparatus manufacturer shall provide a full 10-year stainless steel plumbing components warranty. This warranty shall cover defects in materials or workmanship of apparatus manufacturer designed foam/water plumbing system stainless steel components for 10 years. A copy of the warranty document shall be provided with the proposal.

### **3.444.00 20 YEAR AERIAL DEVICE STRUCTURAL WARRANTY**

The aerial manufacturer shall provide a 20 year structural integrity warranty on the aerial device. This warranty shall cover structural components and shall be extended for a period of 20 years after the date on which the vehicle is delivered to the original purchaser. A copy of the warranty document shall be provided with the proposal. Please refer to warranty document for complete details and exclusions.

### **3.445.00 10 YEAR PAINT AND CORROSION WARRANTY**

The apparatus manufacturer shall provide a 10-year limited paint and corrosion perforation warranty. This warranty shall cover paint peeling, cracking, blistering, and corrosion provided the vehicle is used in a normal and reasonable manner.

The paint shall be prorated for 10 years as follows:

#### **TOP COAT AND APPEARANCE**

(Gloss, Color Retention, Cracking)

0 to 72 months            100%

73 to 120 months            50%

**COATING SYSTEM, ADHESION & CORROSION**

(Includes Dissimilar metal corrosion, Flaking, Blistering, Bubbling)

0 to 36 months            100%  
37 to 84 months            50%  
85 to 120 months            25%

Corrosion perforation shall be covered 100% for 10 years. Corrosion perforation is defined as complete penetration through the exterior metal of the apparatus.

The warranty period shall begin upon delivery of the apparatus to the original user-purchaser. A copy of the warranty document shall be provided with the proposal.

UV paint fade shall be covered in a separate warranty supplied by Akzo Nobel (Sikkens) and shall be for a minimum of 10 years.

**3.446.00 MERITOR REAR AXLE WARRANTY**

A 5-year/unlimited miles, 5-year parts and 5-year labor rear drive single or rear drive tandem axle warranty shall be provided by Meritor Automotive.

**3.447.00 FRONT AXLE WARRANTY**

A 5-year/unlimited miles, 5-year parts and 5-year labor front non-drive steer axle warranty shall be provided by Dana Corporation.

**3.448.00 TRAINING (NO EXCEPTIONS)**

The manufacturer shall provide three (3) days of training covering vehicle maintenance and operational familiarization.

This training shall be provided by a full time, manufacturer employee trainer who specializes in aerial training.

**3.449.00 PUMP PANEL APPROVAL DRAWING**

A detailed large scale approval drawing of the pump panel(s) shall be provided. The drawing shall be provided on a purchased unit prior to the construction process.

**3.450.00 APPROVAL DRAWINGS**

A general arrangement drawing depicting the vehicles appearance shall be provided. The drawing shall consist of left side, right side, front, and rear elevation views.

Vehicles requiring pump controls shall include a general arrangement view of the pump operator's position, scaled the same as the elevation views.

**3.451.00 APPROVAL DRAWINGS-DASH PANEL LAYOUT**

A detailed large scale approval drawing of the dash/console panel layout shall be provided. The drawing shall be provided on a purchased unit prior to the construction process.

**3.452.00 ELECTRONIC MANUALS**

Two (2) copies of all operator, service, and parts manuals MUST be supplied at the time of delivery in digital format-NO EXCEPTIONS! The electronic manuals shall include the following information:

- Operating Instructions, descriptions, specifications, and ratings of the cab, chassis, body, aerial (if applicable), installed components, and auxiliary systems.
- Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and firefighting systems.
- Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.
- Instructions regarding the frequency and procedure for recommended maintenance. Maintenance instructions for the repair and replacement of installed components.
- Parts listing with descriptions and illustrations for identification.
- Warranty descriptions and coverage.

The electronic document shall incorporate a navigation page with electronic links to the operator's manual, service manual, parts manual, and warranty information, as well as instructions on how to use the manual. Each copy shall include a table of contents with links to the specified documents or illustrations.

The electronic document must be formatted in such a manner as to allow not only the printing of the entire manual, but to also the cutting, pasting, or copying of individual documents to other electronic media, such as electronic mail, memos, and the like.

A find feature shall be included to allow for searches by text or by part number.

These electronic manuals shall be accessible from any computer operating system capable of supporting portable document format (PDF). Permanent copies of all pertinent data shall be kept file at both the local dealership and at the manufacturer's location.

### **3.453.00 FIRE APPARATUS SAFETY GUIDE**

Fire Apparatus Safety Guide published by FAMA, latest edition. This safety manual is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of a fire apparatus and to suggest possible ways of dealing with these situations. This manual is NOT a substitute for the fire apparatus operator and maintenance manuals or commercial chassis manufacturer's operator and maintenance manuals.

**3.451.00** (5) Streamlight Fire Vulcan LED Vehicle Mount with 12V DC (Orange)

**3.452.00** (4) NYH-4 Leatherhead 4' NY Hook (Black Powder Coat) w/Chisel End

**3.453.00** (2) NYH-6 Leatherhead 6' NY Hook (Black Powder Coat) w/Chisel End

**3.454.00** (20) Sections Key Hose 1.75"x50' "Key Combat Ready" Hose 1000' Total

**3.455.00** (6) 4863 Akron Style 4863 -4863 Akron Assault Mid-Range 1.5" 50psi

**3.456.00** (1) 2127 Akron 2127-1 1/2" x 1 1/2" Shutoff

**3.457.00** (2) 149 Akron Style 1499 -1499 Plain 1 1/2" Tip with 15/16" orifice

**3.458.00** (1) 2581 Akron Style 2581-Leader Line Wye 2.5" F Inlet x (2) 1.5" M Outlet with Polymer Handles

**3.459.00** (1) TRUE NORTH L2 RIT BAG RBL20 True North L-2 RIT Bag w/Skid Plate, Red

- 3.460.00** (1) MSA\_G1\_RIT\_SYSTEM MSA G1 RIT System, QC Regulator, 6-ft. Quick-Fill & ExtendAire II Systems and Facepiece
- 3.461.00** (1) MSA\_G1\_60MIN\_CYLINDER MSA G1 60 minute carbon cylinder
- 3.462.00** (4) FAY-6 Leatherhead 6# Flat Axe (Yellow) 36" Handle
- 3.463.00** (2) PAY-6 Leatherhead 6# Pick Axe (Yellow) 36" Handle
- 3.464.00** (2) LB-36 36" Leatherhead Halligan Bar
- 3.465.00** (2) SLY-12-36 Leatherhead 12# Sledge (Yellow) 36" Handle
- 3.466.00** (1) Herbert 5" Hose Clamp
- 3.467.00** (1) BC\_24 Fire Hooks Bolt Cutters 24"
- 3.468.00** (1) DeWalt Battery Powered Tool Set (Combo kit features a drill driver, impact driver, reciprocating saw, circular saw, two batteries, a charger, carrying bag and work light.)
- 3.469.00** (1) DeWalt Hand Tool Set -142 Piece Mechanic Set
- 3.470.00** (4) XL PROPAK FIRE ProPak XL Traffic Vest ANSI Class II Certified "FIRE" PRINTED ON BACK AND FRONT
- 3.471.00** (4) Husky Salvage Cover -18oz Vinyl, Black, 12'x18'
- 3.472.00** (2) PLY-4DH-B Leatherhead Pro-Lite Round 4' Drywall Hook, HiViz Yellow Handle w/Butt End
- 3.473.00** (1) SHV-F55 Fire Hooks Flat Shovel 55" with Celtex Grips
- 3.474.00** (1) Team Equipment -Husqvarna K970 Rescue Saw
- 3.475.00** (1) Team Equipment -Air Filter Polyester for K970 Ring, K970 Chain
- 3.476.00** (1) Team Equip. Husqvarna Shark II 20" Rescue Chainsaw 21 lbs. 74cc
- 3.477.00** (1) Team Equipment -Shark II 20" Replacement Carbide Tipped Chain
- 3.478.00** (1) Team Equipment -Air Filter Shark II 576
- 3.479.00** (1) RB\_FABRICATIONS R&B Fab-High Rise Pack (Bag Only)
- 3.480.00** (3) K45\_3 Kocheck K45-3 Triple Holder (1) K05 Double Hydrant Wrench & (2) K01 Spanners
- 3.481.00** (1) KS34 Kocheck Set of 4: 4",5" Storz X Universal Spanner Wrench W/Holder
- 3.482.00** (1) Rescue Tech -1/2" Lifeline, 150'
- 3.483.00** (1) Rescue Tech -1/2" Lifeline, 300'
- 3.484.00** (1) Honda EU2000 Generator w/LED Light
- 3.485.00** (1) Rhyno Windshield Kit -Basic
- 3.486.00** (1) Genesis MV Crash Kit



- 3.487.00** (1) Fire Hooks 4' New Yorker. A yellow fiberglass pole with ash core and a malleable iron head
- 3.488.00** (1) Rescue Tech -Stokes Basket Stainless Steel Rectangular Stokes Stretcher
- 3.489.00** (2) Rescue Tech -Corona FR Truck/Escape Belt w/Ladder Hook
- 3.490.00** (2) Rescue Tech -Vanguard II Full BodyHarness \*Sizes Small – Xlarge \*Color : Gold or Black
- 3.491.00** (1) 2393 Akron Style 2393 -2393 Axial Playpipe with Stacked Tips
- 3.492.00** (5) FA2\_AR33\_005 Fireade AR/AFFF -5 Gallon Pail
- 3.493.00** (1) Little Giant Ladder LT 26 ft. Aluminum Multi-Position Ladder with 300 lbs. Capacity Type IA
- 3.494.00** (1) DeWalt 36" Crow/Pry Bar
- 3.495.00** (1) DeWalt 24" Crow/Pry Bar
- 3.496.00** (2) Kochek 37R15G -1.5" NH Rigid Female xGHT Male
- 3.497.00** (2) RB\_FABRICATIONS R&B Fab-Water Can Harness
- 3.498.00** (1) Tempest 910-1820 VS-1 18" PPV BatteryFan
- 3.499.00** (1) TRH-6 Fire Hooks 6' Arson Trash Hook Fiberglass standard with D handle
- 3.500.00** (2) MSA\_M\_CHARGE 481071 Hose Airline Neoprene 3/8" 8FT
- 3.501.00** (1) MSA\_GENERAL\_MERCHANDISE 630307 Male Plug w/Female 1/4" NPT, Snap-Tite (BR)
- 3.502.00** (1) MSA\_GENERAL\_MERCHANDISE 471777 Female Socket Assembly (used toconnect Air-Supply Hose to Male Plug onRespirator), Snap-Ti
- 3.503.00** (2) MSA EXTENDAIRE II HOSE LINE MSA G1 ExtendAire Airline Hose with Foster Plug
- 3.504.00** (4) K2 160x120 9hz Thermal Camera Kit
- 3.505.00** (4) TFLT199414 K2 Vehicle Mount
- 3.506.00** (2) 46000 46000 -Streamlight -Portable Scene Light II 120v/AC/12v DC
- 3.507.00** (20) Key Hose "Combat Ready" 2" x 50' (1000' total)
- 3.508.00** (1) Hurst eDraulic 2.0 SC 758E2 Combination Tool w/charger and 2 EXL Batteries
- 3.509.00** (1) Horizontal Mounting Bracket for SC 758E2
- 3.510.00** (1) Hurst eDraulic R 421E2 Ram w/charger and 2 EXL Batteries
- 3.511.00** (1) Horizontal Mounting Bracket for R 421E2
- 3.512.00** (1) Akron-4863-Mid-Range Assault Nozzle without pistol Grip 50psi
- 3.513.00** (10) All American 5" LDH Yellow w/Storz
- 3.514.00** (1) CM-2 Rubber Mallet

- 3.515.00** (1) Fire Hooks Unlimited K Tool kit
- 3.516.00** (1) 442RD R&B Hydrant Bag w/Tuff Bottom
- 3.517.00** (1) Fire Hooks Hydrant Wrench
- 3.518.00** (1) 13" Pipe Wrench
- 3.519.00** (1) 2.5"X2.5" Hydrant Gate Valve w/Hand Wheel
- 3.510.00** (1) Kocheck 5"Storz to 4.5" NH Swivel Rocker Lug Female Thread
- 3.511.00** (1) Kocheck Set of 4: 4", 5" Storz X Universal Spanner Wrench w/Holder
- 3.512.00** (4) Kocheck K01 Single Universal Spanner Wrench
- 3.513.00** (1) Kocheck S54R525-5" Storz to 2.5" NH Swivel Rocker Lug Female Thread
- 3.514.00** (4) MSA G1 SCBA 4500psi, w/TIC, Rechargeable, Hose and Pouch, CGA QC
- 3.515.00** (4) MSA G1 Medium Face Pieces with neck Strap
- 3.516.00** (4) MSA G1 45 min Carbon Cylinders with QC

#### **IV. REQUEST FOR PROPOSAL INSTRUCTIONS**

- 4.1.00** The request for proposal shall be detailed as follows.
- 1.) SCBO The South Carolina Business Opportunity website located at SCFAA-South Carolina Fiscal Accountability Authority website located at <https://scbo.sc.gov/online-edition>.
- 2.) City of Cayce Website RFP shall be detailed at [www.caycesc.gov](http://www.caycesc.gov) by clicking on the “Connect drop down menu and selecting “Latest News” for a viewing of the official RFP-Request for Proposal.

#### **V. BONDING REQUIREMENTS**

- 5.1.00** There are no bonds required for this proposal.

#### **VI. ADMINISTRATIVE RULES FOR RFP**

##### **6.1.00 ADDITIONAL INFORMATION; QUESTIONS/INQUIRIES**

- 6.1.01** Questions and inquiries must be submitted through email by 5/21/2021, by 12:00 PM, EST to both Sarah Harris/Steven Bullard at [sharris@caycesc.gov](mailto:sharris@caycesc.gov) & [sbullard@cityofcayce-sc.gov](mailto:sbullard@cityofcayce-sc.gov). *Questions/inquiries will not be accepted or considered after the indicated deadline.*

**City of Cayce**  
**Attn: Sarah Harris/Steven Bullard**  
**Grants Administration/Fire Department**  
**1800 12<sup>th</sup> Street**  
**Cayce, SC 29033**  
**Phone: 803-550-9545**  
**Email: [sharris@caycesc.gov](mailto:sharris@caycesc.gov)/[sbullard@cityofcayce-sc.gov](mailto:sbullard@cityofcayce-sc.gov)**

##### **6.2.00 RECEIPT OF PROPOSALS**

- 6.2.01** Proposals are to be submitted no later than 12:00 P.M. EST., 6/18/2021, to Sarah Harris, Grant & Special Project Manager, City of Cayce, 1800 12<sup>th</sup> Street, Cayce, SC 29033. Proposals must be dropped off at the drive-thru window drop-off at City Hall and should be addressed to Sarah Harris. *Due to the possibility of negotiations with any offeror submitting a proposal which appears to be eligible for contract and award pursuant to the selection criteria set forth in this Request for Proposal, terms and conditions will not be divulged at the time of opening.*

##### **6.3.00 PREPARATION OF PROPOSALS**

- 6.3.01** Each proposer shall carefully examine all RFP documents and thoroughly familiarize itself with all requirements prior to submitting a proposal. Should a proposer find discrepancies, ambiguities, or omissions in proposal documents, or should the offeror be in doubt as to their meaning, the proposer shall at once request written clarification from the City of Cayce. The individual submitting the proposal shall be responsible for its prompt submission by the indicated instructions/deadline detailed in this RFP. Any interpretations/clarification of proposal documentation will be made in writing via email from the points of contact detailed in this RFP.

- 6.3.02** Before submitting a proposal, each offeror shall be responsible for making all investigations and examinations necessary to ascertain conditions and requirements affecting the requirements of this proposal. Failure to make such investigations and examinations shall not relieve the successful offeror the obligation to comply, in every detail, with all provisions and requirements of the RFP.
- 6.3.03** No proposals will be considered from any firm failing to perform acceptably on any other contract with the City of Cayce.
- 6.3.04** If the offeror is a corporation, the proposal shall be signed in the name of and under the seal of the corporation by duly authorized officer of the corporation with the designation of the signer's official capacity. The proposal shall show the state in which the corporation is chartered, and, if that state is other than South Carolina, the proposal shall show that the corporation is authorized to do business in the state of South Carolina. If the offeror is a partnership, the proposal shall be signed in the name of the partnership by a general partner or other person who is duly authorized to bind the partnership. The signer's official capacity and authority shall be shown. If the offeror is an individual or sole proprietorship, the proposal shall be signed by the individual in person, stating the name or style under which the offeror is doing business. In any case, the proposal shall show the current business address of the offeror which is to be used for receiving communications from the City.

**6.4.00 DISQUALIFICATIONS OF OFFEROR(S)**

- 6.4.01** More than one proposal from an individual, firm, partnership, corporation, or association under the same or different names will not be considered. Reasonable grounds for believing that an offeror is interested in more than one proposal for the same work will cause the rejection of all proposals in which such offerors are believed to be interested. Any or all proposals will be rejected if there is reason to believe that collusion exists among the offerors and no participants in such collusion will be considered in future proposals for the same work. Proposals in which the prices obviously are unbalanced will be rejected.

**6.5.00 CORRECTIONS MADE BY OFFEROR(S)**

- 6.5.01** Offerors are cautioned not to obliterate, erase, or strike over any printed material as set forth in this Request for Proposal. In quoting prices, wherever offeror has made an error and has corrected, any and all such corrections should be initialed by the person signing the proposal. Failure to comply with this provision may result in rejection of the proposal. All documents submitted must be legible.

**6.6.00 EVALUATION OF PROPOSALS**

- 6.6.01** In evaluating the proposals, the City of Cayce reserves the right to accept or reject all or any part of any proposal, waive minor technicalities, and award the contract to the offeror deemed to best serve the interests of the City; and adopt any part or all of a proposal if it is judged in the best interests of the City.
- 6.6.02** Each proposal will be evaluated on the content of the offeror's proposal, i.e., the burden of information clarification and research rests solely on each offeror's effort and will be considered a reflection of interest and efficiency.
- 6.6.03** During the review process, the review panel shall have the right to request from offerors any other information or evidence which it deems necessary for evaluation of the proposal and relevant to any one or more of the stated evaluation factors. The failure of an offeror to promptly provide such

requested information or evidence shall be sufficient grounds for determining the offeror to be non-responsive and for rejection of the proposal.

**6.6.04** The City of Cayce reserves the right to contact an offeror for clarification of information submitted, to contact references, and to use other sources of obtaining information regarding the offeror that is deemed appropriate and would assist in the evaluation.

**6.6.05** Proposals which, after discussion and submission of additional clarification and/or supplementary information, are determined to meet the specifications of the Request for Proposal will be classified as “acceptable”. Proposals found not to be acceptable will be classified as “unacceptable” and no further discussion concerning same will be conducted.

#### **6.7.00 EVALUATION CRITERIA**

**6.7.01** The City of Cayce intends to award a contract resulting from this Request for Proposal to the responsive and responsible offeror whose proposal is determine to be the most advantageous to the City taking into consideration the evaluation factors set forth herein. The City reserves the right to reject any and all proposals. City of Cayce shall be the sole judge of whether or not a proposal meets the requirements of this RFP.

Responses may be evaluated on the following criteria utilizing the score sheets. The City will not be responsible for any costs associated with interviews of responders or for demonstrations.

- Responsiveness to this RFP
- Service
- Quality of Proposal
- References
- Cost

#### **6.8.00 BASIS FOR AWARD**

**6.8.01** An award resulting from this request shall be awarded to the responsive and responsible offeror(s) whose proposal is determined to be most advantageous in all phases to the City, taking into consideration cost and the evaluation factors set forth herein; the right is reserved to reject any and all proposals received and in all cases, the City will be the sole judge as to whether an offeror’s proposal has or has not satisfactorily met the requirements of this RFP.

**6.8.02** An evaluation Committee has been established in order to review and evaluate all proposals submitted in response to this RFP. The committee shall conduct a preliminary evaluation of all responsive technical proposals. Based upon this review, the cost proposals of the highest rated offeror(s) will be reviewed.

#### **6.9.00 ORAL PRESENTATIONS**

**6.9.01** Based on the results of the preliminary evaluation, the highest rated offeror(s) may be invited by the Procurement Officer to make oral presentations to the Evaluation Committee. This committee will then conduct a final evaluation of the offeror(s). The Evaluation Committee shall then negotiate a proposed contract with the highest qualified offeror. At the time the proposed contract is negotiated, the offeror and the Evaluation Committee may negotiate any changes desired in the Request for Proposal if deemed in the best interest of City of Cayce. If a satisfactory proposed contract cannot be

negotiated with the highest qualified offeror, negotiations will be formally terminated. Negotiations shall then be undertaken with the second most qualified offeror and so on. The Committee will make appropriate recommendation(s) to City of Cayce and City of Cayce Council prior to actual award of contract.

**6.9.02** Each offeror who submits a response to this RFP may be required to make an oral presentation of the submitted proposal to the City. Such presentations provide an opportunity for the offeror to clarify the proposal to ensure mutual understanding and will in no way change the offeror's original proposal. Subsequent travel expense by the offeror will be at the offeror's expense.

**6.9.03** Offerors are advised that, in the event of receipt of an adequate number of proposals, which in the opinion of both Grants Administration/Fire Services require no clarifications and/or supplementary information, such proposals may be evaluated without further discussion. Hence, proposals should be submitted initially on the most complete and favorable terms from a technical standpoint which offerors are capable of submitting to the City. Should proposals submitted require additional clarification and/or supplementary information, offerors should be prepared to submit such additional clarification and/or supplementary information, in a timely manner, when so requested.

#### **6.10.00 CONTRACTING**

**6.10.01** Upon award of the proposal, this document and the successful offeror's proposal, including all correspondence, supporting documents and completed forms, shall become part of the contract. All written communication between the City of Cayce and the successful offeror after the proposal opening may also be incorporated into the contract.

**6.11.00** All amendments to and interpretations of this solicitation shall be in writing. The City of Cayce shall not be legally bound by any amendment or interpretation that is not in writing. Only information supplied by the City of Cayce in writing or in this RFP should be used in preparing offeror responses. All contacts that an offeror may have had before or after receipt of this RFP with any individuals, employees, or representatives of the City of Cayce and any information that may have been read in any news media or seen or heard in any communication facility regarding this proposal should be disregarded in preparing responses.

#### **6.12.00 CITY RESPONSIBILITY TO PROPOSAL**

**6.12.01** This solicitation does not commit the City of Cayce to award a contract, to pay any costs incurred in the preparation of a proposal, or to procure or contract for the articles of goods or services. The City of Cayce reserves the right to accept or reject any or all proposals received as a result of this request, or to cancel in part or in its entirety this proposal if it is in the best interest of the City to do so. If the proposal fails to conform to the essential requirements of the RFP, the City of Cayce alone will be the judge as to whether that variance is significant enough to consider the RFP non-responsive and therefore not considered for award.

#### **6.13.00 TERMINOLOGY**

**6.13.01** The terminology used and the organization of the RFP are not intended to be restrictive in any way. Appropriate interpretation of the intent of the RFP should be made by the offeror in these situations

#### **6.14.00 PROHIBITION OF GRATUITIES**

**6.14.01** Section 8-13-420 of the 1976 Code of Laws of South Carolina states in part as follows: “Whoever gives or offers to any public official or public employee any compensation including a promise of future employment to influence his action, vote, opinion or judgment as a public official or public employee, or such public official solicits or accepts such compensation to influence his action, vote or judgment shall be subject to the punishment as provided by Sections 16-9-210 and 16-9-220.” Gratuities in any form are strictly prohibited.

**6.15.00 PROPRIETARY/CONFIDENTIAL INFORMATION**

**6.15.01** Trade secrets or proprietary information submitted by an offeror In connection with a procurement transaction shall not be subject to public disclosure under the Freedom of Information Act; however, the offer must invoke the protections of this section prior to or upon submission of the data or other materials and must identify the data or other materials to be protected and state reasons why protection is necessary. Disposition of material after award is made should be stated by the offeror. No information, materials or other documents relating to this procurement will be presented or made otherwise available to any other person, agency, or organization until after award.

**6.15.02** All offerors must visibly mark as “Confidential” each part of their proposal which they consider to contain proprietary information. **All unmarked pages will be subject to release in accordance with the guidelines set forth under section 11-35-410 of the consolidated procurement code.** Privileged and confidential information is defined as “information in specific detail not customarily released to the general public, the release of which might cause harm to the competitive position of the part supplying the information.” The examples of such information provided in the statute are:

- 1.) Customer Lists
- 2.) Design recommendations and identification of prospective problem areas under an RFP.
- 3.) Design concepts, including methods and procedures.
- 4.) Biographical data on key employees of the offeror.

**6.15.03** Evaluative documents predecisional in nature such as inter or intra-agency memoranda containing technical evaluations and recommendations are exempted so long as the contract award does not expressly adopt or incorporate the inter-or intra-agency memoranda reflecting the predecisional deliberations.

**6.15.04 MARKING YOUR ENTIRE PROPOSAL AS CONFIDENTIAL/PROPRIETARY IS NOT IN CONFORMANCE WITH THE SOUTH CAROLINA FREEDOM OF INFORMATION ACT.**

**6.16.00 OWNERSHIP MANUAL**

**6.16.01** All proposals submitted in response to this document become the property of the City of Cayce. Proposals submitted may be reviewed and evaluated by any person(s) at the discretion of the City of Cayce upon award of the contract. Ownership of all data, material and documentation originated and prepared for the City of Cayce pursuant to this contract shall belong exclusively to the City.

**6.17.00 DISCUSSIONS/NEGOTIATIONS**

**6.17.01** By submission of a proposal, offeror agrees that during the period following issuance of the RFP and prior to the final award of contract, offeror shall not discuss this procurement with any party except the Procurement Officer or other parties that may be designated in this solicitation. Offeror shall not

attempt to discuss with or attempt to negotiate with the using agency/department, any aspects of the procurement without prior approval of the Procurement Officer.

#### **6.18.00 MINIMUM QUALIFICATIONS**

- 6.18.01** The City of Cayce reserves the right to determine whether offerors have the minimum qualifications to perform a contract of this type. The determination by the City concerning offeror qualifications shall be final.
- 6.19.01** Any prospective proposer, offeror, and/or contractor, who is aggrieved in connection with the solicitation of a contract shall protest to the City Manager within five (5) calendar days of the date of issuance of the Request for Proposals or other solicitation documents, whichever is applicable, or any amendment thereto, if the amendment is at issue. Any actual proposer, offeror, and/or contractor, who is aggrieved in connection with the intended award or award of a contract, shall protest to the City Manager within five (5) calendar days of the notification of award. The protest shall be in writing and shall set forth the specific grounds of the protest with enough particularity to give notice of the issues to be decided.
- 6.20.00** An offeror may withdraw their proposal without prejudice to themselves no later than the day and hour set in the advertisement for receiving proposals. Withdrawal must be submitted in writing via email to both [sharris@caycesc.gov](mailto:sharris@caycesc.gov) and [sbullard@cityofcayce-sc.gov](mailto:sbullard@cityofcayce-sc.gov) by the indicated deadline in the RFP. Withdrawal is the sole responsibility of the offeror.

#### **6.21.00 NO CONTACT POLICY**

- 6.21.01** QUESTIONS REGARDING SPECIFICATIONS AND/OR THE SOLICITATION PROCESS: To ensure fair considerations for all offerors, the City prohibits any type of communications to or with any department, employee, or City Official during the solicitation process, except as provided in the solicitation. This includes communication initiated by an offeror or any City Official or employee evaluating or considering the response, prior to the time an award decision has been public.
- a.) Communications between the offeror and the City shall be initiated by Procurement Services or the appropriate City Representative in order to obtain necessary information or clarification needed to develop a proper and accurate evaluation of the response. Any communications initiated by an offeror concerning the submitted response shall be grounds for disqualifying the offending vendor from consideration for award of the solicitation and/or any future solicitations.
  - b.) It is the sole responsibility of the offeror to contact Procurement Services prior to submitting a response to ascertain if any amendments have been issued.
  - c.) Any question(s) concerning this document, the specifications, or the solicitation process must be made in writing via email addressed to both [sharris@caycesc.gov](mailto:sharris@caycesc.gov) and [sbullard@cityofcayce-sc.gov](mailto:sbullard@cityofcayce-sc.gov). No exceptions will be made after the deadline indicated in the RFP.

### **VII. PROPOSAL PRESENTATION**

#### **7.1.00 DELIVERY OF PROPOSALS**



**7.1.01** Sealed proposal must be submitted no later than 12:00 PM EST., 6/18/2021 to Sarah Harris, Grant & Special Project Manager, City of Cayce, 1800 12<sup>th</sup> Street, Cayce, SC 29033. Sealed proposal must be dropped off at the drive-thru window drop-off at City Hall and should be addressed to Sarah Harris. Due to the possibility of negotiations with any offeror submitting a proposal which appears to be eligible for contract and award pursuant to the selection criteria set forth in this Request for Proposal, terms and conditions will not be divulged at the time of opening. Each file size shall not exceed fifty (50) MB. Offerors must complete all forms included in this RFP. Failure to include all forms may result in disqualification of the offeror's proposal. Each offeror shall provide one (1) original version and one (1) redacted version.

**7.1.02** All proposals should be concise and clear and should convey all the information requested by the City. Proposals should be prepared simply and economically. All proposals shall be complete and effective to satisfy the requirements of the RFP. Emphasis should be on completeness and clarity of content.

**7.1.03** There is no intent to limit the content of proposals. Offerors may include any information deemed pertinent in addition to that outlined below. Failure to provide all required information may result in the proposal being non-responsive. If your proposal includes any information or materials other than the information requested in the Request for Proposal, you are to include this information as a separate appendix to your proposal.

**7.1.04** The City of Cayce reserves the right to reject any and/or all proposals in whole or in part.

**7.2.00 ORDER OF PRESENTATION-TECHNICAL PROPOSAL**

**7.2.01** There is no requirement for a separate technical proposal. Section 3.2.00, 3.3.00 and the price/jobber sheet will be considered your company's technical proposal.

**7.3.00 STATEMENT OF QUALIFICATIONS**

**7.3.01** Must have all licenses required to complete the tasks listed in this RFP.

**7.3.02** Substantial compliance with the Request for Proposals content and format.

**7.4.00 REFERENCES**

**7.4.01** Provide a listing of at least three (3) current customers or customers at which the offeror has or has had a valid contract for similar services at any time during the past (12) month period immediately preceding date of this request. Include the following information for each customer.

- a.) Name of customer.
- b.) The term of offeror's contract.
- c.) Provide the name and telephone number of the customer who can be contacted regarding the offeror's performance. Offeror may attach letters from such facility managers with comments regarding offeror's performance and reputation at those facilities.
- d.) Any performance evaluations that may have been conducted.

**7.5.00 PERSONNEL**

**7.5.01** Offeror must identify in this section, each member of its staff who will or might participate in the project and the nature and scope of that person's responsibilities and duties. Resumes of staff are required which indicate education, background, and recent relevant experience with the subject matter of the project. Current telephone numbers must be included. Offeror must demonstrate how its proposed staffing plan will be sufficient to complete the services required in a timely fashion.

The personnel to work on this project as identified in the proposal are considered to be essential to the services to be provided. No personnel substitutions following contract award will be made without the prior consent of the City. All requested substitutions must be submitted in writing, together with resumes for approval. All replacements must be equal or superior stature and will be paid at the same rate as the person being replaced.

The proposal shall list all names and telephone numbers of the individuals authorized to conduct negotiation.

#### **7.6.00 UNDERSTANDING THE PROJECT**

**7.6.01** In this section, the offeror shall discuss the requirements, item by item, as outlined in section three, Scope of Work. Provide a description of the offeror's approach, technique and procedures to accomplish the scope of services identified and required by this document.

#### **7.7.00 TREATMENT OF ISSUES**

**7.7.01** Provide certification that offeror has the ability to commence full operations within thirty (30) days after notification of award. In this section offerors also may comment, if deemed appropriate, on any of the issues within the Request for Proposals, including suggestions on possible alternative approaches.

#### **7.8.00 RFP FORMS**

**7.8.01** This section should include signed copies of the following RFP forms:

- a.) Non-collusion Affidavit
- b.) Certificate of Familiarity

### **VIII. OVERVIEW OF REQUIREMENTS**

**8.1.00** Include in the appendix any additional information or materials which may be helpful to explain or evaluate the proposal. Offerors may submit, as an option, any additional contractual terms and conditions which they wish to propose.

### **IX. CONTRACTUAL REQUIREMENTS**

**9.1.00** The proposer shall provide all of the proposed work and services as finally agreed upon and accepted by the City of Cayce. Each offeror shall fully acquaint himself with conditions relating to the scope and restrictions attending the execution of the work under the conditions of this proposal. It is expected that this will sometimes require on-site observation. The failure or omission of an offeror to acquaint themselves with existing conditions shall in no way relieve them of any obligation with respect to this proposal or to the contract.

#### **9.2.00 AFFIRMATIVE ACTION**

**9.2.01** The Contractor will take affirmative action and comply with all Federal employment and State employment of the handicapped, and concerning the treatment of all employees, without regard or discrimination by reason of race, color, religion, sex, national origin or physical handicap. The following are incorporated herein by reference: 41 C.F.R. 60-1.4, 60-250.4 and 60-741-4.

#### **9.3.00 SC LAW CLAUSE**

**9.3.01** Upon award of contract under this proposal, the person, partnership, association or corporation to whom the award is made must comply with the laws of South Carolina which require such

person or entity to be authorized and/or licensed to do business in this State. Notwithstanding the fact that applicable statutes may be exempt or excluded the successful offeror from requirements that it be authorized and/or licensed to do business in this State, by submission of this signed proposal, the offeror agrees to subject itself to the jurisdiction and process of the courts of the State of South Carolina, City of Cayce, as to all matters and disputes arising or to arise under the contract and the performance thereof, including any questions as to the liability for taxes, licenses, or fees levied by the State

#### **9.4.00 COMPLIANCE WITH LAWS**

**9.4.01** The contractor shall keep fully informed of all existing and future state and federal laws and municipal ordinances and regulations in any manner affecting those engaged or employed in the work, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the specifications for this work in relation to any such law, ordinance, regulation, order or decree, he shall forthwith report same to the City of Cayce, in writing via email to both [sharris@caycesc.gov](mailto:sharris@caycesc.gov) and [sbullard@cityofcayce-sc.gov](mailto:sbullard@cityofcayce-sc.gov). The contractor shall at all times observe and comply with all such existing and future laws, ordinances, regulations, orders, and decrees; and he shall protect and indemnify the City, its officers and agents, against any claim or liability arising from or based upon violation of any such law, ordinance, regulation, order or decree whether by themselves or their employees.

#### **9.5.00 INDEMNIFICATION**

**9.5.01** The contractor and any of its subcontractors shall indemnify, defend, hold harmless and reimburse the City, their agents, officers and employees from and against any and all losses, liabilities, expenses, and all claims for damages of any nature whatsoever, relating to or arising out of any action or failure to act, by the contractor, its subcontractors, officers, agents and employees, or relating to or arising out of the performance or failure to perform by the contractor, its subcontractors, officers, agents and employees of any of the obligations under this Agreement. Losses, liabilities, expenses and claims for damages shall include, but not be limited to, civil and criminal fines and penalties, a taking, whether direct or indirect (inverse), loss of use and/or services, bodily injury, death, personal injury, or injury to real or personal property, defense costs, legal fees and costs and attorney's fees for an appeal.

**9.5.02** The City of Cayce shall promptly notify the offeror of any civil or criminal actions filed against it or of any notice of violation from any federal or state agency or of any claim as soon as practical. The contractor upon receipt of such notice shall have the right at its election to defend any and all actions or suits or join in the defense. Nothing herein shall be construed to prevent the City from defending its own interest.

#### **9.6.00 EQUAL EMPLOYMENT OPPORTUNITY**

**9.6.01** Contractor agrees that it will not discriminate in hiring, promotion, treatment, or other terms and conditions of employment based upon race, sex, national origin, age, disability, or in any way violative of Title VII of 1964 Civil Rights Act and amendments or the South Carolina Human Affairs Law, except as permitted by said laws.

#### **9.7.00 SOUTH CAROLINA STATE AND LOCAL TAX LAW**

**9.7.01** By submission of a signed proposal, you are certifying, under penalties of perjury, that you comply with Section 12-54-1020(B) of the SC Code of Laws 1976, as amended, relating to payment of any applicable taxes. This will certify to the City of Cayce your compliance.

**9.8.00 GOVERNING LAW**

**9.8.01** Contractor hereby agrees to subject itself to the jurisdiction and process of the courts and to the law of the State of South Carolina of all matters and disputes arising or to arise under this contract and the performance thereof, including all matters pertaining to the validity, construction, interpretation and effect of a resulting contract. In the event of dispute between parties hereunder, all such disputes shall be pursued in Circuit Court for the State of South Carolina.

**9.9.00 ATTORNEY FEES**

**9.9.01** In the event that the City of Cayce is required and shall bring a suit or action to compel performance of or recover for any breach of any stipulation, covenant, term or condition of a resulting contract, the City may seek attorney fees from the contractor and contractor will pay the City such attorney fees as the court may award. Otherwise, attorney fees in connection with any suit or action hereunder will be borne by the parties experiencing said expenses.

**9.10.00 ASSIGNMENT AND MODIFICATION**

**9.10.01** The contract resulting from this RFP shall be binding upon the contractor, its successors, and assigns. This contract shall be binding upon the City in accordance with its terms and conditions. Contract shall not be assigned by contractor without the express written consent of the City, such consent to be within the sole discretion of the City. Any change in majority ownership or operational control of contractor shall be deemed as assignment by operation of law and shall not be permitted except as provided for herein.

**9.10.02** No agreement to modify the formal contract shall be binding on the part of the City unless such modification requires writing and execution by an authorized agent of the City.

**9.11.00 SUBCONTRACTING**

**9.11.01** If any of the work covered by this RFP is to be subcontracted, the contractor shall identify the subcontracting organization and the contractual arrangements made therewith. All subcontractors must be approved by the City of Cayce. The successful offeror will also furnish the corporate or company name and the names of the officers of any subcontractors engaged by the offeror.

**9.12.00 INDEMNIFICATION FOR LEGAL OR CONSULTANT SERVICES**

**9.12.01** Any contract for legal or consultant services entered into by the City of Cayce shall be in accordance with Section 11-9-105 of the 1976 Code of Laws of South Carolina, as amended, which requires completion of all services. In the event all services are not fully rendered as provided for in the contract, any monies which have been paid by the City under the contract must be refunded to the City along with twelve (12) percent penalty.

**9.13.00 DRUG-FREE WORKPLACE**

**9.13.01** (Note: This clause applies to any resultant contract of \$50,000 or more). The State of South Carolina has amended Title 44, code of Laws of South Carolina, 1976, relating to health, by adding Chapter 107, so as to enact a Drug-Free Workplace Act (See Act No. 593, 1190 Acts and Joint Resolutions). By submission of a signed proposal, you are certifying that you will comply with this Act (see Section 44-107-30). This will certify to the City of Cayce your compliance.

**9.14.00 PAYMENT TERMS**

**9.14.01** Payment for services pursuant to a successful contract will be made within (30) days of receipt of a detailed monthly invoice unless any items thereon are questioned, in which event payment will be withheld pending verification of the amount claimed and the validity of the claim. Contractor shall provide complete cooperation during any such investigation. Invoice shall be for services rendered for the period of the first day of the month through the last day of the month.

**9.15.00** **TERMINATION**

**9.15.01** ***For Cause:*** In the event of material breach by contractor, the City of Cayce shall be given written notice specifying the material breach. The City of Cayce would regard any deviation from the requirements of the contract that was neither trivial nor innocent as being material. Such deviations are evaluated on an instance-by-instance basis but any deviation which impairs the utilization or value of the property to the City would be regarded by the City as a material breach. Upon receipt of such notice, if contractor has not begun correction of the material breach within two (2) days or has not substantially corrected the material breach within ten (5) days of receipt of written notice, City of Cayce shall have the right to terminate unilaterally and immediately services hereunder without further notice. City of Cayce reserves the right to purchase any and all services or other items thereafter in the open market, charging the contractor with any additional costs. Should such charge be assessed, no subsequent proposals or proposals of the defaulting contractor will be considered until the assessed charge has been satisfied. Additionally, the City shall have a similar right of rescission in any instance where contractor provides or seeks to provide any services for a price higher than that specified herein, without regard to cause, including governmental regulatory intervention and insistence. In the event of rescission, revocation or termination, all documents and other materials in the possession of City of Cayce or scheduled for delivery to the City relating to performance hereunder shall become the property of the City. City of Cayce's failure to exercise their rights to terminate under this provision shall not be construed as a waiver of their rights to terminate, rescind or revoke the services herein in the event of any subsequent breach.

**9.15.02** ***Non-appropriation:*** If the City of Cayce Council fails to appropriate or authorize the expenditures of sufficient funds to provide the continuation of this contract or if a lawful order issued in, or for any fiscal year during the term of the contract, reduce the funds appropriated or authorized in such amounts as to preclude making the payments set out therein, the contract shall terminate on the date said funds are no longer available without any termination charges or other liability incurring to the City.

**9.15.03** ***Termination for Convenience:*** The City, by written notice, may terminate this contract in whole or in part, when it is in the best interest of the City.

**9.16.00** **ILLEGAL IMMIGRATION & PUBLIC CONTRACTS**

**9.16.01** In accordance with the South Carolina Illegal Immigration Reform Act, 2008, Act No. 280. Section 3 of this Act added to Chapter 14 to Title 8 of the South Carolina Code of Laws prohibits covered persons from entering into covered contracts unless the contractor agrees either (a) to verify all new employees through the federal work authorization program (and requires the same from subcontractors and sub-subcontractors) or (b) to employ only qualifying workers. Effectively, the Act also requires contractors to agree to provide any documentation required to establish either (a) that the Act does or does not apply to the contractor, subcontractor, or sub-subcontractor; or (b) that the contractor, and any subcontractor or sub-subcontractor, are in compliance with Sections 3 of the Act.

**IX. SPECIAL PROVISIONS**

**10.1.00 CHANGES**

**10.1.01** City of Cayce has the right to add or delete services within the scope at a later date.

**10.1.02** No services for which an additional cost or fee will be charged by the contractor will be furnished without prior written authorization from the City of Cayce.

**10.1.03** The amount and types of insurance required should be commensurate with the hazards and magnitude of the undertaking, but in no event of lesser amount nor more restrictive than the limits of liability and schedule of hazards below described. Without limiting its liability under the contract agreement, the contractor shall procure and maintain, at its expense during the life of this contract, insurance of the types in the minimum amounts stated below:

**10.1.04 INSURANCE**

<b>10.1.05</b>	<b><u>SCHEDULE</u></b>	<b><u>LIMIT</u></b>
	<b>WORKERS COMPENSATION</b> As required by the State of South Carolina.	Statutory
	<b>COMPREHENSIVE GENERAL LIABILITY</b> Premises Operations Single Limit Contractual Liability Independent Contractors Personal Injury Products -Completed Operations	\$1,000,000 (per occurrence)
	<b>PROFESSIONAL LIABILITY</b>	\$1,000,000/\$2,000,000 (per occurrence)
	<b>AUTOMOBILE LIABILITY</b> All Owned, Non-Owned, and Hired	\$600,000 Combined (per occurrence or tort claim liability, whichever is greater)

**10.2.00** The contractor’s comprehensive general liability policy shall also include blanket contractual liability coverage or shall be endorsed to cover the liability assumed by the contractor. Said insurance shall be written by a company or companies approved to do business in the State of South Carolina and acceptable to the City. Before commencing any work hereunder, certificates evidencing the maintenance of said insurance shall be furnished to the City of Cayce. The City of Cayce, its officials, employees and volunteers are to be covered as insured’s as respects: liability arising out of activities performed by or on behalf of the contractor, including the insured’s general supervision of the contract; products and completed operations of the contractor; premises owned, occupied or used by the contractor; or automobiles owned, leased, hired or borrowed by the contractor. The coverage shall contain no special limitations on the scope of protection afforded to the City of Cayce, its officials, employees or volunteers. To accomplish this objective, the City of Cayce shall be named as an additional insured under the contractor’s insurance as outlined above.

**10.2.01** The contractor shall take out and maintain, during the life of this contract, the statutory Workmen’s Compensation and Employer’s Liability Insurance for all of his employees to be engaged in work on the project under this contract, and in case any such work is sublet, the contractor shall require the subcontractor similarly to provide Workmen’s Compensation and Employer’s Liability Insurance for all of the latter’s employees to be engaged in such work.

- 10.2.02** Other insurance: This insurance is primary, and our and our obligations are not affected by any other insurance carried by the additional insured whether primary, excess, and contingent or on another basis.
- 10.2.03** Each insurance required by the City of Cayce shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the City of Cayce.
- 10.2.04** Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all the requirements stated herein.
- 10.2.05** All certificates and endorsements must be received and approved by the City of Cayce within five (5) business days after notification of award.
- 10.2.06** The City, its officers and employees shall be named as an “additional insured” in the Automobile Liability policies and it shall be stated on the Insurance Certificate with the provision that this coverage “is primary to all other coverage the City may possess”.
- 10.3.00 SOCIAL SECURITY**
- 10.3.01** The contractor shall be and remain an independent contractor with respect to all services performed hereunder and agrees to and does hereby accept full and exclusive liabilities for the payment of any and all contributions or taxes for Social Security, unemployment insurance, or old age retirement benefits, pensions, or annuities now or hereafter imposed under any state or federal law which are measured by the wages, salaries, or other compensation paid to persons employed by the contractor or work performed under the terms of this award and further agrees to obey all lawful rules and regulations and to meet all lawful requirements which are now or hereafter may be issued or promulgated under said respective laws by duly authorized state and federal officials; and said contractor also agrees to indemnify and save harmless the City from any such contributions of taxes or liability hereof.
- 10.4.00 WORKERS COMPENSATION COVERAGE**
- 10.4.01** The contractor shall comply with the State law known as the Worker’s Compensation Act. The contractor shall maintain such insurance as will protect both contractor and the City from claims under Worker’s Compensation Acts and from any other claims for damages for personal injury, including death, which may arise from operations under this contract, whether such operations are by the contractor or anyone directly or indirectly employed in the work.

# **XI. ATTACHMENTS**



**NON-COLLUSION AFFIDAVIT**

STATE OF SOUTH CAROLINA  
CITY OF CAYCE

\_\_\_\_\_, being first duly sworn, deposes and says that:

1. He/She is the \_\_\_\_\_ of offeror that has submitted the attached proposal;
2. He/She is fully informed respecting the preparation and contents of the attached proposal and of all pertinent circumstances respecting such proposal;
3. Such proposal is genuine and is not a collusive or sham proposal;
4. Neither the said offeror nor any of its officers, partners, owners agents, representatives, employees or parties of interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly, with any other offeror, firm or person to submit a collusive sham proposal in connection with the contract for which the attached proposal has been submitted or to refrain from proposal in connection with such contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other offeror, firm or person to fix the price or prices in the attached proposal or of any other offeror, or to fix any overhead, profit or cost element of the proposal price of any other offeror or to secure through collusion, conspiracy, connivance or unlawful agreement any advantage against the City of Cayce or any person interested in the proposed contract; and
5. The price or prices quoted in the attached proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the offeror or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

Authorized Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 2021

Company: \_\_\_\_\_

Authorized Signature: \_\_\_\_\_

Notary Public

Printed Name: \_\_\_\_\_

Commission Expires: \_\_\_\_\_

**CERTIFICATE OF FAMILIARITY**

The undersigned, having fully familiarized himself with the information contained within this entire solicitation and applicable amendments, submits the attached response to the solicitation and other applicable information to the City, which I verify to be true and correct to the best of my knowledge. I certify that this response is made without prior understanding, agreement, or connection with any corporation, firm or person submitting a response for the same materials, supplies, service or equipment, and is in all respects, fair and without collusion or fraud. I agree to this response by all conditions of this response and certify that I am authorized to submit this solicitation's response. I further certify that this response is good for a period of one hundred twenty (120) days, unless otherwise stated.

\_\_\_\_\_  
Company Name as registered with the IRS

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Correspondence Address

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
City, State, Zip

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Telephone Number



CITY OF CAYCE VENDOR NUMBER \_\_\_\_\_

**IF VENDOR NUMBER IS NOT SUPPLIED, THE BELOW SECTION MUST BE COMPLETED.**

\_\_\_\_\_  
Remittance Address

\_\_\_\_\_  
City, State, Zip

\_\_\_\_\_  
Fax Number

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Toll-Free Number if available

\_\_\_\_\_  
Federal Tax ID Number

\_\_\_\_\_  
SC Sales Tax Number



Option: Other commodities/services provided by your company.

**City of Cayce**  
Sarah Harris/Steven Bullard  
1800 12<sup>th</sup> Street  
Cayce, South Carolina, 29033

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Phone (803) 550-9545  
Fax (803) 796-9072

(DATE)

(CONTRACT VENDOR AND ADDRESS)

**RE: CONTRACT**  
**BID NUMBER: (SOLICITATION #)**  
**(SOLICITATION NAME)**

Dear Mr./Ms. (NAME):

Enclosed is a signed original contract for the above referenced contract. Upon review and approval, please have a copy of the contract signed on behalf of your company and return one fully executed copy of the contract along with certificate of insurance to my office. In order to fully execute this document, make sure that it is dated properly.

If your company has not done business with the City of Cayce, please contact me for a "Vendor Application" and "W-9 Form". We will require these forms to be filled out and returned to our office in order to add your company to our payment database.

For all billing inquiries, your Accounts Payable contact will be Sarah Harris at (803) 550-9545. **Please be sure to provide this contact information with your company's Accounts Receivable department.**

We look forward to working with you on this project. Please let me know if you should you have any questions or concerns regarding this contract.

Sincerely,

(NAME)  
Sarah Harris/Steven Bullard  
Grants Administration/Fire Services

STATE OF SOUTH CAROLINA ) CONTRACT FOR (CONTRACT NAME)  
CITY OF CAYCE )

THIS AGREEMENT is entered into by and between the **City of Cayce, 1800 12<sup>th</sup> Street, Cayce, South Carolina 29033** (hereinafter referred as “City”), and **(CONTRACT VENDOR NAME AND ADDRESS)** (hereinafter referred to as “Company”).

NOW THEREFORE, for and in consideration of the mutual covenants and conditions set forth herein, the parties hereto agree as follows:

1. **Scope of Contract.** Company shall provide all of the work and services required by **(BID NUMBER) (IFB/RFP)**, which is incorporated herein and made a part hereof, for the **(SOLICITATION NAME)**.

2. **Term of Contract.** The term of this contract shall commence on **(DATE)** and shall continue for a period of **(NUMBER) (#) year(s)**. City shall have the right, but not the obligation, to renew this contract for **(NUMBER) (#) additional one year periods** under the same terms and conditions. This contract may be extended upon City written notice not less than **(NUMBER) (#) days** prior to the expiration of the initial term or any extension hereof.

3. **Compensation.** City agrees to pay Company according to the schedule of charges attached hereto and incorporated herein as Exhibit A and there shall be no deviation from these charges without a written change order as provided for herein. The charges shall include all tariffs, taxes, fees and other assessments imposed from time to time by any federal, state, or local governments.

4. **Payment Terms.** Invoicing will be allowed on a monthly basis. Application for payment shall reflect services completed through the last day of the month. Payment of invoices shall be due within thirty (30) days after receipt of an accurate, undisputed, and properly submitted invoice to the City after acceptance of completed order/project.

5. **Insurance.** Company shall provide insurance as set forth in the BID.

6. **Modification/Change Orders.** Any change orders, alternations, amendments or other modifications to the order shall not be effective unless reduced to writing, signed by the City and Company and executed with the same formality as this contract.

7. **Termination.** This contract may be terminated pursuant to the BID.

8. **Warranty.** Company’s services are warranted to be performed in a timely and workmanlike manner and such services shall meet in addition to the response to the BID.

9. **Indemnification.** Company shall provide indemnification as set forth in the BID.

10. **Breach /Waiver.** No term or provision hereof shall be deemed waived unless breach thereof is waived in writing and signed by the party claimed to have waived and consented. No consent

by any party to, or waiver of, a breach by the other, whether expressed or implied, shall constitute a consent to, or waiver of, or excuse for, any difference or subsequent breach.

11. **Severability.** If any term or provision of this contract shall be found to be illegal or unenforceable, then, notwithstanding any such illegality or unenforceability, the remainder of said contract shall remain in full force and effect and such term or provision shall be deemed to be deleted and severable there from.

12. **Entire Agreement and Priority of Documents.** This document, together with all subordinate and other documents incorporated by reference herein, will constitute the entire agreement between the parties with respect to the subject matter contained herein and may only be modified by an amendment executed in writing by both parties. Company hereby agrees, except where this contract specifically indicates otherwise, all written bids, specifications, brochures and sales materials presented by Company to City leading to this contract, and all other Company representations, commitments, warranties prior to and in connection with this contract, shall be deemed to be and are, incorporated by reference into and made a part of this contract. Except as otherwise expressly stated, in the event of a conflict in the interpretation of the contract, the order of priority in descending order is (I) this document, (ii) the BID, and then (iii) the Response.

IN WITNESS WHEREOF, the Company and the City have signed and executed this contract this \_\_\_\_\_ day of \_\_\_\_\_, 2018.

WITNESSES:

\_\_\_\_\_

Procurement Officer

**SAMPLE CONTRACT**

(CONTRACT VENDOR NAME AND ADDRESS)

BY: \_\_\_\_\_

ITS: \_\_\_\_\_

**CITY OF CAYCE,  
SOUTH CAROLINA**

BY: \_\_\_\_\_

Director of Procurement

**SAMPLE SCORE SHEET**

***Request for Proposals (RFP)***

**Fire Ladder Apparatus, Rear Mount Platform  
Emergency Services/Fire**

**Review of Responses**

VENDOR: \_\_\_\_\_

DATE: \_\_\_\_\_

Non Responsive	Low	Medium Low	Average	Medium High	High	CRITERIA	Total Score	Comments
0	1	2	3	4	5	Responsiveness to this RFP		
0	1	2	3	4	5	Service		
0	1	2	3	4	5	Quality of Proposal		
0	1	2	3	4	5	References		
0	1	2	3	4	5	Cost		

**Maximum Points 25**

**Total Score \_\_\_\_\_**

Notes: