

ATTACHMENT B – LADDER SPECIFICATIONS

INTENT OF SPECIFICATIONS

It is the intent of these specifications to obtain the best results and the most acceptable apparatus for service in the fire department. These specifications cover the general requirements as to the type of construction, together with certain details as to finish, equipment, and appliances with which the successful bidder must conform. Minor details of construction and materials which are not otherwise specified are left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features. However, all designs and fabrications by the manufacturer must meet or exceed all NFPA and DOT standards that are applicable. The design and fabrication style of the structural members of the apparatus mentioned in this document are recommendations, not direct instructions unless specifically stated. These “structural members” include but are not limited to the frame, suspension, aerial, and aerial waterway. These shall meet or exceed the strength requirements and safety factors stated in the description. They shall be constructed with the long-term durability of the apparatus and the safety of its occupants and its users as a top priority. Given the intended severe duty use of the apparatus, any specification or design from a bidder that is deemed (by the purchaser) unsafe, unreliable, or one that reduces the overall lifetime and/or performance of the apparatus will not be accepted.

Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of 50 years.

Each bidder shall furnish satisfactory evidence of his ability to construct the apparatus specified. The bidder shall also show that they are in a position to render prompt service and furnish replacement parts for said apparatus.

Aerials containing load ratings and capabilities of the highest level within the respective model class shall be accepted. Bids submitted containing medium-duty or light-duty aerial ladders shall not be considered as meeting minimum requirements and will automatically be rejected.

CONTRACTOR'S SPECIFICATIONS

Each bid shall be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under the contract shall conform.

These specifications shall indicate the size, type, model, and make of all component parts and equipment.

The submitted bids shall clearly describe the capabilities of the aerial device. Items such as safety factor certification, horizontal reach, vertical reach, scrub chart information, load capabilities, flow ratings, monitor capabilities, short set capabilities, safety interlock information,

estimated completed weight information and other pertinent information shall be either submitted with the bid or readily available if requested.

TIMELY PROPOSALS

It is the bidder's responsibility to see that their proposals arrive on time. Late proposals, facsimiles, emails, telegram, or telephone bids shall not be considered.

DRAWINGS

All bid drawings shall be stamped PROPOSAL.

- A total of six (6) drawings shall be supplied. The provided drawings can be printed to any paper size, but the scale will only be valid when printed to the paper size listed in the title block
- Drawings shall show five (5) views: left (drivers), right (officers), front, rear, and top.
- OAL (overall length) in feet and inches. The estimated length shall be rounded up to the nearest inch.
- OAH (overall height) in feet and inches. The estimated height shall be rounded up to the nearest inch.
- Wheelbase in inches
- Pump house width in inches
- Front of the body to the centerline of the rear axle in inches
- Front and rear overhang in inches
- Angle of approach and departure
- Roll-up doors will be shown in the open position. Lap doors will be shown in the closed position
- Compartment dimensions shall be shown in a table on the drawing. The table shall display:
 1. Clear door opening – The width/height of the clear door opening
 2. Interior dimensions – The interior compartment dimensions excluding any accessories or pockets (i.e., roll-up door drums, hard suction hose pans, suspension pockets, etc.)
 3. Divide heights – The measurement where the compartment changes from full depth to shallow depth
 4. Compartment depths – Depth of the compartment with the door closed
- Ground ladders shall be labeled with a letter designation referring to the table for an explanation of the ladder
- No pump panel or instrument panel controls, discharges or inlets shall be shown. The panel space is to be left blank and labeled "Pump Panel"
- Rear plumbing, such as 2 1/2" discharges, rear steamers, and direct tank fills, shall be shown
- Water tank outline (if applicable)
- Water tank and foam cell fill towers (If applicable)
- Generator outline (if applicable)
- Warning lights • D.O.T. lights
- Text Block Items
- Chassis make/model

- Fire pump make/model
- Water tank capacity (if applicable)
- Foam cell capacity (if applicable)
- Body material
- Hose bed capacity in cubic feet (if applicable)
- Total compartment cubic feet
- Utilize a unique bid number
- Drawings shall be printed on white paper with black ink

OBLIGATIONS

We reserve the right to accept or reject any or all bids on such basis as the purchaser deems to be in its best interest. All bidders shall be advised that the purchaser is not bound in any manner to automatically accept the lowest bid. We shall only be obligated to purchase the lowest bid that meets these detailed specifications as closely as possible.

SPECIALIZATION

Due to the complexity of the apparatus proposed, it is the desire of the purchaser to obtain equipment that is built by companies that specialize in the construction in accordance with NFPA 1901, current edition compliant aerial devices.

The aerial device shall be engineered and fabricated by a manufacturer with a minimum of 40 years of experience in the aerial field. No exceptions shall be allowed.

No prototype devices or aerials without a proven field record shall be acceptable. The aerial device provided shall be of the highest quality available in the industry.

LIABILITY

The bidder, if their bid is accepted, shall defend all suits and assume all liability for the use of any patented process, device, or article forming a part of the apparatus or any appliance furnished under the contract.

INFORMATION REQUIRED UPON DELIVERY

The manufacturer shall supply at the time of delivery at least two copies of a complete operation and maintenance manual covering the completed aerial device as delivered.

Parts manuals, where possible, shall be cross-referenced to show the actual manufacturer's name, part number, and description of all parts and fittings that are commercially available.

DESIGN / CONSTRUCTION / TESTING CRITERIA

The following criteria shall apply to this specification to the extent specified herein:

- NFPA 1901, Current Edition

- American Society for Testing and Materials (ATSM A36)
- Society of Automotive Engineers, Inc. (SAE) "SAE Handbook"
- American Welding Society (AWS) AWSO 14.477
- American Welding Society (AWS) D1.1 and D1.2
- American Society of Non-Destructive Testing (ASNT) "ASNT CP189"

The aerial ladder shall be designed, fabricated, and tested in accordance with the above codes and specifications, as well as all other applicable codes, standards, and specifications that may be referenced by any of the above.

NON-DESTRUCTIVE TESTING

Steel ladders, turntable, stabilizers, and torque box shall have 100% of all welds tested using both magnetic particle method and visual testing method. Aerials that are fabricated of aluminum shall have 100% of all welds tested using the dye penetrant method and visual method. All testing shall be performed by certified technicians, which are employees of an independent nationally recognized, and certified third-party testing company. Manufacturers who rely on visual inspection (either inhouse or by a third party) as the primary method of testing, and magnetic particle or dye penetrant as a secondary or "proving" test method for only suspect areas shall not be acceptable. In any case, welds shall be tested using two (2) separate NDT inspection methods regardless of the material used to construct the aerial device.

THIRD-PARTY CERTIFICATION

All bids shall include copies of the certification of testing of the aerial device. The purchaser desires a device that has been tested by a third party for compliance with the minimum 2 to 1 safety factor specified in accordance with NFPA 1901, current edition. Devices that have not been certified by a third-party engineering firm that is independent of the manufacturer shall not be acceptable, no exceptions.

AERIAL DEVICE SAFETY FACTOR AND RATED CAPACITY

The purchaser desires to purchase, using these specifications, an aerial device with a minimum 2.0:1 Safety Factor as required and defined in accordance with NFPA 1901, current edition. Therefore, the aerial manufacturer shall hereby certify, by submitting a bid for these specifications that the aerial device meets or exceeds all requirements and conditions in these specifications.

BID FORMS / SPECIFICATIONS

All bid forms shall be submitted on the attached bid form. The bid form and/or these specifications shall be filled out by checking either the "YES" or "NO" column for each section/paragraph. Failure to use this form and/or these specifications shall be cause for immediate rejection of any bid.

EXCEPTION TO SPECIFICATIONS

The following chassis, pump, and body specifications shall be strictly adhered to. Exceptions shall be allowed if they are equal to or superior to that specified and provided, they are listed and fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS". Exception lists shall refer to the specification page number. Each check in the "NO" column shall be listed and fully explained. Where no check is made in a particular paragraph either "YES" or "NO", it shall be assumed the bidder is taking exception to that paragraph. If a paragraph contains an empty column, where the bidder neglected to check the proper "YES" or "NO" column, it is assumed the bidder is not conforming to the requirements of this paragraph. If no explanation is given in the "EXCEPTIONS TO SPECIFICATIONS" document, the bid is subject to immediate rejection.

PROPOSALS TAKING TOTAL EXCEPTION TO THESE SPECIFICATIONS WILL BE IMMEDIATELY REJECTED.

The buyer is aware that all bidders shall have to take some exceptions, therefore;

BIDDERS THAT TAKE NO EXCEPTIONS shall BE REQUIRED TO MEET EVERY PARAGRAPH TO THE FULLEST EXTENT SHOULD THEIR BID BE ACCEPTED.

It is the intent of the purchaser to receive bids that do not require telephone calls or other communications to ascertain what a bidder is intending to supply.

Upon delivery, the apparatus shall be inspected against these specifications and not those supplied by the bidder with their proposal. Deviations shall not be acceptable unless noted as exceptions at the time of the bid. The apparatus shall be rejected until said deviations are corrected to the satisfaction of the buyer.

Decisions regarding equal to or better than shall be the sole responsibility of the recipient of the bids rather than the companies submitting bids. All deviations, regardless of significance, must be explained in the "**EXCEPTIONS TO SPECIFICATIONS**" section of the bid.

When exceptions are not taken but inconsistencies are noted in the submitted detailed specifications, the bid may be rejected.

PROPOSAL SEQUENCE

Bid specifications shall be submitted in the same sequence as these specifications for ease of checking compliance. No exceptions shall be allowed to this requirement. The apparatus committee intends to be thorough during the evaluation of the bidding process. To maximize efficiency and minimize time to thoroughly evaluate all received bids, this requirement must be strictly enforced.

AWARD OF CONTRACT

All bids submitted shall be valid for a minimum of 30 days during which time bid securities submitted with the proposals shall be held. Criteria for the award shall include, but not be limited to, the following:

- Apparatus Performance and Safety Levels / Considerations
- Completeness of proposal
- Accuracy of accompanying data
- Past performance of the bidder
- Compliance with the detailed specifications
- Compliance with purchaser's request(s) for personnel qualifications or certifications
- Exceptions and clarifications
- Financial stability of bidder
- Local representation of the manufacturer
- Serviceability of the proposed apparatus
- Service capabilities of the bidder's local representative
- Compliance with NFPA 1901, current edition
- Any other factor the purchaser deems relevant

After the evaluation and award process is complete, all bidders shall be notified of the results and securities shall be returned.

PREREQUISITE BIDDING REQUIREMENTS

Any manufacturer submitting a proposal or bid, to these specifications, shall meet the following conditions:

- The manufacturer of the apparatus herein specified, shall be wholly owned (100%) and managed by a Company, Corporation, and/or Parent Company that is wholly based and permanently resides in the United States of America.
- The Company, Corporation, and/or Parent Company, and all assets belonging to such, shall be wholly owned and managed (100%) by the entities specified above.
- Any proposal, bid, or response to these specifications by any foreign-based, owned, or managed (in part or whole) Company, Corporation, and/or Parent Company shall be cause for immediate rejection. Any proposal, bid, or response to these specifications by any Company, Corporation, and/or Parent Company, that is owned, operated, managed, or held in contract, in part or wholly by a partnership or other agreement, shall be cause for immediate rejection.
- Exceptions to these conditions will not be allowed under any circumstances.

<u>General:</u> Ladder Specifications				
<u>BIDDER MUST FILL IN BLANKS TO INDICATE COMPLIANCE, OR STATE EXCEPTION FOR OUR ACCEPTANCE. FAILURE TO COMPLY WITH THIS REQUIREMENT MAY RENDER YOUR BID UNRESPONSIVE.</u>				
1. Bidder Name: _____				
2. Body: _____		Make: _____		Model: _____
				Year: _____
1.0	<u>Safety Requirements</u>	YES	NO	EXCEPTIONS / NOTES
1.1	It is required that the bidder shall meet all State and Federal safety standards and laws that are in effect on the date of the bid for the item(s) that are being specified and the particular use for which they are meant.			
2.0	<u>Acquaintance with Specifications</u>	YES	NO	EXCEPTIONS / NOTES
2.1	It is the responsibility of the bidder to review all the bidding requirements. Failure of a bidder to be acquainted with this information shall not relieve them from any obligations of the bid requirements.			
3.0	<u>Quality and Workmanship</u>	YES	NO	EXCEPTIONS / NOTES
3.1	The design of the apparatus shall embody the latest approved automotive engineering practices. Experimental designs and methods shall not be acceptable.			
3.2	The workmanship shall be of the highest quality in its respective field. Special consideration shall be given to the following points: accessibility of the various units that require periodic maintenance, ease of operation (including both pumping and driving), and symmetrical proportions.			
4.0	<u>GENERAL CONSTRUCTION</u>	YES	NO	EXCEPTIONS / NOTES
4.1	The complete apparatus, assemblies, subassemblies, parts, and so on, shall be designed and constructed with due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the apparatus is to be subjected when placed in service.			
4.2	All parts of the apparatus shall be strong enough to withstand the general service under full load. The apparatus shall be so designed that the various parts are readily accessible for lubrication, inspection, adjustment, and repair.			

4.3	The apparatus shall be designed and constructed, and the equipment so mounted, with due consideration to distribution of the load between the front and rear axles, and side to side loading that all specified equipment, including a full complement of specified ground ladders, full water tank, loose equipment, and firefighters; shall be carried without overloading or damaging the apparatus as per requirements defined in NFPA 1901.			
5.0	<u>ROADABILITY</u>	YES	NO	EXCEPTIONS / NOTES
5.1	<p>The apparatus, when fully equipped and loaded, shall be capable of the following performance while on dry paved roads that are in good condition:</p> <ul style="list-style-type: none"> • Accelerating from 0 to 35 mph within 25 seconds on a 0 percent grade • Attaining a speed of 50 mph on 0 percent grade • Maintaining a speed of at least 20 mph on any grade up to and including 6 percent • The maximum top speed of the apparatus shall not exceed the tire manufacturer's maximum speed rating for the tires installed on the apparatus. 			
6.0	<u>FAILURE TO MEET TESTS</u>	YES	NO	EXCEPTIONS / NOTES
6.1	<p>In the event the apparatus fails to meet the test requirements of these specifications on the first trials, second trials may be made at the option of the bidder within 30 days of the date of the first trials.</p> <p>Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes as required to conform to any clause of the specifications within 30 days after the notice is given to the bidder of such changes, shall be cause for rejection of the apparatus.</p> <p>Permission to keep or store the apparatus in any building owned or occupied by the Department during the specified period, with the permission of the bidder, shall not constitute acceptance.</p> <p>No Exceptions.</p>			

7.0	<u>NFPA 1901-2016</u>	YES	NO	EXCEPTIONS / NOTES
7.1	The National Fire Protection Association "Standard for Automotive Fire Apparatus", 2016 edition, is hereby adopted and made a part of these specifications, the same as if it were written out in full detail, except for the section dealing with "Equipment Recommended for Various Types of Apparatus". Bidders shall provide the equipment requested herein and the buyer shall supply the rest before the apparatus is put into service. It is the intent of the purchaser to purchase an apparatus that meets 100% of the minimum standards defined and outlined in NFPA 1901 2016 edition. There are to be no exceptions to this requirement.			
8.0	<u>INSPECTION CERTIFICATE NFPA 1901 COMPLIANCE</u>	YES	NO	EXCEPTIONS / NOTES
8.1	<p>An OEM inspection certificate for the apparatus shall be furnished upon delivery. The purpose of this NFPA 1901 compliance inspection shall be to serve as proof to the customer that all applicable standards have been met or exceeded by the responsible manufacturer.</p> <p>The following objectives shall be achieved as a result (this listing shall not be construed as being all-inclusive):</p> <ul style="list-style-type: none"> • Ensure that understanding of all parties' responsibilities has been addressed by the actual referencing of NFPA 1901 and the amendments in these specifications and the purchase contract and documentation. • Ensure that only structural materials complying with appropriate standards and codes are used for construction. • Ensure the applicable standards of design and manufacturing have been met or exceeded. • Ensure that safety factors have been met or exceeded where required. • Ensure that applicable standards for testing and inspection have been met or exceeded by personnel with the appropriate qualifications, experience, and certifications. • Ensure that where applicable components, equipment, and loose equipment carry the appropriate characteristics, classifications, and/or certifications. • Ensure that in general all applicable requirements outlined in NFPA 1901, and those codes, standards, and specifications referenced by said parties are met, exceeded, and/or addressed. 			

9.0	<u>CONSTRUCTION DOCUMENTATION</u>	YES	NO	EXCEPTIONS / NOTES
9.1	<p>The contractor shall supply, at the time of delivery, at least one (1) copy of the following documents:</p> <ul style="list-style-type: none"> • The manufacturer's record of apparatus construction details, including the following information: • Owner's name and address • Apparatus manufacturer, model, and serial number • Chassis make, model, and serial number • GAWR of front and rear axles • Front tire size and total rated capacity in pounds • Rear tire size and total rated capacity in pounds • Chassis weight distribution in pounds with water and manufacturer-mounted equipment (front and rear) • Engine make, model, serial number, rated horsepower and related speed and governed speed • Type of fuel and fuel tank capacity • Electrical system voltage and alternator output in amps 			
9.2	<ul style="list-style-type: none"> • Battery's make, model, and capacity in cold cranking amps (CCA) • Chassis transmission's make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio • If applicable, the pump's make, model, rated capacity in gallons per minute, and serial number • Pump transmission's make, model, serial number, and gear ratio. • If applicable, the auxiliary pump's make, model, rated capacity in gallons per minute, and serial number • Water tank certified capacity in gallons • On aerial apparatus, the device type, rated vertical height in feet, rated horizontal reach in feet, and rated capacity in pounds • Paint manufacturer and paint number(s) • Company name and signature of responsible company representative • Certification of slip resistance of all stepping, standing, and walking surfaces 			

9.3	<ul style="list-style-type: none"> • If the apparatus has a fire pump, a copy of the following shall be provided: pump manufacturers certification of suction capability, apparatus manufacturer's approval for stationary pumping applications, engine manufacturer certified brake horsepower curve showing the maximum governed speed, pump manufacturers certification of the hydrostatic test, and the certification of inspection and test for the fire pump 			
9.4	<ul style="list-style-type: none"> • If the apparatus has an aerial device, the certification of inspection and test for the aerial device, and all the technical information required for inspections to comply with NFPA 1914, Standard for Testing Fire Department Aerial Devices • If the apparatus has a fixed line voltage power source, the certification of the test for the fixed power source • If the apparatus is equipped with an air system, test results of the air quality, the SCBA fill station, and the air system installation • Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose) • Written load analysis and results of the electrical system performance tests • When the apparatus is equipped with a water tank, the certification of the water tank capacity 			
10.0	STATEMENT OF EXCEPTIONS	YES	NO	EXCEPTIONS / NOTES
10.1	<p>The proposed apparatus as described in this specification document and all related material with the bid package shall meet or exceed all applicable sections for the category of apparatus as defined by NFPA 1901 unless specifically noted within this specification or other official documents associated with this bid.</p> <p>Should any area, section, or portion of the apparatus not meet the intent and applicable requirements, a clearly defined listing or explanation of what and why compliance was not achieved shall be provided to the purchaser at the time of delivery.</p>			

11.0	<u>OWNER'S MANUAL</u>	YES	NO	EXCEPTIONS / NOTES
11.1	An owner's manual containing the construction, operation, and service documentation shall be provided on a USB Drive. One (1) copy of the USB shall be provided with the apparatus.			
12.0	<u>ELECTRICAL MANUAL</u>	YES	NO	EXCEPTIONS / NOTES
12.1	A complete electrical manual for the apparatus shall also be provided on the USB Drive. This manual shall be specifically prepared for this individual unit rather than a generic schematic manual designed to accommodate all apparatus. The electrical manual shall also include electrical schematics, harness layouts, multiplex display specifications (including Node Input/output Spreadsheet and Node Relationship Spreadsheet), and Master Wire Listing. A contact letter shall also be provided by the electrical engineer, who built the manual, with instructions on using the manual and contact information for assistance with electrical manual questions.			
13.0	<u>ELECTRICAL SCHEMATICS</u>	YES	NO	EXCEPTIONS / NOTES
13.1	A complete electrical manual for the apparatus shall also be provided on the USB Drive. This manual shall be specifically prepared for this individual unit rather than a generic schematic manual designed to accommodate all apparatus. The electrical manual shall also include electrical schematics, harness layouts, multiplex display specifications (including Node Input/output Spreadsheet and Node Relationship Spreadsheet), and Master Wire Listing. A contact letter shall also be provided by the electrical engineer, who built the manual, with instructions on using the manual and contact information for assistance with electrical manual questions.			
14.0	<u>ELECTRICAL SCHEMATICS</u>	YES	NO	EXCEPTIONS / NOTES
14.1	A section of the electrical manual shall include schematics of the electrical system and components of the apparatus. These schematics shall be specifically prepared for this individual unit rather than a generic schematic designed to accommodate all apparatus.			

15.0	<u>PUMP PLUMBING SCHEMATICS</u>	YES	NO	EXCEPTIONS / NOTES
15.1	A section of the electrical manual shall include a schematic of the pump plumbing. This schematic shall be specifically prepared for this individual unit rather than a generic schematic designed to accommodate all apparatus.			
16.0	<u>HYDRAULIC SCHEMATICS</u>	YES	NO	EXCEPTIONS / NOTES
16.1	A section of the electrical manual shall include schematics of the hydraulic components on the apparatus including but not limited to: <ul style="list-style-type: none"> • Ladder Rack(s) and Hose Bed Door(s) (if applicable) • Aerial – Retraction/Extension (if applicable) • Aerial – Rotation (if applicable) • Tiller – HVAC Hydraulics System (if applicable) 			
17.0	<u>FIRE APPARATUS SAFETY GUIDE</u>	YES	NO	EXCEPTIONS / NOTES
17.1	One (1) printed copy of the FAMA Fire Apparatus Safety Guide shall be provided with the apparatus. This guide provides safety instructions for the operations of the fire apparatus.			
18.0	<u>AERIAL OPERATION/PARTS/MAINTENANCE MANUALS</u>	YES	NO	EXCEPTIONS / NOTES
18.1	One (1) printed aerial operation and maintenance manual shall be provided with the apparatus at the time of delivery. These manuals shall be written in a "step-by-step" format for ease of reference. One (1) USB shall be provided with a digital copy of the aerial manuals included with the printed version. A digital version of the aerial manuals will also be included with the complete Owner's Manual USB for the apparatus.			
18.2	The information included in the manuals shall include, but not be limited to the following: <ul style="list-style-type: none"> • Manufacturer Defined Terminology; (To help impart a full understanding of the terminology used in the manuals) • Safety Information and Warnings; (To warn of dangerous conditions/personnel injury/equipment damage) • Complete Rated Capacities Information; (Allowable loads and GPM flows) • Complete and Detailed Operating Systems Descriptions; (To impart an understanding of operation/capabilities/working principles) 			

18.3	<ul style="list-style-type: none"> • Instruction For Manufacturer Recommended Deployment and Operation of All Systems During All Specific Conditions; (To ensure safer, more efficient operation of the aerial device) • Current, Actual Illustrations of Aerial Components Throughout the Manual; (To aid in the location of specific components, being addressed in the manual) • Complete Maintenance Instructions/Methods/Materials/Intervals/Inspections. 			
19.0	<u>AERIAL LADDER DEVICE DEMONSTRATION</u>	YES	NO	EXCEPTIONS / NOTES
19.1	<p>A factory-trained and authorized instructor shall provide one (1) consecutive day of onsite classes after apparatus acceptance.</p> <p>Topics covered in the class shall include:</p> <ul style="list-style-type: none"> • General familiarization and demonstration of the aerial device • Aerial apparatus safety including a review of all safety devices, interlocks, and operational hazards • Positioning and locating the vehicle for safe operations • Chassis parking brakes and engagement of hydraulic system • Deployment of stabilization devices and use of ground pads • Operation of elevation, extension, and rotation of the aerial device • Operation of waterway, nozzle, and other firefighting devices of the aerial device • Operation and use of breathing air system • Specific aerial device maintenance and service areas for operators • Shutdown and return to service operations • Operation of tip controls and platform controls if equipped <p>Classes shall consist of presentations as well as a hands-on demonstration.</p>			

20.0	<u>MISCELLANEOUS EQUIPMENT ALLOWANCE</u>	YES	NO	EXCEPTIONS / NOTES
20.1	The Gross Axle Weight Rating (GAWR) and the Gross Combined Weight Rating (GCWR) or Gross Vehicle Weight Rating (GVWR) of the chassis shall be adequate to carry the weight of the unequipped apparatus with the water tank and other tanks full, specified hose load, unequipped personnel weight, ground ladders, and miscellaneous equipment allowance of 2,500 pounds.			
21.0	<u>TILT TABLE TESTING IS NOT REQUIRED</u>	YES	NO	EXCEPTIONS / NOTES
21.1	A similar apparatus has previously passed the NFPA requirement of maintaining a stability of 26.5 degrees in both directions.			
22.0	<u>VEHICLE STABILITY</u>	YES	NO	EXCEPTIONS / NOTES
22.1	<p>The apparatus shall comply in accordance with NFPA 1901, current edition requirements as it applies to vehicle stability. The apparatus as described in the specifications shall be classified into one of the following categories:</p> <ul style="list-style-type: none"> • The apparatus shall go through actual tilt table testing which shall be determined by the apparatus manufacturer unless a similar apparatus has previously passed the NFPA required tilt table test. • The apparatus shall be equipped with a rollover stability control system as defined in section 4.13.1.2 of NFPA 1901. • The apparatus shall be deemed a similar apparatus and meet the intent of section 4.13.1.1.2 of NFPA 1901. 			
23.0	<u>INDEPENDENT THIRD-PARTY PUMP CERTIFICATION</u>	YES	NO	EXCEPTIONS / NOTES
23.1	<p>The fire pump shall be tested and certified by Underwriter's Laboratories, a nationally recognized independent third-party testing company. Tests shall be conducted so that the pump performs as listed below:</p> <ul style="list-style-type: none"> • 100% of rated capacity at 150 pounds net pressure • 70% of rated capacity at 200 pounds net pressure • 50% of rated capacity at 250 pounds net pressure • 100% of rated capacity at 165 pounds net pressure <p>The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined in accordance with NFPA 1901, current edition. The pump shall be free from objectionable pulsation and vibration.</p>			

24.0	<u>PUMP CERTIFICATION</u>	YES	NO	EXCEPTIONS / NOTES
24.1	The pump shall be certified in U.S. gallons per minute (GPM).			
25.0	<u>PERFORMANCE BOND AND PAYMENT BOND-100%</u>	YES	NO	EXCEPTIONS / NOTES
25.1	<p>The manufacturer shall provide, within thirty (30) days after award of contract, and along with a signed copy of the contract, a performance bond, which guarantees performance of all terms and conditions of the contract and of the Basic One (1) Year Limited Warranty agreement, and a payment bond, which shall guarantee payment for labor, materials, and equipment furnished for use in the performance of the contract. The performance bond will specifically cover the performance of the contract according to its terms and conditions. The payment bond will cover payment of labor, materials, and equipment furnished for use in the performance of the contract. This performance bond and payment bond will be issued by a surety company who is listed by the U.S. Treasury Department's list of approved sureties, as published in Circular 570, as of the bid date. The performance bond and payment bond will be issued in an amount equal to 100% of the contract amount and will be dated concurrent to, or subsequent to, the date of the contract.</p> <p>Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle will apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle will not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision will prevail.</p>			

26.0	<u>ONLINE CUSTOMER INTERACTION</u>	YES	NO	EXCEPTIONS / NOTES
26.1	<p>The fire department shall be able to view digital photos of their apparatus in the specified phases of construction. The following phases will be captured and displayed:</p> <ul style="list-style-type: none"> • Chassis arrival to the OEM • Fabrication • Pump and Plumbing • Paint • Assembly • Completion of production <p>The photos shall be uploaded to a secure website, only accessible to the customer and representatives of the OEM.</p>			
27.0	<u>PRE-CONSTRUCTION MEETING</u>	YES	NO	EXCEPTIONS / NOTES
27.1	<p>A pre-construction meeting shall be held at the manufacturer's facility at a time agreed upon between department officials and the dealership. The pre-construction meeting is the most important meeting during the after-sale production process. The purpose of this meeting is to finalize all aspects of the specifications, discuss and clarify all design details of the apparatus, and share or provide all information so all parties agree on the apparatus being constructed. The goal of the pre-construction meeting is for the purchaser and dealer representative(s) to discuss and clarify all aspects of the proposed apparatus and to provide all necessary information to the apparatus manufacturer that shall ensure the apparatus is built to the satisfaction of all parties involved.</p>			
27.2	<p>The apparatus manufacturer shall create and forward to the dealer a "Pre-construction" document containing the following items:</p> <ul style="list-style-type: none"> • Complete specifications of the apparatus including the chassis • Detailed amps draw report • Listing of clarifications or questions from the manufacturer that require attention (shelf locations, lettering details, etc.) • A total of six (6) packets of 11" x 17" drawings, each packet complete with a single view • All drawings shall be drawn and printed to an appropriate scale to maximize the size of the apparatus on each 11" x 17" sheet of paper. 			

27.3	During this preconstruction meeting, any changes or clarifications must be documented on a manufacturer-issued change order. The change order shall be signed by the customer and dealership and ultimately by the apparatus manufacturer. The change order becomes an extension of the contract with the official signatures of all three parties. All change order items resulting from the preconstruction meeting shall be implemented into the official shop order document. The successful bidder shall be responsible for the cost of (4) department members for an inspection trip(s) that will be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs such as travel, lodging and meals will be the responsibility of the bidder.			
28.0	<u>MID-POINT INSPECTION</u>	YES	NO	EXCEPTIONS / NOTES
28.1	An inspection of the apparatus in production by the customer shall be at the apparatus manufacturer's facility. The customer shall be allowed to visually inspect the apparatus so that any discrepancies may be addressed. A company representative shall be present at the inspection to answer all questions. Adequate notice shall be given to the dealer as to when the apparatus will be available for inspection. The successful bidder shall be responsible for the cost of (4) department members for an inspection trip(s) that will be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs such as travel, lodging and meals will be the responsibility of the bidder.			
29.0	<u>FINAL INSPECTION</u>	YES	NO	EXCEPTIONS / NOTES
29.1	The department/dealer representative will inspect the final apparatus before it leaves the apparatus body manufacturer's facility. This will allow any changes that may be required, to be done so promptly. After leaving the facility, all repairs or alterations will be performed by either the dealer or an OEM-approved service center. The successful bidder shall be responsible for the cost of (4) department members for an inspection trip(s) that will be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs such as travel, lodging and meals will be the responsibility of the bidder.			

30.0	<u>ADDITIONAL REQUIREMENTS</u>	YES	NO	EXCEPTIONS / NOTES
30.1	<p>The City of Charlotte desires to purchase the apparatus from a dealer who meets the following minimal requirements:</p> <ul style="list-style-type: none"> • Dealer and or the dealer principal shall have a minimum of ten (10) year experience with the apparatus manufacturer. • Dealer shall have a brick-and-mortar service center with full capabilities to perform mechanical, chassis, pump, electrical and other general warranty adjustments within thirty (30) miles of Charlotte Fire Department Headquarters, located at 500 Dalton Ave, Charlotte, NC. • Service center shall employ at least two (2) EVT Master Certified technicians and have full mobile capabilities. • Service center shall employ one (1) Cummins certified technician in each of the following platforms, ISL9, ISX12 and ISX15. • Service center mobile capabilities shall also be available twenty-four (24) hours per day, 365 days per year. This information shall be provided in writing to the buyer indicating a minimum one (1) hour response to any out of service condition for any vehicles covered under warranty. • If the afore mentioned service capabilities are not able to be met, the City of Charlotte Fleet Management technicians shall be afforded the opportunity to become factory trained to affect warranty repairs. Any warranty repairs shall be repaid to the City of Charlotte, Charlotte Fire Department and/or the City of Charlotte Fleet Management Division. • Completion time of apparatus from time of order placement to final delivery to the customer shall not exceed sixteen (16) months or 480 days. Twelve (12) months or 365 days to Fourteen (14) months or 420 days is a customer preferred construction period, however a two (2) month allowance will also be considered. Adhering to this construction schedule will allow the customer to maintain their apparatus replacement schedule. 			

30.2	<ul style="list-style-type: none"> Whether in the cab, body or chassis, all welds shall meet the American Welding Society requirements. Any aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum. Furthermore, all welds shall be presentable and clean in appearance while adhering to the standards addressed. All welds shall be presentable and meet the inspection satisfaction of the customer. Any welds not presentable shall be rejected by the customer. There shall be no exceptions. 			
31.0	<u>MISCELLANEOUS EQUIPMENT</u>	YES	NO	EXCEPTIONS / NOTES
31.1	Miscellaneous equipment, as defined by NFPA 1901, sections 8.8.2 and 8.8.3, shall be the responsibility of the purchaser. The apparatus shall be designed and manufactured in such a manner as to provide ample enclosed space for which to store such equipment.			
32.0	<u>CHASSIS AND LABELING</u>	YES	NO	EXCEPTIONS / NOTES
32.1	The cab and chassis shall include the applicable caution, warning, and safety notice labels with text to be written in English. All applicable caution, warning, and safety notice labels shall be Innovative Controls brand. Where applicable to the location within the specific layout and label package of the cab and chassis, the labels shall include decorative chrome bezels. Designs shall include bezels that fit individual labels or packaged configurations of labels in certain common locations.			

32.2	<p>The following labels shall be Innovative Controls brand, each including a decorative chrome bezel (where applicable):</p> <ul style="list-style-type: none"> • Shoreline • Aerial Stowed • Aerial Breakers 2 • Air Conditioner • Cab Tilt Plate • Air Compressor Breaker • Battery Conditioner Breaker • Helmet Caution • Horn Tag • Q2B Tag • Load Center Plate • Not a Step Label • Occupancy Tag 			
32.3	<ul style="list-style-type: none"> • Do Not Move • Occupants Must Be Seated • Do Not Stand • Danger Do Not Weld • Danger--Untrained Operator • Def Fill Access • Battery Direct • Kneeling • IFS Air Fault • Engine Brake • Retarder • LR 100 Amp Node • 300 Amp EPU • 100 Amp Front O/R Node • 100 Amp T/T Node • 100 Amp RR O/R Node • 10 Amp EPU • Master Power • 12 Volt Power • Aerial Hours • Pump In Drive • Windshield Washer Fluid 			

34.0	<u>APPARATUS TYPE</u>	YES	NO	EXCEPTIONS / NOTES
34.1	The apparatus shall be a Quint vehicle designed for emergency service use. The apparatus shall include a permanently mounted fire pump which has a rated capacity of 750 gallons per minute, a water tank, a hose storage area, a complement of ground ladders, and an aerial ladder or elevating platform with a permanently mounted waterway that shall be rear mounted.			
35.0	<u>VEHICLE TYPE</u>	YES	NO	EXCEPTIONS / NOTES
35.1	The chassis shall be manufactured for use as a straight truck-type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.			
36.0	<u>MAXIMUM OVERALL HEIGHT</u>	YES	NO	EXCEPTIONS / NOTES
36.1	The overall height of the apparatus shall not exceed 143" (11'10") from the ground. This measurement shall be taken with the tires properly inflated and with the apparatus in the unloaded condition to ensure a maximum overall height. To provide the maximum overall height, proposed units using calculated weight as a means to achieve a lower overall height shall not be accepted. The measurement shall be taken at the highest point of the apparatus.			
37.0	<u>MAXIMUM OVERALL LENGTH</u>	YES	NO	EXCEPTIONS / NOTES
37.1	The overall length of the apparatus shall be 491" (40'11").			
38.0	<u>REAR OVERHANG</u>	YES	NO	EXCEPTIONS / NOTES
38.1	The chassis rear overhang shall be 60.50 inches.			
39.0	<u>WHEELBASE</u>	YES	NO	EXCEPTIONS / NOTES
39.1	The wheelbase of the apparatus shall be 234".			
40.0	<u>ANGLE OF APPROACH</u>	YES	NO	EXCEPTIONS / NOTES
40.1	The angle of approach of the apparatus shall be a minimum of 9 degrees.			
41.0	<u>ANGLE OF DEPARTURE</u>	YES	NO	EXCEPTIONS / NOTES
41.1	The angle of departure of the apparatus shall be a minimum of 10 degrees.			
42.0	<u>AXLE CONFIGURATION</u>	YES	NO	EXCEPTIONS / NOTES
42.1	The chassis shall feature a 6 x 4 axle configuration consisting of a tandem rear drive axle set with a single front steer axle.			

43.0	<u>GROSS AXLE WEIGHT RATINGS FRONT AND REAR</u>	YES	NO	EXCEPTIONS / NOTES
43.1	This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.			
44.0	<u>PUMP PROVISION</u>	YES	NO	EXCEPTIONS / NOTES
44.1	The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the midship location. Chassis driveline pump provisions shall include an interlock feature for the automatic setting of the parking brake when the vehicle is shifted into pump mode while the transmission is in neutral, and the transmission output speed translates to less than 1 mph. When the conditions are met the driver-side parking brake valve shall activate. Once shifted to road mode the condition for electric automatic brake engagement is no longer present and the driver's parking brake control valve shall function normally.			
45.0	<u>CAB STYLE</u>	YES	NO	EXCEPTIONS / NOTES
45.1	<p>The cab shall be custom built, fully enclosed, and have a flat roof over the driver, officer, and crew areas. It shall be designed and built specifically for use as an emergency response vehicle by a company specializing in a cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle.</p> <p>The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall, and side wall panels shall be assembled using welds and proven industrial adhesives designed specifically for metal fabrication for construction. The cab shall be constructed using methods and materials with proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. Any aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.</p>			

45.2	<p>All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.</p> <p>The cab shall be constructed of corrosion-resistant metal plates. The cab shall incorporate tongue and groove-fitted extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the “A” pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and roof skin shall be a minimum of 0.13 inches thick; the rear wall skin shall be a minimum of 0.09 inches thick; the front cab structure shall be a minimum of 0.19 inches thick.</p> <p>The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.</p> <p>The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear.</p> <p>The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.</p>			
46.0	<u>OCCUPANT PROTECTION</u>	YES	NO	EXCEPTIONS / NOTES
46.1	<p>The vehicle shall include an occupant protection system which shall secure belted occupants and increase the survivable space within the cab. Secondary means of occupant protection shall be provided by the vendor and approved by the customer at bid submission.</p>			

47.0	<u>CAB FRONT FASCIA</u>	YES	NO	EXCEPTIONS / NOTES
47.1	The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome-plated molded plastic bezel shall be provided on each side around each set of four lamps.			
48.0	<u>CAB UNDERCOAT</u>	YES	NO	EXCEPTIONS / NOTES
48.1	There shall be a rubberized undercoating applied to the underside of the cab.			
49.0	<u>DRIP RAILS</u>	YES	NO	EXCEPTIONS / NOTES
49.1	Drip trays with drains shall be provided in the upper section of all body compartments with roll up doors.			
50.0	<u>CAB PAINT EXTERIOR</u>	YES	NO	EXCEPTIONS / NOTES
50.1	The cab shall be painted before the installation of glass accessories and all other cab trim. The cab shall be painted the specific color designated with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene. The paint shall have a minimum thickness of 2.00 mils, followed by a clear topcoat not to exceed 2.00 mils.			
51.0	<u>CAB PAINT MANUFACTURER</u>	YES	NO	EXCEPTIONS / NOTES
51.1	The cab shall be painted with Sikkens paint.			
52.0	<u>CAB PAINT PRIMARY/LOWER COLOR</u>	YES	NO	EXCEPTIONS / NOTES
52.1	The primary/lower paint color shall be Sikkens FLNA 31841 Red.			
53.0	<u>CAB PAINT SECONDARY/UPPER COLOR</u>	YES	NO	EXCEPTIONS / NOTES
53.1	The secondary/upper paint color shall be Sikkens FLNA 41876 White.			
54.0	<u>CAB PAINT EXTERIOR BREAKLINE</u>	YES	NO	EXCEPTIONS / NOTES
54.1	The upper and lower paint shall meet at a break line on the cab which shall be located approximately 1.00 inch below the door windows on each side of the cab. The break line shall curve down at the front cab corners to approximately 5.00 inches below the windshields on the front of the cab.			
55.0	<u>CAB PAINT PINSTRIPE</u>	YES	NO	EXCEPTIONS / NOTES
55.1	Where the upper and lower paint colors meet, a 0.50-inch-wide black pinstripe shall be applied over this break line to offer a more finished look by the OEM.			

56.0	<u>CAB PAINT WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
56.1	The cab and chassis shall be covered by the 10 year/100,000 mile manufacturer's paint warranty.			
57.0	<u>CAB PAINT INTERIOR</u>	YES	NO	EXCEPTIONS / NOTES
57.1	The visible interior cab structure surfaces shall feature a medium gray spray-on bed liner coating which shall mold to each surface of the cab interior.			
58.0	<u>CAB ENTRY DOORS</u>	YES	NO	EXCEPTIONS / NOTES
58.1	<p>The cab shall include four (4) entry doors, two (2) front doors, and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA.</p> <p>The doors shall include Weather Stripping Material. Each door hinge shall be constructed of stainless steel and offer a minimum of 90-degree door open angle.</p>			
59.0	<u>CAB ENTRY DOOR TYPE</u>	YES	NO	EXCEPTIONS / NOTES
59.1	All cab entry doors shall be barrier clear design resulting in exposed lower cab steps. The doors shall provide approximately 32.00 inches of clearance from the ground to the bottom of the door. Entry doors shall include Pollak mechanical plunger-style switches for electrical component activation.			
60.0	<u>CAB INSULATION</u>	YES	NO	EXCEPTIONS / NOTES
60.1	<p>The cab ceiling and walls shall include insulation material.</p> <p>The insulation will be rated to decrease exterior noise and increase desired interior temperature control.</p>			
61.0	<u>STORAGE BOX</u>	YES	NO	EXCEPTIONS / NOTES
61.1	<p>There shall be one (1) box on the rear wall of the cab between 2 outboard forward facing SCBA seats for ballistic vest storage. The box exterior, interior, and shelf shall have a bed liner finish to match the engine tunnel. The design of each box shall be as follows:</p> <p>The boxes will each be approximately 20" wide x 18" deep with a height not to exceed eyesight level. There shall be a roll up door to secure stored items. There shall be one (1) adjustable shelf in the box.</p>			

62.0	<u>ELECTRICAL COMPONENT ACCESS/STORAGE</u>	YES	NO	EXCEPTIONS / NOTES
62.1	<p>The following chassis power lead ins shall be provided inside a covered storage area with ease of access for maintenance:</p> <ul style="list-style-type: none"> • One (1) 10-gauge wire terminating at a (6) place fuse block that will be wired hot to the battery. • One (1) 10-gauge wire terminating at a (6) place fuse block that will be wired hot from the battery to an activation switch on the dash. • One (1) 10-gauge wire terminating at a (6) place fuse block that will be wired to the ignition switch. <p>The compartment's exterior, interior, and any shelves shall be coated with a gray bedliner finish.</p>			
63.0	<u>CAB STRUCTURAL WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
63.1	Shall receive a 10 year / 100,000 mile Cab Structural warranty			
64.0	<u>CAB TEST INFORMATION</u>	YES	NO	EXCEPTIONS / NOTES
64.1	<p>The cab shall have successfully completed the preload side impact, static roof load application, and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi-Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles concerning the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5. Documentation of the testing shall be provided upon request.</p>			
65.0	<u>ELECTRICAL SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
65.1	The chassis shall include a single starting electrical system which shall include a 12-volt direct current multiplexing system. The wiring shall be appropriate gauge cross link with insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by a flame-retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.			

66.0	<u>OEM WIRING</u>	YES	NO	EXCEPTIONS / NOTES
66.1	The wiring system shall include a prewire for ECM park brake input and engine ground return circuits located behind the switch panel. The circuits shall include an extra 2.00 feet of wire and shall be labeled "ECM Park Brake Input".			
67.0	<u>MULTIPLEX DISPLAY</u>	YES	NO	EXCEPTIONS / NOTES
67.1	The multiplex electrical system shall include a display which shall be located on the left side of the dash in the Switch panel. The display shall feature a full-color LCD screen that includes a message bar displaying the time of day and important messages requiring acknowledgment by the user which shall all be displayed on the top of the screen in the order they are received. There shall be virtual controls on each side of the display for the onboard diagnostics. The display screen shall be video ready for backup cameras. The display shall be fully programmable.			
68.0	<u>LOAD MANAGEMENT SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
68.1	The apparatus load management shall be performed by the included multiplex system. The multiplex system shall also feature the priority of sequences and shall shed electrical loads based on the priority list specifically programmed.			
69.0	<u>DATA RECORDING SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
69.1	<p>The chassis shall have a Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Multiplex electrical system. The following information shall be recorded:</p> <ul style="list-style-type: none"> • Vehicle Speed • Acceleration • Deceleration • Engine Speed • Engine Throttle Position • ABS Event • Seat Occupied Status • Seat Belt Status • Master Optical Warning Device Switch Position • Time/Date 			

69.2	Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system. The laptop connection shall be a panel-mounted female type B USB connection point, remotely mounted in the left side foot well.			
70.0	<u>ACCESSORY POWER</u>	YES	NO	EXCEPTIONS / NOTES
70.1	The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40-amp battery direct load. One (1) power stud shall be capable of carrying up to a 15-amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud. A 225-amp master switch and fused power and ground stud shall be provided and installed on the chassis near the left-hand battery box for OEM body connections.			
71.0	<u>AUXILIARY ACCESSORY POWER</u>	YES	NO	EXCEPTIONS / NOTES
71.1	An auxiliary six (6) position Blue Sea Systems 5025 blade type fuse panel shall be installed by the apparatus builder. There shall be a fuse panel behind the driver's seat protected by a 40-amp fuse and be wired for a battery direct load.			
72.0	<u>ADDITIONAL ACCESSORY POWER</u>	YES	NO	EXCEPTIONS / NOTES
72.1	<p>An additional six (6) position Blue Sea Systems 5025 blade type fuse panel shall be installed by the manufacturer to be determined at pre-construction.</p> <p>There shall be a fuse panel behind the officer seat installed by the apparatus builder. The fuse panel shall be protected by a 40-amp fuse and be wired for a battery direct load</p> <p>An auxiliary six (6) position Blue Sea Systems 5025 blade type fuse panel shall be installed by the apparatus builder. There shall be a prewire behind the officer's seat with a 3.00-foot coil of additional wire for use by the apparatus builder. The fuse panel shall be protected by a 40-amp fuse and be wired for a battery direct load. The panel shall be wired to an on/off rocker switch labeled "MODEM RESET" which will allow the modem to be reset.</p>			

72.2	An additional six (6) position Blue Sea Systems 5025 blade type fuse panel shall be installed by the apparatus builder. There shall be a prewire behind the officer seat with a 3.00-foot coil of additional wire for use by the apparatus builder. The fuse panel shall be protected by a 40-amp fuse and shall be wired for an ignition switched load.			
73.0	<u>EXTERIOR ELECTRICAL TERMINAL COATING</u>	YES	NO	EXCEPTIONS / NOTES
73.1	All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.			
74.0	<u>ELECTRICAL SYSTEM WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
74.1	There shall be an Electrical System Standard Manufacturer's warranty			
75.0	<u>IDLE REDUCTION TECHNOLOGY ALTERNATOR</u>	YES	NO	EXCEPTIONS / NOTES
75.1	There shall be an Idle Reduction Technology (IRT) system provided and installed on the chassis by the customer. The system shall include an IRT system mounted 12-volt alternator for charging the chassis electrical systems.			
76.0	<u>ENGINE</u>	YES	NO	EXCEPTIONS / NOTES
76.1	<p>The chassis engine shall be a Cummins X15 engine. The X15 engine shall be an in-line six (6) cylinder, four-cycle diesel-powered engine. The engine shall offer a rating of 605 horsepower at 1900 RPM. The torque rating shall feature peak torque of 2050-foot pounds of torque.</p> <p>The X15 engine shall feature a VGT™ Turbocharger, a high-pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2021 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.</p> <p>The engine shall include an engine-mounted combination full-flow/by-pass oil filter with a replaceable spin-on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CK-4 low ash engine oil which shall be utilized for proper engine lubrication.</p>			

76.2	A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle, and a PSG system. A circuit for the J1939 data link shall also be provided at the back of the cab.			
77.0	<u>CAB ENGINE TUNNEL</u>	YES	NO	EXCEPTIONS / NOTES
77.1	The cab interior shall include an integrated engine tunnel constructed of a minimum of Marine Grade 0.19 of an inch thick metal plate. The engine tunnel material shall be the same as the cab construction material.			
78.0	<u>ALUMINUM MOUNTING PLATE ON ENGINE TUNNEL</u>	YES	NO	EXCEPTIONS / NOTES
78.1	A minimum of 3/16" aluminum mounting plate shall be on the top of the chassis engine tunnel for the mounting of equipment. The plate shall be mounted on 3/4" spacers and will be on the flat portion of the engine tunnel only. The mounting plate shall have an abraded finish.			
79.0	<u>ENGINE TUNNEL TRIM</u>	YES	NO	EXCEPTIONS / NOTES
79.1	The cab engine tunnel shall be covered with a multi-layer mat with a non-slip vinyl surface finish. The engine tunnel mat shall be trimmed with aluminum trim.			
80.0	<u>DIESEL PARTICULATE FILTER CONTROLS</u>	YES	NO	EXCEPTIONS / NOTES
80.1	There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit.			
81.0	<u>ENGINE PROGRAMMING HIGH IDLE SPEED</u>	YES	NO	EXCEPTIONS / NOTES
81.1	The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.			
82.0	<u>ENGINE HIGH IDLE CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
82.1	The vehicle shall be equipped with a virtual display button and an automatic high-idle speed control. It shall be pre-set so that when activated, it will operate the engine at the appropriate RPM to increase alternator output.			
83.0	<u>ENGINE PROGRAMMING ROAD SPEED GOVERNOR</u>	YES	NO	EXCEPTIONS / NOTES
83.1	The engine shall include programming which will govern the top speed of the vehicle.			

84.0	<u>AUXILIARY ENGINE BRAKE</u>	YES	NO	EXCEPTIONS / NOTES
84.1	<p>A compression brake, for the six (6) cylinder engine shall be provided. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs.</p> <p>The engine compression brake shall activate upon 0% accelerator when in operation mode and actuate the vehicle's brake lights.</p> <p>The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.</p>			
85.0	<u>AUXILIARY ENGINE BRAKE CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
85.1	<p>An engine compression brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected:</p> <ul style="list-style-type: none"> · A valid gear ratio is detected. · The driver has requested or enabled engine compression brake operation. · The throttle is at a minimum engine speed position. · The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift. <p>The compression brake shall be controlled through an on/off switch and a low/medium/high selector switch.</p>			
86.0	<u>ELECTRONIC ENGINE OIL LEVEL INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
86.1	<p>The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.</p>			

87.0	<u>FLUID FILLS</u>	YES	NO	EXCEPTIONS / NOTES
87.1	The front of the chassis shall accommodate fluid fill for the engine oil through the grille. This area shall also accommodate a check for the engine oil. The transmission, power steering, and coolant fluid fills and checks shall be under the cab. The windshield washer fill shall be easily accessible.			
88.0	<u>ENGINE DRAIN PLUG</u>	YES	NO	EXCEPTIONS / NOTES
88.1	The engine shall include an original equipment manufacturer-installed oil drain plug.			
89.0	<u>ENGINE WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
89.1	The Cummins engine shall have a standard 5 year and 100,000 mile manufacturer's warranty			
90.0	<u>REMOTE THROTTLE HARNESS</u>	YES	NO	EXCEPTIONS / NOTES
90.1	<p>An apparatus interface wiring harness for the engine and transmission pump interlocks shall be supplied with the chassis.</p> <p>The harness shall include a connector for connection to a chassis pump panel harness supplied by the body builder and shall terminate in the left frame rail behind the cab for connection by the body builder. The harness shall include circuits deemed for a pump panel and shall contain circuits for a hand throttle, and a multiplexed gauge. Separate circuits shall also be included for a pump control switch, "Pump Engaged" and "OK to Pump" indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, clean power, customer ignition, air horn solenoid switch, high idle switch, and high idle indicator light. The harness shall contain interlocks that will prevent shifting to road or pump mode unless the transmission output speed translates to less than 1 mph and the transmission is in neutral. The shift to pump mode shall also require the parking brake to be set.</p>			
91.0	<u>ENGINE PROGRAMMING REMOTE THROTTLE</u>	YES	NO	EXCEPTIONS / NOTES
91.1	The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939-based pump controller or when the discreet wire remote throttle controls are not required.			

92.0	<u>ENGINE AIR INTAKE</u>	YES	NO	EXCEPTIONS / NOTES
92.1	<p>The engine air intake system shall include an ember separator. This ember separator shall be designed to protect the downstream air filter from embers using a combination of unique flat and crimped metal screens packaged in a heavy-duty frame. This multilayered screen shall trap embers and allow them to burn out before passing through the pack.</p>			
	<p>The engine air intake system shall also include an air cleaner mounted above the radiator. This air cleaner shall utilize a replaceable dry type of filter element designed to prevent dust and debris from being ingested into the engine. A service cover shall be provided on the housing, reducing the chance of contaminating the air intake system during air filter service.</p>			
	<p>The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.</p>			
93.0	<u>ENGINE FAN DRIVE</u>	YES	NO	EXCEPTIONS / NOTES
93.1	<p>The engine cooling system fan shall incorporate a thermostatically controlled, Horton fully variable type fan drive with SmartClutch J-1939 CAN controller.</p>			
	<p>The variable speed fan clutch only engages at the amount needed for proper cooling to facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail-safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure. The fan speed shall include a J-1939 CAN clutch controller to receive a signal from the engine control module to activate at variable rates of speed. Variable speeds shall be set through thermostatic and engine speed signals to run as efficiently and quietly as required to maintain temperature.</p>			

94.0	<u>ENGINE COOLING SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
94.1	<p>There shall be a heavy-duty cooling system designed to meet the demands of the emergency response industry. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements.</p> <p>The cooling system shall be comprised of a radiator that provides the maximum cooling capacity for the specified engine as well as serviceability.</p> <p>The radiator shall be equipped with a drain cock to drain the coolant for serviceability.</p> <p>The radiator and charge air cooler shall be removable through the bottom of the chassis.</p>			
95.0	<u>ENGINE COOLING SYSTEM PROTECTION</u>	YES	NO	EXCEPTIONS / NOTES
95.1	The engine cooling system shall include a recirculation shield designed to act as a light-duty skid plate below the radiator. The skid plate shall be painted to match the frame components and must include service provisions to allow for coolant reclamation.			
96.0	<u>ENGINE COOLANT</u>	YES	NO	EXCEPTIONS / NOTES
96.1	The cooling package shall include Extended Life Coolant (ELC).			
97.0	<u>ELECTRONIC COOLANT LEVEL INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
97.1	The instrument panel shall feature a low engine coolant indicator light which shall be in the center of the instrument panel with an audible alarm.			
98.0	<u>COOLANT HOSES</u>	YES	NO	EXCEPTIONS / NOTES
98.1	The cooling system hoses shall be silicone heater hoses and formed silicone coolant hoses with formed aluminized steel tubing. Bulkhead fittings shall be used where the heater hoses pass through the cab. All heater hoses, silicone coolant hoses, and tubing shall be secured with stainless steel constant torque band clamps.			
99.0	<u>ENGINE COOLANT OVERFLOW BOTTLE</u>	YES	NO	EXCEPTIONS / NOTES
99.1	A remote engine coolant overflow expansion bottle shall be provided in the case of overfilling the coolant system. The overflow bottle shall capture the expansion fluid or overfill rather than allow the fluid to drain on the ground.			

100.0	<u>ENGINE PUMP HEAT EXCHANGER</u>	YES	NO	EXCEPTIONS / NOTES
100.1	A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. The heat exchanger shall be designed to prohibit water from the pump from contacting the engine coolant.			
101.0	<u>ENGINE EXHAUST SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
101.1	<p>The exhaust system shall include an end-in end-out horizontally mounted single module after treatment device, and a downpipe from the charge air cooled turbo. The single module shall include four temperature sensors, a diesel particulate filter (DPF), a urea dosing module (UL2), and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be mixed and injected into the system through the DPF and SCR.</p> <p>The system shall utilize 0.07-inch-thick stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF.</p> <p>The single module after treatment through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.</p> <p>The exhaust system after the treatment module shall be mounted below the frame in the inboard position. The mounting brackets shall be mounted on the inside of the frame.</p>			
102.0	<u>ENGINE EXHAUST ACCESSORIES</u>	YES	NO	EXCEPTIONS / NOTES
102.1	The exhaust system shall be modified to accept a Plymovent exhaust extraction system collar.			
103.0	<u>EXHAUST HEAT DEFLECTOR SHIELD</u>	YES	NO	EXCEPTIONS / NOTES
103.1	A 4" heat deflector shield shall be installed over the exhaust to aid in dissipating the heat to prevent exhaust heat from adversely affecting contents stored in the body.			

104.0	<u>ENGINE EXHAUST WRAP</u>	YES	NO	EXCEPTIONS / NOTES
104.1	The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover to retain the necessary heat for DPF regeneration.			
105.0	<u>DIESEL EXHAUST FLUID TANK</u>	YES	NO	EXCEPTIONS / NOTES
105.1	The exhaust system shall include a molded polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a capacity of ten (10) usable gallons and shall be mounted on the left-hand side of the chassis frame behind the batteries below the frame. The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step.			
106.0	<u>TRANSMISSION</u>	YES	NO	EXCEPTIONS / NOTES
106.1	<p>The drive train shall include an Allison model EVS 4000 torque converting, automatic transmission which shall include electronic controls and an output retarder. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.</p> <p>The transmission shall include two (2) internal oil filters which shall offer Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.</p> <p>The transmission gear ratios shall be 1st 3.51:1 2nd 1.91:1 3rd 1.43:1 4th 1.00:1 5th 0.74:1 6th 0.64:1 (if applicable) Rev 4.80:1</p>			
107.0	<u>TRANSMISSION MODE PROGRAMMING</u>	YES	NO	EXCEPTIONS / NOTES
107.1	The transmission, upon start-up, will select a six (6) speed operation without the need to press the mode button. The transmission programming shall only include S1 performance shift schedules. The mode button shall not include a secondary economy shift schedule.			

108.0	<u>TRANSMISSION FEATURE PROGRAMMING</u>	YES	NO	EXCEPTIONS / NOTES
108.1	<p>The Allison transmission EVS shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the parking brake is applied, regardless of the drive range requested on the shift selector. This requires re-selecting the drive range to shift out of neutral for the override.</p> <p>This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.</p> <p>A transmission interface connector shall be provided in the cab. The transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.</p>			
109.0	<u>ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
109.1	The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.			
110.0	<u>TRANSMISSION SHIFT SELECTOR</u>	YES	NO	EXCEPTIONS / NOTES
110.1	An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.			

111.0	<u>TRANSMISSION RETARDER CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
111.1	The Allison transmission retarder shall be engaged with the first one-third at 0% throttle and the remaining two-thirds shall be modulated by brake pedal actuation. The system shall include a retarder on/off rocker switch mounted on the dash.			
112.0	<u>TRANSMISSION RETARDER CAPACITY LEVEL</u>	YES	NO	EXCEPTIONS / NOTES
112.1	The transmission retarder shall be programmed so the maximum retardation shall be at the high-capacity level.			
113.0	<u>TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE</u>	YES	NO	EXCEPTIONS / NOTES
113.1	When the auxiliary brake is engaged, the transmission shall automatically shift to third gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.			
114.0	<u>TRANSMISSION COOLING SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
114.1	The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements.			
115.0	<u>TRANSMISSION DRAIN PLUG</u>	YES	NO	EXCEPTIONS / NOTES
115.1	The transmission shall include an original equipment manufacturer installed magnetic transmission fluid drain plug.			
116.0	<u>TRANSMISSION WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
116.1	The Allison EVS 4000 series transmission shall carry the standard 5-year manufacturer's warranty.			
117.0	<u>PTO LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
117.1	The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o'clock position and one (1) in the 1:00 o'clock position.			
118.0	<u>DRIVELINE</u>	YES	NO	EXCEPTIONS / NOTES
118.1	All drivelines shall be heavy duty metal tube and equipped with MSI 1810 series universal joints for the main drivelines, and 1710 series for the inter-axle shaft.			

118.2	The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®. The drivelines shall include Meritor brand u-joints with thrust washers.			
119.0	<u>DRIVELINE INSTALLATION</u>	YES	NO	EXCEPTIONS / NOTES
119.1	The chassis drivelines shall be sized for intended application and torque requirements. The installation shall comply with driveline manufacturer's guidelines.			
120.0	<u>MIDSHIP PUMP / GEARBOX</u>	YES	NO	EXCEPTIONS / NOTES
120.1	A temporary jackshaft driveline shall be installed by the chassis manufacturer to accommodate the mid-ship split shaft pump as specified by the apparatus manufacturer.			
121.0	<u>MIDSHIP PUMP / GEARBOX MODEL</u>	YES	NO	EXCEPTIONS / NOTES
121.1	The midship pump/gearbox provisions shall be for a Waterous CMU pump.			
122.0	<u>MIDSHIP PUMP GEARBOX DROP</u>	YES	NO	EXCEPTIONS / NOTES
122.1	The pump gearbox shall be a Waterous pump type of gearbox.			
123.0	<u>MIDSHIP PUMP RATIO</u>	YES	NO	EXCEPTIONS / NOTES
123.1	The ratio for the midship pump shall be 2.26:1.			
124.0	<u>MIDSHIP PUMP LOCATION C/L SUCTION TO C/L REAR AXLE</u>	YES	NO	EXCEPTIONS / NOTES
124.1	The midship pump shall be located so the dimension from the centerline of the suction to the centerline of the rear axle is 94.00 inches.			
125.0	<u>PUMP SHIFT CONTROLS</u>	YES	NO	EXCEPTIONS / NOTES
125.1	One (1) pump shift control panel shall be mounted on the lower center section of the center dash panel. The following shall be provided on the panel: a three (3) position locking toggle switch; an engraved PUMP ENGAGED identification light; and an engraved OK TO PUMP identification light. The pump shift control panel shall be black with a yellow border outline.			

125.2	One (1) label indicating pump instructions and the transmission shift selector position used for pumping shall be provided and located so it can be read from the driver's position per NFPA 16.10.1.3. The road mode shall be selected when the switch is in the up position and pump mode shall be selected when the switch is in the down position.			
126.0	<u>PUMP SHIFT CONTROL PLUMBING</u>	YES	NO	EXCEPTIONS / NOTES
126.1	Air connections shall be provided from the air supply tank to the pump shift control valve and from the pump shift control valve to the frame mounted bracket. The frame mounted bracket shall include labeling identifying the pump and road connection points with threaded 0.25-inch NPT fittings on the solenoid for attaching the customer installed pump. The air supply shall be pressure protected from service brake system.			
127.0	<u>FUEL LINES</u>	YES	NO	EXCEPTIONS / NOTES
127.1	The fuel system supply and return lines installed from the fuel tank to the engine shall be reinforced braided stainless steel tubing rated for diesel fuel.			
128.0	<u>FUEL FILTER/WATER SEPARATOR</u>	YES	NO	EXCEPTIONS / NOTES
128.1	<p>The fuel system shall have a fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.</p> <p>A water in fuel sensor shall be provided and wired to an instrument panel lamp and audible alarm to indicate when water is present in the fuel/water separator.</p> <p>A secondary fuel filter shall be included as approved by the engine manufacturer.</p>			
129.0	<u>ELECTRIC FUEL PRIMER</u>	YES	NO	EXCEPTIONS / NOTES
129.1	Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.			

130.0	<u>FUEL TANK</u>	YES	NO	EXCEPTIONS / NOTES
130.1	<p>The fuel tank shall have a capacity of sixty-eight (68) gallons.</p> <p>The baffled tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.</p> <p>The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00-inch NPT fill ports for right- or left-hand fill. A 0.50-inch NPT drain plug shall be centered in the bottom of the tank.</p> <p>The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with "U" straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.</p>			
131.0	<u>FUEL TANK MATERIAL AND FINISH</u>	YES	NO	EXCEPTIONS / NOTES
131.1	<p>The fuel tank shall be constructed of 12-gauge aluminized steel. The exterior of the tank shall be powder coated black and then painted to match the frame components.</p> <p>All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The crosshatch adhesion test per ASTM D3359 Method B, results to be 5B minimum. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794, results to be 5B minimum.</p>			

132.0	<u>FUEL TANK STRAP MATERIAL</u>	YES	NO	EXCEPTIONS / NOTES
132.1	The fuel tank straps shall be constructed of steel. The fuel tank straps shall be powder coated black and then painted to match the frame components if possible.			
133.0	<u>FUEL TANK GAUGE ACCESS PANEL</u>	YES	NO	EXCEPTIONS / NOTES
133.1	Access shall be provided in the torque box for service of the fuel tank gauge without removing the fuel tank.			
134.0	<u>FUEL TANK FILL PORT</u>	YES	NO	EXCEPTIONS / NOTES
134.1	The fuel tank fill ports shall be provided with two (2) left fill ports located one (1) in the forward position and one (1) in the middle position and the right fill port located in the middle position of the fuel tank.			
135.0	<u>FUEL FILLS</u>	YES	NO	EXCEPTIONS / NOTES
135.1	There shall be two (2) fuel fill pockets located in the rear wheel well area, one (1) on each the driver's and officer's sides.			
136.0	<u>FUEL TANK SERVICEABILITY PROVISIONS</u>	YES	NO	EXCEPTIONS / NOTES
136.1	The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.			
137.0	<u>FUEL TANK DRAIN PLUG</u>	YES	NO	EXCEPTIONS / NOTES
137.1	A 0.5-inch NPT magnetic drain plug shall be centered in the bottom of the fuel tank.			
138.0	<u>FRONT AXLE</u>	YES	NO	EXCEPTIONS / NOTES
138.1	The front axle shall be compatible with the Hendrickson Steertek NXT suspension. The axle shall include a 3.74 inch drop and a 71.00 inch king pin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle. The weight capacity for the axle shall be rated to 23,000 pounds. This rating shall require special approvals from the wheel manufacturers.			
139.0	<u>FRONT AXLE CRAMP ANGLE</u>	YES	NO	EXCEPTIONS / NOTES
139.1	The chassis shall have a front axle cramp angle of minimum 50 degrees			

140.0	<u>FRONT WHEEL BEARING</u>	YES	NO	EXCEPTIONS / NOTES
140.1	The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.			
141.0	<u>FRONT SHOCK ABSORBERS</u>	YES	NO	EXCEPTIONS / NOTES
141.1	<p>Two (2) Bilstein inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system. The shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely light peak-to-valley tolerance and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.</p> <p>The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. Proposals offering the use of conventional twin tube or “road sensing” designed shocks shall not be considered.</p>			
142.0	<u>FRONT SUSPENSION</u>	YES	NO	EXCEPTIONS / NOTES
142.1	The front suspension shall include an eleven (11) leaf spring pack in which the longest leaf measures 53.38 inch long and 4.00 inches wide. The springs shall be shot peened for long life and include a military double wrapped front eye. The springs shall be bolted in place with M20 10.9 bolts and have replaceable polyurethane bushings in the spring eyes. The spring capacity shall be rated at 23,000 pounds.			
143.0	<u>STEERING COLUMN/WHEEL</u>	YES	NO	EXCEPTIONS / NOTES
143.1	The cab shall include a Douglas Autotech steering column which shall include a seven (7) position tilt, a 2.25 inch telescopic adjustment, and an 18.00 inch, four (4) spoke steering wheel located at the driver’s position. The steering wheel shall be covered with black polyurethane foam padding.			

143.2	The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.			
144.0	<u>POWER STEERING PUMP</u>	YES	NO	EXCEPTIONS / NOTES
144.1	The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type. The power steering system shall include an oil to air passive cooler.			
145.0	<u>REAR AXLE</u>	YES	NO	EXCEPTIONS / NOTES
145.1	<p>The rear axle shall be a Meritor model RT-52-185 tandem drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 54,000 pounds.</p> <p>The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of 0.56 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.</p> <p>The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.</p>			
146.0	<u>REAR DIFFERENTIAL CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
146.1	The tandem axle chassis shall include an inter-axle differential lock, which will allow both axles to be engaged as drive axles. The differential lock shall be controlled by a locking rocker switch on the switch panel. The light on the switch shall illuminate with positive engagement of the inter-axle differential control.			

146.2	A driver controlled differential lock shall be installed on one of the tandem rear axles. This feature shall allow the main differential to be locked and unlocked when encountering poor road or highway conditions, where maximum traction is needed, for use at speeds no greater than 25 MPH. The driver controlled differential lock shall be controlled by a separate locking rocker switch on the switch panel. The light on the switch shall illuminate with positive engagement of the differential control.			
147.0	<u>VEHICLE TOP SPEED</u>	YES	NO	EXCEPTIONS / NOTES
147.1	The top speed of the vehicle shall be approximately 65 MPH +/-2 MPH at governed engine RPM.			
148.0	<u>REAR SUSPENSION</u>	YES	NO	EXCEPTIONS / NOTES
148.1	The tandem rear axle shall feature a Ridewell Dynalastic RD202 with accordion style elastomer springs. The suspension shall incorporate a straddle mount pedestal and urethane pivot bushings, preset load distribution and independent axle movement. The rear tandem suspension shall include 54.00-inch axle centers. The rear tandem suspension capacity shall be rated at 54,000 pounds.			
149.0	<u>REAR SHOCK ABSORBERS</u>	YES	NO	EXCEPTIONS / NOTES
149.1	Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.			
150.0	<u>TIRE INTERMITTENT SERVICE RATING</u>	YES	NO	EXCEPTIONS / NOTES
150.1	The chassis shall be rated using Intermittent Service ratings provided to the emergency vehicle market by the tire manufacturers as the basis for determining the maximum vehicle load and speed.			
151.0	<u>FRONT TIRE</u>	YES	NO	EXCEPTIONS / NOTES
151.1	The front tires shall be Michelin 425/65R-22.5 20PR "L" tubeless radial XZY3 mixed service tread.			
152.0	<u>REAR TIRE</u>	YES	NO	EXCEPTIONS / NOTES
152.1	The rear tires shall be Michelin 315/80R-22.5 20PR "L" tubeless radial XDN2 Grip all weather tread.			

153.0	<u>REAR AXLE RATIO</u>	YES	NO	EXCEPTIONS / NOTES
153.1	The rear axle ratio shall be 5.38:1.			
154.0	<u>TIRE PRESSURE INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
154.1	There shall be electronic chrome LED valve caps which shall illuminate with a red LED when tire pressure drops 8psi provided.			
155.0	<u>WHEELS</u>	YES	NO	EXCEPTIONS / NOTES
155.1	<p>The front wheels shall be Alcoa hub piloted, 22.50-inch X 12.25-inch aluminum wheels. The outer face of the wheels shall feature Alcoa's Dura-Bright® finish</p> <p>The rear wheels shall be Alcoa hub piloted, 22.50-inch X 9.00-inch aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment The inner rear wheels shall be Alcoa hub piloted, 22.50-inch X 9.00-inch aluminum wheels with a polished inner and outer surface and Alcoa Dura-Bright® wheel treatment.</p>			
156.0	<u>WHEEL TRIM</u>	YES	NO	EXCEPTIONS / NOTES
156.1	<p>The front wheels shall include stainless steel lug nut covers and stainless-steel baby moons. The baby moons shall have cutouts for oil seal viewing when applicable.</p> <p>The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats. Each wheel trim component shall meet D.O.T. certification.</p>			
157.0	<u>AUXILIARY LUBRICATION SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
157.1	A Groeneveld centralized lubrication system shall be installed on the chassis. The system shall be capable of lubricating up to twenty-four (24) grease points on the chassis. A park brake interlock is incorporated into the ignition system to keep the system from operating while parked. A system diagnostic indicator light shall be provided on the dash. The main line system shall be monitored via a pressure switch. The system shall be mounted on the left-hand frame rail. A remote fill location shall be supplied to allow for ease of grease replenishment.			

158.0	<u>BRAKE SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
158.1	<p>A rapid build-up air brake system shall be provided. The air brakes shall include, at a minimum, a three (3) air tank, four (4) reservoir system with a total of 6236 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.</p> <p>The tandem rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.</p> <p>A six (6) sensor, six (6) modulator Anti-lock Braking System (ABS) shall be installed on the front and tandem rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.</p> <p>Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the tandem rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.</p>			

158.2	<p>A virtual style switch shall be provided and properly labeled “mud/snow”. When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.</p> <p>The Electronic Stability Control (ESC) unit is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle’s motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle’s lateral acceleration. The Controller Area Network (CAN) bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.</p>			
159.0	<u>FRONT BRAKES</u>	YES	NO	EXCEPTIONS / NOTES
159.1	The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00-inch vented rotors.			
160.0	<u>REAR BRAKES</u>	YES	NO	EXCEPTIONS / NOTES
160.1	The rear brakes shall be Meritor 16.50-inch X 8.63-inch S-cam drum type. The brakes shall feature a cast iron shoe.			
161.0	<u>PARK BRAKE</u>	YES	NO	EXCEPTIONS / NOTES
161.1	Upon application of the push-pull valve in the cab, the rear brakes will engage via a mechanical spring.			
162.0	<u>PARK BRAKE CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
162.1	<p>A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color.</p> <p>The parking brake actuation valve shall be mounted in the center switch panel.</p>			

163.0	<u>REAR BRAKE SLACK ADJUSTERS</u>	YES	NO	EXCEPTIONS / NOTES
163.1	Rear brake automatic slack adjusters shall be installed on the axle.			
164.0	<u>AIR DRYER</u>	YES	NO	EXCEPTIONS / NOTES
164.1	The brake system shall include a Wabco air dryer.			
165.0	<u>FRONT BRAKE CHAMBERS</u>	YES	NO	EXCEPTIONS / NOTES
165.1	The front brakes shall be provided with long stroke brake chambers.			
166.0	<u>REAR BRAKE CHAMBERS</u>	YES	NO	EXCEPTIONS / NOTES
166.1	The rear axle shall include brake chambers which shall convert the energy of compressed air into mechanical force and motion.			
167.0	<u>AIR COMPRESSOR</u>	YES	NO	EXCEPTIONS / NOTES
167.1	The air compressor provided for the engine shall be a naturally aspirated Wabco® SS440 single cylinder pass-through drive type compressor which shall be capable of producing 26.0 CFM at 1200 engine RPMs. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation.			
168.0	<u>AIR GOVERNOR</u>	YES	NO	EXCEPTIONS / NOTES
168.1	An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket.			
169.0	<u>AUXILIARY AIR RESERVOIR</u>	YES	NO	EXCEPTIONS / NOTES
169.1	One (1) auxiliary air reservoir with a 1200 cubic inch capacity shall be installed on the chassis to act as an additional reserve supply to the air system for air horn, air tool, or other non-service brake use. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.			
170.0	<u>MOISTURE EJECTORS</u>	YES	NO	EXCEPTIONS / NOTES
170.1	Automatic moisture ejectors with a manual drain provision shall be installed on all reservoirs of the air supply system.			

171.0	<u>AIR SUPPLY LINES</u>	YES	NO	EXCEPTIONS / NOTES
171.1	The air system on the chassis shall be plumbed with color coded reinforced nylon tubing air lines. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue. Compression type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.			
172.0	<u>VEHICLE TOWED AIR SUPPLY PACKAGE</u>	YES	NO	EXCEPTIONS / NOTES
172.1	The chassis shall include a vehicle towing air supply package. The air service brake connection shall be accomplished via trailer glad hands located under the left side of the front bumper. The connecting surface of the glad hand connections shall be rotated vertical and shall be mounted as far rearward under the bumper as possible. The connections shall include labels to distinguish between the “Primary” and “Service” air systems.			
173.0	<u>REAR AIR TANK MOUNTING</u>	YES	NO	EXCEPTIONS / NOTES
173.1	If a combination of wheelbase, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted perpendicular to frame.			

174.0	<u>FRAME</u>	YES	NO	EXCEPTIONS / NOTES
174.1	<p>The frame shall consist of triple side rails and cross members forming a ladder style frame. The side rails shall be formed in the shape of a "C" channel, with the outer rail measuring 10.25 inches high X 3.50 inches deep X 0.38 inches thick, with an inner channel 9.44 inches high X 3.13 inches deep X 0.38 inches thick, and a second inner channel, 8.55 inches high X 2.75 inches deep X 0.25 inches thick which shall be provided extending from the rear of the cab to the forward rear suspension cross member. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. The triple rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,921,500-inch pounds and have a minimum section modulus of 35.65 cubic inches. The frame shall measure 35.00 inches in width.</p>			
174.2	<p>Proposals calculating the frame strength using the "box method" shall not be considered.</p> <p>A minimum of seven (7) fully gusseted 0.25-inch-thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using high strength fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25-inch-thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.</p> <p>All relief areas shall be cut in with a minimum 2.00-inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.</p>			

175.0	<u>FRAME PAINT</u>	YES	NO	EXCEPTIONS / NOTES
175.1	<ul style="list-style-type: none"> • Main frame “C” channel or channels <p>Parts which shall be powder coated shall include but are not limited to:</p> <ul style="list-style-type: none"> • Steering gear bracket • Front splayed rails and fish plates • Bumper extensions • Cross members • Cross member gussets • Fuel tank mounting brackets • Fuel tank straps (unless material/finish is specified in 3130 subcategory) • Air tanks (unless color coded tanks are specified in 3205 subcategory) • Air tank mounting brackets • Exhaust mounting brackets • Air cleaner skid plate • Radiator skid plate • Battery supports, battery trays and battery covers 			
175.2	<p>Other non-painted under carriage components which may be received from the suppliers with coatings already applied, shall include but are not limited to:</p> <ul style="list-style-type: none"> • Suspension components • Front and rear axles <p>All powder coatings, primers and paint used shall be compatible with all metals, pretreatments and primers used. The crosshatch adhesion test per ASTM D3359 shall not have a failure of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.</p>			
176.0	<u>FRAME WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
176.1	Shall receive a Lifetime Frame Assembly Structural warranty.			

177.0	<u>BODY MOUNT SUB FRAME</u>	YES	NO	EXCEPTIONS / NOTES
177.1	<p>The main body mount sub frame shall be constructed from formed steel channel bolted and welded to the torque box. The sub frame shall be located at the front and rear of the body and in front of, above, and rear of the wheel well opening.</p> <p>The compartment area behind the rear axle shall be supported by a drop frame fabricated of steel tube and angles. All drop frame structures shall be welded directly to the torque box to allow the body to be a completely separate structure from the chassis.</p>			
178.0	<u>FRONT BUMPER</u>	YES	NO	EXCEPTIONS / NOTES
178.1	<p>The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be 0.38 thick ASTM A36 steel which shall measure 12.00 inches high with a 3.05-inch flange and shall be 104.50 inches wide with angled front corners.</p> <p>The bumper shall be primed and painted as specified.</p>			
179.0	<u>STORAGE WELL COVER</u>	YES	NO	EXCEPTIONS / NOTES
179.1	<p>A raised aluminum tread plate cover shall be installed on the top of the front bumper that shall cover both the center and the right-side storage wells. The cover shall be the full length of the bumper except for the area on the driver's side. The lid shall be sloped in the back to aid in engine cooling. It shall include two (2) gas cylinders to hold it in the open position. A handle shall be installed on the top center edge of the cover, with a butterfly latch on each side to hold it shut. Stainless Steel fasteners shall be used in the hinge of the lid.</p> <p>The full-width storage well shall utilize Dri-Dek interlocking squares. For maximum slip resistance and drainage, each square shall have a knobby perforated surface.</p> <p>The front bumper cover shall have one (1) LED light installed on the vertical inside portion. The light shall be enclosed within a waterproof Lexan tube enclosure.</p>			

180.0	<u>CHASSIS SUPPLIED Q2B</u>	YES	NO	EXCEPTIONS / NOTES
180.1	<p>A chassis supplied Q2B siren shall be pedestal mounted on the front bumper extension by the apparatus manufacturer.</p> <p>The siren shall be pedestal mounted on the outboard driver's side of the extended bumper gravel shield.</p> <p>The siren shall be controlled be two (2) foot switches, one (1) on the driver's side floorboard and one (1) on the officer's side floorboard.</p>			
181.0	<u>AIR HORNS</u>	YES	NO	EXCEPTIONS / NOTES
181.1	Two (2) chassis supplied air horns shall be installed by the apparatus body manufacturer.			
182.0	<u>AIR HORN LOCATIONS</u>	YES	NO	EXCEPTIONS / NOTES
182.1	Two (2) air horns shall be recess mounted in the driver's side of the front bumper.			
183.0	<u>AIR HORN ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
183.1	<p>A chassis steering wheel button shall be provided to control the air horns.</p> <p>One (1) air horn button shall be provided on the driver's side pump panel. The button shall be red in color and include a label reading "AIR HORN".</p>			
184.0	<u>AIR HORN RESERVOIR</u>	YES	NO	EXCEPTIONS / NOTES
184.1	One (1) air reservoir, with a 1200 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.			
185.0	<u>SPEAKER</u>	YES	NO	EXCEPTIONS / NOTES
185.1	<p>One (1) chassis supplied siren speaker shall be installed by the apparatus manufacturer.</p> <p>The speaker shall be recess mounted outboard in the officer's side of the front bumper.</p>			

186.0	<u>CAB TILT SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
186.1	<p>The entire cab shall be capable of tilting approximately 45-degrees. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.</p> <p>The electric-over-hydraulic lift system shall include an ignition interlock and red cab-lock-down indicator lamp on the tilt control which shall illuminate when holding the “Down” button to indicate safe road operation.</p> <p>It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.</p>			
186.2	<p>Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.</p> <p>Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90-inch ball and be anchored to frame brackets with 1.25-inch diameter studs.</p> <p>A steel safety channel assembly, painted safety yellow shall be installed on the right-side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.</p>			

187.0	<u>CAB TILT LIMIT SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
187.1	A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The limit adjustment of the switch shall be preset by the chassis manufacturer to prevent damage to the cab, or any bumper mounted option mounted in the cab tilt arc. Further adjustment to the limit by the apparatus manufacturer shall be available to accommodate additional equipment.			
188.0	<u>CAB TILT CONTROL RECEPTACLE</u>	YES	NO	EXCEPTIONS / NOTES
188.1	<p>The cab tilt control cable shall include a receptacle which shall be temporarily located on the right-hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control pendant. The tilt pump shall include 8.00 feet of cable with a six (6) pin Deutsch receptacle with a cap.</p> <p>The remote-control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote-control pendant shall be shipped loose with the chassis.</p>			
189.0	<u>CAB TILT LOCK DOWN INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
189.1	<p>The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.</p> <p>In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar with the parking brake released.</p>			
190.0	<u>CAB WINDSHIELD</u>	YES	NO	EXCEPTIONS / NOTES
190.1	The cab windshield shall be of a two (2) piece wraparound design for maximum visibility.			
191.0	<u>GLASS FRONT DOOR</u>	YES	NO	EXCEPTIONS / NOTES
191.1	The windows located in the left and right front doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance.			

192.0	<u>GLASS REAR DOOR RIGHT HAND</u>	YES	NO	EXCEPTIONS / NOTES
192.1	The window located in the right-hand side rear window shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance.			
193.0	<u>GLASS REAR DOOR LEFT HAND</u>	YES	NO	EXCEPTIONS / NOTES
193.1	The rear left hand side crew door shall include a window. The window shall be a powered type and shall be controlled by a switch on the door panel ledge and on the driver's control panel.			
194.0	<u>GLASS TINT REAR DOOR LEFT HAND</u>	YES	NO	EXCEPTIONS / NOTES
194.1	The window located in the left-hand side rear door shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance.			

195.0	<u>CLIMATE CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
195.1	<p>A ceiling mounted combination defroster and cabin heating and air conditioning system shall be located above the engine tunnel area. The system covers and plenums shall be of severe duty design made of aluminum which shall be coated with a customer specified interior paint. The design of the system's covers shall provide quick access to washable air intake filters as well as easy access to other serviceable items. The air delivery plenums provide targeted airflow. Adjustable louvers will provide comfort for all the occupants.</p> <p>The system shall be capable of producing up to 12 FPM of air velocity at all occupant seating positions. Separate front and rear blower motors shall be controlled independently.</p> <p>The system shall also provide heater pull up performance which meets or exceeds the performance requirements of SAE J1612 as well as defrost performance that meets or exceeds the performance requirements of SAE J381.</p> <p>A gravity drain system shall be provided that is capable of evacuating condensate from the vehicle while on a slope of up to a 13% grade in any direction.</p> <p>The air conditioning system plumbing shall be a mixture of custom bent zinc coated steel fittings and flexible hose with EZ-Clip fittings. The overhead heater/defroster plumbing shall include an electronic flow control valve that re-directs hot coolant away from the evaporator, via a bypass loop, as the temperature control is moved toward the cold position.</p>			

196.0	<u>CLIMATE CONTROL DRAIN</u>	YES	NO	EXCEPTIONS / NOTES
196.1	The climate control system shall include a gravity drain for water management.			
197.0	<u>CLIMATE CONTROL ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
197.1	<p>The heating, defrosting and air conditioning controls shall be in the center dash center switch panel, in a position which is easily accessible to the driver. The climate control shall be activated by a rotary switch.</p> <p>The center dash rocker switch panel shall include a switch to activate an HVAC rear blower control switch located in the crew area forward facing seat frame. The switch shall be a rheostat type that will allow the rear crew control of the rear HVAC blower speed. When the rocker switch is turned off the HVAC rear blower speed shall be controlled by the front rotary control switch in the center dash.</p>			
198.0	<u>HVAC OVERHEAD COVER PAINT</u>	YES	NO	EXCEPTIONS / NOTES
198.1	The overhead HVAC cover shall be painted with a multi-tone texture finish.			
199.0	<u>HEATER HOSE INSULATION</u>	YES	NO	EXCEPTIONS / NOTES
199.1	The heater hoses leading from the engine to the cab shall include a foam insulation wrap which runs the length of the hose improving heating in extreme cold climates. The heater hoses which shall be routed inside the cab shall not be insulated.			
200.0	<u>A/C CONDENSER LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
200.1	A roof mounted A/C condenser shall be installed centered on the cab forward of the raised roof against the slope rise.			
201.0	<u>A/C COMPRESSOR</u>	YES	NO	EXCEPTIONS / NOTES
201.1	The air-conditioning compressor shall be a belt driven, engine mounted compressor. The compressor shall be compatible with R134-a refrigerant.			

202.0	<u>UNDER CAB INSULATION</u>	YES	NO	EXCEPTIONS / NOTES
202.1	<p>The underside of the cab tunnel surrounding the engine shall be lined with multi-layer insulation.</p> <p>The insulation shall keep the decibel level at or above NFPA recommendations.</p> <p>The engine tunnel insulation shall meet or exceed FMVSS 302 flammability test.</p> <p>The cab floor insulation shall meet or exceed MVSS 302 flammability test.</p>			
203.0	<u>INTERIOR TRIM FLOOR</u>	YES	NO	EXCEPTIONS / NOTES
203.1	The floor of the cab shall be covered with a multi-layer mat consisting of sound absorbing closed cell foam with a non-slip vinyl surface with a pebble grain finish. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat. The floor shall have an overlay of aluminum embossed tread plate which shall feature a bedliner spray on coating.			
204.0	<u>INTERIOR TRIM</u>	YES	NO	EXCEPTIONS / NOTES
204.1	The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. It shall be constructed of insulated vinyl over a hard board backing.			
205.0	<u>REAR WALL INTERIOR TRIM</u>	YES	NO	EXCEPTIONS / NOTES
205.1	The rear wall of the cab shall be trimmed with vinyl.			
206.0	<u>HEADER TRIM</u>	YES	NO	EXCEPTIONS / NOTES
206.1	The cab interior shall feature header trim over the driver and officer dash constructed of Marine Grade, minimum 0.13-inch-thick aluminum.			
207.0	<u>TRIM CENTER DASH</u>	YES	NO	EXCEPTIONS / NOTES
207.1	The main center dash area shall be constructed of Marine Grade, minimum 0.13-inch-thick aluminum plate. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation. The center dash electrical access cover shall include a gas cylinder stay which shall hold the cover open during maintenance.			

208.0	<u>TRIM LEFT-HAND DASH</u>	YES	NO	EXCEPTIONS / NOTES
208.1	The left-hand dash shall be constructed of Marine Grade, minimum 0.13-inch-thick aluminum plate for a perfect fit around the instrument panel. The left-hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.			
209.0	<u>TRIM RIGHT-HAND DASH</u>	YES	NO	EXCEPTIONS / NOTES
209.1	The right-hand dash shall be constructed of Marine Grade, minimum 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door and a Mobile Data Terminal (MDT) provision. A glove compartment shall be included. The MDT provision shall be provided above the glove compartment.			
210.0	<u>POWER POINT DASH MOUNT</u>	YES	NO	EXCEPTIONS / NOTES
210.1	The cab shall include one (1) 12-volt cigarette lighter type receptacles in the switch panel to provide a power source for 12-volt electrical equipment. The cab shall also include two (2) Blue Sea dual universal serial bus (USB) charging receptacles in the cab dash switch panel to provide a power source for USB chargeable electrical equipment. The USB ports shall be capable of a 5 Volt-2.1-amp total output. The receptacles shall be wired battery direct.			
211.0	<u>STEP TRIM</u>	YES	NO	EXCEPTIONS / NOTES
211.1	Each cab entry door shall include a three-step entry. The first step closest to the ground shall be constructed of polished 5052 H32 aluminum Grip Strut® grating with angled outer corners. The grating shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The step shall feature a splash guard to reduce water and debris from splashing into the step.			

211.2	The splash guard shall have an opening on both sides and two (2) rows of slotted openings to allow debris and water to flow through rather than becoming trapped within the stepping surface. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed in a minimum 0.08-inch-thick embossed aluminum tread plate.			
212.0	<u>STEP TRIM KICKPLATE</u>	YES	NO	EXCEPTIONS / NOTES
212.1	The cab steps shall include a kick plate in the rise of each step.			
213.0	<u>UNDER CAB ACCESS DOOR</u>	YES	NO	EXCEPTIONS / NOTES
213.1	The cab shall include an under-cab access door. The under-cab access door shall provide access to the diesel exhaust fluid fill.			
214.0	<u>INTERIOR DOOR TRIM</u>	YES	NO	EXCEPTIONS / NOTES
214.1	The interior trim on the doors of the cab shall consist of a two (2) piece panel constructed of stainless steel with a brushed finish.			
215.0	<u>DOOR TRIM CUSTOMER NAMEPLATE</u>	YES	NO	EXCEPTIONS / NOTES
215.1	The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their Department.			
216.0	<u>CAB DOOR TRIM REFLECTIVE</u>	YES	NO	EXCEPTIONS / NOTES
216.1	The interior of each door shall include high visibility reflective tape. A white reflective tape shall be provided vertically along the outer rear edge of the door. The lowest portion of each door skin shall include a reflective tape chevron with red and white stripes. The chevron tape shall measure 6.00 inches in height.			
217.0	<u>INTERIOR GRAB HANDLE "A" PILLAR</u>	YES	NO	EXCEPTIONS / NOTES
217.1	There shall be two (2) rubber covered grab handles installed inside the cab, one on each "A" post at the left and right door openings. The handles shall assist personnel in entering and exiting the cab.			

218.0	<u>INTERIOR GRAB HANDLE FRONT DOOR</u>	YES	NO	EXCEPTIONS / NOTES
218.1	Each front door shall include one (1) ergonomically contoured 9.00-inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab.			
219.0	<u>INTERIOR GRAB HANDLE REAR DOOR</u>	YES	NO	EXCEPTIONS / NOTES
219.1	A cast aluminum assist handle shall be provided on the inside of each rear crew door. A handle shall extend horizontally the width of the window just above the windowsill. The handle shall include a textured red finish and assist personnel in exiting and entering the cab.			
220.0	<u>INTERIOR SOFT TRIM COLOR</u>	YES	NO	EXCEPTIONS / NOTES
220.1	The cab interior soft trim surfaces shall be gray in color.			
221.0	<u>INTERIOR TRIM SUNVISOR</u>	YES	NO	EXCEPTIONS / NOTES
221.1	The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield. Each sun visor shall be constructed of Masonite and covered with padded vinyl trim.			
222.0	<u>INTERIOR FLOOR COLOR</u>	YES	NO	EXCEPTIONS / NOTES
222.1	The cab interior floor shall be treadplate finished in a medium gray spray on bedliner coating.			
223.0	<u>HEADER TRIM INTERIOR PAINT</u>	YES	NO	EXCEPTIONS / NOTES
223.1	The metal surfaces in the header area shall feature a medium gray spray on bedliner coating.			
224.0	<u>TRIM CENTER DASH INTERIOR PAINT</u>	YES	NO	EXCEPTIONS / NOTES
224.1	The entire center dash and any accessory pods attached to the dash shall feature a gray spray on bedliner coating.			
225.0	<u>TRIM LEFT HAND DASH INTERIOR PAINT</u>	YES	NO	EXCEPTIONS / NOTES
225.1	The left-hand dash shall feature a gray spray on bedliner coating.			
226.0	<u>TRIM RIGHT HAND DASH INTERIOR PAINT</u>	YES	NO	EXCEPTIONS / NOTES
226.1	The right-hand dash shall feature a gray spray on bedliner coating.			

227.0	<u>FLOOR INTERIOR PAINT</u>	YES	NO	EXCEPTIONS / NOTES
227.1	The metal surfaces on the floor of the cab shall feature a gray spray on bedliner coating.			
228.0	<u>DASH PANEL GROUP</u>	YES	NO	EXCEPTIONS / NOTES
228.1	The main center dash area shall include three (3) aluminum removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The panels shall be coated with a black texture finish. The center panel shall be within comfortable reach of both the driver and officer.			
229.0	<u>SWITCHES CENTER PANEL</u>	YES	NO	EXCEPTIONS / NOTES
229.1	<p>The center dash panel shall include six (6) switch positions in the upper left portion of the panel.</p> <p>A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.</p>			
230.0	<u>SWITCHES LEFT PANEL</u>	YES	NO	EXCEPTIONS / NOTES
230.1	<p>The left dash panel shall include five (5) switches. There shall be three (3) across the top of the panel with two (2) below. Two (2) of the top row of switches shall be rocker type and the left one (1) shall be the windshield wiper/washer control switch. The lower switches shall be a rocker type switch.</p> <p>A rocker switch with a blank legend installed directly above shall be provided for any position not designated by a specific option. The non-designated switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.</p>			

231.0	<u>SWITCHES RIGHT PANEL</u>	YES	NO	EXCEPTIONS / NOTES
231.1	The right dash panel shall include no rocker switches or legends.			
232.0	<u>SEAT BELT WARNING</u>	YES	NO	EXCEPTIONS / NOTES
232.1	<p>A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the multiplex display and control screen(s) for each seat and a single belt indicator light in the switch panel.</p> <p>The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and applicable audible alarm shall remain active until all occupied seats have the seat belts fastened.</p>			
233.0	<u>SEAT MATERIAL</u>	YES	NO	EXCEPTIONS / NOTES
233.1	The Bostrom Firefighter seats shall include a covering of extra high strength, tear resistant, and waterproof fabric made of durable Durawear Plus™ 1800 denier ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Durawear Plus shall include low seam stitching to eliminate seam wear. Durawear Plus™ meets or exceeds specification of the common trade name Imperial 1800. The material meets FMVSS 302 flammability requirements.			

233.2	<p>Seats shall be Foam Block™ encapsulated foam with Zip Clean covers. The encapsulated Foam Block™ feature shall resist gas and liquid absorption in the cushion. Seat cushions, head rest and side bolsters shall zip off using a heavy-duty skirted zipper to allow for quick removal and easy cleaning. All Zip off covers are designed for machine washing and air drying.</p> <p>One (1) extra seat cushion and applicable back cover(s) shall be provided per seating position.</p>			
234.0	<u>SEAT COLOR</u>	YES	NO	EXCEPTIONS / NOTES
234.1	All seats supplied with the chassis shall be black in color. All seats shall include red seat belts.			
235.0	<u>SEAT DRIVER</u>	YES	NO	EXCEPTIONS / NOTES
235.1	<p>The driver's seat shall be an H.O. Bostrom 500 Series Firefighter Sierra model seat. The seat shall feature eight-way electric positioning. The eight positions shall include up and down, fore and aft with 8.00 inches of travel, back angle adjustment and seat rake adjustment. The seat shall feature integral springs to isolate shock.</p> <p>The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt, automatic retractor and buckle as an integral part of the seat assembly. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.</p> <p>The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches measured with the seat height adjusted to the lowest position of travel.</p>			

235.2	<p>This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.</p> <p>The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.</p>			
236.0	<u>SEAT BACK DRIVER</u>	YES	NO	EXCEPTIONS / NOTES
236.1	The driver's seat shall include a standard seat back incorporating all the belts to seat feature (ABTS). The seat back shall feature a contoured head rest.			
237.0	<u>OCCUPANT PROTECTION DRIVER</u>	YES	NO	EXCEPTIONS / NOTES
237.1	The driver's position shall be equipped with an occupant protection system.			
238.0	<u>ADDITIONAL SEAT COVER DRIVER</u>	YES	NO	EXCEPTIONS / NOTES
238.1	One (1) set of additional seat cushion and seat back covers shall be provided for the driver's position. The seat back cover shall either be a single piece for non-SCBA backs or a set of covers for bolsters and head cushions around the SCBA backs, dependent on seat back style.			
239.0	<u>SEAT OFFICER</u>	YES	NO	EXCEPTIONS / NOTES
239.1	The officer's seat shall be an H.O. Bostrom 500 Series Sierra model seat. The seat shall feature two-way manual adjustment and shall include a tapered and padded seat cushion. The seat shall also feature integral springs to isolate shock.			

239.2	<p>The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt, automatic retractor and buckle as an integral part of the seat assembly. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.</p> <p>The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00.</p> <p>This model of seat shall have successfully completed the static load tests by FMVSS 207, 209, 210 and 302 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.</p>			
240.0	<u>SEAT BACK OFFICER</u>	YES	NO	EXCEPTIONS / NOTES
240.1	<p>The officer's seat back shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.</p>			

240.2	<p>The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention.</p> <p>The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises. The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.</p>			
241.0	<u>SEAT MOUNTING OFFICER</u>	YES	NO	EXCEPTIONS / NOTES
241.1	The officer's seat shall offer a special mounting position which is 4.00 inches rearward of the standard location offering increased leg room for the occupant.			
242.0	<u>OCCUPANT PROTECTION OFFICER</u>	YES	NO	EXCEPTIONS / NOTES
242.1	The officer's position shall be equipped with an occupant protection system.			
243.0	<u>ADDITIONAL SEAT COVER OFFICER</u>	YES	NO	EXCEPTIONS / NOTES
243.1	One (1) set of additional seat cushion and seat back covers shall be provided for the officer's position. The seat back cover shall either be a single piece for non-SCBA backs or a set of covers for bolsters and head cushions around the SCBA backs, dependent on seat back style.			
244.0	<u>POWER SEAT WIRING</u>	YES	NO	EXCEPTIONS / NOTES
244.1	The power seat or seats installed in the cab shall be wired directly to battery power.			
245.0	<u>SEAT REAR-FACING OUTER LOCATION, MOUNTING, FRAME, SEAT BELT ORIENTATION AND ADDITIONAL SEAT COVERS.</u>	YES	NO	EXCEPTIONS / NOTES

245.1	<p><u>LOCATION</u></p> <p>The crew area shall include two (2) rear-facing outboard seats, which include one (1) located next to the outer wall of the cab on the left side of the cab behind the driver's seat and one (1) located next to the outer wall on the right side of the cab behind the officer's seat.</p>			
245.2	<p><u>SEAT MOUNTING REARWARD FACING OUTER</u></p> <p>The rear-facing outer seat frame mounting holes shall be mounted 1.00-inch inboard from the outer edge of the forward-facing seat frame.</p>			
245.3	<p><u>SEAT FRAME REARWARD FACING</u></p> <p>Two rear-facing outboard seating positions shall include an enclosed-style seat frame located and installed at the behind the driver seat and officer seat. These seats will face the forward-facing seats. The seat box shall be painted the same color as the remaining interior.</p>			
245.4	<p><u>SEAT BELT ORIENTATION CREW</u></p> <p>The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip. This seat belt orientation is for both rearward and forward facing crew seats.</p>			
245.5	<p><u>ADDITIONAL SEAT COVER REARWARD FACING OUTER</u></p> <p>One (1) set of additional seat cushions and seat back covers shall be provided for each forward-facing outer position. The seat back cover shall either be a single piece for non-SCBA backs or a set of covers for bolsters and head cushions around the SCBA backs, dependent on seat back style in each position.</p>			

246.0	<u>SEAT CREW REARWARD FACING OUTER</u>	YES	NO	EXCEPTIONS / NOTES
246.1	<p>The crew area shall include a seat in the rear-facing outer position which shall be an H.O. Bostrom 500 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position. The seat and cushion shall be fixed and compact in design. The seat shall be in a securely fixed position to prevent the seat from moving.</p> <p>The seat shall feature an all-belts-to-seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.</p> <p>The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.</p> <p>This model of the seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. To reflect the larger size of outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, which decides the burning rate of materials in the occupant compartments of motor vehicles.</p>			

247.0	<u>SEAT BACK REARWARD-FACING OUTER</u>	YES	NO	EXCEPTIONS / NOTES
247.1	<p>The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.</p> <p>The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA-fitted seat occupant rises.</p> <p>The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.</p>			
248.0	<u>SEATS FORWARD FACING OUTER, LOCATION, FRAME, MOUNTING, SEATS, AND SEAT BACKS</u>	YES	NO	EXCEPTIONS / NOTES
248.1	<p><u>SEAT FRAME</u></p> <p>The forward-facing outer seat frame mounting holes shall be mounted 1.00-inch inboard from the outer edge of the forward-facing seat frame.</p>			

<p>248.2</p>	<p><u>SEATS</u></p> <p>The crew area shall include a seat in the forward-facing outer position which shall be an H.O. Bostrom 500 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position. The seat and cushion shall be hinged and compact in design for additional room. The seat shall include a “Fold and Hold” feature so that the cushion shall remain in the seated position and simply touch to flip up.</p> <p>The seat shall feature an all-belts-to-seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.</p> <p>The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.</p> <p>This model of the seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. To reflect the larger size of outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, which decides the burning rate of materials in the occupant compartments of motor vehicles.</p>			
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	<p><u>SEAT BACKS</u></p> <p>The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.</p>			
248.3	<p>The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA-fitted seat occupant rises.</p> <p>The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.</p>			
248.4	<p><u>SEAT MOUNTING</u></p> <p>The forward-facing outer seat frame mounting holes shall be mounted 1.00-inch inboard from the outer edge of the forward-facing seat frame.</p>			
249.0	<p><u>ADDITIONAL SEAT COVER FORWARD FACING OUTER</u></p>	YES	NO	EXCEPTIONS / NOTES
249.1	<p>One (1) set of additional seat cushions and seat back covers shall be provided for each forward-facing outer position. The seat back cover shall either be a single piece for non-SCBA backs or a set of covers for bolsters and head cushions around the SCBA backs, dependent on seat back style in each position.</p>			

250.0	<u>FORWARD-FACING STORAGE</u>	YES	NO	EXCEPTIONS / NOTES
250.1	There shall be two (2) access points to the seat frame storage area, one underneath each seat frame. Each access point shall be covered by netting.			
250.2	There shall be a storage box equipped with netting located in between the forward facing outer crew seats. This box shall not extend past the depth of the frame of the seats themselves and will not extend from the floor to the ceiling of the cab. This box will be mounted to the back of the cab wall and the dimensions shall be approximately 40inches in height and 20 inches in depth. The width of the box shall be designed to fill the space between the forward facing seating completely. Exact dimensions will be finalized during pre-construction.			
251.0	<u>CAB FRONT UNDER-SEAT STORAGE ACCESS</u>	YES	NO	EXCEPTIONS / NOTES
251.1	The left and right under-seat storage areas shall have a solid aluminum hinged door with a non-locking latch.			
252.0	<u>SEAT COMPARTMENT DOOR FINISH</u>	YES	NO	EXCEPTIONS / NOTES
252.1	All under-seat storage compartment access doors shall feature a medium gray spray-on bed liner coating.			

253.0	<u>ACTIVE AIR PURIFICATION SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
253.1	<p>The vehicle shall be equipped with an Active Air Purification system to provide purification of the air inside the apparatus. Model: CAPS Commuter, 12 VDC</p> <p><u>System Certification/Testing:</u> The system will/shall be 3rd party tested to verify H2O2 production at 0.02 ppm, and to support virus and bacteria kill rates. The manufacturer must be ISO 9001:2015 certified and an EPA Registered establishment. The system will/shall meet all applicable sections of IEC 61373:2010 for shock and vibration, and SAE J1455 for electrical specifications. 3rd Party testing must be performed for effectiveness against SARS-CoV-2 in a chamber at least 1,280 cubic feet in size. [No Exceptions]</p> <p><u>System Operating Conditions:</u> The unit will/shall be resistant to dust particles normally found in apparatus. The working temperature of the system will/shall be -22°F to 149°F (-30°C to 65°C).</p> <p>The unit will/shall be permitted to operate at any time with or without occupants in the cab and will/shall pose no harm to the occupants from H2O2, Ozone, or UVC light [No Exceptions]</p> <p>Mounting location will be determined at preconstruction meeting.</p>			
254.0	<u>WINDSHIELD WIPER SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
254.1	<p>The cab shall include a triple arm linkage wiper system which shall clear the windshield of water, ice, and debris. There shall be two (2) windshield wipers; each shall be affixed to a radial arm. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position.</p>			
255.0	<u>ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
255.1	<p>The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message.</p>			

256.0	<u>CAB DOOR HARDWARE</u>	YES	NO	EXCEPTIONS / NOTES
256.1	<p>The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of aluminum with a chrome-plated finish.</p> <p>The interior exit door handles shall be flush paddle type with a black finish, which is incorporated into the upper door panel.</p> <p>All cab entry doors shall include locks that are keyed alike. The door locks shall be designed to prevent an accidental lockout.</p> <p>The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel.</p>			
257.0	<u>DOOR LOCKS</u>	YES	NO	EXCEPTIONS / NOTES
257.1	Each cab entry door shall include a manually operated door lock. Each door lock may be actuated from the inside of the cab utilizing a red knob located on the paddle handle of the respective door or by using a TriMark key from the exterior.			
258.0	<u>GRAB HANDLES</u>	YES	NO	EXCEPTIONS / NOTES
258.1	The cab shall include one (1) knurled aluminum, anti-slip exterior assist handle, installed behind each cab door. The assist handle shall be made of extruded aluminum with a knurled finish to enable non-slip assistance with a gloved hand.			

259.0	<u>BACKLIT HANDRAILS</u>	YES	NO	EXCEPTIONS / NOTES
259.1	<p>All handrails, unless otherwise stated, shall be constructed of knurled aluminum with white-colored LED backlighting. All railing shields and brackets shall be chrome plated and shall be bolted to the body with stainless steel bolts. The lower bracket on all vertical handrails shall have a drain hole drilled in it at the lowest point.</p> <p>The following handrails shall be provided on the apparatus:</p> <ul style="list-style-type: none"> • A Knurled Aluminum handrail shall be installed forward on the top of the body, on the driver's side. • A Knurled Aluminum handrail shall be installed on the top officer's side in front of the body. • Two (2) vertical handrails shall be installed on the rear of the apparatus, one (1) on the driver's side and one (1) on the officer's side. • A handrail shall be installed on the rear of each hose bed cover door. 			
260.0	<u>REARVIEW MIRRORS</u>	YES	NO	EXCEPTIONS / NOTES
260.1	<p>Dual vision mirror heads shall be provided and installed on each of the front cab doors.</p> <p>The mirrors shall include integral convex mirrors installed in the mirror head below the flat glass to provide a wider field of vision. The flat and convex mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver.</p> <p>The mirrors shall be constructed of a corrosion-resistant plastic housing.</p>			
261.0	<u>AUXILIARY EXTERIOR MIRRORS</u>	YES	NO	EXCEPTIONS / NOTES
261.1	The cab exterior shall include one (1) 10.00-inch diameter polished stainless steel convex look-down mirror.			
262.0	<u>EXTERIOR TRIM REAR CORNER</u>	YES	NO	EXCEPTIONS / NOTES
262.1	There shall be mirror finish stainless steel scuff plates on the outside corners at the back of the cab. The stainless-steel plate shall be affixed to the cab using two-sided adhesive tape.			

263.0	<u>CAB FENDER</u>	YES	NO	EXCEPTIONS / NOTES
263.1	In addition to the chassis supplied front mud flaps, two (2) mud flaps shall be provided rearward of the rear axles on the apparatus.			
264.0	<u>MUD FLAPS</u>	YES	NO	EXCEPTIONS / NOTES
264.1	In addition to the chassis supplied front mud flaps, two (2) mud flaps shall be provided rearward of the rear axles on the apparatus.			
265.0	<u>IGNITION</u>	YES	NO	EXCEPTIONS / NOTES
265.1	A master battery system with a keyless start ignition system shall be provided.			
266.0	<u>BATTERIES</u>	YES	NO	EXCEPTIONS / NOTES
266.1	<p>The single start electrical system shall include six (6) Delco BCI 31 700 CCA batteries with a 180-minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541.</p> <p>There shall be a 500-amp Blue Sea magnetic latching (bi-stable) relay installed that automatically combines batteries during charging and isolates batteries when discharging and when starting the engine.</p> <p>Start Isolation shall be configured for temporary isolation of house loads from engine circuits during engine cranking to protect sensitive electronics. The relay shall isolate the right front battery when the truck is starting. It shall not disengage the isolation until 3 - 5 minutes after the truck is running.</p> <p>The included auto charge relay includes LED output to remotely indicate when batteries are combined, isolated, in voltage lockout, or in Start or Engine isolation.</p>			
267.0	<u>BATTERY TRAY</u>	YES	NO	EXCEPTIONS / NOTES
267.1	<p>The batteries shall be installed within two (2) steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.</p> <p>The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed on the bottom of the trays to allow for airflow and help prevent moisture build-up. The batteries shall be held in place by non-conducting phenolic resin hold-down boards.</p>			

268.0	<u>BATTERY BOX COVER</u>	YES	NO	EXCEPTIONS / NOTES
268.1	Each battery box shall include a steel cover that protects the top of the batteries. Each cover shall include flush latches which shall keep the cover secure as well as a black powder-coated handle for convenience when opening.			
269.0	<u>BATTERY CABLE</u>	YES	NO	EXCEPTIONS / NOTES
269.1	The starting system shall include cables which shall be protected by a 275 degrees F. minimum flame retardant loom, sealed at the ends with heat shrink and sealant.			
270.0	<u>BATTERY JUMPER STUD</u>	YES	NO	EXCEPTIONS / NOTES
270.1	The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step, 8.00 inches apart. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.			
271.0	<u>ALTERNATOR</u>	YES	NO	EXCEPTIONS / NOTES
271.1	The charging system shall include a 360-amp Niehoff 12-volt multi-power alternator. The alternator shall be designed to equally share the vehicle load with a secondary apparatus-mounted alternator. The alternator shall include an ignition excited external regulator and harness.			
272.0	<u>STARTER MOTOR</u>	YES	NO	EXCEPTIONS / NOTES
272.1	The single start electrical system shall include a Delco brand starter motor.			
273.0	<u>AUXILIARY AIR COMPRESSOR SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
273.1	A GAST brand 120V air compressor shall be supplied. The air compressor shall be installed behind the driver's seat. The air compressor shall be plumbed into the air brake system to maintain air pressure. There shall also be an aluminum treadplate protective cover fabricated with open ends to allow for adequate ventilation.			
274.0	<u>COVER FOR GAST PUMP</u>	YES	NO	EXCEPTIONS / NOTES
274.1	There shall be a cover fabricated out of a tread plate installed over the chassis-supplied Gast pump located behind the driver seat in the chassis cab. The cover shall be opened at the ends and have a grate installed to allow airflow.			
275.0	<u>ELECTRICAL INLET LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
275.1	An electrical inlet shall be installed in the left-hand side lower front step in the mid-forward position.			

276.0	<u>ELECTRICAL INLET</u>	YES	NO	EXCEPTIONS / NOTES
276.1	A Kussmaul 20-amp electrical receptacle shall be supplied. A single item or addition of multiple items must not exceed the rating of the electric inlet that it's connected to.			
277.0	<u>ELECTRICAL INLET CONNECTION</u>	YES	NO	EXCEPTIONS / NOTES
277.1	The electrical inlet shall include a 120/240V power supply.			
278.0	<u>ELECTRICAL INLET COVER</u>	YES	NO	EXCEPTIONS / NOTES
278.1	The electrical inlet connection shall include a red cover.			
279.0	<u>HEADLIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
279.1	The cab front shall include two (2) FireTech rectangular LED headlamps with high/low beams in the same housing and two (2) separate FireTech LED high beam-only headlamps mounted in bright chrome bezels.			
280.0	<u>HEADLIGHT LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
280.1	The headlights shall be located on the front fascia of the cab directly below the front warning lights.			
281.0	<u>FRONT TURN SIGNALS</u>	YES	NO	EXCEPTIONS / NOTES
281.1	The front fascia shall include two (2) Whelen model 600 4.00-inch X 6.00-inch programmable amber LED turn signals which shall be installed in a polished aluminum radius mount housing above and outboard of the front warning and headlamps.			
282.0	<u>SIDE TURN/MARKER LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
282.1	The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners.			
283.0	<u>MARKER AND ICC LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
283.1	In accordance with FMVSS, there shall be five (5) marker lamps on the front of the vehicle designating identification and clearance. There shall be five (5) face-mounted lights integrated into the scene light.			
284.0	<u>HEADLIGHT AND MARKER LIGHT ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
284.1	The headlights and marker lights shall be controlled via a virtual button on the multiplex display. There shall be a virtual dimmer control on the multiplex display to adjust the brightness of the dash lights. The headlamps and markers lamps shall illuminate to 100% brilliance when the ignition switch is in the "On" position.			
285.0	<u>LIGHTBAR SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
285.1	The light bar shall be controlled by a virtual button on the multiplex display and control screen.			

286.0	<u>INTERIOR OVERHEAD LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
286.1	The cab shall include an LED dome lamp located over each door. The lights shall include push switches on each lamp to activate both the clear and red portions of the light individually.			
287.0	<u>LIGHTBAR PROVISION</u>	YES	NO	EXCEPTIONS / NOTES
287.1	There shall be one (1) light bar installed on the cab roof. The light bar installation shall include a lowered mounting that shall place the light bar just above the junction box and wiring to a control switch on the cab dash.			
288.0	<u>CAB FRONT LIGHTBAR MODEL</u>	YES	NO	EXCEPTIONS / NOTES
288.1	The cab shall be provided with one (1) Whelen model F4N92 Rota-Beam light bar. The light bar shall be 92.00 inches in length and feature twenty-two (22) customizable pods.			
289.0	<u>FRONT SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
289.1	The front of the cab shall include one (1) HiViz model FireTech FT-B-72-ML-W LED scene light installed on the brow of the cab. The light shall feature (5) five integrated marker lights.			
290.0	<u>FRONT SCENE LIGHT LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
290.1	There shall be one (1) scene light mounted center on the front brow of the cab.			
291.0	<u>FRONT SCENE LIGHTS ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
291.1	The front scene lighting shall be activated by a virtual button on the multiplex display and control screen			
292.0	<u>SIDE SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
292.1	The side of the cab shall include two (2) Firetech model FT-GESM Guardian Elite LED scene lights, one (1) on each side which shall be surface mounted with a chrome bezel.			
293.0	<u>SIDE SCENE LIGHT LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
293.1	The scene lighting located on the left and right sides of the cab shall be mounted in the upper mid-forward portion of the 10.00-inch raised roof of the cab between the front and rear crew doors.			
294.0	<u>SIDE SCENE ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
294.1	The scene lights shall be activated by opening the respective side cab doors and by a virtual button on the multiplex display and control screen.			
295.0	<u>AUXILIARY SIDE SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
295.1	The light bar shall include two (2) side scene lights.			

296.0	<u>AUXILIARY SIDE SCENE LIGHT ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
296.1	The additional side scene lighting shall be activated via two (2) virtual buttons on the multiplex display and control screen(s), one (1) for each light.			
297.0	<u>GROUND LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
297.1	Each door shall include an LED ground light mounted to the underside of the cab step below each door.			
298.0	<u>GROUND LIGHT CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
298.1	The ground lighting shall be activated when the parking brake is set and through a virtual button on the multiplex display and control screen.			
299.0	<u>UNDER BUMPER LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
299.1	There shall be two (2) 4.00-inch round LED NFPA-compliant ground lights mounted under the bumper. The under-bumper ground lighting shall be interlocked with the parking brake and the marker light activation.			
300.0	<u>LOWER CAB STEP LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
300.1	The middle step located at each door shall include an LED light which shall activate with the opening of the respective door.			
301.0	<u>INTERMEDIATE STEP LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
301.1	The intermediate step well area at each door shall include an LED light within a chrome housing. The egress step lights shall provide visibility to the step well area for the first step exiting the vehicle. The egress step lights shall activate with entry step lighting.			
302.0	<u>ENGINE COMPARTMENT LIGHT</u>	YES	NO	EXCEPTIONS / NOTES
302.1	There shall be a LED NFPA-compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall activate automatically when the cab is tilted.			
303.0	<u>DO NOT MOVE APPARATUS LIGHT</u>	YES	NO	EXCEPTIONS / NOTES
303.1	The front headliner of the cab shall include a flashing red Whelen 500 Series TIR6™ Super-LED® light clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound while the light is activated. The flashing red light shall be 5.40 inches long X 1.70 inches wide X 0.90 inches high and shall be located centered left to right for the greatest visibility.			

303.2	The light and alarm shall be interlocked for activation when either a cab door is not firmly closed or an apparatus compartment door is not closed, and the parking brake is released.			
304.0	<u>MASTER WARNING SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
304.1	A master switch shall be included, as a virtual button on the multiplex display and control screen which shall be labeled "E Master" for identification. The button shall feature control over all devices wired through it. Any warning device switches left in the "ON" position when the master switch is activated shall automatically power up.			
305.0	<u>HEADLIGHT FLASHER</u>	YES	NO	EXCEPTIONS / NOTES
305.1	The LED Halo ring shall alternate from left to right on the driver side, outer to inner light and the LED Halo ring shall alternate from right to left on the officer side, outer to inner light. Deliberate operator selection of high beams will override the flashing function until low beams are again selected.			
306.0	<u>HEADLIGHT FLASHER SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
306.1	The flashing headlights shall be activated through a virtual button on the multiplex display and control screen. There shall be no blocking mode on clear warning lights.			
307.0	<u>INBOARD FRONT WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
307.1	The cab front fascia shall include two (2) Whelen 600 Series Super LED Rota-Beam front warning lights in the left and right inboard positions. The lights shall be mounted to the front fascia of the cab within a chrome bezel. The lights shall be programmed to emit the "Rotator 150" counterclockwise flash pattern.			
308.0	<u>INBOARD FRONT WARNING LIGHTS COLOR</u>	YES	NO	EXCEPTIONS / NOTES
308.1	The warning lights mounted on the cab front fascia in the inboard positions shall be red.			
309.0	<u>OUTBOARD FRONT WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
309.1	The cab front fascia shall include two (2) Whelen 600 series Super LED Rota-Beam front warning lights in the left and right outboard positions. The lights shall be mounted to the front fascia of the cab within a chrome bezel. The lights shall be programmed to emit the "Rotator 150" clockwise flash pattern.			
310.0	<u>OUTBOARD FRONT WARNING LIGHTS COLOR</u>	YES	NO	EXCEPTIONS / NOTES
310.1	The warning lights mounted on the cab front fascia in the outboard position shall be clear.			

311.0	<u>FRONT WARNING SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
311.1	The front warning lights shall be controlled through a virtual control on the multiplex display and control screen.			
312.0	<u>INTERSECTION WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
312.1	The chassis shall include two (2) Whelen 600 series Super LED intersection warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors.			
313.0	<u>INTERSECTION WARNING LIGHTS' COLOR</u>	YES	NO	EXCEPTIONS / NOTES
313.1	The intersection lights shall be red.			
314.0	<u>INTERSECTION WARNING LIGHTS' LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
314.1	The intersection lights shall be mounted on the side of the bumper in the rearward position.			
315.0	<u>SIDE WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
315.1	The cab sides shall include two (2) Whelen 600 series Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel.			
316.0	<u>SIDE WARNING LIGHTS COLOR</u>	YES	NO	EXCEPTIONS / NOTES
316.1	The warning lights located on the side of the cab shall be red.			
317.0	<u>SIDE WARNING LIGHTS' LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
317.1	The warning lights on the side of the cab shall be mounted over the front wheel well forward from the center of the front axle.			
318.0	<u>SIDE AND INTERSECTION WARNING SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
318.1	The side warning lights shall be controlled through a virtual button on the multiplex display and control screen. This button shall be clearly labeled for identification.			
319.0	<u>OPTICOM EMITTER CHASSIS SUPPLIED/INSTALLED</u>	YES	NO	EXCEPTIONS / NOTES
319.1	One (1) chassis supplied and installed standalone low profile Opticom emitter shall be located above the windshield on the chassis cab.			

320.0	<u>ROTO-RAYS WARNING LIGHT</u>	YES	NO	EXCEPTIONS / NOTES
320.1	<p>A Roto-Rays® warning light shall be provided on the cab. The Roto-Rays light shall consist of three (3) round chrome heads, each equipped with an LED light. The LED lights shall be one (1) red, one (1) clear, and one (1) green in color. The Roto-Rays light shall be installed on the top center of the cab front fascia using a custom bracket.</p> <p>When activated, the entire light head assembly shall rotate at 200 RPM.</p>			
321.0	<u>ROTO-RAYS WARNING LIGHT SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
321.1	The Roto-Rays® front warning light(s) shall be separately controlled through a virtual button on the multiplex display and control screen. When the parking brake is engaged, the light shall stop rotating.			
322.0	<u>INTERIOR DOOR OPEN WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
322.1	The interior of each door shall include one (1) LED warning light. The light shall be located on the upper portion of the door frame to be visible when a person is standing in front of the door while entering or exiting the cab. Each light shall activate with a scrolling directional flash pattern which moves from inside to outside when the door is in the open position.			
323.0	<u>SIREN CONTROL HEAD</u>	YES	NO	EXCEPTIONS / NOTES
323.1	A Whelen electronic siren control head with a remote amplifier shall be provided and flush mounted in the switch panel with a location specific to the customer's needs. The siren shall offer radio broadcast, public address, wail, yelp, or piercer tones, and hands-free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected.			
324.0	<u>STEERING WHEEL HORN BUTTON SELECTOR SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
324.1	A virtual button on the multiplex display and control screen shall be provided to allow control of either the electric horn or the air horn from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position to meet FMCSA requirements.			
325.0	<u>AUDIBLE WARNING LEFT-HAND FOOT SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
325.1	Two (2) foot-actuated switches shall be supplied for installation in the front section of the cab for driver actuation. One (1) switch shall be wired to actuate the air horn(s) and one (1) switch the mechanical siren(s).			

326.0	<u>AIR HORN FOOT SWITCH LEFT HAND</u>	YES	NO	EXCEPTIONS / NOTES
326.1	Two (2) foot-actuated switches shall be supplied for installation in the front section of the cab for driver actuation. One (1) switch shall be wired to actuate the air horn(s) and one (1) switch the mechanical siren(s).			
327.0	<u>AIR HORN FOOT SWITCH LEFT HAND</u>	YES	NO	EXCEPTIONS / NOTES
327.1	The air horn foot switch shall be located on the left-hand side of the driver in an easily reachable location.			
328.0	<u>AIR HORN FOOT SWITCH LEFT-HAND POSITION</u>	YES	NO	EXCEPTIONS / NOTES
328.1	The air horn foot switch shall be positioned inboard of any other foot switch, if applicable.			
329.0	<u>MECHANICAL SIREN FOOT SWITCH LEFT-HAND LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
329.1	The mechanical siren foot switch shall be located on the left-hand side accessible to the driver between the steering column and the door.			
330.0	<u>MECHANICAL SIREN FOOT SWITCH LEFT-HAND POSITION</u>	YES	NO	EXCEPTIONS / NOTES
330.1	The mechanical siren foot switch shall be positioned outboard of any other foot switch, if applicable.			
331.0	<u>AUDIBLE WARNING LEFT-HAND FOOT SWITCH BRACKET</u>	YES	NO	EXCEPTIONS / NOTES
331.1	A 30.00-degree angled foot switch bracket, wide enough to accommodate (2) foot switches, shall be installed outboard of the steering column for specified driver-accessible foot switch activations.			
332.0	<u>AUDIBLE WARNING RIGHT-HAND FOOT SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
332.1	Two (2) foot-actuated switches shall be supplied for installation in the front section of the cab for officer actuation. One (1) switch shall be wired to actuate the air horn(s) and one (1) switch the mechanical siren(s).			
333.0	<u>AIR HORN FOOT SWITCH RIGHT HAND</u>	YES	NO	EXCEPTIONS / NOTES
333.1	The air horn foot switch located on the right-hand side of the cab shall be in an easily reachable location.			
334.0	<u>MECHANICAL SIREN FOOT SWITCH RIGHT HAND</u>	YES	NO	EXCEPTIONS / NOTES
334.1	There shall be a mechanical Siren Foot switch on the right-hand side of the truck.			
335.0	<u>MECHANICAL SIREN BRAKE/AUXILIARY ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
335.1	Two (2) red push button type momentary type siren brakes shall be provided in the switch panel on the dash.			

336.0	<u>MECHANICAL SIREN INTERLOCK</u>	YES	NO	EXCEPTIONS / NOTES
336.1	The siren shall only be active when the master warning switch is on to prevent accidental engagement.			
337.0	<u>BACK-UP ALARM</u>	YES	NO	EXCEPTIONS / NOTES
337.1	A backup alarm shall be installed at the rear of the chassis with an output level of 107 db minimum. The alarm shall automatically activate when the transmission is placed in reverse.			
338.0	<u>INSTRUMENTATION</u>	YES	NO	EXCEPTIONS / NOTES
338.1	<p>An instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the data bus to reduce redundant sensors and wiring.</p> <p>An icon lightbar message center with an integral LCD odometer/trip odometer shall be included. The LCD message center screen shall be capable of custom configuration by the users for displaying certain vehicle status and diagnostic functions.</p> <p>The instrument panel shall contain the following gauges:</p> <p>One (1) three-movement gauge displaying vehicle speed, fuel level, and Diesel Exhaust Fluid (DEF) level. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H. The scale on the fuel and DEF level gauges shall read from empty to full as a fraction of full tank capacity. Red indicator lights in the gauge and an audible alarm shall indicate low fuel or low DEF at 1/8th tank level.</p> <p>One (1) three-movement gauge displaying engine RPM, and primary and secondary air system pressures shall be included. The scale on the tachometer shall read from 0 to 3000 RPM. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI) with a red line zone indicating critical levels of air pressure. Red indicator lights in the gauge and an audible alarm shall indicate low air pressure.</p>			

<p>388.2</p>	<p>One (1) four-2movement gauge displaying engine oil pressure, coolant temperature, voltmeter, and transmission temperature shall be included. The scale on the engine oil pressure gauge shall read from 0 to 100 pounds PSI with a red line zone indicating critical levels of oil pressure. A red indicator light in the gauge and audible alarm shall indicate low engine oil pressure. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (°F) with a red line zone indicating critical coolant temperatures. A red indicator light in the gauge and audible alarm shall indicate high coolant temperature. The scale on the voltmeter shall read from 9 to 18 volts with a red line zone indicating critical levels of battery voltage. A red indicator light in the gauge and an audible alarm shall indicate high or low system voltage. The low voltage alarm shall indicate when the system voltage has dropped below 11.8 volts for more than 120 seconds in accordance with the requirements of NFPA 1901. The scale on the transmission temperature gauge shall read from 100 to 300 degrees °F with a red line zone indicating critical temperatures. A red indicator light in the gauge and an audible alarm shall indicate a high transmission temperature.</p> <p>The light bar portion of the message center shall include twenty-eight (28) LED-backlit indicators. The lightbar shall be split with fourteen (14) indicators on each side of the LCD message screen. The lightbar shall contain the following indicators and produce the following audible alarms when supplied in conjunction with applicable configurations:</p> <p><u>RED INDICATORS</u></p> <ul style="list-style-type: none"> • Stop Engine - indicates critical engine fault • Air Filter Restricted - indicates excessive engine air intake restriction • Park Brake - indicates parking brake is set • Seat Belt - indicates a seat is occupied and the corresponding seat belt remains unfastened • Low Coolant - indicates critically low engine coolant • Cab Tilt Lock - indicates the cab tilt system locks are not engaged. 			
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	<p><u>AMBER INDICATORS</u></p> <ul style="list-style-type: none"> • Malfunction Indicator Lamp (MIL) - indicates an engine emission control system fault • Check Engine - indicates engine fault • Check Transmission - indicates transmission fault • Anti-Lock Brake System (ABS) - indicates an anti-lock brake system fault • High exhaust system temperature – indicates elevated exhaust temperatures • Water in Fuel - indicates the presence of water in the fuel filter • Wait to Start - indicates active engine air preheat cycle • Windshield Washer Fluid – indicates washer fluid is low • DPF restriction - indicates a restriction of the diesel particulate filter • Regen Inhibit-indicates regeneration of the DPF has been inhibited by the operator • Range Inhibit - a transmission operation is prevented and requested shift request may not occur. • SRS - indicates a problem in the supplemental restraint system • Check Message - indicates a vehicle status or diagnostic message on the LCD requiring attention. <p><u>GREEN INDICATORS</u></p> <ul style="list-style-type: none"> • Left and Right turn signal indicators • ATC - indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for the ATC system • High Idle - indicates engine high idle is active. • Cruise Control - indicates cruise control is enabled • OK to Pump - indicates the pump is engaged and conditions have been met for pump operations • Pump Engaged - indicates the pump transmission is currently in pump gear • Auxiliary Brake - indicates secondary braking device is active <p><u>BLUE INDICATORS</u></p> <p>High Beam indicator</p>			
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	<u>AUDIBLE ALARMS</u> <ul style="list-style-type: none"> • Air Filter Restriction • Cab Tilt Lock • Check Engine • Check Transmission • Open Door/Compartment • High Coolant Temperature • High or Low System Voltage • High Transmission Temperature • Low Air Pressure • Low Coolant Level • Low-DEF Level • Low Engine Oil Pressure • Low Fuel • Seatbelt Indicator • Stop Engine • Water in Fuel • Extended • Left/Right Turn Signal on • ABS System Fault 			
389.0	<u>BACKLIGHTING COLOR</u>	YES	NO	EXCEPTIONS / NOTES
389.1	The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting.			
390.0	<u>AUXILIARY SPEEDOMETER</u>	YES	NO	EXCEPTIONS / NOTES
390.1	The dash shall include an auxiliary analog speedometer.			
391.0	<u>CAMERA</u>	YES	NO	EXCEPTIONS / NOTES
391.1	<p>An FRC branded inView 360-HD™ heavy-duty 360° camera system powered by SEON shall be supplied. Three (3) HD cameras with box-shaped housing shall be shipped loose for OEM installation in the body to afford the driver a clear view of the rear and sides of the vehicle and one (1) HD camera shall be mounted on the front of the cab, above the windshield.</p> <p>The system shall provide a dual camera view. One (1) view shall be a stitched bird's eye 360.00 degrees view around the truck and one (1) shall be a direct feed from a single camera. This feed shall display the rear camera when the transmission is placed in reverse, the left or right camera with the activation of the respective side turn signal, or the front camera at all other times.</p>			
392.0	<u>CAMERA DISPLAY</u>	YES	NO	EXCEPTIONS / NOTES
392.1	The camera system shall be wired to a single multiplex display located on the driver's side dash. The camera system display can be activated through the multiplex display panel.			

393.0	<u>CAB EXTERIOR PROTECTION</u>	YES	NO	EXCEPTIONS / NOTES
393.1	The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.			
394.0	<u>FIRE EXTINGUISHER</u>	YES	NO	EXCEPTIONS / NOTES
394.1	A 2.50-pound D.O.T-approved fire extinguisher with a BC rating shall be provided.			
395.0	<u>ROAD SAFETY KIT</u>	YES	NO	EXCEPTIONS / NOTES
395.1	The cab and chassis shall include one (1) emergency road safety triangle kit.			
396.0	<u>WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
396.1	The manufacturer shall provide a Lifetime Custom Chassis warranty			
397.0	<u>CHASSIS OPERATION MANUAL</u>	YES	NO	EXCEPTIONS / NOTES
397.1	There shall be two (2) digital copies of the chassis operation manual provided with the chassis.			

398.0	<u>ENGINE AND TRANSMISSION OPERATION MANUALS</u>	YES	NO	EXCEPTIONS / NOTES
398.1	The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items: (1) Hard copy of the Engine Operation and Maintenance Manual with a digital copy (1) Digital copy of the Transmission Operator's manual (1) Digital copy of the Engine Owner's manual			
399.0	<u>CAB/CHASSIS AS BUILT WIRING DIAGRAMS</u>	YES	NO	EXCEPTIONS / NOTES
399.1	The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams.			
400.0	<u>MIRROR INSTALL</u>	YES	NO	EXCEPTIONS / NOTES
400.1	There shall be a supplied "look down" mirror installed on the front officer side of the cab.			
401.0	<u>PIVOT POINT AUTO LUBE LINES</u>	YES	NO	EXCEPTIONS / NOTES
401.1	There shall be two (2) lines run from the Vogel Auto Lube to the zerks for the cab pivot points on the cab.			
402.0	<u>BATTERY CHARGER</u>	YES	NO	EXCEPTIONS / NOTES
402.1	A PRO Charging Professional Series PS3 battery conditioner shall be supplied by the OEM. This charger shall tie into the same chassis-supplied 20-amp electrical inlet connection as the chassis-supplied air pump. The Pro Charging BFG display shall be located on the external cab radius of the red paint area. The charger itself shall be located inside the PL1 compartment.			
403.0	<u>12V KUSSMAUL USB DUAL PORTS</u>	YES	NO	EXCEPTIONS / NOTES
403.1	There shall be two (2) Kussmaul 12V USB dual ports installed in the chassis cab. The outlet shall be battery direct and have a maximum of a 5-amp fuse provided with the power circuit.			
404.0	<u>12V ACCESSORY OUTLETS</u>	YES	NO	EXCEPTIONS / NOTES
404.1	There shall be two (2) 12-volt accessory outlets provided. Each outlet shall consist of one (1) hot and one (1) ground 14-gauge wire run from the batteries to the specified location. Each outlet shall be battery direct and have a minimum of a 20-amp fuse provided with the power circuit.			

405.0	<u>IPAD, IPAD MOUNTING BRACKET AND CHARGING</u>	YES	NO	EXCEPTIONS / NOTES
405.1	There shall be an IPAD, IPAD mounting bracket, charging cable and dedicated 12-volt outlet for the IPAD. The location for the mounting bracket and dedicated 12-volt outlet will be in the rear of the cab in the crew area and determined at pre-construction.			
406.0	<u>120V RECEPTACLE</u>	YES	NO	EXCEPTIONS / NOTES
406.1	Two (2) NEMA 520R, 120-volt, duplex, 3wire, straight blade (household type) receptacles shall be installed on the apparatus and wired to the shoreline. The receptacle shall have a 20-amp rating and include a spring-loaded weather-resistant cover if mounted in an exterior location.			
406.2	One outlet shall be located inside the chassis cab, behind the driver's seat. One outlet shall be located inside the chassis cab, behind the officer's seat.			
407.0	<u>120V RECEPTACLE</u>	YES	NO	EXCEPTIONS / NOTES
407.1	One (1) NEMA 520R, 120-volt, duplex, 3wire, straight blade (household type) receptacle shall be installed on the apparatus and wired to the shoreline. The receptacle shall have a 20-amp rating and include a spring-loaded weather-resistant cover if mounted in an exterior location. The receptacle shall be located forward of the electrical equipment box inside the chassis cab. It shall be mounted on the TB tunnel on the chassis floor.			

408.0	<u>ENGINE TUNNEL TREAD PLATE SHELF/ELECTRICAL BOX</u>	YES	NO	EXCEPTIONS / NOTES
408.1	<p>One (1) aluminum tread plate shelf/electrical cabinet feature shall be installed on the rear of the engine tunnel. The component shall have a top mounting surface, rear-facing glove box holders, and storage pockets for (2) cups and (2) handheld radios. The rear upper face shall have room for USB's and Power Points to be mounted there. The lower portion will have a removable rear access plate that will utilize flat turn style retention latches</p> <p>Dimensions shall be 37.5" wide x 26.25" tall. The top surface shall be 13" deep and the lowest portion shall be around 4.25" deep.</p> <p>The exterior and interior shall be coated in gray bedliner material to match the chassis floor and cab interior.</p> <p>The following power lead-ins, shall be installed in the lower center portion of this component.</p> <p>One (1) 10-gauge wire terminating at a (6) place fuse block that will be wired hot to the battery.</p> <p>One (1) 10-gauge wire terminating at a (6) place fuse block that will be wired hot from the battery to an activation switch on the dash.</p> <p>One (1) 10-gauge wire terminating at a (6) place fuse block that will be wired to the ignition switch.</p>			
409.0	<u>HOURLY METER</u>	YES	NO	EXCEPTIONS / NOTES
409.1	There shall be an hour meter provided and installed inside the center dash panel on the driver's side. The hour meter shall be activated only when the chassis ignition has been engaged			
410.0	<u>WATER TANK</u>	YES	NO	EXCEPTIONS / NOTES
410.1	The apparatus shall be equipped with a United Plastic Fabricating (UPF) 400 U.S. gallon water tank.			
411.0	<u>WATER TANK DRAIN</u>	YES	NO	EXCEPTIONS / NOTES
411.1	A 1 1/2" drain valve shall be provided in the pump compartment to drain the water tank. The valve shall include a locking lever to prevent accidental draining of the water tank.			
412.0	<u>WATER TANK FILL TOWER</u>	YES	NO	EXCEPTIONS / NOTES
412.1	The tank shall have a combination vent and manual fill tower, marked "Water Fill", located at the driver's side front corner of the tank.			

413.0	<u>TANK BAFFLES</u>	YES	NO	EXCEPTIONS / NOTES
413.1	The water tank shall have tank baffles designed to provide maximum water flow and interlock with one another.			
414.0	<u>TANK SUMP</u>	YES	NO	EXCEPTIONS / NOTES
414.1	One (1) sump shall be provided at the bottom of the water tank and an anti-swirl plate shall be located above the sump.			
415.0	<u>WATER TANK LEVEL GAUGE</u>	YES	NO	EXCEPTIONS / NOTES
415.1	There shall be two (2) weatherproof encapsulated water level gauges with LED lights. The indicators shall monitor the water tank level and shall be mounted on the pump panel.			
416.0	<u>TANK FILL CONNECTION</u>	YES	NO	EXCEPTIONS / NOTES
416.1	All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and shall be capable of withstanding sustained fill rates of up to 1,000 GPM.			
417.0	<u>TANK LID</u>	YES	NO	EXCEPTIONS / NOTES
417.1	The tank lid shall be constructed of polypropylene and be designed to allow for individual removal and inspection if necessary.			
418.0	<u>4" WATER TANK OVERFLOW</u>	YES	NO	EXCEPTIONS / NOTES
418.1	The tank shall be equipped with a minimum of a 4" schedule 40 polypropylene overflow/ air vent pipe installed in the fill tower extending through the tank and dumping behind the rear axle.			

419.0	<u>FOAM CELL</u>	YES	NO	EXCEPTIONS / NOTES
419.1	<p>One (1) United Plastic Fabricating (UPF) 30 U.S. gallon foam cell shall be incorporated into the water tank. One (1) pressure/vacuum vent shall be installed and one (1) drain hose shall be connected to the foam cell. The drain shall have a quarter-turn valve installed inside the pump compartment and it shall drain below the frame rail of the chassis.</p> <p>The foam cell shall be designed for use with Class "B" foam. The foam cell shall have a manual fill tower constructed of 1/2" PT3 polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The foam fill tower shall be black, indicating the type of foam to be utilized, and located on the officer's side front corner of the water tank. The capacity of the cell shall be engraved on the top of the fill tower lid. The tower shall have a 1/4" thick removable polypropylene screen and a stainless steel hinged-type cover. Inside the fill tower, approximately 1.5" down from the top, there shall be an antifoam fill tube that extends down to the bottom of the cell. A pressure vacuum vent shall be provided in the lid of the fill tower.</p>			
420.0	<u>FOAM TANK LEVEL GAUGE</u>	YES	NO	EXCEPTIONS / NOTES
420.1	There shall be two (2) weatherproof encapsulated water level gauges with LED lights. The indicators shall monitor the water tank level and shall be mounted on the pump panel.			

421.0	<u>HOSE BED</u>	YES	NO	EXCEPTIONS / NOTES
421.1	<p>The hose bed shall be located on the officer's side of the turntable support structure above the low compartment extending over the officer's side wheel well and have a minimum of 30 cubic feet of combined storage space in accordance with NFPA 1901, current edition. The hose bed shall extend backward, past the officer's side of the turntable support, and exit at the rear of the apparatus. The access shall be free of obstructions that may interfere with the deployment and loading of the hose. A 1" stainless steel body trim piece shall be at the rear bottom of the hose bed, to protect the chevron striping when deploying the hose.</p> <p>The interior walls of the hose bed shall be painted the same body color as the upper portion of the body.</p> <p>The floor of the hose bed shall be constructed of DuraDek fiber reinforced plastic material to prevent the accumulation of water and to allow ventilation to aid in drying the hose. The flooring shall be fabricated of "T" beam pultrusions in parallel connected with cross slats that are first mechanically bonded and then epoxied, forming a large sheet. The top portion of each "T" cross-section shall measure 1 1/4" wide and 3/16" thick with beaded ends. The vertical portion shall be 3/8" thick, beading out at the bottom to a thickness of 1/2" and tall enough to result in an overall height of 1". The "T" sections shall be spaced 3/4" apart to allow for drainage and ventilation.</p> <p>Each "T" beam shall be constructed utilizing continuous glass fiber strands that are high in resistance to tension, compression, and bending. An outer sheath consisting of a continuous strand mat to prevent linear splitting and slipping shall surround the core. The sheath shall also serve to draw the protective resin to the bar surface. Both reinforcements shall be pulled through an isophthalic polyester resin, treated with antimony trioxide for fire resistance, to form a solid length.</p>			

421.2	<p>The flooring shall then be protected with a polyurethane coating to screen out ultraviolet rays. The bright white coating shall be baked on.</p> <p>The hose bed area shall be adequately lit to meet requirements.</p> <p>The hose bed shall contain the following hose load: 800' of 5" rubber hose</p>			
422.0	<u>HOSE BED END COVER</u>	YES	NO	EXCEPTIONS / NOTES
422.1	There shall be a section of 2" black webbing installed on the rear of the hose bed for retention purposes. It shall be attached with a "C" channel at the bottom and shall be held closed with "J" hooks and footman's loops on the sides.			
423.0	<u>HOSE BED COVER</u>	YES	NO	EXCEPTIONS / NOTES
423.1	There shall be a dual-hinged TB cover installed on the top of the hose bed. The hinged covers shall open towards the outboard edge of the body and shall be kept from swinging down and making contact with the side of the body by a means of retention.			

424.0	<u>ALUMINUM BODY CONSTRUCTION</u>	YES	NO	EXCEPTIONS / NOTES
424.1	<p>The apparatus body shall be fabricated from a minimum of a 1/8" aluminum sheet. The total outside width of the apparatus body shall not exceed 100 inches. The width measurement of the sidewalls shall be made from the outside wall of the two opposite sides of the body.</p> <p>The complete apparatus body shall be fabricated utilizing the break and bend techniques to form a strong, yet flexible, unibody structure. The body shall be constructed with holding fixtures to ensure proper dimensioning. Each apparatus body is specific in design to meet the unique requirements of the purchasing fire department.</p> <p>The main body compartments on each side, as well as the rear center compartment if applicable, shall contain a sweep-out floor design. Each compartment shall be made to the most practical dimensions to provide maximum storage for the fire department's equipment. The door opening threshold shall be positioned lower than the compartment floor permitting easy cleaning of the compartments.</p> <p>Continuous, solid welded seams shall be located at the upper front and upper rear corners of the apparatus body. The flooring of all lower, main body compartmentation shall also have solid weld seams. All door jams, on both the top and the bottom, shall be solid welded as well. Each main door jam consists of a double jam design; this is comparable to a double-struck frame design, which provides superior strength and durability. All double door jams are to be welded together utilizing the plug weld technique. All remaining compartment walls shall be stitch welded.</p>			
424.2	<p>The compartment floors, specifically L1 and R1, shall have a minimum of two (2) 2" x 2" square tubes welded to the entire width of the compartment floor. The two (2) rear side compartments as well as the rear center compartment, if applicable, shall be welded to the rear deck support structure. Each lower, rear compartment shall be welded to the cross tubes providing strength and durability to the entire apparatus body.</p>			

424.3	<p>The body design shall include a "false wall" design in the lower portion of each lower, rear compartment. This "false wall" is required to allow for easy accessibility to the rear electrical components found in the rear tail-light cluster area.</p> <p>On the upper area of the apparatus body, directly above the side compartment door openings, a header is to be fabricated from an aluminum sheet. This area shall be free of any body seams and shall be painted the same color as the apparatus body. The height of the header may vary depending on the following factors: apparatus design, lettering requirements, scene lights, and warning light requirements as well as various other options. A "J" channel shall be incorporated into the body design to provide a rain gutter to further assist in preventing excessive moisture from getting into the compartments.</p>			
425.0	<u>SIDE COMPARTMENT DOORS</u>	YES	NO	EXCEPTIONS / NOTES
425.1	<p>Hansen International Inc. Roll up doors shall be installed on each side body compartment, eight (8) total. Each easy opening door shall be equipped with a pretensioned internally lubricated counterbalance spring contained within a 0.060" x 4" diameter aluminum door roller tube and supported with a .625" diameter steel center shaft. The roller assembly and shaft shall be supported with two (2) preassembled and adjustable mounting plates of 0.090" zinc plated steel. The paint shall match the apparatus body. Each heavy-duty lift and door handlebar assembly shall be constructed with a double-walled hard anodized extruded aluminum lath consisting of two (2) 0.060" wall thicknesses. The lift handlebar assembly shall have four (4) roller wheels to reduce friction and ease the opening of the door. The handle assembly shall be equipped with a 2" horizontal fullwidth shelf with antislip ribbing on top to assist door closing.</p>			
426.0	<u>TRIMRITE STAINLESS STEEL FASTENERS</u>	YES	NO	EXCEPTIONS / NOTES
426.1	<p>TrimRite stainless steel fasteners shall be provided for all exposed and unpainted fasteners throughout the body in locations such as overlays, pump panels, and other numerous hardware mounting locations.</p>			
427.0	<u>WALKWAYS AND OVERLAYS</u>	YES	NO	EXCEPTIONS / NOTES
427.1	<p>All exterior surfaces designated by the manufacturer as stepping, standing, or walking areas shall be overlaid with a bright tread plate to provide a slip-resistant surface, even when the surface is wet. The degree of slip resistance shall be in accordance with NFPA 1901, current edition.</p>			

428.0	<u>STEPPING SURFACES</u>	YES	NO	EXCEPTIONS / NOTES
428.1	All steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of at least 500 pounds. Steps shall be provided at any area that personnel may need to climb and shall be adequately lit.			
429.0	<u>WEATHERPROOF DOOR SWITCHES</u>	YES	NO	EXCEPTIONS / NOTES
429.1	Because of the harsh environment and susceptibility to moisture on the fire ground, the fire apparatus compartment doors shall utilize weatherproof switches. No Exceptions. The switches shall be used for activation of the compartment lights and to provide a signal to the door open circuit in the cab.			
430.0	<u>DOOR HANDLES</u>	YES	NO	EXCEPTIONS / NOTES
430.1	The door handles on the side body compartments of the apparatus shall be nonlocking style.			
431.0	<u>REAR BODY COMPARTMENT</u>	YES	NO	EXCEPTIONS / NOTES
431.1	A compartment shall be located at the rear of the apparatus that extends into the apparatus torque box.			
432.0	<u>REAR COMPARTMENT DOOR</u>	YES	NO	EXCEPTIONS / NOTES
432.1	The T1 compartment shall be equipped with one (1) custom built Hansen International Inc. Roll up door. The door shall be produced by an ISO9001 certified company and tested to at least 100,000 cycles. The easy opening doors shall be equipped with a pretensioned internally lubricated counterbalance spring contained within a 0.060" x 4" diameter aluminum door roller tube and supported with a .625" diameter steel center shaft. The roller assembly and shaft shall be supported with two (2) preassembled and adjustable mounting plates of 0.090" zinc plated steel. The mounting plates shall have dual synthetic molded roller wheels that shall support the door above the guide channels as it is fed onto the roller tube counterbalance for storage. The roll up door shall be finished with anodized satin.			
432.2	The heavy-duty lift and door handle-bar assembly shall be constructed with a double-walled hard anodized extruded aluminum lath consisting of two (2) 0.060" wall thicknesses. The lift handlebar assembly shall have four (4) roller wheels to reduce friction and ease the opening of the door. The handle assembly shall be equipped with a 2" horizontal full-width shelf with antislip ribbing on top to assist door closing. The shelf shall have two (2) riveted heavy-duty rubber bumpers to prevent metal-to-metal impact overhead. The latch bar shall consist of a full width .750" diameter stainless steel tube handle with centrally located knurled antislip sections and 1.25" hand clearance between the handle and the door surface.			

432.3	There shall be a secondary enclosure provided behind the roll-up door assembly to prevent the ladders from sliding back against the roll-up door and preventing the roll-up door from opening. The inner TB lap door design inside the torque box and behind the roll up door shall be a single horizontally hinged, short, flip-up style retention door, that shall keep the ladders from contacting the inner face of the roll up door. There shall be one LED light provided inside the ladder storage compartment.			
433.0	<u>REAR DECK LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
433.1	Two (2) Unity, model AGR P46SLC, LED deck lights shall be provided on the rear of the apparatus. Each light shall be a 6" round light in a chrome housing and a switch on the light head. The lighting circuit shall be activated when the parking brake is engaged.			
434.0	<u>REAR DECK</u>	YES	NO	EXCEPTIONS / NOTES
434.1	A modular bolton deck shall be installed on the rear of the apparatus. The rear deck shall be constructed of antislip bright tread plate. The recessed rear deck shall be installed between the left and right-side body, below the rear compartments. The rear deck shall be 4 1/4" deep.			
435.0	<u>LICENSE PLATE BRACKET</u>	YES	NO	EXCEPTIONS / NOTES
435.1	A license plate bracket shall be mounted on the rear of the apparatus. A clear LED light shall be incorporated into the bracket.			
436.0	<u>DUNNAGE COMPARTMENT</u>	YES	NO	EXCEPTIONS / NOTES
436.1	A dunnage compartment shall be located above the torque box. The dunnage compartment floor shall be constructed of a tread plate.			
437.0	<u>DUNNAGE COMPARTMENT 2</u>	YES	NO	EXCEPTIONS / NOTES
437.1	A dunnage compartment shall be located above the pump module. The dunnage compartment floor shall be constructed of a tread plate. A hinged cover shall be provided for the dunnage compartment. The cover shall be constructed from antislip tread plate material. The cover shall also include a bar grate insert to allow for proper airflow in the dunnage area.			
438.0	<u>BODY COMPARTMENT LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
438.1	A total of sixteen (16) white LED compartment lights shall be installed in the body compartments.			
439.0	<u>COMPARTMENT LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
439.1	One (1) LED track light shall be installed in each compartment.			

440.0	<u>COMPARTMENT COATING</u>	YES	NO	EXCEPTIONS / NOTES
440.1	The interior of the body compartments shall be coated with gray bed liner coating unless otherwise specified. The coating shall be durable enough to withstand the everyday wear and tear of equipment removal and shifting.			
441.0	<u>COMPARTMENT FLOORING TILES</u>	YES	NO	EXCEPTIONS / NOTES
441.1	Interlocking plastic squares shall be in all body compartments. The tiles shall be applied to all body compartment shelves, adjustable-height trays, floor mounted trays, and on compartment floors that do not contain floor mounted trays. No tiles shall be applied on compartment floors underneath floor mounted trays.			
442.0	<u>COMPARTMENT AIR RELEASE</u>	YES	NO	EXCEPTIONS / NOTES
442.1	Each compartment shall be vented to help remove trapped air when closing the compartment door. The vent shall be a rubber gasket in the area of the outboard corners of the compartment.			
443.0	<u>COMPARTMENT DRAIN HOLES</u>	YES	NO	EXCEPTIONS / NOTES
443.1	Each body compartment shall be equipped with drain holes to allow standing water to exit underneath the apparatus.			
444.0	<u>POLY BODY RUB RAILS</u>	YES	NO	EXCEPTIONS / NOTES
444.1	Rub rails shall be installed beneath the compartment doors to protect the apparatus body from damage should the body be brushed or rubbed against another object.			
445.0	<u>LEFT SIDE FRONT STABILIZER ACCESS DOOR</u>	YES	NO	EXCEPTIONS / NOTES
445.1	There shall be a tread plate door on the rear portion of the left side front stabilizer. The vertically hinged panel shall be of the single pan design and shall be positively latched in the closed position utilizing a pushbutton latch.			
446.0	<u>DRIVER'S (LEFT) SIDE BODY COMPARTMENTS COMPARTMENT L1</u>	YES	NO	EXCEPTIONS / NOTES
446.1	<p>A full-height compartment shall be located ahead of the rear wheels on the driver's side of the apparatus body. This compartment shall be designated as L1 within these specifications and any ensuing paperwork or drawings after contract execution.</p> <p>The dimensions of the compartment shall be:</p> <ul style="list-style-type: none"> • Height: 58" • Width: 27" • Depth: 23" Upper and 23" Lower 			

446.2	<p><u>L1 COMPONENTS:</u></p> <ul style="list-style-type: none"> • Adjustable shelf: One (1) aluminum adjustable full-depth shelf shall be installed in the compartment. the shelf shall be constructed of a 3/16" aluminum sheet with a minimum of 2" lips. The shelf shall be coated with bed liner and shall be designed in such a manner that will allow liquids to readily drain. • Mounting board: One (1) plywood mounting board shall be installed on the back wall of the compartment. the board shall be spaced away from the back wall of the compartment with unistrut channels which shall also be used as an easy means of removing the board to mount equipment brackets. The board shall be constructed of 3/4" plywood and have a gray bedliner finish. • Bolt in lip: A 2" angle lip shall be installed on the floor at the door opening. the lip shall help retain equipment located on the floor of the compartment and shall be finished to match the compartment interior. • Compartment struts: Aluminum vertical strut channels shall be welded in the compartment. two (2) struts shall be provided for any full depth portion and one (1) strut shall be provided for any shallow depth portion. 			
447.0	<u>COMPARTMENT L2</u>	YES	NO	EXCEPTIONS / NOTES
447.1	<p>A standard height compartment shall be located above the rear wheels on the driver's side of the apparatus body. This compartment shall be designated as L2 within these specifications and any ensuing paperwork or drawings after contract execution.</p> <p>The dimensions of the compartment shall be:</p> <ul style="list-style-type: none"> • Height: 26" • Width: 33" • Depth: 23" Upper and 23" Lower 			
447.2	<p><u>L2 COMPONENTS:</u></p> <ul style="list-style-type: none"> • Adjustable shelf: One (1) aluminum adjustable full-depth shelf shall be installed in the compartment. The shelf shall be constructed of a 3/16" aluminum sheet with a minimum of 2" lips. The shelf shall be coated with bed liner and shall be designed in such a manner that will allow liquids to readily drain. • Bolt in lip: A 2" angle lip shall be installed on the floor at the door opening. The lip shall help retain equipment located on the floor of the compartment and shall be finished to match the compartment interior. • Compartment struts: Aluminum vertical strut channels shall be welded in the compartment. Two (2) struts shall be provided for any full depth portion and one (1) strut shall be provided for any shallow depth portion. 			

448.0	<u>COMPARTMENT L3</u>	YES	NO	EXCEPTIONS / NOTES
448.1	<p>A standard height compartment shall be located above the rear wheels on the driver's side of the apparatus body. This compartment shall be designated as L3 within these specifications and any ensuing paperwork or drawings after contract execution.</p> <p>The dimensions of the compartment shall be:</p> <ul style="list-style-type: none"> • Height: 26" • Width: 35" • Depth: 23" Upper and 23" Lower 			
448.2	<p><u>L3 COMPONENTS:</u></p> <ul style="list-style-type: none"> • Adjustable shelf: One (1) aluminum adjustable full-depth shelf shall be installed in the compartment. The shelf shall be constructed of a 3/16" aluminum sheet with a minimum of 2" lips. The shelf shall be coated with bed liner and shall be designed in such a manner that will allow liquids to readily drain. • Bolt in lip: A 2" angle lip shall be installed on the floor at the door opening. The lip shall help retain equipment located on the floor of the compartment and shall be finished to match the compartment interior. • Compartment struts: Aluminum vertical strut channels shall be welded in the compartment. Two (2) struts shall be provided for any full depth portion and one (1) strut shall be provided for any shallow depth portion. 			
449.0	<u>COMPARTMENT L4</u>	YES	NO	EXCEPTIONS / NOTES
449.1	<p>A standard height compartment shall be located above the rear wheels on the driver's side of the apparatus body. This compartment shall be designated as L4 within these specifications and any ensuing paperwork or drawings after contract execution.</p> <p>The dimensions of the compartment shall be:</p> <ul style="list-style-type: none"> • Height: 17" • Width: 47" • Depth: 23" Upper and 23" Lower 			

449.2	<p><u>L4 COMPONENTS:</u></p> <ul style="list-style-type: none"> • Adjustable shelf: Aluminum adjustable full-depth shelf shall be installed in the compartment. The shelf shall be constructed of a 3/16" aluminum sheet with a minimum of 2" lips. The shelf shall be coated with bed liner and shall be designed in such a manner as to allow liquids to readily drain. • Mounting board: One (1) plywood mounting board shall be installed on the back wall of the compartment. The board shall be spaced away from the back wall of the compartment with uni-strut channels which shall also be used as an easy means of removing the board to mount equipment brackets. The board shall be constructed of 3/4" plywood and have a gray bedliner finish. • Bolt in lip: A 2" angle lip shall be installed on the floor at the door opening. The lip shall help retain equipment located on the floor of the compartment and shall be finished to match the compartment interior. • Compartment struts: Aluminum vertical strut channels shall be welded in the compartment. Two (2) struts shall be provided for any full depth portion and one (1) strut shall be provided for any shallow depth portion. 			
450.0	<u>COMPARTMENT L5</u>	YES	NO	EXCEPTIONS / NOTES
450.1	<p>A full-height compartment shall be located behind the rear wheels on the driver's side of the apparatus body. This compartment shall be designated as L5 within these specifications and any ensuing paperwork or drawings after contract execution.</p> <p>The dimensions of the compartment shall be:</p> <ul style="list-style-type: none"> • Height: 48" • Width: 27" • Depth: 23" Upper and 23" Lower 			
450.2	<p><u>L5 COMPONENTS:</u></p> <ul style="list-style-type: none"> • Adjustable shelves: Two (2) aluminum adjustable full-depth shelves shall be installed in the compartment. Each shelf shall be constructed of a 3/16" aluminum sheet with a minimum of 2" lips. The shelves shall be coated with bed liner and shall be designed in such a manner as to allow liquids to readily drain. • Bolt in lip: A 2" angle lip shall be installed on the floor at the door opening. The lip shall help retain equipment located on the floor of the compartment and shall be finished to match the compartment interior. • Compartment struts: Aluminum vertical strut channels shall be welded in the compartment. Two (2) struts shall be provided for any full depth portion and one (1) strut shall be provided for any shallow depth portion. 			

451.0	<u>DRIVER'S SIDE REAR WHEEL WELL POSITION WL1</u>	YES	NO	EXCEPTIONS / NOTES
451.1	A single air bottle compartment shall be installed in the forward portion of the rear wheel well area, on the driver's side. The compartment door, flange, and hinges shall be constructed of stainless steel material. The door shall have a rubber gasket to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a molded component that is assembled to the door and flange. The door shall have a brushed stainless-steel finish.			
452.0	<u>DRIVER'S SIDE REAR WHEEL WELL POSITION WL2</u>	YES	NO	EXCEPTIONS / NOTES
452.1	Two (2) single air bottle compartments shall be installed in the rear wheel well area, between the tandem axles. The compartment door, flange, and hinges shall be constructed of stainless steel material. The door shall have a rubber gasket to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a molded component that is assembled to the door and flange. The doors shall have a brushed stainless-steel finish.			
453.0	<u>DRIVER'S SIDE REAR WHEEL WELL POSITION WL3</u>	YES	NO	EXCEPTIONS / NOTES
453.1	A wheel chock compartment shall be installed in the rearward portion of the rear wheel well area, on the driver's side. The compartment shall be capable of storing one wheel chock. The compartment door, flange, and hinges shall be constructed of stainless steel material. The door shall have a rubber gasket to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a molded component that is assembled to the door and flange. The door shall have a brushed stainless-steel finish.			
454.0	<u>COMPARTMENT R1</u>	YES	NO	EXCEPTIONS / NOTES
454.1	A full-height compartment shall be located ahead of the rear wheels on the officer's side of the apparatus body. This compartment shall be designated as R1 within these specifications and any ensuing paperwork or drawings after contract execution. The dimensions of the compartment shall be: • Height: 58" • Width: 27" • Depth: 23" Upper and 23" Lower			

454.2	<u>R1 COMPONENTS:</u> <ul style="list-style-type: none"> Adjustable shelf: One (1) aluminum adjustable full-depth shelf shall be installed in the compartment. The shelf shall be constructed of a 3/16" aluminum sheet with a minimum of 2" lips. The shelf shall be coated with bed liner and shall be designed in such a manner that will allow liquids to readily drain. Bolt in lip: A 2" angle lip shall be installed on the floor at the door opening. The lip shall help retain equipment located on the floor of the compartment and shall be finished to match the compartment interior. Compartment struts: Aluminum vertical strut channels shall be welded in the compartment. Two (2) struts shall be provided for any full depth portion and one (1) strut shall be provided for any shallow depth portion. 			
455.0	<u>COMPARTMENT R2</u>	YES	NO	EXCEPTIONS / NOTES
455.1	<p>A standard height compartment shall be located above the rear wheels on the officer's side of the apparatus body. This compartment shall be designated as R2 within these specifications and any ensuing paperwork or drawings after contract execution.</p> <p>The dimensions of the compartment shall be:</p> <ul style="list-style-type: none"> Height: 26" Width: 58" Depth: 23" Upper and 23" Lower 			
455.2	<u>R2 COMPONENTS:</u> <ul style="list-style-type: none"> Adjustable shelf: One (1) aluminum adjustable full-depth shelf shall be installed in the compartment. The shelf shall be constructed of a 3/16" aluminum sheet with a minimum of 2" lips. The shelf shall be coated with bed liner and shall be designed in such a manner that will allow liquids to readily drain. Compartment struts: Aluminum vertical strut channels shall be welded in the compartment. Two (2) struts shall be provided for any full depth portion and one (1) strut shall be provided for any shallow depth portion. 			
456.0	<u>COMPARTMENT R3</u>	YES	NO	EXCEPTIONS / NOTES
456.1	<p>A lower compartment shall be located behind the rear wheels on the officer's side of the apparatus body. This compartment shall be designated as R3 within these specifications and any ensuing paperwork or drawings after contract execution.</p> <p>The dimensions of the compartment shall be:</p> <ul style="list-style-type: none"> Height: 22" Width: 51" Depth: 23" Upper and 23" Lower 			

456.2	<u>R3 COMPONENTS:</u> <ul style="list-style-type: none"> • Bolt in lip: A 2" angle lip shall be installed on the floor at the door opening. The lip shall help retain equipment located on the floor of the compartment and shall be finished to match the compartment interior. 			
457.0	<u>OFFICER'S SIDE REAR WHEEL WELL POSITION WR1</u>	YES	NO	EXCEPTIONS / NOTES
457.1	A single air bottle compartment shall be installed in the forward portion of the rear wheel well area, on the officer's side. The compartment door, flange, and hinges shall be constructed of stainless steel material. The door shall have a rubber gasket to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a molded component that is assembled to the door and flange. The door shall have a brushed stainless-steel finish.			
458.0	<u>OFFICER'S SIDE REAR WHEEL WELL POSITION WR2</u>	YES	NO	EXCEPTIONS / NOTES
458.1	<p>A wheel chock compartment shall be installed in the rearward portion of the rear wheel well area, on the officer's side. The compartment shall be capable of storing one wheel chock.</p> <p>The compartment door, flange, and hinges shall be constructed of stainless steel material. The door shall have a rubber gasket to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a molded component that is assembled to the door and flange. The door shall have a brushed stainless-steel finish.</p>			
459.0	<u>FRONT STABILIZER COMPARTMENTS</u>	YES	NO	EXCEPTIONS / NOTES
459.1	An upper compartment shall be located above the front stabilizers on both sides of the apparatus. The compartments shall be designated as SL1 (driver's side) and SR1 (officer's side) within these specifications and any ensuing paperwork or drawings after contract execution. Each compartment shall be equipped with a double pan lap door and a chrome nonlocking D-Ring door handle. The front stabilizer compartment shall be transverse in the forward portion of the compartment.			
460.0	<u>STABILIZER COMPARTMENT</u>	YES	NO	EXCEPTIONS / NOTES
460.1	There shall be a compartment in the officer's side front stabilizer area. The depth, door height opening, and door width opening shall be the same as the wheel chock compartment that used to be in this location. The door shall be painted body color and the interior of the compartment shall be coated in gray bedliner material. The door shall have a compression-style latch.			

461.0	<u>TWO REAR TOW EYES</u>	YES	NO	EXCEPTIONS / NOTES
461.1	Two (2) chrome-plated tow eyes shall be installed at the rear of the apparatus above the rear step area. The tow eyes shall be bolted to a heavy-duty assembly that is welded to the torque box. The tow eyes shall have a 2 1/2" ID hole.			
462.0	<u>REAR WHEEL WELLS</u>	YES	NO	EXCEPTIONS / NOTES
462.1	The fenders shall be integral with the body sides and compartments with a seamless appearance. The fenders shall be fitted with bolt-in removable full circular inner liners in the wheel well area for ease of cleaning and maintenance. The liners shall match the material used to build the body. Sufficient clearance shall be provided in the wheel well to allow the use of tire chains when the apparatus is fully loaded.			
463.0	<u>RUBBER FENDERETTES</u>	YES	NO	EXCEPTIONS / NOTES
463.1	Four (4) rubber fenderettes shall be installed at the outboard edge of the rear wheel well area, two (2) on each side. The fenderettes shall be bolted to the apparatus body using nylon washers to space them slightly away from the body to reduce the buildup of road grime.			
464.0	<u>TURNTABLE ACCESS LADDER DRIVER'S SIDE</u>	YES	NO	EXCEPTIONS / NOTES
464.1	<p>For access to the turntable, a turntable access ladder shall be furnished on the driver's side of the apparatus. The ladder design shall utilize two (2) air cylinders to aid in the deployment of the ladder into the climbing position and a positive locking mechanism to lock the ladder assembly into the travel position. The main structural members of the assembly shall be fabricated from 12-gauge 304 stainless steel with aluminum tread plate overlays on the step area. The degree of slip resistance shall be in accordance with NFPA 1901, current edition.</p> <p>The access ladder shall be designed as a two (2) part assembly. The lower ladder assembly shall swing out and down and the upper ladder assembly will angle when the lower assembly is in the down position to an approximate slope of 81 degrees to provide ease of access from the ground to the first step and allow for the maximum angle of departure of the apparatus. When the access ladder is in the down position, the maximum height from the ground to the first step shall not exceed 24". All remaining steps shall have a maximum stepping height that shall not exceed 18".</p>			

464.2	The access ladder shall be connected to the door open warning circuit to warn the driver it is not in the stored position. The access ladder shall be illuminated for nighttime operation with Grote LED lighting. The lights shall be activated by the parking brake. To aid in ascending and descending the access steps, knurled aluminum handrails shall be provided on each side of the steps as well as one (1) on top of the body above the steps.			
465.0	<u>FRONT VERTICAL AREA/REAR CENTER BODY TREAD PLATE OVERLAYS</u>	YES	NO	EXCEPTIONS / NOTES
465.1	There shall be a tread plate overlay on the following vertical areas of the apparatus: Each side on the front of the body to the rear of the pump compartment. The center portion is on the rear of the apparatus body, above and below the ladder compartment.			
466.0	<u>FRONT BODY STEPS AND LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
466.1	Four (4) Cast Products folding steps shall be located on the front of the driver's side body compartments. The folding steps shall have two large open slots to prevent the buildup of ice or mud and to provide a handhold when necessary. The steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of 500 pounds. The steps shall be adequately lit with LED lighting. One (1) light shall be located above the steps.			
467.0	<u>HANDRAILS</u>	YES	NO	EXCEPTIONS / NOTES
467.1	All handrails, unless otherwise stated, shall be constructed of knurled aluminum of not less than 1 1/4" in diameter. All railing shields and brackets shall be chrome plated and bolted to the body with stainless steel bolts. The lower bracket on all vertical handrails shall have a drain hole at the lowest point. The following handrails shall be provided on the apparatus: <ul style="list-style-type: none"> • A vertical handrail shall be installed above the driver's side pump panel. • A horizontal handrail shall be installed above the officer's side of the pump module. • A handrail shall be installed forward on the top of the body, on the driver's side. • A handrail shall be installed on the top officer's side in front of the body. 			

468.0	<u>GROUND LADDER STORAGE</u>	YES	NO	EXCEPTIONS / NOTES
468.1	<p>The ground ladders shall be stored within the torque box and shall be removable from the rear of the apparatus. The ladders shall be fully enclosed, so road dirt and debris cannot foul or damage the ladders. The ladders shall be stored in individual full-length aluminum slides, so they can be removed individually. The slides shall be lined with nylon to aid in moving the ladders.</p> <p>The inner SS door design inside the torque box and behind the roll up door shall be a single horizontally hinged, short, flip-up style retention door, that shall keep the ladders from making contact with the inner face of the roll up door.</p>			
468.2	<p>The following ground ladders shall be supplied with the apparatus:</p> <ul style="list-style-type: none"> • One (1) Duo-Safety, model 585-A, folding aluminum ladder shall be provided. The ladder shall be equipped with heavy cast aluminum swivel safety shoes and carrying handles. The closed dimensions of the ladder shall be 11' 5" long x 5.25" wide. The ladder shall include a heat sensor label to warn if the ladder has been exposed to excessive heat. • Two (2) Duo-Safety, model 875-DR, 16' aluminum roof ladders shall be provided. The ladders shall be equipped with high-strength steel rotating roof hooks with reinforcing brace and steel butt spurs and rounded aluminum top caps for increased durability. The ladders shall include a heat sensor label to warn if the ladders have been exposed to excessive heat. • Two (2), Duo Safety model 1200A 28' two-section aluminum extension ladders shall be provided. The ladders shall be constructed with 6061T6 aluminum alloy and shall have a 750lb duty rating. The ladders shall have a closed length of 16' 3.25". • One (1), Duo-Safety, 40' Aluminum Three Section Extension (No Poles), 1525-NP • One (1) Duo-Safety, model 701, 10' aluminum "Fresno" ladder shall be provided. 			

469.0	<u>PIKE POLE STORAGE</u>	YES	NO	EXCEPTIONS / NOTES
469.1	<p>Six (6) aluminum tubes for the storage of pike poles shall be installed inside the upper portion of the torque box. The following pike poles shall be supplied with this location on the apparatus:</p> <ul style="list-style-type: none"> Two (2) Firehooks, model RH8, 8' super duty fiberglass pike poles shall be provided. Two (2) Nupla, model SPD12, 12' super duty fiberglass pike poles shall be provided. The pike pole shall be constructed of solid fiberglass with an IBeam type pole and a butt-style handle. Two (2) Firehooks, model RH6, 6' pike pole with chisel ends shall be provided. 			
470.0	<u>LITTLE GIANT LADDER STORAGE</u>	YES	NO	EXCEPTIONS / NOTES
470.1	<p>Brackets shall be located above the body to provide storage for the Little Giant ladder. The Little Giant ladder shall be secured in place with a tread plate end cap on the forward end and adjustable straps on the rear end.</p> <ul style="list-style-type: none"> One (1) Wing Enterprises, model 15187882, 17' aluminum Little Giant Defender NFPA compliant ladder shall be provided. 			
471.0	<u>LITTLE GIANT LADDER STORAGE</u>	YES	NO	EXCEPTIONS / NOTES
471.1	<p>Brackets shall be located above the body to provide storage for the Little Giant ladder. The Little Giant ladder shall be secured in place with a tread plate end cap on the forward end and adjustable straps on the rear end.</p> <ul style="list-style-type: none"> One (1) Wing Enterprises, model 15187882, 17' aluminum Little Giant Defender NFPA compliant ladder shall be provided. 			
472.0	<u>WHEEL CHOCKS</u>	YES	NO	EXCEPTIONS / NOTES
472.1	Two (2) pairs of Zico, model SAC44, wheel chocks shall be provided with the apparatus.			
473.0	<u>INDEPENDENT ALUMINUM PUMP MODULE</u>	YES	NO	EXCEPTIONS / NOTES
473.1	The pump module shall be fabricated from an aluminum sheet. The module shall be fabricated as an individual unit independent from the body.			
474.0	<u>PUMP COMPARTMENT LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
474.1	Two (2) LED lights shall be installed in the pump compartment.			

475.0	<u>DRIVER'S SIDE RUNNING BOARD</u>	YES	NO	EXCEPTIONS / NOTES
475.1	A modular bolt on running board, constructed of an anti-slip tread plate, shall be installed on the driver's side of the pump module. The outside edge of the running board shall be flush with the rub rail installed on the body to maintain a uniform appearance. The running board shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.			
476.0	<u>OFFICER'S SIDE RUNNING BOARD</u>	YES	NO	EXCEPTIONS / NOTES
476.1	A modular bolt on running board shall be installed on the officer's side of the pump module. The running board shall be constructed of an anti-slip tread plate. There shall be an integral storage well compartment recessed in the running board. The outside edge of the running board shall be flush with the rub rail that is installed on the body to maintain a uniform appearance. The running board shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.			
476.2	There shall be two (2) PAC, model K5006, straps provided with the storage well. The straps shall be installed over the top of the compartment.			
477.0	<u>PULLOUT PLATFORM</u>	YES	NO	EXCEPTIONS / NOTES
477.1	One (1) Innovative Industries pullout platform shall be located on the driver's side of the pump module. The top surface of the platform shall be constructed of aluminum serrated bar grating for ease of maintenance and to provide a slip-resistant surface for the operator. The platform shall lock in both the retracted and the extended position. The pullout platform shall be capable of supporting a maximum of 500 pounds and shall be wired to the door ajar circuit. The pullout platform's roller assembly shall have a powder coat finish for added corrosion protection.			
478.0	<u>FRONT PUMP ACCESS PANEL</u>	YES	NO	EXCEPTIONS / NOTES
478.1	A tread plate access panel shall be provided on the front of the pump compartment. The panel shall be of the single pan design and shall be positively latched in the closed position utilizing compression latches. An aluminum sill protector shall be installed on the bottom of the door opening to protect the paint from chipping and scratching. This area shall be accessible when the cab is tilted.			

479.0	<u>CONTROL PANEL</u>	YES	NO	EXCEPTIONS / NOTES
479.1	<p>The driver's side of the pump enclosure shall be divided into two sections. The lower section shall be where all valve controls, the primer control, the discharge relief valve controls (pilot valve), and other mechanical controls are located. This surface shall be referred to as the "control panel".</p> <p>All valve controls shall be the self-locking type, activated by either direct control or with a direct linkage utilizing friction locking bell cranks and universal ball swivels. The primary valve handles shall have color-coded tags installed in a recessed area to clearly denote the purpose of each control.</p>			
480.0	<u>INSTRUMENT PANEL</u>	YES	NO	EXCEPTIONS / NOTES
480.1	<p>The surface up above the control panel shall contain all instruments, gauges, test fittings, and optional controls. This surface shall be referred to as the "instrument panel". The instrument panel shall be independent and hinged and latched so that it may be opened. All instruments, gauges, and other equipment shall be installed with sufficient slack in any cabling, tubing, or plumbing to allow the panel to swivel to the fully open position.</p> <p>The instrument and gauge panel shall be vertically hinged "swing out" to provide access for service.</p>			
481.0	<u>PUMP PANEL LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
481.1	<p>The pump operator's control panel and the officer's side pump panel shall each be illuminated by LED lighting. The pump panel lights shall become energized upon setting the parking brake so the gauge information provided may be consulted. A stainless-steel shield shall be installed over the pump panel lights to further protect them from the elements and to act as a reflector for additional illumination.</p> <p>The pump panel lighting shall become energized automatically upon setting the parking brake so the gauge information may be consulted at any time the apparatus is parked.</p>			

482.0	<u>FUEL TANK GAUGE</u>	YES	NO	EXCEPTIONS / NOTES
482.1	<p>A 2" fuel tank gauge shall be provided on the pump panel. The gauge shall provide fuel tank readouts for the pump operator during fire ground operations.</p> <p>The shaft shall be splined to receive broached impeller hubs, for greater resistance to wear, torsional vibration, and torque imposed by the engine, as well as ease of maintenance and repair.</p>			
483.0	<u>OFFICER'S SIDE PUMP PANEL</u>	YES	NO	EXCEPTIONS / NOTES
483.1	A single panel shall be installed on the officer's side of the pump enclosure. This shall be the area where any officer's side discharges, inlets, steamers, and other pump-associated equipment are located. This panel shall be easily removable and held in place with quick-release push latches. It shall be fully removable for pump and plumbing access without the need to use hand tools. Any electrical equipment that may be installed shall be equipped with connectors so they may be easily separated from the opening created when the below-described front access panel is removed.			
484.0	<u>PANEL SURFACES</u>	YES	NO	EXCEPTIONS / NOTES
484.1	The control panel, instrument panel, and officer's side pump panel shall be fabricated from a minimum of 16-gauge stainless steel with a #4 brushed finish.			
485.0	<u>GARNISH RING BEZEL ASSEMBLIES</u>	YES	NO	EXCEPTIONS / NOTES
485.1	Innovative Controls intake and/or discharge garnish rings shall be installed on the apparatus with mounting bolts. These bezel assemblies shall be used to identify intake and/or discharge ports with color and verbiage. The garnish rings shall be 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 shall feature a chrome-plated panel mount bezel with durable UV-resistant polycarbonate inserts. All insert labels meet UL969 and NFPA standards.			

486.0	<u>VERBIAGE TAG BEZEL ASSEMBLIES</u>	YES	NO	EXCEPTIONS / NOTES
486.1	Innovative Controls verbiage tag bezels shall be installed. The bezel assemblies will be used to identify apparatus components. These tags shall be 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 verbiage tag bezel assemblies shall include a chrome plated panel mount bezel with durable easy-to-read UV-resistant polycarbonate inserts featuring the specified verbiage and color coding. These UV-resistant polycarbonate verbiages and color inserts shall be subsurface screen printed to eliminate the possibility of wear and protect the inks from fading. Both the insert labels and bezel shall meet UL969 and NFPA standards.			
487.0	<u>SAFETY MESSAGE BEZEL ASSEMBLIES</u>	YES	NO	EXCEPTIONS / NOTES
487.1	Innovative Controls safety message bezels shall be installed. The bezel assemblies will be used to identify, instruct, or warn the operators. These tags shall be 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 safety message bezel assemblies shall include a chrome plated panel mount bezel with durable easy-to-read UV-resistant polycarbonate inserts featuring ANSI safety standard graphics or custom graphics. These UV-resistant polycarbonate graphic inserts shall be subsurface screen printed to eliminate the possibility of wear and protect the inks from fading. Both the graphic insert labels and bezel shall meet UL969 and NFPA standards.			
488.0	<u>MIDSHIP MOUNT FIRE PUMP</u>	YES	NO	EXCEPTIONS / NOTES
488.1	The pump shall be a Waterous CSUC20 2000 U.S. GPM fire pump. The pump shall be a single-stage centrifugal class "A" rated fire pump, designed specifically for the fire service. The pump body shall be cast as two (2) horizontally split pieces. The body shall be made of high tensile, close grained gray iron with a minimum tensile strength of 40,000 PSI.			

489.0	<u>FLAME-PLATED IMPELLER HUBS</u>	YES	NO	EXCEPTIONS / NOTES
489.1	The pump impellers shall be bronze, specifically designed for the fire service, and accurately balanced for vibration-free running. The stripping edges shall be located on opposite sides of the impellers to reduce shaft deflection. The impeller shaft shall be stainless steel, accurately ground to size, and supported at each end by oil or grease lubricated antifriction ball bearings for rigid, precise support. The bearings used on the impeller shaft shall be automotive-type bearings, easily cross-referenced and readily available at normal parts or bearing stores. The impeller hubs shall be flame plated with tungsten carbide to hardness approximately twice that of tool steel to assure maximum pump life and efficiency. During the flame plating process, the base metal shall not be allowed to exceed a temperature of 300 degrees Fahrenheit to prevent altering the metallurgical properties of the impeller material.			
490.0	<u>IMPELLER WEAR RINGS</u>	YES	NO	EXCEPTIONS / NOTES
490.1	The pump shall be equipped with replaceable bronze wear rings for increased pump life and minimum maintenance cost. The wear rings shall be designed to fit into a groove in the face of the impeller hubs forming a labyrinth that, as the clearance increases with age, directs water from the discharge side in several directions eventually exiting outward, away from the eye of the impeller hub.			
491.0	<u>PUMP TRANSMISSION</u>	YES	NO	EXCEPTIONS / NOTES
491.1	The pump shall have a Waterous model C20 series transmission. The housing of the transmission shall be constructed of high strength, three piece, horizontally split aluminum. The drive line shafts shall be made from alloy steel forgings, hardened, and ground to a size 2.350-inch 46 tooth involute spline. The drive and driven sprockets shall be made of steel and shall be hardened and have ground bores. The drive chain shall be a Morse HV high strength involute form chain. Bearings shall be a deep groove, anti friction ball bearings and shall give support and proper alignment with the impeller shaft assembly.			

491.2	Bearings shall be oil splash lubricated, completely separated from the water being pumped, and protected by a Vring and oil seal. An internal lubrication system shall deliver lubricant directly to the drive chain. This unique design eliminates the need for an external lubrication pump and auxiliary cooling. The pump and transmission shall be easily separable. A two-piece shaft shall be splined allowing for individual repair of either the pump or transmission, to keep downtime to a minimum. All drive line components shall have a torque rating equal to or greater than the final net engine torque.			
492.0	<u>MECHANICAL SEALS</u>	YES	NO	EXCEPTIONS / NOTES
492.1	The pump shall be equipped with self-adjusting, maintenance-free mechanical shaft seals that shall not require manual adjustment. These seals shall be designed in a manner such that they shall remain functional enough to permit continued use of the pump in the unlikely event of a seal failure.			
493.0	<u>ALLOY ANODES</u>	YES	NO	EXCEPTIONS / NOTES
493.1	Four (4) OEM-supplied alloy anodes shall be provided with the fire pump. The anodes shall be installed as follows: Two (2) in the suction manifold of the fire pump • Two (2) in the discharge manifold of the fire pump.			
494.0	<u>PUMP RATING, 2000 GPM</u>	YES	NO	EXCEPTIONS / NOTES
494.1	The pump shall be rated at 2000 gallons per minute.			
495.0	<u>FIRE PUMP MOUNTING</u>	YES	NO	EXCEPTIONS / NOTES
495.1	The fire pump shall be mounted within a separate body module that is not directly connected to the apparatus body. The pump shall be frame mounted; therefore minimizing the likelihood of the pump casing cracking should the apparatus be involved in a collision. The pump module shall be mounted to the frame in a minimum of four (4) locations and shall be reinforced appropriately to carry the expected load for the life of the apparatus.			
496.0	<u>PUMP SHIFT</u>	YES	NO	EXCEPTIONS / NOTES
496.1	The pump shift shall be supplied and installed by the chassis manufacturer. The pump system shift indicator lights in the chassis cab shall be supplied and installed by the chassis manufacturer. The pump system shift indicator lights on the operator's panel shall be incorporated with the pump pressure governor.			

497.0	<u>PRESSURE GOVERNOR</u>	YES	NO	EXCEPTIONS / NOTES
497.1	A Fire Research Pump Boss 400 pressure governor and monitoring display system shall be installed. The system shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8" wide by 1 1/2" deep. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red control module. Inputs for monitored information shall be a J1939 data bus or independent sensors. Outputs for engine control shall be on the J1939 data bus or engine-specific wiring. Inputs to the control module from the pump discharge and intake pressure sensors shall be electrical.			
497.2	<p>The following continuous displays shall be provided:</p> <ul style="list-style-type: none"> • Engine RPM; shown with four daylight bright LED digits more than 1/2" high • Check engine and stop engine warning LEDs • Oil pressure; shown on a dual color (green/red) LED bar graph display • Engine coolant temperature; shown on a dual color (green/red) LED bar graph display • Transmission Temperature: shown on a dual color (green/red) LED bar graph display • Battery voltage; shown on a dual color (green/red) LED bar graph display • Pressure and RPM operating mode LEDs • Pressure / RPM setting; shown on a dot matrix message display • Throttle-ready LED 			

<p>497.3</p>	<p>The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. The LED intensity shall be automatically adjusted for day and nighttime operation. The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. The kit shall monitor inputs and support audible and visual warning alarms for the following conditions:</p> <ul style="list-style-type: none"> • High Battery Voltage • Low Battery Voltage (Engine Off) • Low Battery Voltage (Engine Running) • High Transmission Temperature • Low Engine Oil Pressure • High Engine Coolant Temperature • Out of Water (visual alarm only) • No Engine Response (visual alarm only) <p>The program features shall be accessed via pushbuttons located on the front of the control module. A USB port shall be located at the rear of the control module to upload future firmware enhancements.</p>			
	<p>The governor shall operate in two control modes: pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle-ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode, the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 PSI. Other safety features shall include recognition of no water conditions with an automatically programmed response and a push button to return the engine to idle.</p> <p>An interlock system shall be provided to prevent the advancement of the engine speed at the pump operator's panel unless the apparatus has a "Throttle Ready" indication.</p> <p>The pressure governor and monitoring pressure display shall be programmed to interface with a specific engine.</p>			

498.0	<u>INTAKE RELIEF VALVE</u>	YES	NO	EXCEPTIONS / NOTES
498.1	An Elkhart Brass intake relief valve shall be installed on the suction side of the pump. The valve shall be the preset type, adjustable from 75 to 250 PSI, and shall be designed to prevent vibration from altering the setting. The relief outlet shall be directed below the pump with the discharge terminating in a 2 1/2" male NH threads connection. The discharge shall be away from the pump operator and labeled "Do Not Cap".			
499.0	<u>TRIDENT PRIMING PUMP</u>	YES	NO	EXCEPTIONS / NOTES
499.1	The priming pump shall be a Trident Emergency Products three-barrel, compressed air powered, high efficiency, multistage, venturi-based Air Prime System. All wetted metallic parts of the priming system are to be of brass and stainless steel construction. A pressure protection valve shall be installed with the priming pump. A single panel mounted control shall activate the priming pump and open the priming valve to the pump.			
500.0	<u>MASTER DRAIN VALVE</u>	YES	NO	EXCEPTIONS / NOTES
500.1	A Trident manifold drain valve assembly shall be supplied. This drain shall provide the capability to drain the entire pump by turning a single control. The valve assembly shall consist of a stainless-steel plate and shaft in a bronze body with multiple ports. The drain valve control shall be mounted on the driver's side pump panel and labeled "Master Drain".			
501.0	<u>OVERHEAT PROTECTION SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
501.1	A Waterous Relief Valve shall be furnished to protect from overheating of the pump. The system shall operate by relieving water from the pump when under pressure if the water temperature exceeds a preset temperature. A panel-mounted warning light shall be included to indicate when the system has been activated.			
502.0	<u>PAINT PUMP RED/PAINT INTAKES PRIMARY BODY COLOR</u>	YES	NO	EXCEPTIONS / NOTES
502.1	The pump body shall be painted with PPG polyurethane enamel paint. The pump enclosure shall be painted the same color as the apparatus body. The main intake(s) and auxiliary intake valves shall be painted with a PPG polyurethane enamel paint. The paint color shall be the same as the apparatus body			
503.0	<u>PAINT WATEROUS SINGLE-STAGE PUMP CONTROL ROD BLACK</u>	YES	NO	EXCEPTIONS / NOTES
503.1	The Waterous single-stage pump control rod shall be painted black.			

504.0	<u>HEAT EXCHANGER / HEATED PUMP CORE</u>	YES	NO	EXCEPTIONS / NOTES
504.1	An automatic heat exchanger system shall be provided in the pump. Antifreeze from the vehicle engine shall flow through the pump core jacket. Water flow from the fire pump shall be used to cool the engine antifreeze. This feature shall assist against the pump freezing in cold climates and provide auxiliary cooling to the truck engine.			
505.0	<u>PUMP AND ENGINE COOLING SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
505.1	<p>There shall be a pump and engine cooling system provided on the apparatus. The cooling system shall keep the engine cool when running for long periods and the pump cool during long periods of pumping when water is not being discharged. The cooling system shall also be set up in a way that the cooling system lines can be easily drained through the master pump drain.</p> <p>The cooling system lines shall consist of high-pressure, high-temperature 3/4" (inside diameter) abraded rubber hose. The engine cooling lines shall be installed with one (1) line going from the discharge side of the water pump through an Innovative Controls, model 3004204, 3/8" inline quarter turn ball valve assembly and continuing to the chassis heat exchanger. The return line from the heat exchanger shall then run into the suction side of the pump.</p> <p>The pump cooling lines shall be installed with one (1) line going from the discharge side of the water pump through an Innovative Controls, model 300305920001, 3/4" inline quarter turn ball valve assembly up to the water tank. At the water tank, the pump cooling line shall be plumbed into a 3/4" check valve on the "Tank Fill" valve. The check valve shall prevent tank water from back flowing into the pump when the cooling system is not in use. A return line from the water tank shall be plumbed into the water pump.</p> <p>The engine cooling system valve shall be controlled on the operator's panel, and shall be clearly labeled, "Engine Cooler".</p> <p>The pump cooling system valve shall be controlled on the operator's panel, and shall be clearly labeled, "Pump Cooler".</p>			
506.0	<u>PUMP MANUALS</u>	YES	NO	EXCEPTIONS / NOTES
506.1	Two (2) manuals covering the fire pump transmission and selected options of the fire pump shall be provided with the apparatus.			

507.0	<u>AIR OUTLET ON PUMP PANEL</u>	YES	NO	EXCEPTIONS / NOTES
507.1	A 1/4" quick connect female air outlet shall be located on the driver's side pump panel. This fitting shall be connected to the chassis air brake system. A check valve shall be installed in the line to keep water from backing into the system. The air outlet shall include 25' of air pressure line that shall be housed in one of the body compartments. The air pressure line shall be supplied with a male coupling on one end and a tire gauge/ adapter on the other end.			
508.0	<u>AUTO LUBE FILL EXTENSION ON PUMP PANEL</u>	YES	NO	EXCEPTIONS / NOTES
508.1	There shall be an Groeneveld Auto Lube fill extension provided on the pump panel. The fill extension shall allow for remote filling of the Auto Lube system reservoir.			
509.0	<u>FOAM SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
509.1	A Williams Fire and Hazard Control, Inc., model #WATP1500VCFD, around the pump foam proportioning system shall be provided to proportion Class B foam concentrates into the suction side of the fire pump. The system shall have foam solution capacities of 130-3750 GPM @ 1-6% for Class B foam concentrates utilizing a common, infinitely adjustable metering valve and associated system components. The system shall be capable of operating at pump suction pressures up to 33% of pump main discharge pressure and shall produce foam solution at all discharge outlets simultaneously when in operation.			
510.0	<u>CONTROL PANEL</u>	YES	NO	EXCEPTIONS / NOTES
510.1	The foam system shall be controlled from the pump operators position and shall have a system control panel to include the following three controls: <ul style="list-style-type: none"> • System ON / OFF control valve • Flush ON / OFF control valve • Foam source control switch (TANK / AUXILIARY) 			
511.0	<u>FOAM CONCENTRATE EDUCTOR</u>	YES	NO	EXCEPTIONS / NOTES
511.1	A Williams 2", High Head jet pump eductor shall be provided for installation within the fire pump intake housing/piping to introduce foam concentrate into the suction side of the fire pump. The jet pump shall be supplied motive water from the fire pump discharge housing/piping when in operation. The jet pump eductor shall be capable of operating at pump suction pressures up to 33% of pump main discharge pressure.			
512.0	<u>AUX FOAM INLET AND FOAM PICKUP TUBE</u>	YES	NO	EXCEPTIONS / NOTES
512.1	A 2" auxiliary foam inlet shall be installed with a 2" x 12" clear PVC foam pickup tube. A 2" chrome cap with a chain on the inlet shall be provided.			

513.0	<u>METERING VALVE</u>	YES	NO	EXCEPTIONS / NOTES
513.1	A common, infinitely adjustable proportioning metering valve shall be provided at the operator's position to allow for system proportioning capacity settings. The metering valve shall be of bronze construction with Teflon seats. The valve shall permit operator selection of .250, .500, 1.0, 3 .0, and 6.0% proportioning settings at six specific and infinite intermediate solution flow rates and shall have integral OFF capability.			
514.0	<u>FOAM SUCTION STRAINER</u>	YES	NO	EXCEPTIONS / NOTES
514.1	A 2" bronze "Y" strainer with a blowdown port shall be provided and installed within the jet pump foam suction piping to protect the foam system from foreign matter.			
515.0	<u>FOAM SUCTION CHECK VALVE</u>	YES	NO	EXCEPTIONS / NOTES
515.1	A 2" check valve shall be provided and installed within the jet pump eductor foam suction piping to prevent back pressure and flushing water contamination of the foam concentrate storage tank.			
516.0	<u>FOAM OFF TRUCK INLET CHECK VALVE</u>	YES	NO	EXCEPTIONS / NOTES
516.1	A 2" check valve shall be provided and installed for the off-truck foam pickup. The valve shall keep the foam from the foam tank from back feeding into the off-truck tote if personnel forget to close the tank valve when using the off-truck portion of the system.			
517.0	<u>FOAM CONCENTRATE / FLUSHING INTAKE</u>	YES	NO	EXCEPTIONS / NOTES
517.1	A 2" gated foam concentrate and flushing intake located on the pump enclosure panel shall be provided. The quarter turn valve shall be provided with 2" male NH threads and an NH cap with a retaining chain. The intake shall be piped to the foam jet pump suction piping between the A tank suction check valve and strainer and shall be utilized for external Class B foam concentrate source operation.			
518.0	<u>MOTIVE WATER CONTROL VALVE</u>	YES	NO	EXCEPTIONS / NOTES
518.1	A 1 1/2" manual motive water flow control valve shall be provided for installation in a minimum 1 1/2" port in the fire pump discharge housing/piping to supply pressurized motive water to the jet pump eductor water inlet to allow system operation. The valve shall be controlled from the main system control panel.			
519.0	<u>MOTIVE WATER STRAINER</u>	YES	NO	EXCEPTIONS / NOTES
519.1	A 1 1/2" bronze "Y" strainer with a blowdown port shall be provided and installed within the jet pump motive water supply line to protect the foam system jet pump eductor inlet from foreign matter.			

520.0	<u>FLUSHING WATER VALVE</u>	YES	NO	EXCEPTIONS / NOTES
520.1	A 1" manual valve shall be provided for installation in a minimum 1" port in the fire pump discharge housing/piping to utilize the water pump for foam system flushing. The valve shall be controlled at the main system control panel.			
521.0	<u>FOAM SYSTEM PLUMBING</u>	YES	NO	EXCEPTIONS / NOTES
521.1	Piping and fittings outboard of the foam jet pump eductor shall be stainless steel, brass, and/or highpressure hoses. Grooved couplings shall be used throughout the piping system to allow for chassis flex and ease of dismantling for repairs and maintenance. All gasket materials shall be compatible with foam liquids.			
522.0	<u>NFPA #1901 DESIGN AND PERFORMANCE REQUIREMENTS</u>	YES	NO	EXCEPTIONS / NOTES
522.1	<p>The proportioning system shall be capable of proportioning foam concentrate in accordance with the foam concentrate manufacturer's recommendations for the types of foam concentrates used in the system over the system design range of flow and pressures. The foam proportioning system water flow characteristics and the range of proportioning ratios shall be specified as noted herein.</p> <p>The foam system shall comply with the current applicable sections in accordance with NFPA 1901, current edition as it relates to this specified foam system. Foam system manufacturer options and/or components may be required in addition to those listed within these specifications to be in accordance with NFPA 1901, current edition compliance as it relates to this specified foam system.</p>			
523.0	<u>FOAM SYSTEM CONTROLS</u>	YES	NO	EXCEPTIONS / NOTES
523.1	<p>The foam proportioning system operating controls shall be located at or near the pump operator's position and shall be clearly identified.</p> <p>Foam proportioning systems that incorporate foam concentrate metering valves shall have each metering valve calibrated and marked to indicate the rates of the foam concentrate proportioning available as determined by the design of the system.</p>			

524.0	<u>LABELS, NAMEPLATES, AND INSTRUCTIONS SPECIFICATION</u>	YES	NO	EXCEPTIONS / NOTES
524.1	<p>An instruction plate shall be provided for the foam proportioning system that includes, at a minimum, the piping schematic of the system and basic operating instructions. A nameplate that is marked clearly with the identification and function shall be provided for each control, gauge, and indicator related to the foam proportioning system.</p> <p>A label shall be provided on the pump operator's panel that identifies the types of foam concentrates that the foam proportioning system is designed to use. It shall also state the minimum/maximum foam proportioning rates at the minimum/maximum foam proportioning rated system flow and pressure.</p>			
525.0	<u>MANUALS</u>	YES	NO	EXCEPTIONS / NOTES
525.1	Two (2) copies of an operations and maintenance manual shall be provided. They shall include a complete system diagram together with operating instructions and details outlining all recommended maintenance procedures.			
526.0	<u>YELLOW BACKGROUND PLATE</u>	YES	NO	EXCEPTIONS / NOTES
526.1	A yellow painted background plate shall be located on the pump panel directly behind the foam system controls.			
527.0	<u>FOAM PROPORTIONING SYSTEM TESTING</u>	YES	NO	EXCEPTIONS / NOTES
527.1	The foam proportioning system shall be tested and certified after final installation in accordance with NFPA 1901, current edition.			
528.0	<u>PLUMBING MANIFOLD</u>	YES	NO	EXCEPTIONS / NOTES
528.1	<p>The plumbing manifold shall consist of the inlet side manifold and the discharge side manifold.</p> <p>The inlet side of the plumbing manifold shall utilize schedule 10, 304-grade stainless steel tubing and preformed elbows for inlets that are larger than 3". Side auxiliary inlets that are 3" or smaller shall utilize schedule 40, 304-grade stainless steel threaded tubing and preformed elbows.</p> <p>The inlet manifold shall thread into the pump auxiliary inlet ports and each inlet valve shall thread onto the inlet manifold.</p>			

528.2	The discharge side of the plumbing manifold shall utilize schedule 40, 304-grade stainless steel tubing and pre-formed elbows to ensure the quality of the manifold where welds are required. The discharge manifold shall connect to the pump discharge ports using ½” stainless steel flanges that shall be machined to seat an O-ring to ensure a leakproof seal. Each discharge shall derive from a port on the manifold assembly connected to a discharge valve with 1/2” 304-grade stainless steel flanges. Discharges that terminate in a location other than the pump module (i.e. rear discharges) that do not require welding shall utilize a combination of high-pressure flex hose and schedule 10, 304-grade stainless steel tubing to allow flexibility between the body and the pump module.			
529.0	<u>INNOVATIVE CONTROLS DISCHARGE GAUGES</u> <u>2 1/2" 0-400 PSI</u>	YES	NO	EXCEPTIONS / NOTES
529.1	<p>The discharge gauges on the apparatus shall be 2 1/2” diameter Innovative Controls pressure gauges. The gauges shall have a one-piece diecast brass case that integrates the valve stem connection, movement support, and bourdon tube support into a single unit that eliminates distortion and leakage. Clear scratch-resistant molded lenses shall be used to ensure distortion-free viewing and they shall be sealed to the gauge by being trapped together with a profile gasket by a crimped stainless-steel bezel. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40° F to +160°F.</p> <p>The gauges shall exceed ASME B40.100 Grade B 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.</p> <p>Polished stainless steel bezels shall be provided to prevent corrosion and protect lenses and gauge cases. The gauges shall be installed into decorative chrome-plated mounting bezels that incorporate valve-identifying verbiage and/or color labels.</p> <p>The gauges shall display a range from 0 to 400 PSI and shall have an orange tip on the pointer.</p>			

530.0	<u>MASTER PRESSURE CENTER ASSEMBLY</u>	YES	NO	EXCEPTIONS / NOTES
530.1	<p>The master gauges shall be installed on the pump panel no more than 6 inches apart in an integrated master pressure assembly that includes the two (2) master gauges and the test port manifold.</p> <p>The master intake and master discharge gauges shall be 4” diameter Innovative Controls pressure gauges. Each gauge shall have a one-piece diecast brass case that integrates the valve stem connection, movement support, and bourdon tube support into a single unit that eliminates distortion and leakage. A clear scratch-resistant molded lens shall be used to ensure distortion-free viewing and it shall be sealed to the gauge by being trapped together with a profile gasket by a crimped stainless steel bezel. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from – 40°F to +160°F.</p> <p>Each gauge shall exceed ASME B40.100 Grade B 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. A polished stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.</p> <p>The two (2) master gauges shall be installed into a 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.</p> <p>The gauge on the left shall be the master pump intake gauge and display a range from 30 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 burgundy graphics on a white background.</p>			

531.0	<u>HARDWARE BRAND</u>	YES	NO	EXCEPTIONS / NOTES
531.1	<p>The non-Storz discharge and intake fittings provided on this apparatus shall be South Park Corp. Brand. The adapter/cap/plug fittings shall be manufactured from high-quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.</p> <p>The Storz discharge and intake fittings provided on this apparatus shall be Task Force Tips Brand.</p> <p>The auxiliary intake(s) shall terminate with NH swivels, and the discharges shall terminate with male NH threads.</p>			
532.0	<u>DISCHARGE, PRECONNECT, AND INTAKE DRAINS</u>	YES	NO	EXCEPTIONS / NOTES
532.1	An Innovative Controls 3/4" quarter turn drain valve shall be included on each discharge, gated intake, and steamer valve (if applicable). A side stem, long stroke chrome plated lift handle shall be provided on the drain valve to facilitate use with a gloved hand. The drain valve shall have a verbiage tag that angles upward so that it can easily be seen and read by the operator before opening. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with a flexible hose that is routed in such a manner as to assure complete drainage below the apparatus. A matching color-coded bezel shall be included.			
533.0	<u>AUTOMATIC DRAINS</u>	YES	NO	EXCEPTIONS / NOTES
533.1	A Class 1 automatic drain shall be installed on the deluge valve (if applicable). The drains shall also be located in low laying areas (i.e., front discharge) The Drains will open whenever the pressure in the line drops below 6 PSI.			
534.0	<u>PLUMBING LABELS</u>	YES	NO	EXCEPTIONS / NOTES
534.1	Innovative Controls brand labels shall be used to identify any pump valve controller, gauge, or drain on the apparatus. The labels shall be color coded in accordance with NFPA 1901, current edition compliance. The colors and verbiage of the labels shall be the OEM standard label package. The label package shall comply with the following:			

534.2	<ul style="list-style-type: none"> • Each Pump to Tank Fill shall be labeled "Tank Fill" and shall have a light blue label color. • Each Tank-to-Pump shall be labeled "Tank to Pump" and shall have a navy blue label color. • Each intake label shall be burgundy in color and shall have verbiage to identify it. • Each discharge label shall have a unique color and shall have verbiage to identify it. • For easy identification of each component, the verbiage of each label shall be size 22 pt, font "Helvetica Neue Condensed Bold" 			
534.3	The tank plumbing valves and controllers shall have the OEM Standard label package unless stated otherwise. The Pump to Tank Fill shall be labeled "TANK FILL" and shall have a light blue label color. The Tank to Pump shall be labeled "TANK TO PUMP" and shall have a Navy-Blue label color.			
535.0	<u>2" TANK FILL</u>	YES	NO	EXCEPTIONS / NOTES
535.1	<p>A 2" tank fill shall be plumbed from the pump to the tank. Installation shall be completed with 2" Class 1 rubber hose and stainless-steel hose couplings.</p> <p>An Akron Brass, model 8820, 2" Swing Out valve shall be provided. The valve shall have an all-brass body with a flow-optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a warranty from the valve manufacturer.</p>			
536.0	<u>PUMP TO TANK FILL HANDLE</u>	YES	NO	EXCEPTIONS / NOTES
536.1	2", Akron 8800 2" manual valve, push pull style handle			
537.0	<u>3" TANK TO PUMP</u>	YES	NO	EXCEPTIONS / NOTES
537.1	A 3" tank-to-pump shall be plumbed with a Class 1 flexible hose from the tank to the suction side of the pump. An Akron Brass, model 8830, 3" Swing Out valve shall be provided. The valve shall have an all brass body with a flow-optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball.			

537.2	<p>The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall also include a necessary B3SH pump flange adapter, which shall be specifically used for the tank-to-pump line to properly adjust the plumbing based on the pitch of the pump. The valve shall carry a warranty from the valve manufacturer.</p> <p>A check valve shall be between the pump suction and the booster tank valve. The check valve shall eliminate backflow into the water tank when the pump is connected to a pressurized source.</p> <p>The valve shall be actuated by an Akron Brass, model R1 manual actuator. The manual actuator shall be controlled by an Innovative Controls push/pull T-handle.</p>			
538.0	<u>TANK TO PUMP HANDLE</u>	YES	NO	EXCEPTIONS / NOTES
538.1	3", Akron 8800 3" manual valve, push pull style handle			
539.0	<u>6" DRIVER SIDE MAIN INTAKE</u>	YES	NO	EXCEPTIONS / NOTES
539.1	<p>There shall be a 6" main intake located on the driver's side of the pump module. The suction fittings shall include a removable diecast screen to provide cathodic protection for the pump thus reducing corrosion. A short steamer barrel shall be installed to accommodate an intake valve without exceeding the legal overall body width.</p> <p>There shall be one (1) KocheK model SKE56R, 6" Female NH swivel rocker lug x 5" Storz 30° elbow adapter provided. The adapter shall be lightweight aluminum with a black KCoat finish.</p> <p>There shall be one (1) KocheK model CC507, 5" Storz blind cap with the chain provided. The cap shall have a KCoat finish.</p>			
540.0	<u>BUTTERFLY VALVE</u>	YES	NO	EXCEPTIONS / NOTES
540.1	A 6" butterfly valve with an automatic relief and manual control shall be installed in the side suction sleeve casting completely behind the panel. A hand-wheel control shall be provided through the side panel. The automatic relief valve shall be mounted on the intake side of the butterfly valve and factory preset to 125PSI with a maximum pressure of 300PSI. The valve shall relieve excess pressure to the atmosphere. A green "open" indicator light and a red "closed" indicator light shall be provided.			

541.0	<u>BLEEDER VALVE</u>	YES	NO	EXCEPTIONS / NOTES
541.1	An inline bleeder/drain valve shall be provided on the steamer inlet. The valve shall be used to bleed off air or water in accordance with NFPA 1901, current edition.			
542.0	<u>INTAKE RELIEF VALVE</u>	YES	NO	EXCEPTIONS / NOTES
542.1	An Elkhart Brass intake relief valve shall be installed on the steamer valve. The valve shall be the preset type, adjustable from 75 to 250 PSI, and shall be designed to prevent vibration from altering the setting. The relief outlet shall be directed below the pump with the discharge terminating in a 2 1/2" male NH threads connection. The discharge shall be away from the pump operator and labeled "Do Not Cap".			
543.0	<u>2 1/2" DRIVER'S SIDE AUXILIARY INTAKE</u>	YES	NO	EXCEPTIONS / NOTES
543.1	<p>A 2 1/2" gated auxiliary intake with 2 1/2" plumbing shall be provided on the driver's side of the pump module. The auxiliary intake shall be fully recessed behind the panel to keep the valve protected from the elements.</p> <p>An Akron Brass, model 8825, 2 1/2" SwingOut valve shall be provided. The valve shall have an all-brass body with a flow-optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be manufactured and assembled in the United States. The valve shall carry a warranty from the valve manufacturer.</p> <p>The valve shall be actuated by an Akron Brass, model TSC manual actuator installed directly on the valve. The handle shall allow the valve to be controlled directly at the valve.</p> <p>One (1) 2 1/2" NH thread rocker lug chrome plated vented plug, complete with cable or chain, shall be provided.</p>			
544.0	<u>6" OFFICER SIDE MAIN INTAKE</u>	YES	NO	EXCEPTIONS / NOTES
544.1	A 6" main intake shall be located on the officer's side of the pump module. The suction fittings shall include a removable diecast screen to provide cathodic protection for the pump thus reducing corrosion. A short steamer barrel shall be installed to accommodate an intake valve without exceeding the legal overall body width. The intake shall terminate male NH threads.			

544.2	<p>There shall be one (1) Kochek model SKE56R, 6" Female NH swivel rocker lug x 5" Storz 30° elbow adapter provided. The adapter shall be lightweight aluminum with a black KCoat finish.</p> <p>There shall be one (1) Kochek model CC507, 5" Storz blind cap with the chain provided. The cap shall have a KCoat finish.</p>			
545.0	<u>BUTTERFLY VALVE</u>	YES	NO	EXCEPTIONS / NOTES
545.1	A 6" butterfly valve with an automatic relief and manual control shall be installed in the side suction sleeve casting completely behind the panel. A hand-wheel control shall be provided through the side panel. The automatic relief valve shall be mounted on the intake side of the butterfly valve and factory preset to 125PSI with a maximum pressure of 300PSI. The valve shall relieve excess pressure to the atmosphere. A green "open" indicator light and a red "closed" indicator light shall be provided.			
546.0	<u>BLEEDER VALVE</u>	YES	NO	EXCEPTIONS / NOTES
546.1	An inline bleeder/drain valve shall be provided on the steamer inlet. The valve shall be used to bleed o air or water in accordance with NFPA 1901, current edition.			
547.0	<u>INTAKE RELIEF VALVE</u>	YES	NO	EXCEPTIONS / NOTES
547.1	An Elkhart Brass intake relief valve shall be installed on the steamer valve. The valve shall be the preset type, adjustable from 75 to 250 PSI, and shall be designed to prevent vibration from altering the setting. The relief outlet shall be directed below the pump with the discharge terminating in a 2 1/2" male NH threads connection. The discharge shall be away from the pump operator and labeled "Do Not Cap".			
548.0	<u>2 1/2" OFFICER'S SIDE AUXILIARY INTAKE</u>	YES	NO	EXCEPTIONS / NOTES
548.1	<p>A 2 1/2" gated auxiliary intake with 2 1/2" plumbing shall be provided on the officer's side of the pump module. The auxiliary intake shall be fully recessed behind the panel to keep the valve protected from the elements.</p> <p>An Akron Brass, model 8825, 2 1/2" Swingout valve shall be provided. The valve shall have an all-brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball.</p>			

548.2	<p>The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be manufactured and assembled in the United States. The valve shall carry by the valve manufacturer.</p> <p>The valve shall be actuated by an Akron Brass, model TSC manual actuator installed directly on the valve. The handle shall allow the valve to be controlled directly at the valve.</p>			
549.0	<u>2 1/2" DRIVER'S SIDE DISCHARGE</u>	YES	NO	EXCEPTIONS / NOTES
549.1	<p>A 2 1/2" discharge with 2 1/2" plumbing shall be located on the driver's side of the pump compartment. The discharge shall terminate with a male NH thread.</p> <p>An Akron Brass, model 8625, 2 1/2" SwingOut™ valve shall be provided. The valve shall have an all-brass body with a flow-optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be manufactured and assembled in the United States. The valve shall carry a warranty from the valve manufacturer.</p> <p>The valve shall be actuated by an Akron Brass manual gear actuator installed on the valve. The gear actuator shall operate at a 50:1 gear ratio, which operates from fully open to fully closed in twelve (12) rotations.</p>			
549.2	<p>The gear actuator shall be controlled by an Akron Brass 5" handwheel valve controller. The handwheel worm gear shall be connected to the remote-mounted valve via a rod assembly. The handwheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure. A position indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA standard to minimize the effects of a water hammer.</p>			

549.3	<p>The discharge shall have a 2 1/2" brass case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and an orange tip on the pointer.</p> <p>One (1) 2 1/2" female NH thread swivel rocker lug x 2 1/2" male NH thread 30-degree chrome plated elbow adapter shall be provided.</p> <p>One (1) 2 1/2" NH thread rocker lug chrome plated vented cap, complete with cable or chain, shall be provided.</p>			
550.0	<u>2 1/2" DRIVER'S SIDE DISCHARGE</u>	YES	NO	EXCEPTIONS / NOTES
550.1	<p>A 2 1/2" discharge with 2 1/2" plumbing shall be located on the driver's side of the pump compartment. The discharge shall terminate with a male NH thread.</p> <p>An Akron Brass, model 8625, 2 1/2" SwingOut™ valve shall be provided. The valve shall have an all-brass body with a flow-optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be manufactured and assembled in the United States. The valve shall carry a warranty from the valve manufacturer.</p> <p>The valve shall be actuated by an Akron Brass manual gear actuator installed on the valve. The gear actuator shall operate at a 50:1 gear ratio, which operates from fully open to fully closed in twelve (12) rotations.</p> <p>The gear actuator shall be controlled by an Akron Brass 5" handwheel valve controller.</p> <p>The handwheel worm gear shall be connected to the remote-mounted valve via a rod assembly. The handwheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure. A position indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA standard.</p>			

550.2	<p>The discharge shall have a 2 1/2" brass case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and an orange tip on the pointer.</p> <p>One (1) 2 1/2" female NH thread swivel rocker lug x 2 1/2" male NH thread 30-degree chrome plated elbow adapter shall be provided.</p> <p>One (1) 2 1/2" NH thread rocker lug chrome plated vented cap, complete with cable or chain, shall be provided.</p>			
551.0	<u>2 1/2" OFFICER'S SIDE DISCHARGE</u>	YES	NO	EXCEPTIONS / NOTES
551.1	<p>A 2 1/2" discharge with 2 1/2" plumbing shall be located on the officer's side of the pump compartment. The discharge shall terminate with a male NH thread.</p> <p>An Akron Brass, model 8625, 2 1/2" SwingOut™ valve shall be provided. The valve shall have an all-brass body with a flow-optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be manufactured and assembled in the United States. The valve shall carry a warranty from the valve manufacturer.</p> <p>The valve shall be actuated by an Akron Brass manual gear actuator installed on the valve. The gear actuator shall operate at a 50:1 gear ratio, which operates from fully open to fully closed in twelve (12) rotations.</p> <p>The gear actuator shall be controlled by an Akron Brass 5" handwheel valve controller. The handwheel worm gear shall be connected to the remote-mounted valve via a rod assembly. The handwheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure. A position indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA standard to minimize the effects of a water hammer.</p>			

551.2	<p>The discharge shall have a 2 1/2" brass case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and an orange tip on the pointer.</p> <p>One (1) 2 1/2" female NH thread swivel rocker lug x 2 1/2" male NH thread 30-degree chrome plated elbow adapter shall be provided.</p> <p>One (1) 2 1/2" NH thread rocker lug chrome plated vented cap, complete with cable or chain, shall be provided.</p>			
552.0	4" OFFICER'S SIDE DISCHARGE	YES	NO	EXCEPTIONS / NOTES
552.1	<p>A 4" large diameter discharge, with 4" plumbing, shall be located on the officer's side of the pump compartment. The discharge shall terminate with a male NH thread.</p> <p>One (1) Akron Brass, model 8840, 4" SwingOut valve shall be provided. The valve shall have an all-cast brass valve body with a 4" full flow waterway ideal for flows up to 2000 GPM and a maximum body length of 4". The valve shall utilize a bronze flat ball design with a single urethane seat and be structurally rated to 500 PSI with a 250 PSI operating pressure. The valve shall not require the lubrication of seats or any other internal waterway parts and shall be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a warranty from the valve manufacturer.</p> <p>The valve shall be actuated by an Akron Brass gear actuator installed on the valve. The gear actuator shall operate at a 50:1 gear ratio, which actuates from fully open to fully closed in twelve (12) rotations.</p> <p>The gear actuator shall be controlled by an Akron Brass 6" handwheel valve controller. The handwheel worm gear shall be connected to the remote-mounted valve via a rod assembly. The handwheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure. A position indicator shall show the position of the ball valve in accordance with NFPA 1901, current edition. Opening and closing speed shall comply with the current NFPA standard.</p>			

552.2	<p>The discharge shall have a 2 1/2" brass case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and an orange tip on the pointer.</p> <p>There shall be one (1) Kochek model SKE54R, 4" Female NH swivel rocker lug x 5" Storz 30° elbow adapter provided. The adapter shall be lightweight aluminum with a black KCoat finish.</p> <p>There shall be one (1) Kochek model CC507, 5" Storz blind cap with the chain provided. The cap shall have a KCoat finish</p>			
553.0	<u>1 1/2" FRONT BUMPER DISCHARGE 2 1/2" PLUMBING</u>	YES	NO	EXCEPTIONS / NOTES
553.1	<p>There shall be a 1 1/2" discharge located inside the officer's side hose well of the front bumper. The discharge shall be plumbed with 2 1/2" plumbing and high-pressure flex hose with stainless steel couplings. The discharge shall have a 2 1/2" x 2 1/2" swivel, and a 2 1/2" x 1 1/2" adapter. The discharge shall terminate MNST.</p> <p>The discharge shall have Class1 model 34AD automatic drains installed in the low routed areas below the manual drain. The automatic drains shall open whenever pressure in the line drops below 6 psi.</p> <p>The adapters used for the front plumbing will be added to the specs as follows:</p> <ul style="list-style-type: none"> • One (1) PL15551, ELBOW, 2 1/2NPTX2 1/2NSTM 90d Trident 01.086.5 • One (1) AC10721, ADAPTER, 2 1/2NSTF X 1 1/2NSTM Trident 01.008.0 <p>An Akron Brass, model 8620, 2" SwingOut™ valve shall be provided. The valve shall have an all brass body with a flow-optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be manufactured and assembled in the United States.</p>			

553.2	<p>The valve shall carry a ten (10) year warranty by the valve manufacturer. The valve shall be actuated by an Akron Brass manual gear actuator installed on the valve. The gear actuator shall operate at a 50:1 gear ratio, which operates from fully open to fully closed in twelve (12) rotations.</p> <p>The gear actuator shall be controlled by an Akron Brass 5" handwheel valve controller. The handwheel worm gear shall be connected to the remote-mounted valve via a rod assembly. The handwheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure. A position indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA standard to minimize the effects of water a hammer.</p> <p>The discharge shall have a 2 1/2" brass case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and an orange tip on the pointer.</p> <p>The discharge shall be designated as a pre-connect so no cap and chain shall be required.</p>			
554.0	<u>CROSSLAY CONFIGURATION</u>	YES	NO	EXCEPTIONS / NOTES
554.1	<p>Two (2) 1 1/2" and one (1) 2 1/2" crosslay pre-connects shall be located above the pump panel. A high-pressure flex hose with stainless steel couplings shall be used in the plumbing.</p> <p>A 90-degree swivel elbow shall be utilized to keep the hose from kinking when pulled from either side of the apparatus. The swivel for each crosslay shall be located outboard for ease of making connections while changing the hose.</p> <p>The crosslay area shall be adequately lit to meet requirements.</p> <p>The pre-connect hose beds shall be sized to accommodate the following hose load:</p> <p>The interior of the pre-connect hose bed shall have a maintenance-free abraded finish.</p>			
555.0	<u>CROSSLAY FLOORING</u>	YES	NO	EXCEPTIONS / NOTES
555.1	<p>The floor of the pre-connect area shall be covered with DuraDek fiber reinforced material. The DuraDek shall have "T" beams in parallel connected with cross slats that are first mechanically bonded and then epoxied. The "T" sections shall be spaced 3/4" apart to allow for drainage and ventilation.</p>			

556.0	<u>CROSSLAY ROLLERS</u>	YES	NO	EXCEPTIONS / NOTES
556.1	Stainless steel rollers shall be provided at each end of the crosslay hose bed to facilitate the deployment of the hose. Vertical rollers shall be installed on each side of the hose bed opening and a horizontal roller shall be installed under the opening.			
557.0	<u>CROSSLAY DIVIDERS</u>	YES	NO	EXCEPTIONS / NOTES
557.1	Two (2) dividers shall be in the crosslay area. Each divider shall be fabricated of 3/16" aluminum and shall be mounted in a channel on each end for adjustability. The dividers shall have a maintenance-free abraded finish.			
558.0	<u>CROSSLAY COVER</u>	YES	NO	EXCEPTIONS / NOTES
558.1	A heavy-duty 22 oz. vinyl-coated nylon cover shall be located over the top of the preconnected crosslays. The top of the cover shall be connected to the top forward portion of the crosslays through a C-Rail channel and shall attach to the top-rear portion using Velcro.			
559.0	<u>CROSSLAY END COVERS</u>	YES	NO	EXCEPTIONS / NOTES
559.1	A webbing restraint shall be located on each end of the preconnected crosslays. The webbing shall be a two-piece design and one (1) side of each piece shall be wrapped around the crosslay rollers. Each piece shall be attached to each other in the center of the crosslays using Velcro.			
560.0	<u>1 1/2" PRE-CONNECT</u>	YES	NO	EXCEPTIONS / NOTES
560.1	<p>A 1 1/2" pre-connect with 2" plumbing shall be provided. The pre-connect shall terminate out a swivel male NST threads.</p> <p>The 1 1/2" crosslay pre-connect shall have a capacity of 200' of 1 3/4" double jacket fire hose stored in a single stack.</p> <p>An Akron Brass, model 8620, 2" SwingOut™ valve shall be provided. The valve shall have an all-brass body with a flow-optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be manufactured and assembled in the United States. The valve shall carry a warranty from the valve manufacturer.</p>			

560.2	<p>The valve shall be actuated by an Akron Brass manual gear actuator installed on the valve. The gear actuator shall operate at a 50:1 gear ratio, which operates from fully open to fully closed in twelve (12) rotations.</p> <p>The gear actuator shall be controlled by an Akron Brass 5" handwheel valve controller.</p> <p>The handwheel worm gear shall be connected to the remote-mounted valve via a rod assembly. The handwheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure. A position indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA standard.</p> <p>The discharge shall have a 2 1/2" brass case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and an orange tip on the pointer.</p> <p>The discharge shall be designated as a pre-connect so no cap and chain shall be required.</p>			
561.0	<u>1 1/2" PRECONNECT</u>	YES	NO	EXCEPTIONS / NOTES
561.1	<p>A 1 1/2" preconnect with 2" plumbing shall be provided. The pre-connect shall terminate out a swivel male NST threads.</p> <p>The 1 1/2" crosslay pre-connect shall have a capacity of 200' of 1 3/4" double jacket fire hose stored in a single stack.</p> <p>An Akron Brass, model 8620, 2" SwingOut™ valve shall be provided. The valve shall have an all-brass body with a flow-optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be manufactured and assembled in the United States. The valve shall carry a warranty from the valve manufacturer.</p>			

561.2	<p>The valve shall be actuated by an Akron Brass manual gear actuator installed on the valve. The gear actuator shall operate at a 50:1 gear ratio, which operates from fully open to fully closed in twelve (12) rotations.</p> <p>The gear actuator shall be controlled by an Akron Brass 5" handwheel valve controller. The handwheel worm gear shall be connected to the remote-mounted valve via a rod assembly. The handwheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure. A position indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA standard.</p> <p>The discharge shall have a 2 1/2" brass case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and an orange tip on the pointer.</p> <p>The discharge shall be designated as a pre-connect so no cap and chain shall be required.</p>			
562.0	<u>2 1/2" PRECONNECT</u>	YES	NO	EXCEPTIONS / NOTES
562.1	<p>A 2 1/2" pre-connect with 2 1/2" plumbing shall be provided. The pre-connect shall terminate out a swivel NST.</p> <p>The 2 1/2" crosslay pre-connect shall have a capacity of 150' of 2 1/2" double jacket fire hose stored in a single stack.</p> <p>An Akron Brass, model 8625, 2 1/2" SwingOut™ valve shall be provided. The valve shall have an all-brass body with a flow-optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be manufactured and assembled in the United States. The valve shall carry a warranty from the valve manufacturer.</p>			

562.2	<p>The valve shall be actuated by an Akron Brass manual gear actuator installed on the valve. The gear actuator shall operate at a 50:1 gear ratio, which operates from fully open to fully closed in twelve (12) rotations.</p> <p>The gear actuator shall be controlled by an Akron Brass 5" handwheel valve controller. The handwheel worm gear shall be connected to the remote-mounted valve via a rod assembly. The handwheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure. A position indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA standard.</p> <p>The discharge shall have a 2 1/2" brass case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and an orange tip on the pointer.</p> <p>The discharge shall be designated as a pre-connect so no cap and chain shall be required.</p>			
563.0	<u>AERIAL WATERWAY DISCHARGE</u>	YES	NO	EXCEPTIONS / NOTES
563.1	<p>A discharge shall be plumbed to the aerial waterway with 4" plumbing. The plumbing shall be constructed from schedule 10 stainless steel components.</p> <p>An Akron Brass, model 8940, 4" SwingOut valve shall be provided. The valve shall have an all-brass body with flow optimizing Fusion CF composite ball with Hydromax technology. The valve shall not require lubrication of seats or any other internal waterway parts and must be capable of swinging out of the waterway for maintenance by the removal of four bolts. The valve shall carry a warranty from the valve manufacturer.</p> <p>The valve shall be actuated by an Akron Brass electric actuator installed on the valve. The electric actuator shall have a 25:1 gear ratio, which actuates from fully open to fully close in eight (8) seconds, a clutchless motor, and utilizes an electric controller with a current limiting design.</p>			

563.2	<p>The electric actuator shall be controlled by an Akron Brass, model 9333, Navigator Pro electric valve controller. The electric controls shall be of true position feedback design, requiring no clutches in the motor or current limiting. The unit shall be completely sealed with momentary open, and close as well as an optional one (1) touch full open feature to operate the actuator. Two (2) additional buttons shall be available to be used for preset selection, preset activation, and menu navigation. The controller shall have up to three (3) preset locations that can be user set and easily recalled upon each use. The unit shall be capable of being used in conjunction with at least two (2) additional displays to control one (1) valve. The unit shall provide position indication through a full-color backlit LCD. The display shall be a full-color LCD with a backlight. It shall have manual adjustment of the brightness as well as an auto-dimming option. The unit shall carry a standard warranty.</p> <p>The discharge shall have a 2 1/2" brass case gauge with a bezel and a display range from 0 to 400 PSI.</p>			
564.0	<u>ELECTRICAL SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
564.1	<p>Wiring harnesses shall be the automotive type, engineered specifically for the builder's apparatus, and shall meet the following criteria. Under no circumstances shall diodes, resistors, or fusible links be located within the wiring harness. All such components shall be in an easy-to-access wiring junction box or the main circuit breaker area. All wire shall meet white book, baseline advanced design transit coach specification and Society of Automotive Engineers recommended practices. It shall be a stranded copper wire core with crosslinked polyethylene insulation complying with SAE specification J1128. Each wire shall be hot stamp function coded every three inches starting one inch from the end and continuing throughout the entire harness. In addition to function coding, each wire shall be numbered, colored, and gauge coded.</p>			
564.2	<p>Wire harnesses shall be protected by a 275-degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.</p>			

<p>564.3</p>	<p>Harnesses shall be modular in design; the main harness system is subdivided into several smaller sub-harnesses. The harness subsections shall be connected using Deutsch branded, heavy-duty, environmentally sealed, connectors with silicone seals and a rear insertion/removal contact system. For isolation of electrical "zones", the harness subsections shall consist of the main harness, a pump harness with a separate pump gauge panel harness, a left body harness with a separate left compartment harness, a right body harness with a separate right compartment harness, and a rear body harness with two separate rear compartment harnesses.</p> <p>The main harness and three body harnesses shall interconnect at a central, easy-to-reach location and their connectors shall not be obstructed by other harnesses or fuel/airlines. In addition, the main and body harness connectors shall be color-coded for ease of identification with their respective colors noted on the accompanying electrical diagrams.</p> <p>Where connectors are not provided by the electrical component manufacturer, all 12-volt lights and other electrical components (excluding rocker and toggle switches) shall connect to the harnesses using Deutsch brand connectors; butt connectors are considered unacceptable.</p> <p>All Deutsch connectors shall meet the following criteria:</p> <ul style="list-style-type: none"> • All connectors shall be rated for three feet of submersion in water. • Temperature ranges from 67° F to 257° F continuous at rated current. • All contacts shall be soldered unless a crimping tool or machine is used that gives an even and precise pressure for the terminal being used. • All contacts shall be pull-tested to ensure their integrity. 			
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565.0	<u>AERIAL WIRING</u>	YES	NO	EXCEPTIONS / NOTES
565.1	The AC wiring shall be Thermoplastic Elastomer (TPE) control cables and shall be highly flexible with very fine copper stranding. The cables shall have a center core strain relief for high tensile strength. The conductors shall be braided in bundles around the high tensile strength core. The outer jacket shall be gusset filled, pressure extruded, oil resistant, bio-oil resistant, PVC free, halogen-free, and UV resistant with low-temperature flexibility. The cables shall have a minimum bending radius of not greater than 5x the outer total diameter of the cable while moving.			
566.0	<u>MULTIPLEX DISPLAY ELECTRICAL MANAGEMENT SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
566.1	The apparatus shall be equipped with a Multiplex Display System.			
567.0	<u>SYSTEM NETWORK</u>	YES	NO	EXCEPTIONS / NOTES
567.1	The Multiplex system shall contain a Peer-to-Peer network.			
568.0	<u>SYSTEM RELIABILITY</u>	YES	NO	EXCEPTIONS / NOTES
568.1	The Multiplex system shall be able to perform in extreme temperature conditions, from 40° to +85° C (40 degrees to +185-degree Fahrenheit) The system shall be sealed against the environment, moisture, humidity, salt, or fluids such as diesel fuel, motor oil, or brake fluid. The enclosures shall be rugged to withstand being mounted in various locations or compartments around the vehicle. The modules shall be protected from over-voltage and reverse polarity.			
569.0	<u>12 VOLT SYSTEMS TEST</u>	YES	NO	EXCEPTIONS / NOTES
569.1	After completion of the unit, the 12-volt electrical system shall undergo a battery of tests as listed in NFPA 1901. These tests shall include, but not be limited to: <ul style="list-style-type: none"> • Reserve capacity test • Alternator performance test at idle • Alternator performance test at full load • Low voltage alarm test Certification of the results shall be supplied with the apparatus at the time of delivery.			

570.0	<u>TAILLIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
570.1	<p>A Whelen 600 series LED taillight assembly shall be installed on each side of the rear of the apparatus. Each assembly shall include the following:</p> <ul style="list-style-type: none"> • One (1) red LED stop/tail combination light • One (1) amber LED turn light with an arrow • One (1) clear LED backup light <p>The lights shall be mounted in a chrome-plated four (4) light composite housing. The remaining slot in the housing shall be populated with a warning light specified in the warning light section.</p>			
571.0	<u>REAR WORK LIGHT SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
571.1	A switch shall be installed above the taillight bezel on the left side of the rear of the apparatus. The switch shall be wired to the backup lights to provide additional work lighting. The rear work light circuit shall be deactivated when the parking brake is disengaged. In addition to the lights being activated by the above switch, the lights shall also come on when the transmission is placed in reverse.			
572.0	<u>REAR WORK LIGHT WIRING</u>	YES	NO	EXCEPTIONS / NOTES
572.1	The backup lights shall be wired to the rear work light switch. This switching circuit shall be deactivated when the parking brake is released. The lights shall also be activated when the transmission is placed in reverse.			
573.0	<u>CAB SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
573.1	A switch shall be provided in the cab to activate the backup lights. This switching circuit shall be deactivated when the parking brake is released.			
574.0	<u>MIDSHIP TURN SIGNALS</u>	YES	NO	EXCEPTIONS / NOTES
574.1	Two (2) TruckLite model 21 LED midship auxiliary/turn signal lights shall be installed in the rub rail, one (1) on each side of the body.			
575.0	<u>PARKING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
575.1	Two (2) TecNiq. Inc. LED parking lights shall be provided on the apparatus. The lights shall be a surface mount design and have an anodized, diecast, marine grade aluminum body with a stainless cover. The primary spot output shall be 30 degrees from the mounting surface with a secondary rectangular flood output used for area illumination. These lights shall be installed in the rear fender wells, one (1) per side. The lights shall activate when the transmission is placed in reverse and shall be aimed toward the rear			

576.0	<u>CLEARANCE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
576.1	<p>Grote red LED clearance lights shall be installed in the outside corners of the rear bumper and a TruckLite bar cluster located in the lower middle portion of the rear of the apparatus. Clearance reflectors shall be placed on the apparatus to be in full compliance with applicable ICC and DOT codes and regulations.</p> <p>Two (2) extension marker lights (rubber arm style) shall be installed at the rear portion of the body. The lights shall be attached to the back wall of the rear flex joint area. These lights shall aid the driver as to the location of the rear of the body during driving operations. The lights shall have forward-facing amber bulbs and rearward-facing red bulbs.</p>			
577.0	<u>CAMERA SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
577.1	A backup camera system shall be installed in the cab with the chassis. The camera shall be installed on the rear center upper portion of the apparatus.			
578.0	<u>INSTALL CUSTOMER-SUPPLIED ANTENNAS</u>	YES	NO	EXCEPTIONS / NOTES
578.1	There shall be two (2) customer-supplied antennas installed on the chassis cab roof by the OEM. The cables shall terminate inside the center dash area.			
579.0	<u>RADIO INTERFACE</u>	YES	NO	EXCEPTIONS / NOTES
579.1	<p>One (1) Firecom mobile radio interface cable shall be supplied with the intercom system. The cable shall be radio specific and shall allow the Firecom intercom system to interface with the Motorola mobile radio system. The model of headsets used shall determine which personnel shall have radio transmit ability.</p> <p>The radio interface cable drop shall be routed to the general area of the termination of the radio antenna(s) or center dash if no antenna is required.</p>			
580.0	<u>FIRECOM DIGITAL WIRELESS INTERCOM SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
580.1	A Firecom model 5100D digital intercom system shall be provided on the apparatus. The system shall have a touchpad with digital logic control and LED indicators. It shall be compatible with VHF and UHF radios. The 5100D system shall have a total power input requirement for each system not to exceed two amps. It shall have independent transmit and receive level adjustments.			

580.2	The system shall have the capacity for up to four (4) headsets without reduction or fluctuation of sound level, regardless of the number of attached headsets. It shall have a separate 3.5 mm auxiliary input and output jack. The intercom control head shall be located in the optimal position by OEM unless otherwise specified by the customer. The intercom shall have a standard warranty from the intercom manufacturer.			
581.0	<u>CAB POSITIONS</u>	YES	NO	EXCEPTIONS / NOTES
581.1	<p>The Firecom intercom system shall accommodate one (1) wireless driver position, one (1) wireless officer position, and three (3) wireless crew positions in the chassis cab. One (1) Firecom, model WB505R, wireless base station shall be utilized. The base station shall provide wireless capabilities and shall be mounted in the optimal location by OEM unless otherwise specified by the customer.</p> <p>Four (4) Firecom, model UHW505, under the helmet, radio transmit headset shall be provided, one (1) each for the driver and officer, and two (2) to be used in the crew area. Each headset shall include, volume control, a noise - canceling microphone, adjustable head strap, flex boom microphone, liquid foam ear seals, and a red push-to-talk button. A charging station for each wireless headset shall be located next to the wireless headset hanger hooks.</p> <p>There will be a headset hanger at each of the five (5) seating positions in the cab to hold a headset when not in use. The driver's and officer's hangers shall be mounted inboard of each position, and all hangers shall be located in the optimal position based on cab and seat configuration by OEM unless otherwise specified by the customer. There shall be a charging cable provided at each of the five (5) cab positions.</p>			
582.0	<u>UPPER ZONE B/D SIDE WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
582.1	<p>Four (4) Whelen 600 Series Super LED lights with chrome plated flanges shall be installed, two (2) each in Upper Zone B and Upper Zone D. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The conformal-coated PC board and sealed lens/reflector assembly shall provide additional protection against environmental elements. The solid-state warning lights shall be vibration resistant.</p> <p>The upper zone warning lights shall all have red LED's and red lenses.</p>			

583.0	<u>LOWER ZONE WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
583.1	<p>Six (6) Whelen Super LED lights with chrome plated flanges shall be installed in the lower zone of the apparatus to be in accordance with NFPA 1901, current edition compliance. The hard-coated lens shall provide extended life/luster protection against UV and chemical stresses. The PC board and sealed lens/reflector assembly shall provide additional protection against environmental elements. The solid-state warning lights shall be vibration resistant.</p> <p>Two (2) 600 Series ROTABEAM lights shall be installed in the lower zone C. These lights shall have red LED's and red lenses.</p> <p>Four (4) 600 Series lights shall be installed, two (2) in lower zone B and two (2) in lower zone D. These lights shall have red LED's and red lenses.</p> <p>The lower zone warning lights shall all have red LED's and red lenses.</p>			
584.0	<u>UPPER ZONE ADDITIONAL WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
584.1	<p>There shall be two (2) Whelen, model WIONSMCR, wide angle LED lights with flanges installed. The lights shall have red LEDs and a clear lens. They shall be installed one (1) on each side of the body at the rear, in upper zones B and D, so that the upper zone C can meet NFPA.</p> <p>There shall be two (2) Whelen, model WIONSMCA, wide angle LED lights with flanges installed. The lights shall have amber LEDs and a clear lens. They shall be installed at the rear of the body, one (1) on each side of the rear upper scene light. Amber lights with clear lenses.</p>			
585.0	<u>UPPER ZONE A</u>	YES	NO	EXCEPTIONS / NOTES
585.1	The upper zone A warning lights shall be supplied and installed by the chassis manufacturer.			
586.0	<u>UPPER ZONE C</u>	YES	NO	EXCEPTIONS / NOTES
586.1	<p>There shall be two (2) Whelen 600 Series ROTABEAM SuperLED lights with chrome-plated flange installed in Upper Zone C, on the upper rear face of the apparatus. The hard-coated lens shall provide extended life/luster protection against UV and chemical stresses. The PC board and sealed lens/reflector assembly shall provide additional protection against environmental elements. The solid-state warning lights shall be vibration resistant.</p> <p>The driver's and officer's side beacons shall both have red LED's and red lenses.</p>			

587.0	<u>OPTICOM EMITTER CHASSIS SUPPLIED/INSTALLED</u>	YES	NO	EXCEPTIONS / NOTES
587.1	One (1) chassis supplied and installed standalone low profile Opticom emitter shall be located above the windshield on the chassis cab.			
588.0	<u>SPEAKER</u>	YES	NO	EXCEPTIONS / NOTES
588.1	One (1) chassis-supplied siren speaker shall be installed by the apparatus manufacturer. The speaker shall be recess mounted outboard on the officer's side of the front bumper.			
589.0	<u>AIR HORN LOCATIONS</u>	YES	NO	EXCEPTIONS / NOTES
589.1	Two (2) air horns shall be recess mounted on the driver's side of the front bumper.			
590.0	<u>INSTALL CHASSIS SUPPLIED Q2B</u>	YES	NO	EXCEPTIONS / NOTES
590.1	A chassis supplied Q2B siren shall be pedestal mounted on the front bumper extension by the apparatus manufacturer. The siren shall be pedestal mounted on the outboard driver's side of the extended bumper gravel shield.			
591.0	<u>12V POWER LEAD DROP</u>	YES	NO	EXCEPTIONS / NOTES
591.1	One (1) 12-volt power lead drop with a 6position Blue Sea Systems ATO style fuse block with cover shall be provided. The power lead drop shall consist of one (1) hot and one (1) ground wire run from the batteries to the specified location. The power lead drop shall be battery direct and have a minimum of a 30-amp fuse provided with the power circuit. The distribution panel shall be designed with a grounding pad and compact, lightweight construction. The distribution panel shall be capable of using ATC/ATO blade fuses or ATC-style DC circuit breakers. This power lead setup shall be located in the following compartments: <ul style="list-style-type: none"> • R1 compartment. • SL compartment. • SR compartment. • L2 compartment. • L3 compartment. 			

592.0	<u>120V/12V COMBINATION SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
592.1	<p>There shall be one (1) FTMB2.15FWCPREC, FireTech Guardian Elite LED, partially recessed brow style scene light. The light produces 11,880 effective lumens. The light shall have a lifetime warranty. The lights shall be wired to 12V and 120V which require (1) HVFPM150/HLG15024BLANK power supply, and (1) 24v coil relay.</p> <p>The light shall be located on the rear face of the body in the center.</p> <p>The rear scene light(s) shall be controlled by a switch located on the multiplex display. The light(s) shall be controlled by one (1) switch. The switch shall be labeled "REAR SCENE."</p> <p>In addition to the switch located on the multiplex display, the rear scene light(s) shall be activated by the rear work light switch and when the apparatus is placed in reverse.</p>			
593.0	<u>120V/12V COMBINATION SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
593.1	<p>There shall be three (3) FireTech Guardian JR LED Surface Mounted Scene lights. The Guardian JR is a fixture that produces 5,000 lumens. The lights shall have a lifetime warranty.</p> <p>The lights shall be wired to 12V and 120V which require (1) HVFPM320/ HLG32024BLANK power supply, and (1) 24v coil relay.</p> <p>The three (3) lights shall be installed on the side face of the body on the left side.</p> <p>The driver's side and officer's side scene light(s) shall be controlled by a switch located on the multiplex display in the chassis cab. The activation for the driver's side scene lights on the multiplex display shall be labeled "LEFT SCENE" and the officer's side shall be labeled "RIGHT SCENE."</p>			

594.0	<u>120V/12V COMBINATION SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
594.1	<p>There shall be three (3) FireTech Guardian JR LED Surface Mounted Scene lights. The Guardian JR is a fixture that produces 5,000 lumens. The lights shall have a lifetime warranty. The lights shall be wired to 12V and 120V which require (1) HVFPM320/ HLG32024BLANK power supply, and (1) 24v coil relay.</p> <p>The three (3) lights shall be installed on the side face of the body on the right side.</p> <p>The driver's side and officer's side scene light(s) shall be controlled by a switch located on the multiplex display in the chassis cab. The activation for the driver's side scene lights on the multiplex display shall be labeled "LEFT SCENE" and the officer's side shall be labeled "RIGHT SCENE."</p>			
595.0	<u>12V BROW LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
595.1	<p>There shall be two (2) FTMB2.18FW, FireTech LED, brow style scene lights. The lights produce 19,008 effective lumens each. The lights shall have a lifetime warranty. The lights shall be wired to 12V only.</p> <p>The two (2) lights shall be located on the front of the chassis, one (1) on each side.</p> <p>The front scene light(s) shall be controlled by a switch located on the multiplex display in the chassis cab. The lights shall be controlled by one (1) switch. The switch shall be labeled "FRONT SCENE."</p>			
596.0	<u>REMOVABLE ACCESS PANEL</u>	YES	NO	EXCEPTIONS / NOTES
596.1	There shall be removable stainless steel access plates located on the pump panel around the left steamer inlet to allow access for service of the inlet valve.			
597.0	<u>PERIMETER GROUND LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
597.1	<p>Whelen, model 20C0CDCR, 4" round LED lights shall be installed beneath the apparatus in areas where personnel may be expected to climb on and off the apparatus. The lights shall illuminate the ground within 30" of the apparatus to provide visibility of any obstructions or hazards. These areas shall include, but not be limited to, side running boards and the rear step area.</p> <p>The lights shall be activated when the parking brake is engaged or when the transmission is placed in reverse.</p>			

598.0	<u>AUXILIARY HEATER IN CAB</u>	YES	NO	EXCEPTIONS / NOTES
598.1	A 9,000 BTU 120-volt auxiliary heater shall be provided in the chassis cab to maintain chassis heat when the main chassis engine is shut down. The heater shall have a blower controlled by a 12-volt motor.			
599.0	<u>SG09 AUXILIARY POWER UNIT</u>	YES	NO	EXCEPTIONS / NOTES
599.1	The apparatus shall be equipped with an SG09 auxiliary power unit (APU) specifically designed to reduce the idle time of the main chassis engine.			
600.0	<u>VERIFIED IDLING REDUCTION TECHNOLOGIES</u>	YES	NO	EXCEPTIONS / NOTES
600.1	<p>EPA has evaluated idle reduction technologies/devices as part of grants, cooperative agreements, emissions testing, engineering analyses, modeling, demonstration projects, and external peer-reviewed reports to study the effects of idling on air quality, fuel consumption, and driver health. Based on this evaluation and research, EPA has determined that a variety of idle reduction technologies save fuel and reduce emissions when compared to idling the main chassis engine.</p> <p>Idle reduction technology allows engine operators to refrain from long duration idling of the main chassis engine by using an alternative technology. An idle reduction technology is generally defined as the installation of a technology or device that:</p> <ul style="list-style-type: none"> • Is installed on a vehicle • Reduces unnecessary main chassis engine idling of the vehicle or equipment, and/or • Is designed to provide services (e.g., heating, air conditioning, and/or electricity) to the vehicle or equipment that would otherwise require the operation of the main chassis engine while the vehicle or equipment is temporarily parked or remains stationary. <p>The APU shall provide 12v DC power, 120/240v A/C power, and HVAC for the apparatus. Idle times of the main chassis engine are reduced by utilizing automatic start/stop control of the main chassis engine and the APU. In addition to automatic control, manual control of the APU shall be provided. The APU shall be adequately enclosed and protected from the elements. Systems that require the APU to run continuously in conjunction with the main chassis engine are not desired and shall be immediately rejected.</p>			

601.0	<u>SYSTEM COMPONENTS</u>	YES	NO	EXCEPTIONS / NOTES
601.1	<ul style="list-style-type: none"> • Diesel Engine – Caterpillar C1.5 Tier 4 Emissions diesel engine. Fuel for the operation of the APU shall be provided from the chassis fuel tank. A separate fuel pick-up shall be provided to the APU engine. This engine shall carry the manufacturer's warranty. • Alternator – 12v power for the apparatus shall be provided by a 360-amp Niehoff alternator. The alternator shall be synchronized in conjunction with the chassis alternator to share the total 12v load when both engines are running, reducing wear and increasing service life. The alternator shall have a limited warranty. • Generator – 9.5 kw Continuous 12 kw Peak (Maximum Rating) Marathon generator. The generator shall have a standard manufacturer's warranty. • HVAC – The HVAC system shall utilize a TM21, 215 cm3 compressor integrated with the chassis-supplied condenser and evaporator with a cooling capacity of 37,500 BTU/ hr. The heating system shall be chassis supplied. The AC compressor shall have a limited warranty. 			
602.0	<u>CONTROLS</u>	YES	NO	EXCEPTIONS / NOTES
602.1	<p>Two integrated display control panels shall be located in the cab and on the pump panel. The displays shall provide the user with the following information:</p> <ul style="list-style-type: none"> • Mode selector for manual or automatic operation • Start/stop switch for manual operation • Run indicator • 120/240 VAC generator information: volts, frequency, and amps (each leg) • Low voltage warning at 11.9 VDC • Engine hours (with maintenance required indicator) • Engine overheat warning indicator • Engine low oil pressure warning indicator • Glow plug preheat indication • Shutdown status (low oil pressure or high-water temperature) • Time remaining on auto-start timer • Automatic day/night mode (user enabled) 			

603.0	<u>SYSTEM OPERATION</u>	YES	NO	EXCEPTIONS / NOTES
603.1	<p>The APU automatically engages once the factory's pre-determined conditions have been met. When the chassis engine remains at an idle condition for a predetermined period, and only after the parkbrake has been engaged, the APU system shall automatically engage and provide power to the apparatus. Once all conditions are met the APU system shall automatically begin chassis engine shutdown. The APU, when activated, shall supply power for the following features/components of the apparatus:</p> <ul style="list-style-type: none"> • 12-volt scene lights • 12-volt chassis interior lights • 12-volt compartment lights • DOT running lights • Head and taillights • Warning lights • Cab heater and air-conditioning • Engine block heater (optional) • Heated mirrors (optional) • AC generator features (lights, cord reel, etc.) <p>The doors that enclose the APU shall be equipped with an interlock that shall prevent the unit from starting during service procedures when the doors are open.</p>			
604.0	<u>AUTO MODE (PUMP/PTO NOT REQUIRED)</u>	YES	NO	EXCEPTIONS / NOTES
604.1	<p>When the mode selector switch is set to “Auto” and the chassis master power disconnect and ignition switches are turned on, the APU controller shall power up and display any available data on the screen.</p> <p>If the chassis engine is not started the system will “reset” and enter into a “standby” mode.</p> <p>After the chassis engine is started and the parking brake is not released within a factory set time frame, the system shall issue a message on the display, illuminate the preheat indicator light on both displays, power up the glow plug preheat circuit, and trigger an audible alarm. When the glow plugs are sufficiently warmed, the APU engine will start.</p> <p>The factory set time frame shall be adjustable with factory assistance.</p>			

604.2	<p>Once started, the system shall shut down the chassis engine. Should the parking brake be released within the factory set time frame, the timer shall restart and the APU shall remain on standby.</p> <p>Whenever the ignition switch is turned off and then back on, the system will power up in AUTO MODE, regardless of the previous mode. If the unit was in MANUAL MODE, and the ignition switch is turned off and then back on, the system will power up in AUTO MODE.</p>			
605.0	<u>AUTO MODE (PUMP/PTO REQUIRED)</u>	YES	NO	EXCEPTIONS / NOTES
605.1	<p>When the apparatus arrives at the scene and use of the fire pump or PTO (If equipped) is required, the system shall “not” activate the APU if the following conditions are met:</p> <ul style="list-style-type: none"> • Pump engaged signal and/or • Aerial master signal (or PTO) and/or • Loss of neutral signal and/or • Loss of park brake signal <p>When operation of the pump and/or PTO is no longer required, the system shall activate the APU if the following conditions are met:</p> <ul style="list-style-type: none"> • Pump is disengaged and/or • Aerial master (or PTO) is shut off and/or • Transmission is shifted to neutral and/or • Park brake is applied <p>Should the operator determine the chassis engine is to be started, the operator shall utilize normal procedures for engine start as per departmental procedures. When the chassis engine has been started, both the chassis engine and the APU shall both continue to run. Once the parking brake is released, the APU shall shut down and “reset” to standby mode within 57 seconds. Turning the master power disconnect switch to the off position shall automatically shut down the APU system.</p>			
606.0	<u>MANUAL MODE</u>	YES	NO	EXCEPTIONS / NOTES
606.1	<p>Should manual operation of the system be desired the mode selector switch shall be set to “Manual” and the chassis master power disconnect switch is turned on, the APU controller shall power up and display any available data.</p>			

606.2	<p>The APU shall not operate until the start button is pressed. When the button is pressed, the system shall issue a message on the display, illuminate the preheat indicator light on both displays, power up the glow plug preheat circuit, and trigger an audible alarm. When the glow plugs are sufficiently warmed, the APU engine will start.</p> <p>The APU shall continue to run until the operator hits the start (stop) button or turns off the master power disconnect switch.</p>			
607.0	<u>DISABLE MODE</u>	YES	NO	EXCEPTIONS / NOTES
607.1	When the mode selector switch is set to “Disable” and the chassis master power disconnect switch is turned on, the APU system shall be entirely shutdown and inoperable.			
608.0	<u>AC OVERRIDE INPUT</u>	YES	NO	EXCEPTIONS / NOTES
608.1	<p>An input programmed to the SG09 controller. This input will be on (+12 VDC) whenever the chassis-supplied HVAC controller is on (AC, defrost, defog, etc.). When this input is active, the SG09 controller will immediately initiate the startup sequence.</p> <p>This input is very similar to Auto Mode in that it will shut down the chassis engine if the appropriate conditions are met. The primary difference between the AC override input and Auto Mode is that the standby condition and the timer interlocks (park, neutral, pump/PTO) will be overridden or ignored by the SG09 controller when the HVAC input is active.</p>			
609.0	<u>TRANSFER SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
609.1	<p>A transfer switch shall be installed that will automatically switch from the 120-volt shoreline power to 120Volt generator power when required. The transfer switch shall be near the load center.</p> <p>The SG09 system shall be located inside the top of the pump module. There shall be a visual sight gauge for the SG09.</p>			
610.0	<u>SG09 TOP ACCESS PANEL</u>	YES	NO	EXCEPTIONS / NOTES
610.1	There shall be a double set of tread plate access doors provided on the top of the pump module. The doors shall utilize pop latches to secure them in place.			

611.0	<u>DRIVER'S SIDE SG09 ACCESS PANEL</u>	YES	NO	EXCEPTIONS / NOTES
611.1	A bolton painted aluminum panel shall be on the upper portion of the driver's side of the pump module to allow access to the SG09. The panel shall be of the single pan design and shall be secured utilizing stainless steel fasteners. The panel shall have high-definition precision cuts of an area as large as possible on the panel to allow proper airflow.			
612.0	<u>OFFICER'S SIDE SG09 ACCESS PANEL</u>	YES	NO	EXCEPTIONS / NOTES
612.1	A vertically hinged tread plate access panel shall be on the upper portion of the officer's side of the pump module to allow access to the SG09. The panel shall be of the single pan design and shall be positively latched in the closed position utilizing compression latches. The panel shall have high-definition precision cuts of a minimum of 380 square inches to allow proper airflow. A gas strut shall be provided on the panel. An aluminum sill protector shall be installed on the bottom of the panel opening to protect the paint from chipping and scratching. The panel shall be wired into the door ajar warning light circuit.			
613.0	<u>20 CIRCUIT NONGFI LOAD CENTER</u>	YES	NO	EXCEPTIONS / NOTES
613.1	A 120/240-volt load center shall be incorporated into the 120/240volt wiring system. The load center shall include adequate circuit breakers to protect the loads specified on the apparatus. The entire 120/240-volt electrical system shall be installed in accordance with NFPA 1901, current edition. This shall include all testing, labeling, wiring methodology, and dimensional requirements. Certification of compliance shall accompany the apparatus at the time of delivery. All 120/240-volt A.C. wiring shall be done in accordance with NFPA 1901, current edition as well as nationally accepted electrical codes.			
614.0	<u>BRANCH CIRCUIT OVERCURRENT PROTECTION</u>	YES	NO	EXCEPTIONS / NOTES
614.1	Over current protection devices shall be provided for circuits in accordance with NFPA 1901, current edition. The load center shall be equipped with a NonGFI two-pole main breaker when six or more individual branch circuits are present. Over-current protection devices shall be marked with labels to identify the function of the circuit they protect. The generator load center shall be located on the forward bulkhead of the L1 compartment.			

615.0	<u>120V RECEPTACLE</u>	YES	NO	EXCEPTIONS / NOTES
615.1	<p>Three (3) NEMA 520R, 120-volt, duplex, 3wire, straight blade (household type) receptacle shall be installed on the apparatus. The receptacle shall have a 20-amp rating and include a spring-loaded weather-resistant cover if mounted in an exterior location. The receptacle shall be wired to the transfer switch.</p> <p>These receptacles shall be located in the following compartments:</p> <ul style="list-style-type: none"> • L1 compartment. • R1 compartment. • L5 compartment. 			
616.0	<u>ELECTRIC CORD REEL</u>	YES	NO	EXCEPTIONS / NOTES
616.1	<p>A Hannay 120-volt electric rewind cord reel shall be installed on the apparatus. A push button labeled "REEL REWIND" shall be installed for 12volts rewinding of the cord reel.</p> <p>Rollers shall be supplied to prevent damage to the electrical cable if pulled in any direction.</p> <p>The cord reel shall be equipped with 200' of yellow STW Seoprene 10/3 wire installed with a cable stop to prevent damage to cable fittings. The cord shall terminate in a single L520 twist lock receptacle.</p>			
617.0	<u>JUNCTION BOX</u>	YES	NO	EXCEPTIONS / NOTES
617.1	<p>A Circle D, model PF51, electrical junction box equipped with four (4) electrical receptacles shall be provided. The cord reel shall be connected to the junction box through a 12" pigtail with heavy-duty water-resistant strain relief and a flexible extender. The pigtail shall utilize an L520 twist lock plug and connector to supply power to the receptacles. The receptacles shall be enclosed in a UL-listed NEMA Type 3R cast aluminum box with an aluminum finish and NFPA-required indicator light.</p> <p>The junction box shall have a silver powder coat finish.</p> <p>Four (4) NEMA 520R, 120-volt, duplex, 3wire, straight blade (household type) receptacle shall be installed on the junction box.</p> <p>The cord reel shall be located above the SL1 compartment.</p>			
618.0	<u>JUNCTION BOX MOUNTING BRACKET</u>	YES	NO	EXCEPTIONS / NOTES
618.1	A tread plate mounting bracket to hold the junction box shall be included.			

619.0	<u>ELECTRIC CORD REEL</u>	YES	NO	EXCEPTIONS / NOTES
619.1	<p>A Hannay 120-volt electric rewind cord reel shall be installed on the apparatus. A push button labeled "REEL REWIND" shall be installed for the rewinding of the cord reel.</p> <p>Rollers shall be supplied to prevent damage to the electrical cable if pulled in any direction. The cord reel shall be equipped with 200' of yellow STW Seoprene 10/3 wire installed with a cable stop to prevent damage to cable fittings. The cord shall terminate in a single L520 twist lock receptacle.</p>			
620.0	<u>JUNCTION BOX</u>	YES	NO	EXCEPTIONS / NOTES
620.1	<p>A Circle D, model PF51, electrical junction box equipped with four (4) electrical receptacles shall be provided. The cord reel shall be connected to the junction box through a 12" pigtail with heavy-duty water-resistant strain relief and a flexible extender. The pigtail shall utilize an L520 twist lock plug and connector to supply power to the receptacles. The receptacles shall be enclosed in a UL-listed NEMA Type 3R cast aluminum box with an aluminum finish and NFPA-required indicator light.</p> <p>The junction box shall have a silver hammertone powder coat finish.</p> <p>Four (4) NEMA 520R, 120-volt, duplex, 3wire, straight blade (household type) receptacle shall be installed on the junction box.</p> <p>The cord reel shall be located above the SR1 compartment.</p>			
621.0	<u>JUNCTION BOX MOUNTING BRACKET</u>	YES	NO	EXCEPTIONS / NOTES
621.1	A tread plate mounting bracket to hold the junction box shall be included.			
622.0	<u>107' AERIAL LADDER CONSTRUCTION STANDARDS</u>	YES	NO	EXCEPTIONS / NOTES
622.1	The aerial ladder shall be of the rear mount design with the turntable mounted over the rear axles of the apparatus, and the ladder extending toward the front of the apparatus when in the bedded position. The aerial ladder shall be comprised of four sections and shall extend to a nominal height of 107' at 72 degrees, measured in a vertical plane from the top rung of the fly section (not including the egress) to the ground. To maintain a maximum level of safety, units exceeding a 76-degree angle of inclination, in accordance with NFPA 1931/1932, current edition, shall not be acceptable.			

623.0	<u>OPERATIONAL ENVELOPE/REACH</u>	YES	NO	EXCEPTIONS / NOTES
623.1	<p>The aerial ladder shall have an operations range of 8 degrees elevation to +72 degrees elevation. The minimum vertical reach of the aerial shall be 107' above the ground with the aerial at full extension and elevation. This measurement shall be taken to the end of the permanent structure and not include the removable egress. Requiring a removable egress to achieve 107' of vertical reach shall not be acceptable.</p> <p>A minimum horizontal reach of 101'5" shall be measured from the turntable centerline to the outermost rung on the outermost fly section, with the aerial at full extension and at 0 degrees elevation. Units measuring the horizontal reach to the end of a removable egress shall be required to hold the egress to the same load testing criteria as the permanent structure.</p> <p>Reach and height shall be measured in accordance with NFPA 1901, current edition.</p>			
624.0	<u>STRUCTURAL MATERIAL</u>	YES	NO	EXCEPTIONS / NOTES
624.1	<p>The primary load support members of the ladder shall be constructed of certified 100,000 PSI yield strength (minimum) steel tubing, with full traceability on all structural materials. Each section shall be trussed diagonally, vertically, and horizontally using welded steel tubing. All critical points shall be reinforced for extra rigidity and to provide a high strength-to-weight ratio.</p> <p>All ladder rungs shall be constructed of certified steel tested per ASTM A370 standards. The steel shall meet a minimum 6.0 Atmospheric Corrosion Factor. The ladder rungs shall be round and welded to each section.</p>			
624.2	<p>All welding of structural components, including the aerial ladder sections, turntable, pedestal, and outriggers, will comply with the American Welding Society standards. All welding personnel will be certified, as qualified under AWS welding codes. Materials used to manufacture the structural components are to be certified by the mill that manufactured the materials. Certifications or re-certifications of structural materials by vendors other than the mill they were manufactured at will not be acceptable. Any material testing that is performed after the mill test will be for verification only and not completed with the intent of changing the classification. Any welded structural component for the ladder will be traceable to their mill lots.</p>			

625.0	<u>PRIMARY DIMENSIONS</u>	YES	NO	EXCEPTIONS / NOTES
625.1	<p>The inside dimensions of the ladder shall be as follows:</p> <ul style="list-style-type: none"> • Base Section 40.250" • First Fly Section 33.500" • Second Fly Section 27.750" • Last Fly Section 22.500" <p>The height of the handrails above the center line of the rungs shall be as follows:</p> <ul style="list-style-type: none"> • Base Section 28.875" • First Fly Section 24.875" • Second Fly Section 21.375" • Last Fly Section 7.375" 			
626.0	<u>NFPA SAFETY FACTOR AND RATED CAPACITIES</u>	YES	NO	EXCEPTIONS / NOTES
626.1	The methodology, definitions, testing, and criteria used by the aerial manufacturer to determine the preceding and following Safety Factor and Rated Capacity of the aerial device shall be in strict compliance with the definitions of such, in accordance with NFPA 1901, current edition, and these specifications. Any apparatus claiming to exceed the testing requirements of NFPA 1901 shall provide certified documentation of the tests.			
627.0	<u>AERIAL DEVICE SAFETY FACTOR AND RATED CAPACITY</u>	YES	NO	EXCEPTIONS / NOTES
627.1	<p>The purchaser desires to purchase with these specifications, an aerial device with a minimum 2.0:1 safety factor as required and in accordance with NFPA 1901, current edition. Therefore, the aerial manufacturer shall hereby certify, by submitting a bid for these specifications; that the aerial device meets or exceeds the following requirements.</p> <p>The design stress or primary stress within all structural load supporting members of the aerial device shall not exceed 50% of the minimum as the welded yield strength of the material based on the combination of the dead load of the aerial plus the rated capacity of 750 lbs. at the tip of the aerial; while flowing 1500 GPM, at a 90-degree angle to ladder centerline; with the structural load supporting members of the aerial device at either; an ambient temperature of 75 degrees F or an elevated temperature of 350 degrees F thereby exhibiting a minimum 2.0:1 safety factor in all feasible operational conditions.</p>			

627.2	These capabilities shall be valid when the apparatus is deployed in the unsupported configuration, while flowing 1500 GPM, based upon 360-degree rotation, from full retraction to full extension, and at any degree of elevation (-8 to +72). To provide a clear picture of apparatus capabilities, any manufacturer with any restrictions to any of these capabilities shall provide the lowest ratings of tip load and water flow.			
628.0	<u>AERIAL DEVICE SAFETY FACTOR SERVICE LIFE</u>	YES	NO	EXCEPTIONS / NOTES
628.1	The purchaser desires to purchase an aerial device with a safety factor that remains NFPA compliant and constant throughout the life of the aerial device. The safety factor of every structural load-bearing member in the aerial device shall remain above 2.0:1 for a "Safety Factor Service Life" of up to 20 years minimum. Any apparatus claiming to exceed the guidelines of NFPA 1901 shall provide certified documentation.			
629.0	<u>AERIAL SPECIAL LABELS</u>	YES	NO	EXCEPTIONS / NOTES
629.1	<p>Legible, permanent signs shall be installed in positions readily visible to the operator to provide operational directions, warnings, and cautions. The signs shall describe the function of each control and provide operating instructions.</p> <p>Warning and caution signs shall indicate hazards inherent in the operation of the aerial device. These hazards shall include, but shall not be limited to:</p> <ul style="list-style-type: none"> • Electrical hazards involved where the aerial device does not protect the personnel from contact with, or in proximity to, an electrically charged conductor. • Electrical hazards involved where the aerial device does not protect ground personnel who might contact the vehicle when in contact with energized electrically charged conductors. • Hazards from stabilizer motion. • Hazards that can result from failure to follow the manufacturer's operating instructions. 			

630.0	<u>AERIAL DEVICE SPECIFICATION PLACARD</u>	YES	NO	EXCEPTIONS / NOTES
630.1	<p>A permanent label shall disclose the following information relative to the aerial device:</p> <ul style="list-style-type: none"> • Make • Model • Insulated or non-insulated • Serial number • Date of manufacture • Rated capacity (s) • Rated vertical height • Rated horizontal reach • Maximum hydraulic system pressure • Hydraulic oil type and capacity • All other appropriate labels to ensure the safe operation of the aerial device shall be permanently affixed in conspicuous locations. 			
631.0	<u>THIRD-PARTY NONDESTRUCTIVE TESTING</u>	YES	NO	EXCEPTIONS / NOTES
631.1	<p>Welds shall be tested using two (2) nondestructive methods by Underwriters Laboratories (UL) or Underwriters Laboratories of Canada (ULC). Due to their unmatched experience testing fire apparatus, UL or ULC shall be the only acceptable organizations to perform the testing of the apparatus. Steel and aluminum ladders, at a minimum, shall have all welds tested using two (2) separate NDT methods. Aerial structures shall have 100 % of all structural welds tested using both the magnetic particle method and visual testing method. Aerials that are fabricated of aluminum must have 100% of all structural welds tested using the dye penetrant method and visual method.</p> <p>All magnetic particle inspections shall be conducted in accordance with ASTM E709, Standard Guide for Magnetic Particle Testing. All dye penetrant inspections shall be conducted in accordance with ASTM E164, Standard Test Method for Liquid Penetrant Examinations.</p> <p>Manufacturers who rely only on visual inspection (performed inhouse or by any third party) as a primary method of testing shall not be considered and their bid shall be rejected.</p>			
632.0	<u>STRUCTURAL SAFETY FACTOR</u>	YES	NO	EXCEPTIONS / NOTES
632.1	<p>The purchaser desires a device that has been tested by a third party for compliance with the 2-to-1 safety factor specified by NFPA 1901. Devices that have not been certified by an engineer that is independent of the manufacturer shall not be acceptable.</p>			

633.0	<u>NFPA AERIAL STABILITY FACTOR AND TESTING</u>	YES	NO	EXCEPTIONS / NOTES
633.1	<p>A one and one-half to one (1.5:1) stability factor shall be provided. This capability shall be established in an unsupported configuration. Since the device is rated while flowing water, stability testing shall account for the distributed weight of water in a full waterway and water reactionary force as required by NFPA 1901.</p> <p>Following are specific descriptions of what tests are to be performed, and the conditions they shall be performed under. The aerial manufacturer shall strictly adhere to these tests and conditions as outlined in these specifications and NFPA 1901.</p> <p>For both of the following tests, the only obstructions to a full 360-degree rotation with the aerial at 0 degrees elevation and full extension shall be presented by the apparatus itself, and NOT external obstructions at the manufacturer's test location(s). This means that the aerial device manufacturer shall ensure that the testing grounds present no obstruction (trees, buildings, etc.) to the full 360-degree rotation at 0 degrees elevation and full extension, which may cause the need to raise the aerial to clear the obstruction.</p> <p>Additionally, the apparatus shall be tested for stability only after the entire apparatus is complete. Manufacturers using a third party to manufacture the aerial device must provide certified documentation that the unit was UL or ULC tested by the manufacturer of the aerial and the final OEM manufacturer. This requirement is specified in NFPA 1901 as the apparatus is in "service ready condition". There shall be no exception to this requirement since it would be unlikely that actual weight distribution could be accurately simulated for the stability testing.</p>			
634.0	<u>TEST 1</u>	YES	NO	EXCEPTIONS / NOTES
634.1	<p>After the above conditions have been satisfied, the aerial shall be subjected to the following test in the presence of the third-party testing company that complies with these specifications. Specifically, the aerial device shall be placed on level ground with the stabilizers deployed per manufacturer recommendations.</p>			

634.2	The aerial device then shall have 1.5 times the rated capacity placed at the tip of the aerial, with the device at full extension and at 0 degrees elevation; which is the most stringent configuration. The device shall be rotated 360 degrees, raising, and lowering the aerial as needed to clear the cab of the apparatus. The aerial shall prove to be stable during the entire test and no component of the aerial shall permanently deform.			
635.0	<u>TEST 2</u>	YES	NO	EXCEPTIONS / NOTES
635.1	After the above conditions have been satisfied, the aerial shall be subjected to the following test in the presence of the third-party testing company that complies with these specifications. Specifically, the aerial device shall be placed on a 5-degree downward slope with the stabilizers deployed per manufacturer recommendations. The aerial device then shall have 1.33 times the rated capacity placed at the tip of the aerial, with the device at full extension and at 0 degrees elevation, which is the most stringent configuration. The device shall be rotated 360 degrees, raising, and lowering the aerial as needed to clear the cab of the apparatus. The aerial shall prove to be stable during the entire test and no component of the aerial permanently deforms.			
636.0	<u>RUNG COVERS</u>	YES	NO	EXCEPTIONS / NOTES
636.1	<p>Each rung shall be covered with secure, heavy-duty, deeply serrated rubber sheathing. The rung cover shall be installed on a minimum of sixty percent (60%) of each ladder rung. Attachment of the sheathing to the rung shall be by mechanical means and an adhesive application. Under no circumstance shall the rung covers turn when a rung is at ambient temperature (75 degrees F) or an elevated temperature (350 degrees F); there shall be no exception to this requirement for the safety of persons climbing the ladder sections.</p> <p>The sheathing shall be easily replaceable if the rubber becomes worn, however, the rung covers shall be designed, constructed, and installed with lifetime service as the objective. To ensure ease of maintenance if damaged, manufacturers using embossed metal in place of the rubber rung covers is not acceptable.</p> <p>To prevent corrosion of the rungs by introducing air to the inside, under no circumstances will rung covers attached with screws or rivets be acceptable.</p>			

637.0	<u>HEAVY DUTY LADDER TRAVEL SUPPORT</u>	YES	NO	EXCEPTIONS / NOTES
637.1	<p>A heavy-duty ladder rest with poly pads shall be provided for support of the ladder in the travel position. The location of the travel support shall be directly behind the chassis cab. The travel support shall be fabricated from heavy-duty steel and painted to match the primary body color. If the body is a two-tone design, the travel support shall be painted to match the top body color. The travel support shall be designed to be easily removable to allow for ease of maintenance and repair if necessary.</p> <p>The base section of the ladder shall contain stainless steel scuff plates where the ladder contacts the ladder support.</p> <p>An indicator light shall be provided on the turntable to indicate when the ladder is aligned with the travel support and may be lowered into it. The ladder rest shall be attached to the front outrigger box assembly for added stability.</p> <p>The ladder rest shall be illuminated for nighttime operation. The illumination light shall automatically activate with the aerial master switch.</p>			
638.0	<u>CRADLE INTERLOCK SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
638.1	<p>A cradle interlock system shall be provided to prevent the lifting of the ladder from the nested position until the operator has positioned all the stabilizers in a load-supporting configuration. An interlock switch shall be installed at the cradle to prevent the operation of the stabilizers once the aerial has been elevated from the nested position.</p>			
639.0	<u>ELEVATION SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
639.1	<p>Two (2) double-acting lift cylinders shall be utilized to provide smooth precise elevation from 8 degrees below horizontal to 72 degrees above horizontal. The lift cylinders shall have a 6" internal diameter (bore) and a 2.5" solid cylinder rod. The lift cylinders shall be equipped with integral holding valves located on the cylinder to prevent the unit from lowering should the charged lines be severed at any point within the hydraulic system.</p>			

639.2	<p>The lowering of the ladder shall be controlled by a pressure limiting valve to limit the downward pull of the ladder when it is bedded. Both raising and lowering functions shall be influenced by flow compensation, which shall maintain ladder tip speed within the design speed regardless of load, angle, or extension. Ladder tip speed shall be decelerated above 65 degrees to reduce "tiplash". Ladder lowering shall be controlled on the down motion to prevent the cylinders from completely retracting, thus allowing a cushion of oil for continuous ladder load readout.</p> <p>The elevation cylinder upper and lower pivot pins shall be installed with a secondary tensioning system to secure the pins and prevent them from slipping out over time. The design shall not inhibit the pins from being removed for future servicing purposes.</p>			
640.0	<u>EXTENSION/RETRACTION SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
640.1	<p>A fully hydraulic powered extension and retraction system shall be provided using two (2) sets of Siamese hydraulic cylinders and cables. Each set shall be capable of operating the ladder in the event of a failure of the other. The extension cylinders shall each have a 3.5" internal diameter (bore) and a 1.5" diameter solid rod. Extension and retraction of the telescopic sections shall be internally limited within the cylinders, eliminating excess strain on the cables, sheaves, and ladder structure. Each of the cylinder, cable, and sheave assemblies shall be completely independent of the other, to provide a safety factor wherein a failure of one assembly will not affect the function and operation of the other. The extension cylinders shall be equipped with counterbalance holding valves to synchronize the cylinders for smoother operation and prevent the unit from retracting should the charged lines be severed at any point within the hydraulic system. The holding valves shall be mounted directly on the cylinders with no hoses between the valve and the cylinder.</p> <p>The reeling of the cable shall be such to provide synchronized, simultaneous movement of all sections from full extension to full retraction. All pulleys and sheaves shall be enclosed as an added safety feature as well as to prevent personnel on the ladder from becoming entangled in them.</p>			

641.0	<u>MAINTENANCE-FREE SHEAVE BEARINGS</u>	YES	NO	EXCEPTIONS / NOTES
641.1	<p>The aerial sheave bearings shall be made with continuous wound PTFE and high-strength fibers encapsulated in a lubricated, high-temperature epoxy resin. This material shall be corrosion resistant, have a high load capacity, and be self-lubricating.</p> <p>It shall also be resistant to shocks, misalignment, and wear. The bearings shall not require lubrication. Aerial cable systems that require extensive maintenance, and constant lubrication, are not acceptable.</p>			
642.0	<u>AERIAL CABLES</u>	YES	NO	EXCEPTIONS / NOTES
642.1	<p>To ensure a maximum level of safety the following standards shall be used on the extension and retraction cable system with no exception:</p> <ul style="list-style-type: none"> • Cables shall have a 5:1 safety factor based on ultimate strength under all safe operating conditions. • The factor of safety shall remain above 2:1 during any extension or retraction system stall • The minimum ratio of the diameter of the cable to the diameter of the sheave shall be 1:12 <p>The cables used between the base and second section shall be 1/2" in diameter. Due to the amount of stress applied to this first pair of cables, they shall be 6x26, Flex-X design for maximum durability, stability, and service life. This design provides greater surface area resulting in less sheave and drum wear. For these reasons, any other cable design on the first set of cables shall not be considered acceptable.</p> <p>The cables between the second and third ladder sections shall be 3/8" in diameter. The cables between the third and fly sections shall be 5/16" in diameter.</p> <p>All cables shall be prestressed, proof loaded, and certified by the cable manufacturer to minimize changes to the cable lengths and performance.</p>			
643.0	<u>CERTIFIED CABLE SWAGED SHACKLES</u>	YES	NO	EXCEPTIONS / NOTES
643.1	All swaged shackle ends shall have a certification test from the manufacturer of the assembly.			

644.0	<u>IGUS ENERGY CHAIN</u>	YES	NO	EXCEPTIONS / NOTES
644.1	<p>The electrical cable, hydraulic hose, and/or air hose shall be routed through the interior of the structural tubing of the ladder sections as well as utilizing the Igus energy chain. The energy chain shall be routed through the inside section of the vertical side walls of the aerial ladder device. The cable and/or hose routing shall use one or both bottom cord rectangular tube(s) on the base section of the ladder and the bottom cord rectangular tube(s) on the last ladder fly section. The ladder sections between the base and last fly shall utilize the energy chain to route all electrical cables and hose lines.</p> <p>The energy chain shall travel within a carrier shield, which is fabricated out of 16-gauge anodized aluminum material. Each model of energy chain used shall be adequately sized to fit the application.</p> <p>Rollers, which are located in the lower portion of the ladder section(s), shall be constructed of a nylon plastic material that is specifically designed for these types of applications. Spacer pads, made from the same material as the rollers, shall be installed and evenly spaced to secure the Igus energy chain within the specifically designed carrier shield(s).</p> <p>The electrical cables used to transfer power to the ladder tip shall be Igus Chain Flex cables. These cables are specially designed for the Igus energy chain system and custom fit for each aerial apparatus. If applicable, the hydraulic hose(s) and air hose(s) shall be Parker Hannifin with a rating of 2,500 PSI.</p>			
645.0	<u>WEAR PADS/BEARING SURFACES</u>	YES	NO	EXCEPTIONS / NOTES
645.1	<p>Nylon wear pads impregnated with molybdenum disulfide and high in molecular weight shall be used between the telescoping sections for maximum weight distribution, strength, and smoothness of operation. This impregnation shall provide a lubricating function.</p>			

645.2	<p>Stainless steel adjustment screws shall be provided on the wear pads to permit proper side tension. Plates shall be installed on the sides of the slide pads where adjustment screws come into contact with them. No exceptions shall be allowed to this requirement to prohibit the adjustment screws from embedding themselves into the pads, which may cause the pad to crack and fail.</p> <p>To prevent additional maintenance and pressure points from the limited surface area, roller systems in place of wear pads will not be considered acceptable.</p>			
646.0	<u>ROTATION BEARING</u>	YES	NO	EXCEPTIONS / NOTES
646.1	<p>A 44-inch diameter external tooth, swing circle bearing shall be used for the rotation system. The bearing shall provide 360-degree continuous rotation.</p> <p>The turntable shall be bolted to the bearing using forty (40) 5/8" SAE grade 8 bolts. The bearing shall be bolted to the base support structure with sixty (60) 5/8" SAE grade 8 bolts. Welding on the bearing in any manner shall not be acceptable.</p> <p>The turntable base and the torque box bearing plate surfaces that contact the bearing shall be machined to prevent loading the bearing when the attaching bolts are brought to full torque. Machining of the surfaces shall be done after all welding to assure no further distortion of the material.</p> <p>Shims shall not be acceptable as they reduce the surface contact area significantly thereby causing a concentration of forces at the shims.</p>			
647.0	<u>BOLT TORQUING FROM TOP SIDE</u>	YES	NO	EXCEPTIONS / NOTES
647.1	<p>All rotation-bearing bolts shall be torqued from the top side of the turntable without the bolt or nut being held under the turntable by a person. Units requiring the removal of equipment to access the torque bolts shall be considered unacceptable.</p> <p>This design shall prevent the bolt from "spinning" while torque is being applied to the fastener. Application of Loctite or a similar compound alone, without any other means provided to hold the fastener, shall not be acceptable. Additionally, this design feature shall not incorporate drilling, bending, welding on, or in any way modifying the structural fastener, nut, or washers.</p>			

648.0	<u>ROTATION GEAR REDUCTION BOX</u>	YES	NO	EXCEPTIONS / NOTES
648.1	<p>A hydraulically driven planetary gearbox with a drive speed reducer shall be used to provide infinite and minute rotation control throughout the entire rotational travel. The rotation gear reduction box shall be installed on the top side of the turntable so that it is easily accessible, yet it shall be installed so that it does not provide an obstruction or tripping hazard to persons on the turntable. Specifically, it shall be installed toward the front of the turntable, under the aerial ladder base section. Under no circumstance shall the gearbox present any interference with the aerial device, even at low elevations.</p> <p>Due to the additional maintenance required to keep two (2) rotation motors functioning properly without binding, units requiring more than one (1) rotation motor are not considered acceptable.</p> <p>A spring applied, hydraulically released disc type swing brake shall be furnished to provide positive braking of the turntable assembly.</p> <p>Provisions shall be made for manual operation of the rotation system should a complete loss of hydraulic power occur. These provisions shall include a manual rotation drive tool supplied with the apparatus.</p> <p>The hydraulic system shall be equipped with pressure relief valves, which shall limit the rotational torque to a nondestructive power. All moving parts of the rotation gear reduction box shall be enclosed or under the turntable decking eliminating safety hazards.</p>			
649.0	<u>ROTATION INTERLOCK SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
649.1	<p>The aerial device shall be equipped with a rotation interlock system to prevent the ladder from being rotated to any side where the stabilizers are not sufficiently extended to provide for the full tip load rating.</p> <p>The system shall monitor the stabilizers for extension. When a stabilizer is not sufficiently extended (short jacked) to provide a full tip load rating, the system shall prevent the aerial from being rotated more than 12 degrees past the front or rear center line into the short jacked side of the apparatus.</p>			

649.2	<p>A slowdown feature shall be built into the rotation interlock system. When the aerial is operating in a short-jacked mode, the rotational speed shall be automatically reduced, by approximately 50%, when the aerial is rotated to within approximately 10 degrees of the front or rear center line of the apparatus. The rotational speed shall remain reduced throughout an arc of approximately 20 degrees over the front or rear of the apparatus, regardless of the direction of the rotation movement.</p> <p>The rotation function shall automatically stop when the aerial approaches the front or rear corner area of the short-jacked side of the apparatus. The rotation interlock system shall allow for normal operation on the side of the apparatus where the stabilizers are sufficiently extended for full tip load rating.</p> <p>An override system, activated by pull knobs within the main turntable control pedestal, shall be provided that allows the operator to rotate the aerial into the not recommended (short-jacked) side of the apparatus, should the situation demand it.</p> <p>To ensure the maximum amount of safety, units allowing aerial rotation to the short-jacked side of the apparatus or systems which only include a visual and audio warning without automatically stopping rotation shall not be acceptable.</p>			
650.0	<u>AERIAL STOW OPERATION INTERLOCK SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
650.1	<p>A safety feature shall be included in the aerial operational system that limits the possibility of damage to the apparatus when stowing the aerial.</p> <p>When a rear-mounted aerial is positioned over the cab area of the apparatus, the interlock system shall not allow the downward movement of the aerial below a preset angle of elevation, unless the aerial is rotated into the bedzone envelope. The bedzone shall be approximately 2 degrees of rotation to the left and right side of the center of the aerial bed support. Once this bedzone envelope is attained, downward movement of the aerial shall be allowed for proper positioning into the bed support.</p> <p>An indicator light shall be located at the turntable control station to inform the aerial operator when the bedzone envelope is attained.</p>			

651.0	<u>COLLISION PROTECTION INTERLOCK</u>	YES	NO	EXCEPTIONS / NOTES
651.1	<p>The apparatus shall be equipped with a cab collision protection interlock. This interlock shall be enabled while rotating the aerial device at elevations as low as, or lower than the cab of the apparatus.</p> <p>Should the operator accidentally rotate the aerial device toward the cab at an elevation low enough to cause a collision with the cab, the interlock shall automatically stop the rotation of the aerial at a point that is within a few degrees of the cab.</p> <p>A manual override shall be provided to override the interlock system.</p>			
652.0	<u>APPARATUS BODY DAMAGE CONTROL INTERLOCK SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
652.1	<p>A safety feature shall be included in the aerial operational system that minimizes the possibility of damage to the apparatus body at all angles for all standard (non-override) operational modes. The system shall automatically stop the downward movement of the aerial at a preset angle of elevation unless the aerial has been rotated at least 80-degrees, left or right, from the center of the ladder support. Once this rotation point is reached, full range downward movement (to 8 degrees) shall be allowed.</p> <p>The aerial manufacturer shall determine and set the angle of elevation where downward aerial movement is stopped. The highest point of an apparatus, in relation to the distance from the turntable, shall be used to determine the preset elevation angle stopping point. The system shall also minimize the possibility of accidental damage to the apparatus body from aerial rotation whenever the aerial elevation is below the preset elevation angle stopping point.</p>			
652.2	<p>Rotational speed shall be reduced by approximately 50% when the aerial is rotated within a minimum of 10 degrees of a body avoidance stopping point. Aerial rotation shall automatically stop before the aerial contacts the body of the apparatus. The body damage interlock system shall not affect aerial operation when the aerial is raised above the preset downward movement stopping point.</p> <p>The body damage interlock system shall not eliminate the possibility of damage to components such as telescopic lights that are in a raised position. A manual override shall be provided that will override the interlock system.</p>			

653.0	<u>POWER TAKEOFF</u>	YES	NO	EXCEPTIONS / NOTES
653.1	The apparatus shall be equipped with a power takeoff (PTO) driven by the chassis transmission and actuated by an electric shift, located inside the cab. The PTO, which drives the hydraulic pump, shall meet all the requirements for the aerial unit operations.			
654.0	<u>HYDRAULIC SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
654.1	<p>The tubing and hoses used in the hydraulic system shall have a high-pressure rating, with the tubing having a minimum burst pressure of 9,600 to 17,400 PSI and the hoses being a minimum of 8,000 to 13,000.</p> <p>The hydraulic oil tank shall have an approximate capacity of 50 gallons. A dipstick shall be provided to check the oil level. The oil fill shall be furnished with a cap that shall act as a ventilator to provide clean fresh air into the oil tank and a 40-micron filter to provide positive protection from contaminants. A magnetic drain plug shall be provided at a low point of the oil tank. An easily accessible 3-micron replaceable oil filter shall be installed on the hydraulic oil tank. The hydraulic oil tank shall be furnished with two pickup tubes, one tube for normal operation and the other for emergency operation. The emergency pickup tube shall extend further down into the oil tank to provide for reserve oil in case a hydraulic line is broken.</p>			
654.2	<p>The hydraulic system shall be protected from possible hydraulic pump malfunctions by a relief valve, which shall route the excess oil into the oil tank when the pressure in the hydraulic system exceeds 3,500 PSI. The hydraulic control valves shall also be protected by being plumbed to a pressure relief valve to protect them from high pressure.</p> <p>The hydraulic system shall be designed in such a way that all non-sealing moving components whose failure could result in the motion of the aerial device shall have a minimum bursting strength of four times the maximum operating pressure to which the component is subjected. The hydraulic system shall have adequate cooling for continuous operation of not less than 2 1/2 hours.</p>			

655.0	<u>"THRUDRIVE" HYDRAULIC PUMP</u>	YES	NO	EXCEPTIONS / NOTES
655.1	<p>The hydraulic system shall be supplied by a pressure compensated, load sensing, variable gallonage type pump. The pump shall provide adequate fluid volume to allow all ladder functions to operate simultaneously, without noticeable loss of speed. The pump shall supply oil only when the ladder is in motion, thereby preventing overheating of the hydraulic oil.</p> <p>The pump shall be a "thru-drive" design. This design shall be provided for applications that require a power source for additional hydraulically operated accessories or tools. An interlock shall be provided that allows the operation of the aerial device PTO shift only after the chassis spring brake has been applied and the chassis transmission has either been placed in the neutral position or the drive position if the driveline has been disengaged from the rear axle.</p>			
656.0	<u>HYDRAULIC PRESSURE GAUGE</u>	YES	NO	EXCEPTIONS / NOTES
656.1	A 2 1/2" Innovative Controls brass case 5,000 PSI, pressure gauge shall be located at the ground level control station to monitor the hydraulic system pressure. The gauge shall be liquid filled to prevent gauge shock when the hydraulic system is energized. The liquid shall not be vulnerable to freezing in subzero temperatures.			
657.0	<u>EMERGENCY PUMP</u>	YES	NO	EXCEPTIONS / NOTES
657.1	The apparatus shall be equipped with one (1) emergency hydraulic pump electrically driven from the chassis battery system. The emergency pump shall be capable of providing adequate ladder functions to stow the aerial and stabilizers in the case of main hydraulic pump failure.			
657.2	<p>Two (2) control switches for this emergency pump shall be provided. One switch shall be installed at the turntable control console and the stabilizer control station. The switches shall be labeled EPU.</p> <p>Each control shall be a spring-loaded momentary switch. A red indicator light shall be mounted adjacent to each switch to indicate activation of the emergency pump.</p>			

658.0	<u>HYDRAULIC SWIVEL</u>	YES	NO	EXCEPTIONS / NOTES
658.1	<p>The aerial ladder shall be equipped with a swivel at the turntable. The swivel shall connect the hydraulic lines from the hydraulic pump and reservoir to the aerial control bank at the turntable, above the point of rotation.</p> <p>The swivel shall connect all the electrical circuits through the rotation point. A minimum of thirty-two (32) collector rings shall be provided. All collector rings shall be enclosed and protected with desiccant plugs to protect against condensation and corrosion. Due to the possibility of paint contamination and dirt attraction, units requiring oil or silicone to protect the collector rings shall not be acceptable.</p> <p>The swivel shall allow for 360 degrees of continuous rotation of the aerial device with no loss of speed or capacity in functions.</p>			
659.0	<u>ANGLE INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
659.1	A liquid-filled angle indicator shall be mounted on the base section of the aerial ladder. The indicator shall give accurate elevation in degrees from 20 to +80 degrees in relation to level. The liquid shall be of proper viscosity and composition to remain in liquid form even when exposed to below-zero temperatures. Reading of the indicator shall be accomplished by observing the position of a suspended ball in relation to the degrees of elevation as marked on the indicator housing. The indicator shall be backlit for visibility in low light conditions.			
660.0	<u>EXTENSION INDICATORS</u>	YES	NO	EXCEPTIONS / NOTES
660.1	Numerals shall be affixed to the inside of the handrail of the base section opposite the turntable control console. The numerals shall be at appropriate intervals indicating total aerial extension in 5-foot increments. A band on the first fly section shall align with these marks at the appropriate extension distance.			
660.2	The extension indicator color shall provide a high contrast with the color of the ladder section to which it is applied. This shall make the length of aerial extension easily readable by the operator by merely glancing at the indicators. Numerals indicating the length of extension shall be placed adjacent to indicating bands.			
661.0	<u>MANUAL ROTATION DRIVE TOOL</u>	YES	NO	EXCEPTIONS / NOTES
661.1	As required by NFPA 1901, one (1) manual rotation drive tool shall be provided as a means to rotate the turntable in the unlikely event of power loss. This drive tool shall be provided as standard equipment.			

662.0	<u>TORQUE BOX</u>	YES	NO	EXCEPTIONS / NOTES
662.1	<p>A "torsion box" subframe shall be installed on the chassis frame rails, integral with the stabilizers. The torque box shall be constructed of a 3/8" steel plate except for the turntable area which shall be a 1/2" steel plate. The steel plates shall have a minimum yield strength of 36,000 psi and ultimate tensile strength of 58,000 – 80,000 psi. The torque box subframe assembly shall be capable of withstanding all torsional and horizontal loads when the apparatus is supported by the stabilizers. The torque box shall be bolted in place to the chassis frame rails using forty (40) 5/8" SAE grade 8 bolts with nuts.</p> <p>The aerial torque box shall be painted with AkzoNobel High Solids polyurethane paint. The color shall be black.</p> <p>To prevent unnecessary stress on the chassis, apparatus that use the chassis frame in place of a true torque box shall not be acceptable.</p> <p>The torque Box will be adequately lit for nighttime operations.</p>			
663.0	<u>FRONT AND REAR STABILIZERS</u>	YES	NO	EXCEPTIONS / NOTES
663.1	<p>Two (2) sets of stabilizers shall be installed for stability. Both sets shall be an extending box beam "H" style. Each set of stabilizers shall support full, certified aerial capabilities at a 16' spread, measured from the outermost edge of the stabilizers on each side of the apparatus. For additional stability, the stabilizers on each side of the apparatus shall have the capability of extending one (1) extra foot to a maximum spread of 18'. To get the true stabilizer spread, apparatus using measurements other than from each outside edge of the stabilizers shall not be considered acceptable.</p>			
663.2	<p>The front stabilizers shall be located directly behind the chassis cab rear wall for maximum setup ability with minimal cab deflection. The stabilizers shall be an integral part of the torque box. A heavyduty undersling assembly shall attach the front stabilizers to the front portion of the torque box. The undersling assembly shall be constructed of 6" x 10" x 1/2" square tubing, 1/4" and 3/8" steel gussets, and 1/2" mounting plates. The overlap of the under-sling and the torque box shall be a minimum of 24". The bottom side of the tubes shall contain a truss assembly that shall maximize the torsional strength of the undersling assembly.</p>			

<p>663.3</p>	<p>The front stabilizers and torque box shall be attached to the truck frame in six (6) separate locations, three (3) on each side of the apparatus, utilizing a 1/2" steel plate. The mounting plates shall be located directly under the front stabilizers utilizing eight (8) grade 8 .625" size bolts per side, under the front torque box area utilizing six (6) grade 8 .625" bolts per side and at the rear stabilizer area utilizing six (6) grade 8 .625" bolts per side.</p> <p>The rear stabilizers shall be located directly behind the chassis rear wheels. The stabilizers shall be an integral part of the torque box.</p> <p>The stabilizers shall be of the double box tube design with jack cylinders that have a 5" internal diameter (bore) and a 2.5" diameter solid cylinder rod. The jack cylinders shall be equipped with integral holding valves, which shall hold the cylinders either in the stowed or the working position, should a charged line be severed at any point within the hydraulic system. The steel used to build the stabilizer system shall have a minimum yield strength of 36,000 psi and ultimate tensile strength of 58,000 – 80,000 psi.</p> <p>Vertical jack cylinder rods shall be fully enclosed by a telescoping inner box to protect the cylinder rods, seal glands, and pistons against damage from nicks, abrasion, and chrome damage. All vertical stabilizer cylinders shall be removable from the top of the box tube. The inner double box system shall be further designed to stabilize the column load imparted upon the cylinder rod, thereby also protecting against damage that may occur from lateral loading possibly caused by side slopes, shifting or sliding of the apparatus on icy or unstable surfaces, sudden sinking of one or more jack pads, or on scene collision while the aerial device is deployed. Vertical stabilizers that require cylinders to be removed from the bottom, or have the vertical stabilizer cylinders exposed, shall not be acceptable.</p> <p>The stabilizers shall be connected to the hazard light circuit to warn the driver if they are not stowed when the parking brake is released. Each extending style stabilizer shall have a polished stainless steel stabilizer cover. The cover shall be adjustable to allow for a proper fit.</p>			
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664.0	<u>TIE OFF POINTS</u>	YES	NO	EXCEPTIONS / NOTES
664.1	Two (2) tie off points with a "D" ring latch shall be installed, one (1) on each side of the apparatus. The tie offs shall be located behind the rear wheel wells on the rear stabilizer panels. Each of the points shall carry a 1500 lb. rating.			
665.0	<u>MECHANICAL STABILIZER LOCKS</u>	YES	NO	EXCEPTIONS / NOTES
665.1	<p>Each extending vertical jack cylinder shall be equipped with a mechanical pin lock to hold it in the working position. The pin shall be zinc plated and have a yellow dipped vinyl handle for increased visibility. The locking system shall be incorporated with the protective tubing used to prevent damage to the jack cylinder rod. The inner and outer jack tubes shall be double thickness in the pinning area for additional strength.</p> <p>Safety is of the utmost concern. It is the intent of the fire department to purchase an apparatus that utilizes mechanical stabilizer locks in addition to the hydraulic holding valves integral to the stabilizer jacks. Should a mechanical failure occur with the stabilizer system or hydraulic seepage cause a stabilizer to drift, the mechanical locks shall keep the desired "stabilizer setup" intact without compromising aerial capabilities or safety. There shall be no exception allowed to this requirement.</p>			
666.0	<u>STABILIZER STROKE</u>	YES	NO	EXCEPTIONS / NOTES
666.1	The stroke of the stabilizers shall be a minimum of 25". The stabilizer pad shall be maintained at a stored height of approximately 12" to 15" (dependent on required ground clearance and angle of departure) resulting in a minimum ground penetration of 10" or greater.			
667.0	<u>STABILIZER FINISH</u>	YES	NO	EXCEPTIONS / NOTES
667.1	The extending front/rear stabilizer beams, inner jack tubes, and stabilizer pads shall be shot blasted to remove any mill scale or contamination. The stabilizers shall be prepared to provide maximum protection for critical components. The outer tubes shall be finished with a water-based, high-quality, single-component acrylic primer. The primer color shall be flat black.			

668.0	<u>WEAR PADS/BEARING SURFACES</u>	YES	NO	EXCEPTIONS / NOTES
668.1	<p>Nylon wear pads impregnated with molybdenum disulfide and high in molecular weight shall be used between the stabilizer housing assembly and the extension tube for maximum smoothness of operation.</p> <p>Two (2) Nylatron wear pads shall be installed in each stabilizer extension system. There shall be one wear pad located on the top back portion of the extension tube assembly that shall glide on the inner wall of the top housing tube wall. There shall be an additional pad located on the inner wall of the bottom housing tube wall that shall separate the bottom side of the extension tube and the bottom wall of the housing tube. The pads shall be installed in such a manner as to reduce friction for ease of operation and to reduce the amount of metal-to-metal contact. Each stabilizer down jack housing tube shall contain four wear pads, one (1) on each side of the tube.</p>			
669.0	<u>STABILIZER EXTENSION SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
669.1	Extension of the front and rear horizontal beams shall be activated by dual extension cylinders, which shall each have a 2" internal diameter (bore) and a 1.25" diameter cylinder rod. The extension cylinders shall be totally enclosed within the extension beams to prevent damage to the rod and hoses. The extension beams shall be 6.00" x 8.00" x .375" wall steel tubing with a .62" steel plate welded to the top and bottom of each beam.			
670.0	<u>STABILIZER ANGLE LEVEL GAUGES</u>	YES	NO	EXCEPTIONS / NOTES
670.1	One (1) manual angle level gauge shall be located on the rear of the apparatus. The gauge shall have a sight bubble that will measure the side-to-side angle of the apparatus in 2-degree increments.			
670.2	One (1) manual angle level gauge shall be located on the apparatus, near the rear. The gauge shall have a sight bubble that will measure the fore-to-aft angle of the apparatus in 2-degree increments.			
671.0	<u>ELECTRIC / HYDRAULIC STABILIZER CONTROLS</u>	YES	NO	EXCEPTIONS / NOTES
671.1	The stabilizer controls shall be located at the rear of the apparatus. Two (2) stations shall be installed, one (1) on each side at the rear, arranged so that the operator has a full view of the stabilizer being positioned. All stabilizer control functions shall be of the electric paddle joystick style. The make and model of the joysticks shall be PQ controls, model M105. The controls shall be designed to allow stabilizers to be operated independently so that the vehicle may be set up in a restricted area or uneven terrain.			

671.2	<p>An electrically actuated diverter valve shall be provided in conjunction with the stabilizer controls as a safety device. The diverter valve shall allow the hydraulic fluid to flow either to the stabilizer circuit or the turntable and ladder circuit.</p> <p>A stabilizer deployment warning alarm, activated by stabilizer mode, shall be provided at each stabilizer to warn personnel. The warning alarm shall deactivate only when all stabilizers are in the load-supporting configuration, or when the diverter switch is no longer in the stabilizer mode.</p> <p>The stabilizer controls shall each be accessible through a brushed stainless-steel door.</p>			
672.0	<u>GROUND CONTROL STATION</u>	YES	NO	EXCEPTIONS / NOTES
672.1	<p>A control station shall be located at the rear of the apparatus in an easily accessible area. The control panel shall be illuminated for nighttime operation. The following items shall be furnished at the control console, clearly identified, and located for ease of operation and viewing:</p> <ul style="list-style-type: none"> • Individual stabilizer down indicator lights • Aerial PTO engaged indicator light • High idle switch with indicator light • Emergency hydraulic pump control with indicator light • Stabilizer/Aerial diverter control with indicator light • Side-to-side leveling bubble <p>A weatherproof compartment shall be furnished behind the control panel and shall contain the aerial circuit breakers, interlock components, and control circuit distribution terminals. The control station shall be accessible through a brushed stainless steel door.</p> <p>The stabilizer controls and ground control station surfaces shall be fabricated from a 3mm thick solid core aluminum composite panel with double-sided painted aluminum outer surfaces bonded to a solid polyethylene core. They shall include an Innovative Controls graphic overlay design and supply a second surface printed UV and scratch-resistant polycarbonate graphic overlay backed with UL 969-compliant outdoor adhesive.</p>			

673.0	<u>STABILIZER PLACEMENT LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
673.1	There shall be four (4) HiViz (FTLZC24B) lights with blue (PCV8500B) covers. The lights shall be recessed into the sides of the body as per engineering drawings and shall provide focused blue lights on the ground that show where the outriggers will land during deployment and placement. Activation shall be from a button in the multiplex display.			
674.0	<u>STABILIZER COVER WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
674.1	One (1) Whelen 600 Series SuperLED flashing light shall be installed on each extending stabilizer cover panel, for a total of four (4). These lights shall be red in color with a red lens and activated by the aerial master switch and emergency master switch.			
675.0	<u>STABILIZER ARM WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
675.1	Eight (8) Whelen 5G Series SuperLED red flashing lights shall be mounted on the stabilizer beams. Each stabilizer beam shall include two (2) lights, one (1) facing forward and one (1) facing rearward. The lights shall be mounted inboard of vertical jack tubes. The warning lights shall be activated by the aerial master switch.			
676.0	<u>STABILIZER WORK LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
676.1	Four (4) TruckLite round 6 Diode LED lights shall be provided, one (1) at each stabilizer location to illuminate the surrounding area. The lights shall be located under the stabilizer beams and activated by the aerial master switch.			
677.0	<u>WHEEL WELL PAD COMPARTMENTS</u> <u>AUXILIARY STABILIZER PADS</u>	YES	NO	EXCEPTIONS / NOTES
677.1	An auxiliary pad for additional load distribution on soft surfaces shall be supplied for each stabilizer. The pads shall be constructed of ultrahigh molecular weight composite material that is a minimum of 1" thick with a minimum surface area of 576 square inches. The auxiliary pads shall be stored in wheel well compartments on each side of the body. There shall be two (2) pads stored in each of the compartments. The compartment door, flange, and hinges shall be constructed of stainless steel material. The door shall have a rubber gasket to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a molded component that is assembled to the door and flange. The door shall have a brushed stainless-steel finish.			

678.0	<u>TURNTABLE</u>	YES	NO	EXCEPTIONS / NOTES
678.1	<p>The turntable shall be designed in such a manner to allow a generous working area, regardless of the position of the aerial, including when positioned at maximum elevation. The turntable shall also be designed to allow for the most efficient use of space on the apparatus body.</p> <p>The turntable shall be a minimum of 95" side to side and 95" forward to aft.</p> <p>It shall be covered with Tread Grip Safe Deck pattern decking to allow the walking surface to shed liquids with unparalleled ease and comply with NFPA intent, to provide secure footing for the operator in all weather conditions.</p> <p>A downward lip shall "skirt" the turntable decking around the entire circumference to protect it from hazards.</p> <p>All hoses and electrical lines shall be routed under removable covers to prevent a tripping hazard. The covers shall also be designed to prevent damage from occurring to these components. Likewise, the center of the turntable shall have a removable step cover to prevent tripping hazards as well as provide for an easier transition to the first rung of the aerial ladder.</p> <p>To prevent unnecessary added weight to the apparatus, the turntable shall not be built entirely from solid materials.</p>			
679.0	<u>TURNTABLE HANDRAILS</u>	YES	NO	EXCEPTIONS / NOTES
679.1	<p>Three (3) handrails shall be of one-piece construction and provide large sweep corners at the edge of the turntable. Each shall be 42" high and shall be constructed from knurled stainless steel. The handrails shall be installed around the rear 180-degree perimeter of the turntable for operator and personnel safety. Each handrail shall be secured to the turntable by the use of two (2) minimum 5/8" anchor bolts on the underside of the turntable. Additionally, chrome-plated stanchions with rubber gaskets shall be provided on the top surface of the turntable where each railing meets the decking surface.</p> <p>There will be two (2) openings in the handrails for access from the turntable access ladders.</p>			
680.0	<u>TURNTABLE RESTRAINTS</u>	YES	NO	EXCEPTIONS / NOTES
680.1	<p>Two (2) stainless steel safety chains with carabiner-type ends shall be installed in the spaces between the handrails. The chains shall be permanently attached at one end.</p>			

681.0	<u>TURNTABLE WORK LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
681.1	<p>The turntable shall be lighted for nighttime operation with a minimum of three (3) Grote LED work lights, which shall be automatically activated by the aerial master switch (day or night). The work lights shall be positioned so the light is directed toward the decking. The lights shall have integral chrome hoods to keep light from glaring upward into the operator's eyes.</p> <p>An additional Grote LED light shall be recess mounted in the front access door of the control stand.</p>			
682.0	<u>AERIAL PIVOT PINS</u>	YES	NO	EXCEPTIONS / NOTES
682.1	<p>The aerial device pivot pins shall be located on the turntable and shall attach the aerial device base section to the turntable. To maintain a suitable safety factor, the pivot pins shall be composed of certified structural steel, thereby ensuring structural integrity.</p> <p>In the interest of safety, the pivot pins shall be located as low as possible and shall be at the aerial device base rails. This shall keep the pivot points away from the areas where persons regressing to and from the aerial base section, might place their hand(s).</p> <p>Aerial pivot pins shall be installed as a means to keep the pins in place. The design shall not inhibit the pins from being removed by a qualified mechanic.</p>			
683.0	<u>AERIAL HOUR METER</u>	YES	NO	EXCEPTIONS / NOTES
683.1	There shall be an hour meter installed at the lower center control station connected to the system engagement control for the aerial. The meter shall register the total hours of aerial use for scheduling periodic maintenance.			
684.0	<u>TURNTABLE CONTROL CONSOLE</u>	YES	NO	EXCEPTIONS / NOTES
684.1	The turntable control console shall be located on the turntable, on the driver's side of the apparatus. The console shall be illuminated by an LED light with mounting clips for nighttime operation and have a hinged weather cover. A pressurized gas-filled cylinder shall be furnished on the cover to hold it in the open position. The gas-filled cylinder shall assist in closing the cover automatically when it is positioned over the center. The console surface shall be angled toward the operator so controls may be viewed and operated ergonomically. Rubber bumpers shall be provided so that when the control console lid is closed, the lid and the control panel will be protected from each other (no metal-to-metal contact).			

<p>684.2</p>	<p>Three (3) handles for the ladder hydraulic functions (elevation, rotation, and extension) shall be installed at the control console. The controls shall be manual for safety and durability reasons. The function of each control lever shall be cast into the plate under the appropriate lever. The controls shall be capable of being operated independently or simultaneously with a gloved hand. The speed of movement caused by moving any control shall be minimally affected when multiple controls are activated.</p> <p>The control console surface shall be fabricated from aluminum and shall include a graphic overlay. The overlay shall be Innovative Controls design and supply a second surface-printed UV and scratch-resistant polycarbonate graphic overlay backed with UL 969compliant outdoor adhesive.</p> <p>A hinged door shall be provided on the front of the control console with a pop latch. This door shall allow access to the inner components for inspection purposes. A recessed work light shall be provided in the access door. There shall be a hinged access door provided on the outboard side of the control panel. The door shall be provided with a spring-loaded, slotted head latch. The opening shall allow access to the electrical components for service purposes.</p> <p>The following items shall be furnished at the console, clearly identified, and located for ease of operation and viewing:</p> <ul style="list-style-type: none"> • Elevation, Extension, and Rotation Controls • Lighted Push/Pull Button to Deactivate Hydraulic and Electrical System • Panel Light Mounted in Cover • Ladder Overload Warning Horn • Monitor Function Controls • Intercom with Controls • Operators Load Chart • Warning Signs <p>To minimize the chance of failed components, turntable consoles requiring a fan to cool interior components shall not be considered acceptable.</p>			
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685.0	<u>AERIAL INFORMATION SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
685.1	<p>The aerial shall be equipped with a 7" color transmissive TFT LCD located at the turntable control console. The display shall be viewable in direct sunlight, with a resolution of WVGA, 800 x 480 pixels, 16-bit color, and an aspect ratio of 16:9.</p> <p>The display shall feature LED backlighting, 1000 nit typical brightness (40,000 h lifetime). The display shall include an internal microprocessor Freescale IMX. 375 32bit, 532 MHz utilizing a QNX operating system. The display shall have a minimum of 2 GB RAM flash memory and 128 Mbytes SDRAM. The display shall support J1939 and NMEA 2000 protocols.</p> <p>For protection against extreme environmental conditions, connections shall utilize 2 Ampseal 23 pin connectors AMP7706801 and AMP7706804. User inputs shall be accomplished utilizing 14 tactile buttons located directly on the display. The display shall be capable of operating 40° C to +85° C and a minimum IP67 rating front and back. For maximum protection, the display case shall be constructed of Polycarbonate capable of random vibration, 7.86 Grms (5.2000 Hz), 3 axis, and a shock of +/- 50G in 3 axis.</p> <p>The display will gather ladder positional data from an array of sensors. This data will not only be displayed for the device operator, but the rotation and elevation sensors will also be used to protect the body, cab, and installed components from collision damage caused by the aerial device.</p> <p>Soft Keys Columns of vertical keys shall be located to the left and/or right of the display. The soft keys correspond to the soft key commands and allow selections with a gloved hand. Icons shall be displayed on the screen adjacent to the soft key and will change according to the options available for the screen being displayed.</p>			

685.2	<p>The display shall provide the operator with critical aerial information and switching of aerial electrical components in an easy-to-read format as follows:</p> <ul style="list-style-type: none"> • Extension Retraction Percentage – Digital readout shown 0% -100% • Ladder Angle 15 to 90 Degrees (Operational range of Aerial 8 to +72 Degrees) • Rotation Position – 0 -360 Degrees • Ladder Load Percentage Display live loads acting on the aerial structure shown as 0 -100% • Breathing Air – 06000 Psi (This is available only if optional breathing air has been specified) • Bed Zone Alignment Light – When the aerial is aligned and within the bed zone the indicator shall change to a bright color to indicate it is safe to bed the aerial. • Rung alignment light – When the aerial rungs of each section are aligned the indicator shall change to a bright color to indicate the rungs are aligned to provide safer climbing of the aerial. • Soft keys located on each side of the display shall be programmed to allow the operator to quickly change screens to view the following: • Positional Waterway – Label shall read “Water Tower” or “Rescue”, depressing this soft key shall allow the user to select what section the waterway will be positioned. When “Water Tower” is displayed the waterway shall be affixed to the uppermost fly section of the aerial. When “Rescue” is displayed, the waterway shall be affixed to the next lower section. • Creeper Control Enable – Label shall read “Creep Master”. Pressing this momentary soft key switch allows creeper controls to be used at the tip of the aerial ladder. When the soft key is pressed the indicator shall change to a bright color to indicate the creeper controls at the tip have been activated. (This option is available only if optional creeper controls have been specified) • High Idle – Label shall read “High Idle”. Pressing this soft key shall increase engine RPM to the chassis preset high idle, pressing the button again shall return engine RPM to the chassis preset idle. The indicator shall change to a bright color to indicate the high idle has been activated. 			
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685.3	<ul style="list-style-type: none"> • Retraction Override Label shall read “Retract Enable”. Pressing this soft key shall allow the aerial ladder to fully retract when in the overlap zone. Once the operator has verified that it is safe to retract the aerial and presses the soft key, the label shall change to a bright color to indicate the aerial can be fully retracted. • Emergency Power Unit Label shall read “EPU”. Pressing this soft key shall activate the electric over hydraulic emergency power unit. • Engine Information Screen – An icon depicting an engine shall be displayed next to the soft key. Pressing this button shall allow the operator to switch to the screen displaying chassis engine information. • Day/Night Display Mode -An icon depicting the sun or the moon shall be displayed next to the soft key, pressing this button shall switch the display to from a bright format for daytime use or a subdued format for nighttime use to maintain a greater vision of the operator. • Lighting /Customer Information Screen -An icon depicting a light bulb shall be displayed next to the soft key, pressing this button shall switch the screen from its current screen to the screen to control lighting on the aerial. <p>The following information shall be displayed on the aerial display:</p> <ul style="list-style-type: none"> • Customer name • Production number • Aerial device type • Aerial device model number • Aerial device serial number • Rated vertical height • Rated horizontal reach • Rated capacity • Contact information for the fire apparatus manufacturer. Information shall include name, address, phone number, and website • Chassis Engine Information Screen • Engine coolant temperature • Oil pressure • Transmission temperature • Fuel level • Battery voltage • Engine RPM 			
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	<ul style="list-style-type: none"> • Engine Warnings – To include Check Engine, Stop Engine, DPF Regeneration Required, Regeneration Status, and High Exhaust Temperature 			
686.0	<u>SYSTEM LOCK CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
686.1	A push/pull systems engagement control shall be installed at the turntable control console. The control shall energize the hydraulic system for the ladder function and provide the flow of hydraulic fluid to the master valve bank. An automatic throttle switch shall be attached to the systems engagement control that advances the engine speed to a preset RPM when the engagement control is in the "RUN" position. In the "LOCK" position, the engine speed shall return to the normal idle RPM and the hydraulic system be deenergized.			
687.0	<u>LOAD SENSING AL11 SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
687.1	Indication for the load sensing system shall be programmed into the AL11 system at the turntable control console.			
688.0	<u>AERIAL LADDER LOAD CHART</u>	YES	NO	EXCEPTIONS / NOTES
688.1	A load chart shall be installed at the turntable control console of the aerial ladder. The load chart shall illustrate the full operating range of the ladder, with the waterway dry or flowing water.			
689.0	<u>AERIAL COMMUNICATION SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
689.1	An Atkinson Dynamics two (2) station communication system shall be provided between the aerial tip and the turntable control console. The communication system shall be a two-way system with the communication speaker at the tip requiring no operator attention to transmit or receive. The transmitting and receiving volume controls shall be located at the turntable control console.			
690.0	<u>12V TRACKING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
690.1	There shall be two (2) FTWLX9SW, FireTech LED, tracking lights. The lights produce 5,734 effective lumens each. The lights shall have a lifetime warranty. The lights shall be wired to 12V only. The tracking lights shall be controlled through the AL11 system.			
691.0	<u>ROTATIONAL GEAR COVER</u>	YES	NO	EXCEPTIONS / NOTES
691.1	There shall be a cover installed on the rotational gear, below the officer's side of the turntable. The gear guard shall protect the hose bed hose from getting caught in the rotational gear. The cover shall be painted aerial ladder color.			

692.0	<u>RETRACTION OVERRIDE SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
692.1	<p>An integral part of the extension/retraction system shall be a safety system to prevent injury to personnel at the end of the fly section while the ladder is being retracted. This system shall be designed in such a manner to prevent retraction of the aerial device when the folding steps at the end of the fly section are in overlap with the rungs of another section.</p> <p>When the steps are in an overlap condition, retraction shall only be accomplished by an operator at the primary control station pressing and holding a momentary switch at the turntable control console while the retraction control is operated.</p> <p>A retraction override switch shall be programmed into the system at the turntable console position.</p>			
693.0	<u>EGRESS</u>	YES	NO	EXCEPTIONS / NOTES
693.1	<p>A shorter than standard length, removable, bolt-on egress shall be installed on the tip of the fly section. Only certified structural fasteners shall be utilized to attach the egress to the tip of the fly section. Additionally, the fasteners shall be stainless steel. This design shall allow for easy replacement should the egress become damaged during rescue operations. This shall prevent the department from experiencing serious downtime, as is common with welded-on egresses. For this reason, a design that allows the egress to be welded to the fly section shall not be acceptable.</p> <p>When the ladder is at 0 degrees elevation, the rungs on the egress shall be on a plane of 11 degrees. This shall provide a smoother transition onto the ladder from the tip when it is at a high angle elevation.</p> <p>The egress shall have handrails that match the fly section handrails for an unnoticeable transition between the two. The egress handrails shall have a radius design at the tip to eliminate corner joints, increase strength, and provide a professional appearance.</p>			
693.2	<p>The rungs on the egress shall be held to the same design load criteria as the rungs of the aerial ladder sections. Specifically, each egress rung shall be able to support a design load of 500 lbs. minimum, distributed across the rung, as specified in NFPA 1901. This shall be in excess of that required by the aforementioned standard. No exceptions shall be allowed to this requirement.</p>			

694.0	<u>BOLT ON EGRESS TIP LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
694.1	There shall be LED lighting installed to the bottom side of the bolt on egress tip.			
695.0	<u>AERIAL LADDER CREEPER CONTROLS</u>	YES	NO	EXCEPTIONS / NOTES
695.1	A remote ladder creeper control shall be provided at the tip of the fly section. The control shall consist of three (3) spring loaded, triple pole double throw, return to center switches, one for each main ladder function. Each function switch shall be labeled on a black and white label that is located adjacent to the switches. Each switch shall be encircled by a rubber boot to protect the switch box from collecting moisture. The creeper control shall allow the crew member on the tip of the ladder to operate these three functions within the speed limitations as outlined in accordance with NFPA 1901, current edition.			
695.2	A momentary switch shall be provided in the system at the lower turntable control console to activate the creeper control system. When the button is held in the "on" position, power shall be available to the person at the tip and they shall be able to adjust the aerial with the creeper controls. When the button is not depressed, the creeper system will be deenergized.			
696.0	<u>SECTION FOLDING STEPS</u>	YES	NO	EXCEPTIONS / NOTES
696.1	<p>One (1) set of folding steps shall be installed at the tip of the ladder to provide solid footing for personnel while operating the elevated master stream device.</p> <p>To meet NFPA requirements that state the operator's feet shall not protrude through the outermost fly section, a kick plate shall be provided with each step.</p> <p>When folded for storage, the steps shall not present any obstruction to personnel on the apparatus. Proper installation of the steps shall require that rubber gaskets shall be installed under the mounting surface where the step is secured to the aerial ladder section with certified structural fasteners.</p>			
697.0	<u>FLY SECTION LOAD LIFTING/RAPPELLING EYES</u>	YES	NO	EXCEPTIONS / NOTES
697.1	The aerial ladder shall be equipped with two (2) load lifting/rappelling eyes at the tip of the fly section. The load lifting/rappelling eyes, as a pair, shall be rated not to exceed the tip load of the ladder structure.			

698.0	<u>FLY SECTION MOUNTED AXE</u>	YES	NO	EXCEPTIONS / NOTES
698.1	An axe mounting bracket and retention strap shall be installed on the fly section. One (1) Fire Hooks Unlimited, model FA6, flathead axe with fiberglass handle shall be provided.			
699.0	<u>FIRETECH 12V LED TIP LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
699.1	Two (2) 12V FireTech LED lights shall be installed at the tip of the aerial. Each light shall mount directly to a horizontal or vertical surface, one (1) each side. Wiring shall extend from the rear of the lights. The LED scene lights shall be for fire service use. The lights shall be located at the aerial tip, one (1) on the driver's side and one (1) on the officer's side. The tip light(s) shall be controlled through the system.			
700.0	<u>120V TIP LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
700.1	There shall be two (2) positional waterway mounted, 12V/120V, FireTech, FTWLX20 FTW, combination LED lights. The lights shall be 20,000 lumens each. One (1) HVSTM600 power supply shall be ordered and installed at the positional waterway to allow the lights to function as either 12V or 120V lights. The lights shall be located on the positional waterway, one (1) on the driver's side and one (1) on the officer's side. The 120V tip light(s) shall be controlled through the AL11 system on the turntable, and by the multiplex display screen located in the cab.			
701.0	<u>WATERWAY SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
701.1	A waterway system shall be provided consisting of the following components and features: A 4 1/2" outside diameter pipe shall be connected to the water supply on one end and to a water swivel at the rotation point of the turntable. The swivel shall allow the ladder to rotate 360 degrees continuously while flowing water.			
701.2	A 4" inside diameter pipe waterway shall be routed through the rotation point swivel up to the heel pin swivel. The heel pin swivel shall allow the water to flow to the waterway while elevating the aerial ladder from 8 degrees below to +72 degrees above horizontal.			

701.3	The heel pivot pin shall not be integral with the waterway swivel at any point. The design of the waterway shall allow complete servicing of the waterway swivel without disturbing the heel pivot pin.			
702.0	<u>WATERWAY PIPE DIAMETERS</u>	YES	NO	EXCEPTIONS / NOTES
702.1	The integral telescopic waterway system shall consist of a 5" outside diameter steel pipe in the base section, a 4 1/2" diameter pipe on the second section, a 4" outside diameter pipe on the third section, and a 3 1/2" outside diameter pipe in the fly section.			
703.0	<u>CHROME PLATED WATERWAY</u>	YES	NO	EXCEPTIONS / NOTES
703.1	<p>The telescopic waterway shall be composed of high-quality steel.</p> <p>Each pipe shall then be prepared to be heavily chrome plated. Materials (nickel/copper/ chrome) used in the chrome plating process shall be of the highest purity to complete the chrome plating process. The chrome shall be polished to an extremely high luster.</p> <p>The waterway on the base section of the aerial device shall be completely covered utilizing AkzoNobel paint of job color.</p>			
704.0	<u>POSITIONAL WATERWAY</u>	YES	NO	EXCEPTIONS / NOTES
704.1	The waterway shall be a positional or detachable type to allow the uppermost fly section to be clear of obstructions when using the aerial device for rescue purposes. It shall be designed in such a manner to allow the master stream device to be affixed to either the tip of the fly or to the end of the next lower section. The device shall be designed in such a manner that when it is in the forward position the monitor master stream device shall be connected to the tip of the ladder and when it is toward the back, the device travels with the next lower ladder section. The connection for remote nozzle controls and electricity to the unit shall be permanent and not incorporate any spring-loaded cable reels or electrical contact pads that can foul or become damaged allowing the monitor to become inoperable. In addition, the system shall require no external power supply such as a battery to operate the monitor.			

704.2	A button shall be provided on the AL11 system at the turntable control console for the positional waterway. The button shall activate an electric actuator mechanism that will lock the monitor in the desired position. Indication shall be provided on the screen of the AL11 to inform the aerial operator of the current position of the monitor. The verbiage on the screen for the two (2) positions shall read "Rescue" and "Water Tower".			
704.3	To ensure maximum safety for personnel, units that require a firefighter to climb to the end of the ladder and manually change the position of the waterway will not be considered acceptable.			
705.0	<u>WATERWAY RELIEF VALVE</u>	YES	NO	EXCEPTIONS / NOTES
705.1	A 3/4" safety relief valve shall be installed in the base section waterway. The relief valve shall be preset at 240 psi. The valve shall protect the waterway from overpressure, which is normally caused by the capping of the monitor outlet. This valve in no way is to act as a relief for the total flow of the system.			
706.0	<u>WATERWAY DRAIN VALVE</u>	YES	NO	EXCEPTIONS / NOTES
706.1	A 1 1/2" drain valve shall be installed in the lower section of the aerial plumbing under the apparatus. The valve, when opened, shall drain the aerial waterway and lower plumbing.			
707.0	<u>WATERWAY INLET</u>	YES	NO	EXCEPTIONS / NOTES
707.1	<p>A 4" inlet, with 4" plumbing, shall be installed on the officer's side pump panel of the apparatus to be used for supplying the aerial waterway.</p> <p>There shall be one (1) South Park, model IL3516AC, 4"NPT X 4"NST, chrome, waterway adapter bushing with screen provided.</p> <p>There shall be one (1) Kocheck, model SKE54R, 4" Female NH swivel rocker lug x 5" Storz 30° elbow adapter provided.</p> <p>There shall also be one (1) Kocheck model CC507, 5" Storz blind cap with chain provided.</p> <p>The adapter and cap shall be light weight aluminum with a black KCoat finish.</p>			
708.0	<u>WATERWAY FLOW METER</u>	YES	NO	EXCEPTIONS / NOTES
708.1	One (1) Fire Research Insight Ultimate combination digital flowmeter and pressure indicator display shall be installed at the aerial ladder turntable control station.			

708.2	The kit shall include a flowmeter/pressure display module. The display module case shall be waterproof, manufactured of anodized machined aluminum, and have dimensions not to exceed 4 3/8" high by 4 3/8" wide by 3 1/2" deep. The module shall have a digital LED display for flow with super bright digits more than 3/8" high. The flow rate shall be displayed in GPM. The module shall have an analog display for pressure with an expanded scale in the normal operating range for more accurate readings. The pressure indicator input and movement shall be electronic. Pressure shall be displayed in PSI.			
708.3	The flowmeter/pressure indicator program features shall be accessed from the front of the module. The program shall support multiple calibration points for flow and pressure, set points for high and low flow warnings, and flow totalizing functions. The pressure indicating needle shall be microprocessor controlled. The module shall be able to communicate with other FRC Insight flowmeters over a datalink.			
709.0	<u>WATERWAY FLOW METER PUMP PANEL</u>	YES	NO	EXCEPTIONS / NOTES
709.1	One (1) Class 1 Flowminder shall be installed to monitor the flow of the aerial waterway. The Flowminder shall have a LED display to indicate the volume of water being discharged. The display shall be weatherproof. The Flowminder shall be located at the pump panel. All discharges shall have the OEM Standard label package unless stated otherwise. Each discharge label shall be a unique color. Specific verbiage and colors on each discharge label tag shall be determined at the pre-construction meeting.			
710.0	<u>AKRON BRASS STREAMMASTER II MONITOR</u>	YES	NO	EXCEPTIONS / NOTES
710.1	An Akron Brass Stream-Master II 3480 all electric monitor shall be installed at the end of the aerial waterway. The monitor shall be constructed of lightweight Pyrolite with a 4", 150lb flange inlet and 3 1/2" thread outlet with cast-in turning vanes in each elbow shall be provided. The monitor shall not to exceed 15" high and 11 5/8" wide. The standard absolute position sensors provide advanced features like programmable obstacle avoidance, oscillation, and stow/deploy positions. The onboard, fully sealed IP 67 CAN control system features "plug and play" installation with built-in wireless capability and a USB port for quick software updates in the field.			

710.2	The Universal II (U2) control system shall include coated, solid state components to resist water corrosion and two (2) multipin interface connectors. The control system will have the capability to automatically lower the nozzle to below 90 degrees elevation to prevent the nozzle from coming into contact with the fly section when retracting the waterway. Each operator station shall be able to control the vertical and horizontal rotation of the monitor and the pattern of the nozzle. The lower operator station will override the upper operator station when operated simultaneously. The monitor shall also be programmed with extended vertical range of 30 degrees, enabling the ladder to be placed below the fire floor and deliver a stream into the involved area, keeping personnel and equipment in a safer position.			
711.0	<u>MONITOR COLOR</u>	YES	NO	EXCEPTIONS / NOTES
711.1	The monitor shall be powder coated Akron Red, AkzoNobel Interpon PG000QF, by the monitor manufacturer and shall not be repainted by the OEM.			
712.0	<u>NOZZLES</u>	YES	NO	EXCEPTIONS / NOTES
712.1	An Akron Brass, model 5178, Akromatic electric combination fog and straight stream master stream nozzle shall be provided. The nozzle shall be equipped with an automatic flow mechanism that provides a flow range of 500 to 1500 GPM at 80 PSI. The nozzle shall be constructed of durable, lightweight Pyrolite and shall have electric 12-volt motor for pattern selection from straight stream to wide fog, grease fitting for maintenance, and a 3 1/2" NH thread swivel base. One (1) Master Stacked Tips Akron 3499 will be provided along with one (1) Akron Stream Shaper 3485.			
713.0	<u>MONITOR SWEEP</u>	YES	NO	EXCEPTIONS / NOTES
713.1	The outlet vertical rotation shall be from 45 degrees to 120 degrees above horizontal with adjustable stops. When the monitor is operated above the plane of the aerial, the tip load shall be reduced by 250 lbs. The adjustable horizontal rotation shall have preset stops at 90 degrees left of center and 90 degrees right of center.			

714.0	<u>MONITOR SAFETY INTERLOCK</u>	YES	NO	EXCEPTIONS / NOTES
714.1	The monitor shall be equipped with a monitor safety interlock (MSI) that shall prevent the monitor or nozzle from coming into contact with the cab windshield and/or roof. The MSI shall automatically stop the operator from lowering the aerial into the cradle until the monitor has been fully raised to prevent damage. In addition, the blue bed zone indicator shall not illuminate until the ladder is aligned with the cradle and the monitor is in the fully raised position.			
715.0	<u>STOW FEATURE</u>	YES	NO	EXCEPTIONS / NOTES
715.1	The monitor shall be equipped with a stow feature. When activated, the stow feature shall return the monitor to a pre-programmed or nested position. The stow feature shall be activated by a covered momentary switch on the turntable control console. A light shall be provided on the control console to advise when the monitor is in the nested position.			
716.0	<u>MONITOR CONTROLS</u>	YES	NO	EXCEPTIONS / NOTES
716.1	<p>The aerial master stream device shall have two (2) separate control stations. One station shall be at the main aerial turntable control console. The other station shall be located at the tip of the aerial ladder. Each station shall have the capability of controlling the nozzle pattern as well as the horizontal and vertical position of the device.</p> <p>There shall be one (1) 60410008 Akron panel mount controller to the pump panel. This shall allow Up/Down, Left/Right, Fog/Stream, and Stow functions to the Stream Master aerial monitor.</p>			
717.0	<u>ROPE RESCUE PACKAGE</u>	YES	NO	EXCEPTIONS / NOTES
717.1	An aerial rope rescue package shall be installed with the following components:			
718.0	<u>RESCUE ROLLER ASSEMBLY</u>	YES	NO	EXCEPTIONS / NOTES
718.1	A rescue roller assembly shall be provided for use on the tip of the fly section. This assembly shall be used to keep rope that is pulled from the operator's turntable position from being frayed or rubbing on and uneven surface of the aerial ladder. Two (2) rollers shall be provided on the assembly, capable of passing 1/2" rope. The entire assembly shall be removable, and the plate shall be coated with black bedliner material.			

719.0	<u>RESCUE ROLLER ASSEMBLY MOUNTING BRACKET</u>	YES	NO	EXCEPTIONS / NOTES
719.1	A mounting bracket shall be provided on the forward portion of the base section for storing the rescue roller assembly.			
720.0	<u>RESCUE ROPE CHANGE OF DIRECTION ASSEMBLY</u>	YES	NO	EXCEPTIONS / NOTES
720.1	A rescue rope change of direction assembly shall be provided for use with the roller assembly on the tip of the fly section. This assembly shall allow the rope to be pulled from different directions. The assembly shall be mounted at the base of the ladder. The entire assembly shall be removable.			
721.0	<u>RESCUE ROPE C.O.D. ASSEMBLY MOUNTING BRACKET</u>	YES	NO	EXCEPTIONS / NOTES
721.1	A mounting bracket shall be provided on the rear portion of the base section for storing the rescue rope change of direction assembly.			
722.0	<u>RUNG ILLUMINATION LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
722.1	<p>The aerial ladder sections shall be equipped with permanently installed blue LED rung illumination lights. The lights shall be mounted on the inside of the ladder sections, facing inward; on each aerial section in a "staggered" configuration. The blue colored lens shall serve to illuminate ladder rungs without inducing any glare, which would hinder safety. Each light shall be equipped with an integral guard to protect it from damage. The lights shall be positioned such that all light be directed inward toward the rungs of the aerial sections, maximizing safety for all personnel during night operations. The lights shall also aid the operator in locating aerial ladder section in conditions of reduced visibility.</p> <p>Designs that use luminescent tape on the rungs shall not be permitted as they require previous exposure to sunlight and can wear off over time. The rung lighting shall be controlled through the AL11 system.</p>			
723.0	<u>AERIAL LADDER SIGNS</u>	YES	NO	EXCEPTIONS / NOTES
723.1	Two (2) sign panels measuring 16" tall x 133" long shall be installed on the base section of the aerial ladder, one on each side. The sign panels shall be fabricated of 1/8" aluminum plate. The signs shall be large enough to accept a maximum lettering size of 12" high.			

724.0	<u>BASE SECTION MOUNTED STOKES BASKET STORAGE</u>	YES	NO	EXCEPTIONS / NOTES
724.1	A storage box shall be provided on the base section for an Oversized Stokes basket. The box shall be on the officer's side of the base section to be the least obtrusive when viewing the aerial tip from the turntable control console. The box shall be fabricated from smooth aluminum and be painted to match the ladder. The box shall be attached to the aerial section using stainless steel fasteners. A retaining strap shall be provided on the box to secure the Stokes basket.			
725.0	<u>FLY SECTION MOUNTED ROOF LADDER</u>	YES	NO	EXCEPTIONS / NOTES
725.1	One (1) roof ladder mounting bracket shall be provided on the officer's side of the fly section for a special width solid beam roof ladder. The brackets shall be formed using break and bend techniques for added strength and an outstanding appearance. Protective rubber pads shall be installed to prevent damage to the roof ladder where the roof ladder contacts the mounting brackets.			
725.2	Stainless steel fasteners shall be employed where the ladder bracket is bolted to the aerial section. When installed in the brackets, the roof ladder shall be retained so that it will not come out of the brackets unexpectedly. The bracket shall be coated with black bed liner material. One (1) DuoSafety, model 875A, 16' aluminum roof ladder with folding roof hooks on both ends of the ladder and a special 14" width shall be provided.			
726.0	<u>FLY SECTION MOUNTED PIKE POLE</u>	YES	NO	EXCEPTIONS / NOTES
726.1	One (1) pike pole mounting bracket shall be provided on the driver's side of the aerial fly section. A strap shall be provided to hold the pike pole in the bracket. One (1) Nupla, model SPD6, 6' fiberglass super-duty pike pole with a standard hook and butt-style handle shall be provided.			
727.0	<u>BED LINER THERMOPLASTIC COATING</u>	YES	NO	EXCEPTIONS / NOTES
727.1	In designated areas, a textured surface, multipurpose material designed for commercial and industrial applications. It shall adhere to the body and serve as a protective, abrasion-resistant liner where applied.			

728.0	<u>BODY PAINT PREPARATION</u>	YES	NO	EXCEPTIONS / NOTES
728.1	<p>The apparatus body and components shall be metal finished as follows to provide a superior substrate for painting:</p> <ul style="list-style-type: none"> • All aluminum sections of the body shall undergo a thorough cleaning process, starting with a phosphoric acid solution to begin the etching process, followed by a complete rinse. The next step shall consist of a chemical conversion coating applied to seal the metal substrate and become part of the aluminum surface for greater film adhesion. • After the cleaning process, the body and its components shall be primed with a high solids primer and the seams shall be caulked. • All bright metal fittings, if unavailable in stainless steel or polished aluminum, shall be heavily chrome plated. Iron fittings shall be copper underplated prior to chrome plating. 			
729.0	<u>PAINT PROCESS</u>	YES	NO	EXCEPTIONS / NOTES
729.1	<p>The paint process shall follow the strict standards as set forth by AkzoNobel Guidelines.</p> <p>The body shall go through a three-stage paint process: primer coat, base coat (color), and clear coat. In the first stage of the paint process, the body shall be coated with primer to achieve a total thickness of 24 mills. In the second stage of the paint process, the body shall be painted with BTLV650 High Solids Polyurethane Base Coat. A minimum of two to three coats of paint shall be applied to achieve covering. In the final stage of the paint process, the body shall be painted with a Clear Top-Coat. A minimum of two to three coats shall be applied to achieve a total dry film thickness of 23 mills.</p> <p>As part of the curing process, the painted body shall go through a Force Dry / Bake Cycle process. The painted components shall be baked at 185 degrees for 3 hours to achieve a complete coating cure on the finished product.</p>			
730.0	<u>HAND POLISHED</u>	YES	NO	EXCEPTIONS / NOTES
730.1	<p>After the Force Dry / Bake Cycle and ample cooldown time, the coated surface shall be sanded using 3M 1000, 1200, and/or 1500 grit sandpaper to remove surface defects. In the final step, the surface shall be buffed with 3M super-duty compound to add extra shine to coated surface. No more than .5 mil of clear shall be removed in this process.</p>			

731.0	<u>BODY PAINT COLOR</u>	YES	NO	EXCEPTIONS / NOTES
731.1	The body shall be painted with AkzoNobel High Solids Polyurethane Base Coat. The single tone body shall be painted AkzoNobel #30891 red.			
732.0	<u>AERIAL COMPONENT PROTECTION / PAINT</u>	YES	NO	EXCEPTIONS / NOTES
732.1	All aerial device components above the rotation point that are not chrome plate, bright aluminum tread plate, or stainless steel shall be painted. The components shall be primed and finish painted with a high gloss polyurethane paint. The support structure and components below the rotation point shall be painted black.			
733.0	<u>AERIAL LADDER SIGN PAINT COLOR</u>	YES	NO	EXCEPTIONS / NOTES
733.1	The aerial ladder signs, mounted on the base section, shall be painted the same color as the aerial ladder.			
734.0	<u>AERIAL DEVICE PAINT COLOR</u>	YES	NO	EXCEPTIONS / NOTES
734.1	The aerial device shall be painted with AkzoNobel High Solids polyurethane enamel paint. The color shall be AkzoNobel #41876 white.			
735.0	<u>AERIAL LADDER EGRESS PAINT COLOR</u>	YES	NO	EXCEPTIONS / NOTES
735.1	The aerial ladder egress shall be painted with PPG Delfleet High Solids polyurethane enamel paint. The color shall be PPG# FDGH4353 red.			
736.0	<u>AERIAL CORROSION PROTECTION</u>	YES	NO	EXCEPTIONS / NOTES
736.1	Internal structural members of the aerial structure shall be 100% concealed from oxygen or have corrosion protection applied. Totally sealed members are not subject to the possibility of corrosion attacking the metal from the interior. The structural tubing of the aerial structure that contains drilled holes or is exposed to outside air and elements shall be protected to eliminate the possibility of corrosion occurring on the inside of the tube. No exceptions as this is imperative to the strength and integrity of the aerial structure. The interior of exposed tubing shall be coated with a compound labeled NWAC 1204.			
736.2	The application of the coating shall be applied after the welding process of the aerial structure is complete and shall cover 100% of the interior of the structural tube. NWAC 1204 is an effective cavity corrosion inhibitor that provides long-term protection for both ferrous and nonferrous metals. The resulting water-repellent, flexible, airdried film has crevice penetrating, spreading, and clinging characteristics. The product dries to a nearly transparent film and provides maximum corrosion protection for all void spaces subject to humidity and condensation.			

737.0	<u>CORROSION PREVENTION</u>	YES	NO	EXCEPTIONS / NOTES
737.1	One (1) 3.75-ounce tube of Electrolysis Corrosion Kontrol (ECK) shall be provided to use when additional items are mounted to the apparatus. ECK protects aluminum and stainless steel against electrolytic reaction, isolates dissimilar metals, and gives bedding protection for hardware and fasteners. ECK contains an anti-seizing lubricant for threads. ECK is dielectric and perfect for use with electrical connectors.			
738.0	<u>GOLD LEAF LETTERING 6"</u>	YES	NO	EXCEPTIONS / NOTES
738.1	Up to fifty-five (55), 22KT gold leaf letters shall be provided and installed on the apparatus. The letters shall be approximately 6" tall with a black outline and shadow.			
739.0	<u>REFLECTIVE LETTERING 6"</u>	YES	NO	EXCEPTIONS / NOTES
739.1	Up to ten (10), reflective letters shall be provided and installed on the apparatus. The letters shall be approximately 6" tall with a black outline and shadow.			
740.0	<u>REFLECTIVE LETTERING 8"</u>	YES	NO	EXCEPTIONS / NOTES
740.1	Up to twenty-five (25), reflective letters shall be provided and installed on the apparatus. The letters shall be approximately 8" tall with a black outline and shadow.			
741.0	<u>REFLECTIVE LETTERING 12"</u>	YES	NO	EXCEPTIONS / NOTES
741.1	Up to forty (40) reflective letters shall be provided and installed on the apparatus. The letters shall be approximately 12" tall with a black outline and shadow.			
742.0	<u>REFLECTIVE LETTERING 18"</u>	YES	NO	EXCEPTIONS / NOTES
742.1	Up to four (4) reflective letters shall be provided and installed on the apparatus. The letters shall be approximately 18" tall with a black outline and shadow.			
743.0	<u>REFLECTIVE LETTERING 24"</u>	YES	NO	EXCEPTIONS / NOTES
743.1	Up to four (4) reflective letters shall be provided and installed on the apparatus. The letters shall be approximately 24" tall with a black outline and shadow.			
744.0	<u>REFLECTIVE STRIPING FRONT CAB</u>	YES	NO	EXCEPTIONS / NOTES
744.1	The retroreflective stripe located on the sides of the apparatus shall wrap around the front of the chassis cab and terminate at the chassis grill.			
745.0	<u>PAINT BREAK LINE</u>	YES	NO	EXCEPTIONS / NOTES
745.1	22KT engine turned gold leaf striping shall be installed at the two-tone paint break on the apparatus.			
746.0	<u>RUB RAIL REFLECTIVE STRIPING</u>	YES	NO	EXCEPTIONS / NOTES
746.1	There shall be 2" reflective striping installed in the rub rail channel. The reflective striping shall be diamond-grade quality material for increased visibility. The reflective shall be silver in color.			

747.0	<u>REFLECTIVE STRIPING</u>	YES	NO	EXCEPTIONS / NOTES
747.1	<p>Striping shall be applied to the exterior of the apparatus and shall conform to the reflectivity requirements in accordance with NFPA 1901, current edition. The striping shall consist of a 6" retroreflective stripe. The striping shall be low across the front of the chassis and along the sides, staying below the tops of the wheel well areas.</p> <p>There shall also be striping on the mid portion of the body that will be specially arranged around the "FIRE RESCUE" verbiage. The main stripe shall be white.</p>			
748.0	<u>REFLECTIVE STRIPING STABILIZER BEAMS</u>	YES	NO	EXCEPTIONS / NOTES
748.1	Retroreflective striping shall be installed on the front and rear sides of the four (4) horizontally extending stabilizer beams for increased visibility when extended. The striping shall be 4" wide and white in color.			
749.0	<u>CHEVRON COLOR RED/FLUORESCENT YELLOW/GREEN</u>	YES	NO	EXCEPTIONS / NOTES
749.1	<p>The chevron striping shall consist of red, 3M part number 1172 EC, and fluorescent yellow-green, 3M part number 3983, and shall meet the chevron color requirements in accordance with NFPA 1901, current edition.</p> <p>Only 3M Diamond Grade VIP Reflective Striping shall be used. 3M Diamond Grade VIP Reflective Striping is a wide-angle prismatic lens reflective sheeting designed for the production of durable traffic control signs and delineators that are exposed vertically in service. If something other than 3M is being used, third-party documentation must be provided with the bid to prove it is compliant with Federal DOT and NFPA 1901, current edition.</p>			
750.0	<u>CHEVRON STRIPING REAR BODY</u>	YES	NO	EXCEPTIONS / NOTES
750.1	<p>Retroreflective striping shall cover at least 50% of the rear-facing vertical surfaces in accordance with NFPA 1901, current edition. The striping shall be in a chevron pattern sloping downward and away from the centerline of the apparatus at an angle of 45 degrees. Each stripe shall be a minimum of 6" in width. The striping shall consist of a solid base layer of reflective material and alternate between the exposed base layer material and durable, transparent, acrylic colored film.</p> <p>The chevron pattern shall include the rear face of the body. The torque box door shall be excluded from the chevron reflective striping.</p>			

751.0	<u>WARRANTIES</u>	YES	NO	EXCEPTIONS / NOTES
751.1	<ul style="list-style-type: none"> · General Standard Warranty · Body Structure Standard Warranty · Electrical Standard Warranty · Plumbing and Piping Standard Warranty · Water Tank, UPF, Standard Lifetime Warranty · Paint and Finish Standard Warranty · Waterous pump Standard warranty 			