

ATTACHMENT A – ENGINE 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, 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, and axels. 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 manufacturer’s ability to construct the apparatus specified. The bidder shall also show that they are able to render prompt service and furnish replacement parts in an expedient manner for said apparatus.

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 parts and equipment.

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
- The 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:

- Clear door opening: the width/height of the clear door opening
- Interior dimensions: the interior compartment dimensions excluding any accessories or pockets (i.e., roll-up door drums, hard suction hose pans, suspension pockets, etc.)
- Divide heights: The measurement where the compartment changes from full depth to shallow depth.
- 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
- Fill towers
- Generator outline
- Warning lights
- D.O.T. lights

Text Block Items:

- Chassis make/model
- Fire pump's make/model
- Water tank capacity
- Foam cell capacity
- Body material
- Hose bed capacity in cubic feet
- 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.

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.

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 every 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 (as judged by the customer), 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 with 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 is 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 accepted unless they were noted as exceptions at the time of bid and 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 those 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 subject to rejection.

PROPOSAL SEQUENCE

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

AWARD OF CONTRACT

All bids submitted shall be good 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
- 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> Engine 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	Safety Requirements	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	Acquaintance with Specifications	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	Quality and Workmanship	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	GENERAL CONSTRUCTION	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 19012016 edition. There are to be no exceptions to this requirement.			

8.0	INSPECTION CERTIFICATE NFPA 1901 COMPLIANCE	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' respective 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 where applicable components, equipment, and loose equipment carry the appropriate characteristics, classifications, and/or certifications. • Ensure that 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>NFPA 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> <p>The manufacturer's record of apparatus construction details, including the following information:</p> <ul style="list-style-type: none"> • 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 or kilograms • Rear tire size and total rated capacity in pounds or kilograms • Chassis weight distribution in pounds with water and manufacturer-mounted equipment (front and rear) • Engine make, model, serial number, rated horsepower, related speed, and governed speed • Type of fuel and fuel tank capacity • Electrical system voltage and alternator output in amps • Battery make, model, and capacity in cold cranking amps (CCA) • Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio 			
9.2	<ul style="list-style-type: none"> • If applicable, the pump make, model, rated capacity in gallons or liters per minute, and serial number • Pump transmission make, model, serial number, and gear ratio. • If applicable, the auxiliary pump make, model, rated capacity in gallons or liters per minute, and serial number • Water tank certified capacity in gallons or liters • On aerial apparatus, the device type rated vertical height in feet or meters, rated horizontal reach in feet or meters, and rated capacity in pounds or kilograms • 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 manufacturer's certification of suction capability, apparatus manufacturers approval for stationary pumping applications, engine manufacturer certified brake horsepower curve showing the maximum governed speed, pump manufacturer certification of the hydrostatic test, and the certification of inspection and test for the fire pump. • 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 water tank capacity 			
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10.0	OPERATION AND SERVICE DOCUMENTATION			YES	NO	EXCEPTIONS / N
10.1	<ul style="list-style-type: none"> • Manufacturer's name and address • Country of manufacturer • Source of service and technical information • Parts and replacement information • Descriptions, specifications, and ratings of the chassis, pump, and aerial device • Wiring diagrams for low voltage and line voltage systems to include the following information: representations of circuit logic for all electrical components and wiring, circuit identification, connector pin identification, zone location of electrical components, safety interlocks, alternator battery power distribution circuits, and input/ output assignment sheets or equivalent circuit logic implemented in multiplexing systems • Lubrication charts • Operating instructions for the chassis, any major components such as a pump or aerial device, and any auxiliary systems • Precautions related to multiple configurations of aerial devices, if applicable • Instructions regarding the frequency and procedure for recommended maintenance • Overall apparatus operating instructions • Safety considerations • Limitations of use • Inspection procedures • Recommended service procedures • Troubleshooting guide • Apparatus body, chassis, and other component manufacturer's warranties • Special data required by this standard • Copies of required manufacturer test data or reports, manufacturer certifications, and independent third-party certifications of test results • A material safety data sheet (MSDS) for any fluid that is specified for use on the apparatus • One (1) copy of the FAMA Safety Guide <p>The contractor shall deliver with the apparatus all manufacturers' operations and service documents supplied with components and equipment that are installed or supplied by the contractor.</p>					

11.0	STATEMENT OF EXCEPTIONS	YES	NO	EXCEPTIONS / NOTES
11.1	<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 defined listing or explanation of what and why compliance was not achieved shall be provided to the purchaser at the time of delivery.</p>			
12.0	OWNER'S MANUAL	YES	NO	EXCEPTIONS / NOTES
12.1	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.			
13.0	ELECTRICAL MANUAL	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	ELECTRICAL SCHEMATICS	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	PUMP PLUMBING SCHEMATICS	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	HYDRAULIC SCHEMATICS	YES	NO	EXCEPTIONS / NOTES
16.1	A section of the electrical manual shall include schematics of the hydraulic components on the apparatus.			
17.0	FIRE APPARATUS SAFETY GUIDE	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 operations of the fire apparatus.			

18.0	MISCELLANEOUS EQUIPMENT ALLOWANCE	YES	NO	EXCEPTIONS / NOTES
18.1	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 2,000 pounds.			
19.0	TILT TABLE TESTING IS NOT REQUIRED	YES	NO	EXCEPTIONS / NOTES
19.1	A similar apparatus has previously passed the NFPA requirement of maintaining the stability of 26.5 degrees in both directions.			
20.0	VEHICLE STABILITY	YES	NO	EXCEPTIONS / NOTES
20.1	<p>The apparatus shall comply with NFPA 1901, current edition requirements as it applies to vehicle stability. The particular apparatus as described in the specification provided within the bid package 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. • 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. 			
21.0	INDEPENDENT THIRD-PARTY PUMP CERTIFICATION	YES	NO	EXCEPTIONS / NOTES
21.1	<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 under NFPA 1901, current edition. The pump shall be free from objectionable pulsation and vibration.</p>			
22.0	PUMP CERTIFICATION	YES	NO	EXCEPTIONS / NOTES
22.1	The pump shall be certified in U.S. gallons per minute (GPM).			

23.0	PERFORMANCE BOND AND PAYMENT BOND- 100%	YES	NO	EXCEPTIONS / NOTES
23.1	<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>			
24.0	ONLINE CUSTOMER INTERACTION	YES	NO	EXCEPTIONS / NOTES
24.1	<p>The fire department shall be able to view digital photos of their apparatus in the specified phases of construction.</p> <p>The photos shall be uploaded to a secure website, only accessible to the customer and representatives of the OEM.</p>			
24.2	<p>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 			

25.0	PRE-CONSTRUCTION MEETING	YES	NO	EXCEPTIONS / NOTES
25.1	A preconstruction meeting shall be held at the manufacturer's facility at a time agreed upon between department officials and the dealership. The preconstruction 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 preconstruction 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.			
25.2	<p>The apparatus manufacturer shall create and forward to the dealer a "Preconstruction" 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. 			
25.3	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.			
26.0	SALES TERMS	YES	NO	EXCEPTIONS / NOTES
26.1	The sale of the chassis shall be governed by the terms contained in the Sales Terms.			

27.0	<u>MIDPOINT INSPECTION</u>	YES	NO	EXCEPTIONS / NOTES
27.1	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.			
28.0	<u>FINAL INSPECTION</u>	YES	NO	EXCEPTIONS / NOTES
28.1	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			
29.0	<u>ADDITIONAL REQUIREMENTS</u>	YES	NO	EXCEPTIONS / NOTES
29.1	<p>The City of Charlotte desires to purchase the apparatus from a dealer who meets the following minimal requirements:</p> <p>Dealer and or the dealer principal shall have a minimum of ten (10) year experience with the apparatus manufacturer</p> <p>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.</p>			
29.2	<p>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.</p> <p>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.</p>			
29.3	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.			

29.4	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.			
29.5	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.			
30.0	<u>MODEL</u>	YES	NO	EXCEPTIONS / NOTES
30.1	The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit, and maneuverability. The chassis shall be manufactured for heavy-duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.			
31.0	<u>APPARATUS TYPE</u>	YES	NO	EXCEPTIONS / NOTES
31.1	The apparatus shall be a pumper vehicle designed for emergency service use which shall be equipped with a permanently mounted fire pump that has a minimum rated capacity of 750 gallons per minute (3000 L/min). The apparatus shall include a water tank and hose body.			
32.0	<u>VEHICLE TYPE</u>	YES	NO	EXCEPTIONS / NOTES
32.1	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.			
33.0	<u>CHASSIS AND LABELING</u>	YES	NO	EXCEPTIONS / NOTES
33.1	Where applicable, the cab and chassis shall include the following: caution, warning, and safety notice labels with text to be written in English. Where applicable, the labels shall include decorative chrome bezels. Designs shall include bezels that fit individual labels or packaged configurations of labels in certain common locations.			
33.2	The following labels Shall be Innovative Controls brand, each including a decorative chrome bezel (where applicable): <ul style="list-style-type: none"> • Shoreline • Air Conditioner • Cab Tilt Plate • Air Compressor Breaker • Battery Conditioner Breaker • Helmet Caution • Horn Tag • Q2B Tag 			

33.3	<ul style="list-style-type: none"> • Load Center Plate • Not a Step Label • Occupancy Tag • 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 • 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>MAXIMUM OVERALL HEIGHT</u>	YES	NO	EXCEPTIONS / NOTES
34.1	The overall height of the apparatus shall be approximately 119” (9’11”) 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 to achieve a lower overall height shall not be accepted. The measurement shall be taken at the highest point of the apparatus.			
35.0	<u>MAXIMUM OVERALL LENGTH</u>	YES	NO	EXCEPTIONS / NOTES
35.1	The overall length of the apparatus shall not exceed 379” (31’-7”)			
36.0	<u>WHEELBASE</u>	YES	NO	EXCEPTIONS / NOTES
36.1	The wheelbase of the apparatus shall not exceed 185”.			
37.0	<u>REAR OVERHANG</u>	YES	NO	EXCEPTIONS / NOTES
37.1	The chassis rear overhang shall be approximately 51.00 inches.			

38.0	<u>VEHICLE ANGLE OF APPROACH</u>	YES	NO	EXCEPTIONS / NOTES
38.1	The angle of approach of the apparatus shall be a minimum of 8.00 degrees.			
39.0	<u>VEHICLE ANGLE OF DEPARTURE</u>	YES	NO	EXCEPTIONS / NOTES
39.1	The angle of departure of the apparatus shall be a minimum of 8.00 degrees.			
40.0	<u>AXLE CONFIGURATION</u>	YES	NO	EXCEPTIONS / NOTES
40.1	The chassis shall feature a 4 x 2 axle configuration consisting of a single rear drive axle with a single front steer axle.			
41.0	<u>GROSS AXLE WEIGHT RATING FRONT</u>	YES	NO	EXCEPTIONS / NOTES
41.1	This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.			
42.0	<u>GROSS AXLE WEIGHT RATING REAR</u>	YES	NO	EXCEPTIONS / NOTES
42.1	This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.			
43.0	<u>PUMP PROVISION</u>	YES	NO	EXCEPTIONS / NOTES
43.1	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.			
44.0	<u>WATER & FOAM TANK CAPACITY</u>	YES	NO	EXCEPTIONS / NOTES
44.1	The chassis shall include a carrying capacity of 530 gallons with integrated 30-gallon foam tank. The water and/or foam tank(s) shall be supplied and installed by the apparatus manufacturer.			
45.0	<u>CAB STYLE</u>	YES	NO	EXCEPTIONS / NOTES
45.1	The cab shall be a custom, fully enclosed, with a 10.00 inch raised roof 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. This style of cab shall offer up to six (6) seating positions.			
45.2	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.			

45.3	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.			
45.4	All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.			
45.5	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.			
45.6	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. All four cab doors shall open to a minimum of 90 degrees.			
46.0	<u>OCCUPANT PROTECTION</u>	YES	NO	EXCEPTIONS / NOTES
46.1	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.			
47.0	<u>CAB FRONT FASCIA</u>	YES	NO	EXCEPTIONS / NOTES
47.1	The front cab fascia shall include two (2) 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 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>CAB SIDE DRIP RAIL</u>	YES	NO	EXCEPTIONS / NOTES
49.1	There shall be a drip rail along the top radius of each cab side.			
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 INTERIOR/COMPONENT COATING</u>	YES	NO	EXCEPTIONS / NOTES
57.1	All visible cab structure surfaces and painted interior components shall be manually selected at each interior component's subcategory.			
58.0	<u>CAB PAINT INTERIOR</u>	YES	NO	EXCEPTIONS / NOTES
58.1	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.			
59.0	<u>CAB ENTRY DOORS</u>	YES	NO	EXCEPTIONS / NOTES
59.1	<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.</p> <p>Each door hinge shall be constructed of stainless steel and offer a minimum 90-degree door open angle.</p>			
60.0	<u>CAB ENTRY DOOR TYPE</u>	YES	NO	EXCEPTIONS / NOTES
60.1	All cab entry doors shall be barrier clear design resulting in exposed lower cab steps. Entry doors shall include Pollak mechanical plunger-style switches for electrical component activation.			
61.0	<u>CAB INSULATION</u>	YES	NO	EXCEPTIONS / NOTES
61.1	The cab ceiling and walls shall include insulation material. The insulation will be rated to decrease exterior noise and increase desired interior temperature control.			
62.0	<u>CAB BOX</u>	YES	NO	EXCEPTIONS / NOTES
62.1	There shall be (1) cab storage box, between the forward facing scba seats on the back wall of the cab. The box shall have a coated bedliner finish to match the engine tunnel.			

62.2	<p>The box will be approximately 30" wide x 20" deep with a height of approximately 36". There shall be one (1) adjustable shelf in each box. There shall be a roll-up door to secure items in the box. Lighting shall be required for the box to match existing compartment lighting throughout.</p> <p>The compartment's exterior, interior, and shelf shall be coated with a 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	The cab shall have 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.			
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 <p>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.</p>			
70.0	<u>ACCESSORY POWER</u>	YES	NO	EXCEPTIONS / NOTES
70.1	<p>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 battery direct power and ground stud shall be provided and installed on the chassis near the left-hand battery box for OEM body connections.</p>			
71.0	<u>AUXILIARY ACCESSORY POWER</u>	YES	NO	EXCEPTIONS / NOTES
71.1	<p>There shall be an auxiliary six (6) position Blue Sea Systems 5025 blade type fuse panel shall be installed. The fuse panel shall be protected by a 40-amp fuse and be wired for a battery direct load.</p> <p>An additional six (6) position Blue Sea Systems 5025 blade type fuse panels shall be installed. The fuse panel shall be protected by a 40-amp fuse and shall be wired for an ignition switched load.</p>			
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 apparatus builder. The fuse panel shall be protected by a 40-amp fuse and be wired for a battery direct load.</p>			

72.2	An auxiliary six (6) position Blue Sea Systems 5025 blade type fuse panel shall be installed 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.			
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>ENGINE</u>	YES	NO	EXCEPTIONS / NOTES
75.1	<p>The chassis engine shall be a Cummins ISX12 engine. The ISX12 engine shall be an in-line six (6) cylinder, four-cycle diesel-powered engine. The engine shall offer a rating of 525 horsepower.</p> <p>The ISX12 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 2023 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> <p>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.</p>			
76.0	<u>CAB ENGINE TUNNEL</u>	YES	NO	EXCEPTIONS / NOTES
76.1	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.			
77.0	<u>ALUMINUM MOUNTING PLATE ON ENGINE TUNNEL</u>	YES	NO	EXCEPTIONS / NOTES
77.1	A 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			

78.0	<u>ENGINE TUNNEL TRIM</u>	YES	NO	EXCEPTIONS / NOTES
78.1	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.			
79.0	<u>DIESEL PARTICULATE FILTER CONTROLS</u>	YES	NO	EXCEPTIONS / NOTES
79.1	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.			
80.0	<u>ENGINE PROGRAMMING HIGH IDLE SPEED</u>	YES	NO	EXCEPTIONS / NOTES
80.1	The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.			
81.0	<u>ENGINE HIGH IDLE CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
81.1	The vehicle shall be equipped with a virtual display button and 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.			
82.0	<u>ENGINE PROGRAMMING ROAD SPEED GOVERNOR</u>	YES	NO	EXCEPTIONS / NOTES
82.1	The engine shall include programming which will govern the top speed of the vehicle.			
83.0	<u>AUXILIARY ENGINE BRAKE</u>	YES	NO	EXCEPTIONS / NOTES
83.1	<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. 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.</p>			
84.0	<u>AUXILIARY ENGINE BRAKE CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
84.1	<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 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 system shall be activated by an on/off Switch and a low/high selector Switch.</p>			

85.0	<u>ELECTRONIC ENGINE OIL LEVEL INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
85.1	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.			
86.0	<u>FLUID FILLS</u>	YES	NO	EXCEPTIONS / NOTES
86.1	Ease of access shall be provided to check and fill automotive fluids, to include power steering, engine oil, transmission fluid, washer fluid.			
87.0	<u>ENGINE DRAIN PLUG</u>	YES	NO	EXCEPTIONS / NOTES
87.1	The engine shall include an original equipment manufacturer-installed oil drain plug.			
88.0	<u>ENGINE WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
88.1	The Cummins engine shall have a standard 5 year and 100,000 mile manufacturer's warranty			
89.0	<u>REMOTE THROTTLE HARNESS</u>	YES	NO	EXCEPTIONS / NOTES
89.1	An apparatus interface wiring harness for the engine and transmission pump interlocks shall be supplied with the chassis. 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.			
90.0	<u>ENGINE PROGRAMMING REMOTE THROTTLE</u>	YES	NO	EXCEPTIONS / NOTES
90.1	The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a pump controller or when the discreet wire remote throttle controls are not required.			
91.0	<u>ENGINE PROGRAMMING IDLE SPEED</u>	YES	NO	EXCEPTIONS / NOTES
91.1	The engine's low idle speed will be programmed at 700 rpm.			

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 or as high as possible to ensure cooler cleaner air is entering the intake. 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 the variable speed fan clutch only engaging at the amount needed for proper cooling to facilitate improved vehicle performance, cab heating in cold climates, and fuel economy.</p> <p>The fan clutch design shall contain a 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 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	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.			
94.2	<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	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 that utilizes a diesel exhaust to meet current EPA standards. The selective catalytic reduction catalyst fluid solution consists 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.			
102.0	<u>ENGINE EXHAUST ACCESSORIES</u>	YES	NO	EXCEPTIONS / NOTES
102.1	The exhaust system shall be modified to accept a magnetic Plymovent exhaust extraction system collar.			
103.0	<u>ENGINE EXHAUST WRAP</u>	YES	NO	EXCEPTIONS / NOTES
103.1	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.			

104.0	<u>DIESEL EXHAUST FLUID TANK</u>	YES	NO	EXCEPTIONS / NOTES
104.1	The exhaust system shall include a molded polyethylene tank for Diesel Exhaust Fluid (DEF). The tank 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.			
105.0	<u>TRANSMISSION</u>	YES	NO	EXCEPTIONS / NOTES
105.1	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.			
105.2	The transmission shall include two (2) internal oil filters and Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.			
105.3	The transmission ratio shall be: 1st 3.51 to 1.00 2nd 1.91 to 1.00 3rd 1.43 to 1.00 4th 1.00 to 1.00 5th 0.74 to 1.00 6th 0.64 to 1.00 R 4.80 to 1.00			
106.0	<u>TRANSMISSION MODE PROGRAMMING</u>	YES	NO	EXCEPTIONS / NOTES
106.1	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.			
107.0	<u>TRANSMISSION FEATURE PROGRAMMING</u>	YES	NO	EXCEPTIONS / NOTES
107.1	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.			
107.2	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.			
107.3	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.			

108.0	<u>ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
108.1	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.			
109.0	<u>TRANSMISSION SHIFT SELECTOR</u>	YES	NO	EXCEPTIONS / NOTES
109.1	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 a 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.			
110.0	<u>TRANSMISSION RETARDER CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
110.1	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.			
111.0	<u>TRANSMISSION RETARDER CAPACITY LEVEL</u>	YES	NO	EXCEPTIONS / NOTES
111.1	The transmission retarder shall be programmed so the maximum retardation shall be at the high-capacity level.			
112.0	<u>TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE</u>	YES	NO	EXCEPTIONS / NOTES
112.1	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.			
113.0	<u>TRANSMISSION COOLING SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
113.1	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.			
114.0	<u>TRANSMISSION DRAIN PLUG</u>	YES	NO	EXCEPTIONS / NOTES
114.1	The transmission shall include an original equipment manufacturer-installed magnetic transmission fluid drain plug.			
115.0	<u>TRANSMISSION WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
115.1	The Allison EVS 4000 series transmission shall carry the standard 5-year manufacturer's warranty.			
116.0	<u>PTO LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
116.1	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 4:00 o'clock position.			
117.0	<u>DRIVELINE</u>	YES	NO	EXCEPTIONS / NOTES
117.1	All drivelines shall be heavy-duty metal tubes and equipped with MSI 1710 series universal joints. The shafts shall be dynamically balanced before installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated. The drivelines shall include Meritor brand u-joints with thrust washers.			

118.0	<u>DRIVELINE INSTALLATION</u>	YES	NO	EXCEPTIONS / NOTES
118.1	The chassis drivelines shall be sized for the intended application and torque requirements. The installation shall comply with the driveline manufacturer's guidelines.			
119.0	<u>MIDSHIP MOUNT FIRE PUMP</u>	YES	NO	EXCEPTIONS / NOTES
119.1	<p>The fire pump shall be a Waterous CMU 2000 GPM two-stage split drive shaft driven fire pump. The pump shall be a two-stage centrifugal class "A" rated fire pump, designed specifically for the fire service.</p> <p>The pump shall be midship mounted and designed to operate through an integral transmission, including a means for power selectivity to the driving axle or the pump. The pump shall be driven by a driveline from the chassis transmission. The engine, transmission, and driveline components shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance.</p>			
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 fire pump.			
122.0	<u>MIDSHIP PUMP GEARBOX DROP</u>	YES	NO	EXCEPTIONS / NOTES
122.1	<p>The pump gearbox shall be a Waterous pump type of gearbox and provide for the best possible driveline angle to reduce and eliminate unnecessary or damaging driveline angles.</p> <p>A driveline angle report shall be provided by the vehicle manufacturer to verify the driveline is within driveline specifications as approved by the transmission manufacturer and the pump manufacturer.</p>			
123.0	<u>MIDSHIP PUMP RATIO</u>	YES	NO	EXCEPTIONS / NOTES
123.1	The ratio for the midship pump shall be 2.27:1			
124.0	<u>PUMP SHIFT CONTROLS</u>	YES	NO	EXCEPTIONS / NOTES
124.1	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. 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 the pump mode shall be selected when the switch is in the down position.			

125.0	<u>PUMP SHIFT CONTROL PLUMBING</u>	YES	NO	EXCEPTIONS / NOTES
125.1	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 the service brake system.			
126.0	<u>FUEL LINES</u>	YES	NO	EXCEPTIONS / NOTES
126.1	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.			
127.0	<u>FUEL FILTER/WATER SEPARATOR</u>	YES	NO	EXCEPTIONS / NOTES
127.1	<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>			
128.0	<u>ELECTRIC FUEL PRIMER</u>	YES	NO	EXCEPTIONS / NOTES
128.1	Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.			
129.0	<u>FUEL TANK</u>	YES	NO	EXCEPTIONS / NOTES
129.1	<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 rollover 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 at 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>			

130.0	<u>FUEL TANK MATERIAL AND FINISH</u>	YES	NO	EXCEPTIONS / NOTES
130.1	<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>			
131.0	<u>FUEL TANK STRAP MATERIAL</u>	YES	NO	EXCEPTIONS / NOTES
131.1	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.			
132.0	<u>FUEL TANK FILL PORT</u>	YES	NO	EXCEPTIONS / NOTES
132.1	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.			
133.0	<u>FUEL FILLS</u>	YES	NO	EXCEPTIONS / NOTES
133.1	There shall be two (2) fuel fill pockets located in the rear wheel well area, one (1) on each of the driver's and officer's sides.			
134.0	<u>FUEL TANK SERVICEABILITY PROVISIONS</u>	YES	NO	EXCEPTIONS / NOTES
134.1	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.			
135.0	<u>FUEL TANK DRAIN PLUG</u>	YES	NO	EXCEPTIONS / NOTES
135.1	A 0.5-inch NPT magnetic drain plug shall be centered in the bottom of the fuel tank.			
136.0	<u>FRONT AXLE</u>	YES	NO	EXCEPTIONS / NOTES
136.1	The front axle shall be compatible with the Hendrickson Steertek NXT suspension. The steer non-drive front axle shall include a 3.74-inch drop and a 71.00-inch kingpin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle.			
137.0	<u>FRONT AXLE CRAMP ANGLE</u>	YES	NO	EXCEPTIONS / NOTES
137.1	The chassis shall have a front axle cramp angle of a minimum of 50 degrees			
138.0	<u>FRONT AXLE WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
138.1	The front axle shall be warranted by Hendrickson for 5 years with unlimited miles under the general service application.			

139.0	<u>FRONT-WHEEL BEARING LUBRICATION</u>	YES	NO	EXCEPTIONS / NOTES
140.0	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	Two (2) Bilstein inert, nitrogen gas-filled heavy-duty shock absorbers shall be provided and installed as part of the front suspension system. The shocks shall be a monotubular design. The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression.			
142.0	<u>FRONT SUSPENSION</u>	YES	NO	EXCEPTIONS / NOTES
142.1	The front suspension shall include a parabolic leaf spring pack. The spring capacity shall be rated at 21,500 pounds.			
143.0	<u>STEERING COLUMN/ WHEEL</u>	YES	NO	EXCEPTIONS / NOTES
143.1	The cab shall include a steering column which shall include both tilting and telescopic adjustments. The steering wheel shall be covered with black padding. The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch, and headlamp dimmer switch.			
144.0	<u>ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
144.1	The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when the fluid level falls below normal.			
145.0	<u>POWER STEERING PUMP</u>	YES	NO	EXCEPTIONS / NOTES
145.1	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.			
146.0	<u>POWER STEERING GEAR</u>	YES	NO	EXCEPTIONS / NOTES
146.1	The power steering gear shall be a TRW model TAS 65 with an assist cylinder.			
147.0	<u>CHASSIS ALIGNMENT</u>	YES	NO	EXCEPTIONS / NOTES
147.1	The chassis frame rails shall be measured to ensure the length is correct and cross-checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer.			
148.0	<u>REAR AXLE</u>	YES	NO	EXCEPTIONS / NOTES
148.1	The rear axle shall be a Meritor model RS-23-186 single drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 24,000 pounds.			

149.0	<u>REAR AXLE DIFFERENTIAL LUBRICATION</u>	YES	NO	EXCEPTIONS / NOTES
149.1	The rear axle differential shall be lubricated with oil.			
150.0	<u>REAR WHEEL BEARING LUBRICATION</u>	YES	NO	EXCEPTIONS / NOTES
150.1	The rear axle wheel bearings shall be lubricated with oil.			
151.0	<u>REAR AXLE DIFFERENTIAL CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
151.1	A driver-controlled differential lock shall be installed on the rear axle. 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 differential lock shall be controlled by a locking rocker switch on the switch panel. The light on the switch shall illuminate with the positive engagement of the differential control.			
152.0	<u>VEHICLE TOP SPEED</u>	YES	NO	EXCEPTIONS / NOTES
152.1	The top speed of the vehicle shall be approximately 65 MPH +/- 2 MPH at governed engine RPM.			
153.0	<u>REAR SUSPENSION</u>	YES	NO	EXCEPTIONS / NOTES
153.1	The single rear axle shall feature a leaf spring pack suspension. The suspension shall also utilize one (1) adjustable and one (1) fixed torque rod. The rear suspension capacity shall be rated from 21,000 to 26,000 pounds.			
154.0	<u>REAR SHOCK ABSORBERS</u>	YES	NO	EXCEPTIONS / NOTES
154.1	Two (2) Bilstein inert, nitrogen gas-filled shock absorbers shall be provided and installed as part of the rear suspension system. The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression.			
155.0	<u>TIRE INTERMITTENT SERVICE RATING</u>	YES	NO	EXCEPTIONS / NOTES
155.1	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.			
156.0	<u>FRONT TIRE</u>	YES	NO	EXCEPTIONS / NOTES
156.1	The front tires shall be Michelin 315/80R-22.5 20PR "L" tubeless radial XZUS 2 regional tread.			
157.0	<u>REAR TIRE</u>	YES	NO	EXCEPTIONS / NOTES
157.1	The rear tires shall be Michelin 11R-22.5 16PR "H" tubeless radial XDN2 all-weather tread.			
158.0	<u>REAR AXLE RATIO</u>	YES	NO	EXCEPTIONS / NOTES
158.1	The rear axle ratio shall be 5.38:1.			
159.0	<u>TIRE PRESSURE INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
159.1	There shall be electronic chrome LED valve caps which shall illuminate with a red LED when tire pressure drops 8psi provided.			

160.0	<u>FRONT WHEEL</u>	YES	NO	EXCEPTIONS / NOTES
160.1	The front wheels shall be Alcoa hub piloted, 22.50-inch X 9.00-inch Level One™ with polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.			
160.2	The wheels shall feature one-piece forged strength and shall include Alcoa's Dura-Bright® finish as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime, and road debris are easily removed by simply cleaning the wheels with soap and water.			
161.0	<u>REAR WHEEL</u>	YES	NO	EXCEPTIONS / NOTES
161.1	The rear wheels shall be Alcoa hub piloted, 22.50-inch X 8.25-inch Level One™ aluminum wheels with a polished outer surface, and Alcoa Dura-Bright® wheel treatment as an integral part of the wheel. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.			
162.0	<u>WHEEL TRIM</u>	YES	NO	EXCEPTIONS / NOTES
162.1	The front wheels shall include stainless steel lug nut covers and stainless-steel baby moons shipped loose with the chassis for installation by the apparatus builder. The baby moons shall have cutouts for oil seal viewing when applicable.			
162.2	Each axle will be painted finished job color. Each wheel trim component shall meet D.O.T. certification.			
163.0	<u>AUXILIARY LUBRICATION SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
163.1	An 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.			
164.0	<u>BRAKE SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
164.1	A rapid build-up air brake system shall be provided. The air brakes shall include, at a minimum, a two (2) air tank, and three (3) reservoir system with a total of 4152 cubic inches 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 controlled service brake application during the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.			

164.2	The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.			
164.3	A four (4) sensor, four (4) modulator Anti-lock Braking System (ABS) shall be installed on the front and rear axles 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 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.			
164.4	Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the single rear axle. The ATC systems all apply the ABS when the drive wheels lose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces. The ATC light shall illuminate during excessive wheel slip and ATC is operational.			
164.5	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.			
165.0	<u>FRONT BRAKES</u>	YES	NO	EXCEPTIONS / NOTES
165.1	The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00-inch vented rotors.			
166.0	<u>REAR BRAKES</u>	YES	NO	EXCEPTIONS / NOTES
166.1	The rear brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00-inch vented rotors.			
167.0	<u>PARK BRAKE</u>	YES	NO	EXCEPTIONS / NOTES
167.1	Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force.			
168.0	<u>PARK BRAKE CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
168.1	A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color. The parking brake actuation valve shall be mounted in the center switch panel.			

169.0	<u>AIR DRYER</u>	YES	NO	EXCEPTIONS / NOTES
169.1	The brake system shall include a Wabco air dryer.			
170.0	<u>FRONT BRAKE CHAMBERS</u>	YES	NO	EXCEPTIONS / NOTES
170.1	The front brakes shall be provided with long stroke brake chambers.			
171.0	<u>REAR BRAKE CHAMBERS</u>	YES	NO	EXCEPTIONS / NOTES
171.1	The rear axle shall include TSE 24/30 H.O.T. (High Output Technology) brake chambers which shall convert the energy of compressed air into mechanical force and motion.			
172.0	<u>AIR COMPRESSOR</u>	YES	NO	EXCEPTIONS / NOTES
172.1	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.			
173.0	<u>AUXILIARY AIR RESERVOIR</u>	YES	NO	EXCEPTIONS / NOTES
173.1	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 an 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.			
174.0	<u>MOISTURE EJECTORS</u>	YES	NO	EXCEPTIONS / NOTES
174.1	Automatic moisture ejectors with a manual drain provision shall be installed on all reservoirs of the air supply system.			
175.0	<u>AIR SUPPLY LINES</u>	YES	NO	EXCEPTIONS / NOTES
175.1	The air system on the chassis shall be plumbed with color-coded reinforced nylon tubing airlines. 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.			
176.0	<u>VEHICLE TOWED AIR SUPPLY PACKAGE</u>	YES	NO	EXCEPTIONS / NOTES
176.1	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 vertically 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.			
177.0	<u>REAR AIR TANK MOUNTING</u>	YES	NO	EXCEPTIONS / NOTES
177.1	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 the frame.			

178.0	FRAME	YES	NO	EXCEPTIONS / NOTES
178.1	The frame shall consist of double rails running parallel to each other with cross members forming a ladder-style frame. The frame 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 upper and lower flanges X 0.375 inches thick. An inner liner of 9.44 inches high X 3.13 inches deep and 0.38 inches thick shall be utilized for strengthening the frame.			
178.2	Each rail shall be constructed of 120,000 psi minimum yield high strength low alloy steel. Each double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100-inch pounds and have a minimum section modulus of 29.21 cubic inches.			
178.3	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 pump body shall not be considered a crossmember. 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.			
178.4	All relief areas shall have a 2.00-inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.			
179.0	FRAME PAINT	YES	NO	EXCEPTIONS / NOTES
179.1	<p>Manufacturer shall provide details on finished frame coating to prevent corrosion of frame rails and attached components</p> <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 • Air tanks • Air tank mounting brackets • Exhaust mounting brackets • Air cleaner skid plate • Radiator skid plate • Battery supports, battery trays, and battery covers 			

179.2	Other non-painted undercarriage components which are received from the suppliers with coatings already applied shall include but are not limited to: • Suspension components • Front and rear axles			
179.3	All powder coatings, primers, and paint used shall be compatible with all metals, pretreatments, and primers. 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.			
180.0	<u>FRAME WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
180.1	Shall receive a Lifetime Frame Assembly Structural warranty.			
181.0	<u>BODY SUBFRAME</u>	YES	NO	EXCEPTIONS / NOTES
181.1	To assure proper body alignment and clearance, the body subframe shall be constructed in a jig and fitted directly on the chassis. The subframe shall be constructed of steel. The chassis frame rails shall be fitted with fiber reinforced rubber to isolate the body frame members from direct contact with chassis frame rails.			
181.2	The main body subframe shall be constructed from steel tubing. The subframe shall run the full length of the body and shall be spaced the same width as the chassis frame rails. The main subframe shall also be the integral support for the water tank. Vertical drop tubes shall be welded to the subframe. From these vertical drop tubes, shall extend cross members constructed of steel angle. These cross members shall extend out to support the compartments. Cross members shall be located at the front and rear of the body and in front and rear of the wheel well opening.			
181.3	A drop frame, fabricated of steel tube and steel angles, shall support the compartment area behind the rear. The rear drop frame shall be constructed using vertical drop tubes, welded to the main subframe. All drop frame structures shall be welded directly to the body subframe to allow the body to be a separate structure from the chassis.			
182.0	<u>BODY MOUNTING</u>	YES	NO	EXCEPTIONS / NOTES
182.1	The body subframe shall be fastened to the chassis frame in such a manner to allow the body and subframe to act as one (1) component, separate from the chassis. As the chassis frame twists under driving conditions, the mounting system shall limit any stress from being transferred into the body. The body mounting system shall also prevent frame side rail or body damage caused by unevenly distributed stress and strains due to load and chassis movement. Body mountings that do not allow relief from chassis movement shall not be acceptable.			

183.0	<u>FRONT BUMPER</u>	YES	NO	EXCEPTIONS / NOTES
183.1	The chassis shall be equipped with a severe duty front bumper constructed from a structural steel channel and have 45 degree angled front corners.			
184.0	<u>FRONT BUMPER EXTENSION LENGTH</u>	YES	NO	EXCEPTIONS / NOTES
184.1	The front bumper shall be extended approximately 16.00 inches ahead of the cab.			
185.0	<u>FRONT BUMPER PAINT</u>	YES	NO	EXCEPTIONS / NOTES
185.1	The front bumper shall be painted the same as the lower cab color.			
186.0	<u>LEFT FRONT BUMPER STORAGE WELLS</u>	YES	NO	EXCEPTIONS / NOTES
186.1	<p>A storage well shall be placed outboard of the left frame rail and accommodate 150' of Key combat ready hose. The top edge of the riser will be trimmed with round aluminum extrusion</p> <p>Front Bumper Storage Well Flooring, Dri-Dek The storage well shall also be provided with drainage holes to allow excess fluid to drain easily and unobstructed.</p> <p>The storage well shall utilize Dri-Dek interlocking squares on the well floor. For maximum slip resistance and drainage, each square shall have a knobby perforated surface.</p>			
187.0	<u>RIGHT FRONT BUMPER STORAGE WELLS</u>	YES	NO	EXCEPTIONS / NOTES
187.1	<p>A storage well shall be place outboard of the right frame rail and accommodate 150' of Key combat ready hose. The top edge of the riser will be trimmed with round aluminum extrusion</p> <p>The storage well shall also be provided with drainage holes to allow excess fluid to drain easily and unobstructed. The storage well flooring shall utilize Dri-Dek interlocking squares. For maximum slip resistance and drainage, each square shall have a knobby perforated surface.</p>			
188.0	<u>FRONT BUMPER DISCHARGES</u>	YES	NO	EXCEPTIONS / NOTES
188.1	<p>The chassis shall include (2) frame-mounted 2.50-inch diameter plumbed pipes. Routing of plumbing to be determined at engineering.</p> <p>The discharge pipe shall be a 2.50-inch stainless steel schedule 10 tube. The discharge shall include a Victaulic groove for connecting to the pump and discharge hose plumbing on each end of the tube.</p> <p>The apparatus manufacturer shall plumb the discharge pipe to the pump and shall provide all valves as required.</p>			

189.0	<u>MECHANICAL SIREN</u>	YES	NO	EXCEPTIONS / NOTES
189.1	The front bumper shall include an electromechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated, and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ siren produces a distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast-down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep. The siren shall include mounting hardware designed to be recessed.			
190.0	<u>MECHANICAL SIREN LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
190.1	The siren shall be recess mounted in the center of the front fascia of the bumper, in a notched configuration. The bumper shall be notched to allow the siren to be mounted completely behind the face of the bumper to protect the siren from damage. The notch will be welded in place for strength with a continuous top and bottom flange. All welds will be metal finished for appearance.			
191.0	<u>AIR HORN</u>	YES	NO	EXCEPTIONS / NOTES
191.1	The chassis shall include two (2) air horns. The air horns shall be trumpet style with a chrome finish.			
192.0	<u>AIR HORN LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
192.1	The air horns shall be recess mounted in the front bumper face, one (1) on the center right side of the bumper in the inboard position relative to the right-hand frame rail and one (1) on the center left side of the bumper in the inboard position relative to the left-hand frame rail.			
193.0	<u>AIR HORN ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
193.1	A steering wheel button shall be provided to control the air horns. 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". (2) ceiling mounted lanyards shall be provided, one on the Captain's side and one on the driver's side. Exact mounting locations to be determined during preconstruction.			
194.0	<u>AIR HORN RESERVOIR</u>	YES	NO	EXCEPTIONS / NOTES
194.1	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.			
195.0	<u>ELECTRONIC SIREN SPEAKER</u>	YES	NO	EXCEPTIONS / NOTES
195.1	There shall be two (2) 100-watt speakers. The speaker shall include a flat mounting flange which shall be polished aluminum.			
196.0	<u>ELECTRONIC SIREN SPEAKER LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
196.1	The electronic siren speaker shall be located on the front bumper face on the right and left 45-degree angles.			

197.0	<u>FRONT BUMPER TOW HOOKS</u>	YES	NO	EXCEPTIONS / NOTES
197.1	Two (2) heavy-duty chrome plated tow hooks shall be installed in the rearward position out of the approach angle area, bolted directly to the side of each chassis frame rail with grade 8 bolts.			
198.0	<u>TOW FORK PROVISION</u>	YES	NO	EXCEPTIONS / NOTES
198.1	Two (2) heavy-duty steel towing forks shall be a bolt-on design and attached to the underside of the frame flange and butted to the bottom frame with a fish plate joint. Each shall be shaped like an upside-down “U” to act as a designated hookup point to accept a tow bar from a service vehicle without having to reach the front axle.			
199.0	<u>CAB TILT SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
199.1	The entire cab shall be capable of tilting to a minimum of 45 degrees allow for ease of maintenance. 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.			
199.2	<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> <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 a 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> <p>A manual hydraulic pump shall be provided that will tilt the cab by hand.</p>			

200.0	<u>CAB TILT LIMIT SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
200.1	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.			
201.0	<u>CAB TILT CONTROL RECEPTACLE</u>	YES	NO	EXCEPTIONS / NOTES
201.1	<p>The cab tilt control cable shall include a receptacle which shall be 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 or sufficient cable to provide clean and secure mounting.</p> <p>The remote-control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote-control pendant shall be furnished with the apparatus.</p>			
202.0	<u>CAB TILT LOCKDOWN INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
202.1	<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>			
203.0	<u>CAB WINDSHIELD</u>	YES	NO	EXCEPTIONS / NOTES
203.1	The cab windshield shall be designed for maximum visibility.			
204.0	<u>GLASS FRONT DOOR</u>	YES	NO	EXCEPTIONS / NOTES
204.1	<p>The front cab doors shall include a window with the capability to roll down completely into the door housing. The left and right front door windows shall be controlled using a switch on each respective side inner door panel. The driver's door shall include a switch for each powered door window in the cab.</p> <p>The windows shall be mounted within the frame of the front doors and trimmed with a black anodized ring on the exterior.</p>			
205.0	<u>GLASS TINT FRONT DOOR</u>	YES	NO	EXCEPTIONS / NOTES
205.1	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.			
206.0	<u>GLASS REAR DOOR RIGHT HAND</u>	YES	NO	EXCEPTIONS / NOTES
206.1	The rear right-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 the driver's control panel.			

207.0	<u>GLASS TINT REAR DOOR RIGHT HAND</u>	YES	NO	EXCEPTIONS / NOTES
207.1	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.			
208.0	<u>GLASS REAR DOOR LEFT HAND</u>	YES	NO	EXCEPTIONS / NOTES
208.1	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 the driver's control panel.			
209.0	<u>GLASS TINT REAR DOOR LEFT HAND</u>	YES	NO	EXCEPTIONS / NOTES
209.1	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.			
210.0	<u>CLIMATE CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
210.1	<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.</p> <p>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 that 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.</p> <p>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>			
211.0	<u>CLIMATE CONTROL DRAIN</u>	YES	NO	EXCEPTIONS / NOTES
211.1	The climate control system shall include a gravity drain for water management.			

212.0	<u>CLIMATE CONTROL ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
212.1	<p>The heating, defrosting and air conditioning controls shall be in the center dash center switch panel, in a position that 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>			
213.0	<u>HVAC OVERHEAD COVER PAINT</u>	YES	NO	EXCEPTIONS / NOTES
213.1	The overhead HVAC cover shall be painted with a multi-tone texture finish.			
214.0	<u>HEATER HOSE INSULATION</u>	YES	NO	EXCEPTIONS / NOTES
214.1	The heater hoses leading from the engine to the cab shall include a foam insulation wrap that runs the length of the hose improving heating in extremely cold climates. The heater hoses which shall be routed inside the cab shall not be insulated.			
215.0	<u>A/C CONDENSER LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
215.1	A roof-mounted A/C condenser shall be installed centered on the cab forward of the raised roof against the slope rise.			
216.0	<u>A/C COMPRESSOR</u>	YES	NO	EXCEPTIONS / NOTES
216.1	The air-conditioning compressor shall be a belt-driven, engine-mounted compressor. The compressor shall be compatible with R134-a refrigerant.			
217.0	<u>UNDER CAB INSULATION</u>	YES	NO	EXCEPTIONS / NOTES
217.1	<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>			
218.0	<u>INTERIOR TRIM FLOOR</u>	YES	NO	EXCEPTIONS / NOTES
218.1	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 bed liner spray-on coating.			

219.0	<u>INTERIOR TRIM</u>	YES	NO	EXCEPTIONS / NOTES
219.1	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 hardboard backing.			
220.0	<u>REAR WALL INTERIOR TRIM</u>	YES	NO	EXCEPTIONS / NOTES
220.1	The rear wall of the cab shall be trimmed with vinyl.			
221.0	<u>HEADER TRIM</u>	YES	NO	EXCEPTIONS / NOTES
221.1	The cab interior shall feature header trim over the driver and officer dash constructed of Marine Grade, minimum 0.13-inch-thick aluminum.			
222.0	<u>TRIM CENTER DASH</u>	YES	NO	EXCEPTIONS / NOTES
222.1	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.			
223.0	<u>TRIM LEFT-HAND DASH</u>	YES	NO	EXCEPTIONS / NOTES
223.1	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.			
224.0	<u>TRIM RIGHT-HAND DASH</u>	YES	NO	EXCEPTIONS / NOTES
224.1	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.			
225.0	<u>POWERPOINT DASH MOUNT</u>	YES	NO	EXCEPTIONS / NOTES
225.1	The cab shall include one (1) 12-volt cigarette lighter type receptacle 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.			
226.0	<u>STEP TRIM</u>	YES	NO	EXCEPTIONS / NOTES
226.1	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 become trapped within the stepping surface. The step shall feature a splash guard to reduce water and debris from splashing into the step.			

226.2	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 that is integral to the construction of the cab for rigidity and strength. The middle step shall be integral to the cab construction and shall be trimmed in a minimum 0.08-inch-thick embossed aluminum tread plate.			
227.0	<u>STEP TRIM KICKPLATE</u>	YES	NO	EXCEPTIONS / NOTES
227.1	The cab steps shall include a kick plate on the rise of each step.			
228.0	<u>UNDER CAB ACCESS DOOR</u>	YES	NO	EXCEPTIONS / NOTES
228.1	The cab shall include an under-cab access door. The under-cab access door shall provide access to the diesel exhaust fluid fill.			
229.0	<u>INTERIOR DOOR TRIM</u>	YES	NO	EXCEPTIONS / NOTES
229.1	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.			
230.0	<u>DOOR TRIM CUSTOMER NAMEPLATE</u>	YES	NO	EXCEPTIONS / NOTES
233.1	The interior door trim on the front doors shall include a customer nameplate that states the vehicle was custom built for their Department.			
234.0	<u>CAB DOOR TRIM REFLECTIVE</u>	YES	NO	EXCEPTIONS / NOTES
234.1	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.			
235.0	<u>INTERIOR GRAB HANDLE "A" PILLAR</u>	YES	NO	EXCEPTIONS / NOTES
235.1	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.			
236.0	<u>INTERIOR GRAB HANDLE FRONT DOOR</u>	YES	NO	EXCEPTIONS / NOTES
236.1	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.			
237.0	<u>INTERIOR GRAB HANDLE REAR DOOR</u>	YES	NO	EXCEPTIONS / NOTES
237.1	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.			
238.0	<u>INTERIOR SOFT TRIM COLOR</u>	YES	NO	EXCEPTIONS / NOTES
238.1	The cab interior soft trim surfaces shall be gray in color.			

239.0	<u>INTERIOR TRIM SUNVISOR</u>	YES	NO	EXCEPTIONS / NOTES
239.1	The header shall include two (2) sun visors, one on 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.			
240.0	<u>INTERIOR FLOOR MAT COLOR</u>	YES	NO	EXCEPTIONS / NOTES
240.1	The cab interior floor mat shall be gray in color.			
241.0	<u>HEADER TRIM INTERIOR PAINT</u>	YES	NO	EXCEPTIONS / NOTES
241.1	The metal surfaces in the header area shall feature a medium gray spray-on bed liner coating.			
242.0	<u>TRIM CENTER DASH INTERIOR PAINT</u>	YES	NO	EXCEPTIONS / NOTES
242.1	The entire center dash and any accessory pods attached to the dash shall feature a gray spray-on bed liner coating.			
243.0	<u>TRIM LEFT-HAND DASH INTERIOR PAINT</u>	YES	NO	EXCEPTIONS / NOTES
243.1	The left-hand dash shall feature a gray spray-on bed liner coating.			
244.0	<u>TRIM RIGHT-HAND DASH INTERIOR PAINT</u>	YES	NO	EXCEPTIONS / NOTES
244.1	The right-hand dash shall feature a gray spray-on bed liner coating.			
245.0	<u>FLOOR INTERIOR PAINT</u>	YES	NO	EXCEPTIONS / NOTES
245.1	The metal surfaces on the floor of the cab shall feature a gray spray-on bed liner coating.			
246.0	<u>DASH PANEL GROUP</u>	YES	NO	EXCEPTIONS / NOTES
246.1	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 the officer.			
247.0	<u>SWITCHES CENTER PANEL</u>	YES	NO	EXCEPTIONS / NOTES
247.1	Switch locations will be determined at preconstruction.			
248.0	<u>SWITCHES LEFT PANEL</u>	YES	NO	EXCEPTIONS / NOTES
248.1	<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>			

249.0	<u>SWITCHES RIGHT PANEL</u>	YES	NO	EXCEPTIONS / NOTES
249.1	The right dash panel shall include no rocker switches or legends.			
250.0	<u>SEAT BELT WARNING</u>	YES	NO	EXCEPTIONS / NOTES
250.1	<p>A 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 parking 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 parking 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>			
251.0	<u>SEAT MATERIAL</u>	YES	NO	EXCEPTIONS / NOTES
251.1	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 the specification of the common trade name Imperial 1800. The material meets FMVSS 302 flammability requirements.			
251.2	<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, headrest, 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>			
252.0	<u>SEAT COLOR</u>	YES	NO	EXCEPTIONS / NOTES
252.1	All seats supplied with the chassis shall be black in color. All seats shall include red seat belts.			
253.0	<u>SEAT DRIVER</u>	YES	NO	EXCEPTIONS / NOTES
253.1	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.			

253.2	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.			
253.3	<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> <p>This model of the 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 the construction of the seat shall also have successfully completed testing concerning the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.</p>			
254.0	<u>SEAT BACK DRIVER</u>	YES	NO	EXCEPTIONS / NOTES
254.1	The driver's seat shall include a standard seat back incorporating an all- belt-to-seat feature (ABTS). The seat back shall feature a contoured headrest.			
255.0	<u>ADDITIONAL SEAT COVER DRIVER</u>	YES	NO	EXCEPTIONS / NOTES
255.1	One (1) set of additional seat cushions 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.			
256.0	<u>SEAT OFFICER</u>	YES	NO	EXCEPTIONS / NOTES
256.1	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. 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.			

256.2	<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 the 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, which decides the burning rate of materials in the occupant compartments of motor vehicles.</p>			
257.0	<u>SEAT BACK OFFICER</u>	YES	NO	EXCEPTIONS / NOTES
257.1	<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> <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.</p> <p>The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.</p>			
258.0	<u>SEAT MOUNTING OFFICER</u>	YES	NO	EXCEPTIONS / NOTES
258.1	The officer's seat shall offer a special mounting position maximum distance rearward of the standard location offering increased leg room for the occupant.			
259.0	<u>ADDITIONAL SEAT COVER OFFICER</u>	YES	NO	EXCEPTIONS / NOTES
259.1	One (1) set of additional seat cushions 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.			
260.0	<u>POWER SEAT WIRING</u>	YES	NO	EXCEPTIONS / NOTES
260.1	The power seat or seats installed in the cab shall be wired directly to battery power.			

261.0	<u>SEAT REAR-FACING OUTER LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
261.1	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.			
262.0	<u>SEAT CREW REARWARD FACING OUTER</u>	YES	NO	EXCEPTIONS / NOTES
262.1	<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>			

263.0	<u>SEAT BACK REARWARD-FACING OUTER</u>	YES	NO	EXCEPTIONS / NOTES
263.1	<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>			
264.0	<u>SEAT MOUNTING REARWARD FACING OUTER</u>	YES	NO	EXCEPTIONS / NOTES
264.1	The rear-facing outer seat frame mounting holes shall be mounted 1.00-inch inboard from the outer edge of the rear-facing seat frame.			
265.0	<u>ADDITIONAL SEAT COVER REARWARD FACING OUTER</u>	YES	NO	EXCEPTIONS / NOTES
265.1	One (1) set of additional seat cushions and seat back covers shall be provided for each rear-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.			
266.0	<u>SEAT FRAME REARWARD FACING</u>	YES	NO	EXCEPTIONS / NOTES
266.1	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.			
267.0	<u>SEAT BELT ORIENTATION CREW</u>	YES	NO	EXCEPTIONS / NOTES
267.1	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.			
268.0	<u>SEAT FRAME FORWARD FACING</u>	YES	NO	EXCEPTIONS / NOTES
268.1	Two forward-facing outboard seating positions shall include an enclosed-style seat frame located and installed at the rear wall. These seats will face the rearward facing seats. The seat box shall be painted the same color as the remaining interior.			

269.0	<u>SEAT CREW FORWARD FACING OUTER</u>	YES	NO	EXCEPTIONS / NOTES
269.1	<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>			
270.0	<u>SEAT BACK FORWARD-FACING OUTER</u>	YES	NO	EXCEPTIONS / NOTES
270.1	<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>			

270.2	<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. 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>			
271.0	<u>SEAT MOUNTING FORWARD FACING OUTER</u>	YES	NO	EXCEPTIONS / NOTES
271.1	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.			
272.0	<u>ADDITIONAL SEAT COVER FORWARD FACING OUTER</u>	YES	NO	EXCEPTIONS / NOTES
272.1	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.			
273.0	<u>FORWARD-FACING STORAGE</u>	YES	NO	EXCEPTIONS / NOTES
273.1	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.			
273.2	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 40 inches 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.			
274.0	<u>CAB FRONT UNDER-SEAT STORAGE ACCESS</u>	YES	NO	EXCEPTIONS / NOTES
274.1	The left and right under-seat storage areas shall have a solid aluminum hinged door with a non-locking latch.			
275.0	<u>SEAT COMPARTMENT DOOR FINISH</u>	YES	NO	EXCEPTIONS / NOTES
275.1	All under-seat storage compartment access doors shall feature a medium gray spray-on bed liner coating to match cab interior finish.			
276.0	<u>ACTIVE AIR PURIFICATION SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
276.1	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			

276.2	<u>System Certification/Testing</u> The system will/shall be 3 rd party tested to verify H ₂ O ₂ 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. 3 rd Party testing must be performed for effectiveness against SARS-CoV-2 in a chamber at least 1,280 cubic feet in size. [No Exceptions]			
276.3	<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). 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 H ₂ O ₂ , Ozone, or UVC light [No Exceptions] Mounting location will be determined at preconstruction meeting.			
277.0	<u>WINDSHIELD WIPER SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
277.1	The cab shall include a triple arm linkage wiper system which shall clear the windshield of water, ice, and debris. There shall be at least 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.			
278.0	<u>ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR</u>	YES	NO	EXCEPTIONS / NOTES
278.1	The windshield washer fluid level shall be monitored electronically.			
279.0	<u>CAB DOOR HARDWARE</u>	YES	NO	EXCEPTIONS / NOTES
279.1	The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of aluminum with a chrome-plated finish. The interior exit door handles shall be flush paddle type with a black finish, which is incorporated into the upper door panel. All cab entry doors shall include locks that are keyed alike. The door locks shall be designed to prevent an accidental lockout. The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel.			
280.0	<u>DOOR LOCKS</u>	YES	NO	EXCEPTIONS / NOTES
280.1	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 key from the exterior.			

281.0	<u>GRAB HANDLES</u>	YES	NO	EXCEPTIONS / NOTES
281.1	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. There shall be a horizontal handle centered above the front warning light/headlight assemblies on the left and right sides			
282.0	<u>BACKLIT EXTERIOR HANDRAILS</u>	YES	NO	EXCEPTIONS / NOTES
282.1	All exterior handrails, unless otherwise stated, shall be constructed of knurled aluminum with white-colored 12V DC 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. The following handrails shall be provided on the apparatus: Knurled Aluminum A 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.			
283.0	<u>REARVIEW MIRRORS</u>	YES	NO	EXCEPTIONS / NOTES
283.1	West coast style dual vision heated mirror heads shall be provided and installed on each of the front cab doors. 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. The mirrors shall be constructed of plastic housing that is corrosion resistant.			
284.0	<u>AUXILIARY EXTERIOR MIRRORS</u>	YES	NO	EXCEPTIONS / NOTES
284.1	The cab exterior shall include one (1) 10.00-inch diameter polished stainless steel convex look-down mirror.			
285.0	<u>EXTERIOR TRIM REAR CORNER</u>	YES	NO	EXCEPTIONS / NOTES
285.1	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.			

286.0	<u>CAB FENDER</u>	YES	NO	EXCEPTIONS / NOTES
286.1	Full-width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum-formed ABS composite and an outer fenderette 3.50 inches wide made of rubber.			
287.0	<u>MUD FLAPS FRONT</u>	YES	NO	EXCEPTIONS / NOTES
287.1	The front wheel wells shall have mud flaps installed on them.			
288.0	<u>MUD FLAPS REAR</u>	YES	NO	EXCEPTIONS / NOTES
288.1	In addition to the chassis supplied front mud flaps, two (2) mud flaps shall be provided rearward of the rear axles on the apparatus.			
289.0	<u>IGNITION</u>	YES	NO	EXCEPTIONS / NOTES
289.1	A master battery system with a keyless start ignition system shall be provided.			
290.0	<u>BATTERY</u>	YES	NO	EXCEPTIONS / NOTES
290.1	<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. A 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>			
291.0	<u>BATTERY TRAY</u>	YES	NO	EXCEPTIONS / NOTES
291.1	<p>The batteries shall be installed within two (2) sliding 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 DriDek shall be installed on the bottom of the trays to allow for airflow and help prevent moisture buildup. The batteries shall be held in place by non-conducting phenolic resin hold-down boards.</p>			

292.0	<u>BATTERY BOX COVER</u>	YES	NO	EXCEPTIONS / NOTES
292.1	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.			
293.0	<u>BATTERY CABLE</u>	YES	NO	EXCEPTIONS / NOTES
293.1	The starting system shall include cables which shall be protected by a 275-degree F. minimum high-temperature flame retardant loom, sealed at the ends with heat shrink and sealant.			
294.0	<u>BATTERY JUMPER STUD</u>	YES	NO	EXCEPTIONS / NOTES
294.1	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.			
295.0	<u>ALTERNATOR</u>	YES	NO	EXCEPTIONS / NOTES
295.1	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.			
296.0	<u>STARTER MOTOR</u>	YES	NO	EXCEPTIONS / NOTES
296.1	The single start electrical system shall include a Delco brand starter motor.			
297.0	<u>AUXILIARY AIR COMPRESSOR SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
297.1	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.			
298.0	<u>COVER FOR GAST PUMP</u>	YES	NO	EXCEPTIONS / NOTES
298.1	There shall be a cover fabricated out of a tread plate installed over the 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. Its purpose is to prevent objects from coming into contact with the pump and potentially causing damage.			
299.0	<u>ELECTRICAL INLET LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
299.1	An electrical inlet shall be installed in the left-hand side lower front step in the mid-forward position.			
300.0	<u>ELECTRICAL INLET</u>	YES	NO	EXCEPTIONS / NOTES
300.1	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.			

301.0	<u>ELECTRICAL INLET CONNECTION</u>	YES	NO	EXCEPTIONS / NOTES
301.1	The electrical inlet shall include a 120/240V power supply.			
302.0	<u>ELECTRICAL INLET COVER</u>	YES	NO	EXCEPTIONS / NOTES
302.1	The electrical inlet connection shall include a red cover.			
303.0	<u>HEADLIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
303.1	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.			
304.0	<u>HEADLIGHT LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
304.1	The headlights shall be located on the front fascia of the cab directly below the front warning lights.			
305.0	<u>FRONT TURN SIGNALS</u>	YES	NO	EXCEPTIONS / NOTES
305.1	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.			
306.0	<u>SIDE TURN/MARKER LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
306.1	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.			
307.0	<u>MARKER AND ICC LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
307.1	Per 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.			
308.0	<u>HEADLIGHT AND MARKER LIGHT ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
308.1	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.			
309.0	<u>LIGHTBAR SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
309.1	The light bar shall be controlled by a virtual button on the multiplex display and control screen.			
310.0	<u>INTERIOR OVERHEAD LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
310.1	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.			
311.0	<u>LIGHTBAR PROVISION</u>	YES	NO	EXCEPTIONS / NOTES
311.1	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.			

312.0	<u>CAB FRONT LIGHTBAR MODEL</u>	YES	NO	EXCEPTIONS / NOTES
312.1	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. See the light bar layout for specific details.			
313.0	<u>FRONT SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
313.1	The front of the cab shall include one (1) Hi-Viz 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. Lower radius mount. The housing shall be powder-coated white.			
314.0	<u>FRONT SCENE LIGHT LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
314.1	There shall be one (1) scene light mounted center on the front brow of the cab.			
315.0	<u>FRONT SCENE LIGHTS ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
315.1	The front scene lighting shall be activated by a virtual button on the multiplex display and control screen.			
316.0	<u>SIDE SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
316.1	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.			
317.0	<u>SIDE SCENE LIGHT LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
317.1	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.			
318.0	<u>SIDE SCENE ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
318.1	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.			
319.0	<u>AUXILIARY SIDE SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
319.1	The light bar shall include two (2) side scene lights.			
320.0	<u>AUXILIARY SIDE SCENE LIGHT ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
320.1	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.			
321.0	<u>GROUND LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
321.1	Each door shall include a Firetech model Number FT-AQX LED ground light mounted to the underside of the cab step below each door.			
322.0	<u>GROUND LIGHT CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
322.1	The ground lighting shall be activated when the parking brake is set and through a virtual button on the multiplex display and control screen.			

323.0	<u>UNDER BUMPER LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
323.1	<p>There shall be two (2) Firetech model Number FT-AQX LED ground lights mounted under the bumper.</p> <p>The under-bumper ground lighting shall be interlocked with the parking brake and the marker light activation.</p>			
324.0	<u>LOWER CAB STEP LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
324.1	The middle step located at each door shall include a Firetech model Number FT-AQX LED light which shall activate with the opening of the respective door.			
325.0	<u>INTERMEDIATE STEP LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
325.1	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.			
326.0	<u>ENGINE COMPARTMENT LIGHT</u>	YES	NO	EXCEPTIONS / NOTES
326.1	There shall be an 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.			
327.0	<u>DO NOT MOVE APPARATUS LIGHT</u>	YES	NO	EXCEPTIONS / NOTES
327.1	<p>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.</p> <p>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.</p> <p>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.</p>			
328.0	<u>MASTER WARNING SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
328.1	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.			
329.0	<u>HEADLIGHT FLASHER</u>	YES	NO	EXCEPTIONS / NOTES
329.1	<p>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.</p> <p>Deliberate operator selection of high beams will override the flashing function until low beams are again selected.</p>			

330.0	<u>HEADLIGHT FLASHER SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
330.1	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.			
331.0	<u>INBOARD FRONT WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
331.1	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.			
332.0	<u>OUTBOARD FRONT WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
332.1	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.			
333.0	<u>OUTBOARD FRONT WARNING LIGHTS COLOR</u>	YES	NO	EXCEPTIONS / NOTES
333.1	The warning lights mounted on the cab front fascia in the outboard position shall be clear.			
334.0	<u>FRONT WARNING SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
334.1	The front warning lights shall be controlled through a virtual control on the multiplex display and control screen.			
335.0	<u>INTERSECTION WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
335.1	The chassis shall include two (2) Whelen M4 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.			
336.0	<u>INTERSECTION WARNING LIGHTS' COLOR</u>	YES	NO	EXCEPTIONS / NOTES
336.1	The intersection lights shall be red.			
337.0	<u>INTERSECTION WARNING LIGHTS' LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
337.1	The intersection lights shall be mounted on the side of the bumper in the rearward position.			
338.0	<u>SIDE WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
338.1	The cab sides shall include two (2) Whelen M4 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.			
339.0	<u>SIDE WARNING LIGHTS COLOR</u>	YES	NO	EXCEPTIONS / NOTES
339.1	The warning lights located on the side of the cab shall be red.			
340.0	<u>SIDE WARNING LIGHTS' LOCATION</u>	YES	NO	EXCEPTIONS / NOTES
340.1	The warning lights on the side of the cab shall be mounted over the front wheel well at the center of the front axle.			
341.0	<u>SIDE AND INTERSECTION WARNING SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
341.1	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.			

342.0	<u>TRAFFIC CONTROL</u>	YES	NO	EXCEPTIONS / NOTES
342.1	There shall be one (1) GTT (Global Traffic Technologies) Opticom model 795H traffic control optical emitter mounted in the lightbar on the front of the cab roof. There shall be an indicator light on the dash. The emitter shall be activated by the master warning switch and shall be deactivated when the parking brake is applied.			
343.0	<u>TRAFFIC DIRECTING LIGHT</u>	YES	NO	EXCEPTIONS / NOTES
343.1	<p>There will be one (1) Whelen Model TADF6, 34.00" long x 2.35" high x 2.38" deep, LED traffic directing light installed at the rear of the apparatus.</p> <p>There will be the Model TDP60000 red and amber LED light assembly included with this installation.</p> <p>This light will be controlled using the multiplex display screen in the cab. Full selectable control will be maintained to choose modes for the traffic direction.</p>			
343.2	<ul style="list-style-type: none"> One (1) switch will control the power to the traffic directing light when the battery switch is on. When the power switch to the traffic directing light is on and the emergency master switch is on, the red LED's will be activated in a warning light pattern. One (1) switch will deactivate the red LED's and activate the amber LEDs in a left traffic directing light pattern. One (1) switch will deactivate the red LED's and activate the amber LEDs in a right traffic directing light pattern. If the left traffic directing switch is on and the right traffic directing switch is on the amber LED's will flash in a flash out pattern. 			
343.3	<p>This traffic directing light will be mounted over the hose bed, between the body side sheets, on a cross tube at the rear of the apparatus.</p> <p>This installation will include a steel box that is painted job color.</p>			
344.0	<u>ROTO-RAYS WARNING LIGHT</u>	YES	NO	EXCEPTIONS / NOTES
344.1	<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 (3) red, in color.</p> <p>When the parking brake is engaged, the Roto-Ray will stop spinning and flash. When activated, the entire light head assembly shall rotate at 200 RPM.</p>			

345.0	<u>ROTO-RAYS WARNING LIGHT SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
345.1	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 and start a flashing pattern.			
346.0	<u>INTERIOR DOOR OPEN WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
346.1	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.			
347.0	<u>SIREN CONTROL HEAD</u>	YES	NO	EXCEPTIONS / NOTES
347.1	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.			
348.0	<u>STEERING WHEEL HORN BUTTON SELECTOR SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
348.1	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.			
349.0	<u>MECHANICAL SIREN FOOT SWITCH LEFT-HAND POSITION</u>	YES	NO	EXCEPTIONS / NOTES
349.1	The mechanical siren foot switch shall be positioned outboard of any other foot switch, if applicable.			
350.0	<u>AUDIBLE WARNING LEFT-HAND FOOT SWITCH BRACKET</u>	YES	NO	EXCEPTIONS / NOTES
350.1	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.			
351.0	<u>AUDIBLE WARNING RIGHT-HAND FOOT SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
351.1	One (1) foot-actuated switch shall be supplied for installation in the front section of the cab for officer actuation. One (1) switch shall activate the mechanical siren(s).			
352.0	<u>AIR HORN PULL CORD RIGHT HAND</u>	YES	NO	EXCEPTIONS / NOTES
352.1	The air horn pull cord located on the right-hand side of the cab shall be in an easily reachable location mounted from the ceiling.			
353.0	<u>MECHANICAL SIREN FOOT SWITCH RIGHT HAND</u>	YES	NO	EXCEPTIONS / NOTES
353.1	There shall be a mechanical Siren Foot switch on the right-hand side of the truck.			

354.0	<u>MECHANICAL SIREN BRAKE/AUXILIARY ACTIVATION</u>	YES	NO	EXCEPTIONS / NOTES
354.1	Two (2) red push button type momentary type siren brakes shall be provided in the switch panel on the dash. An electrical switch shall be provided to isolate power to the mechanical siren.			
355.0	<u>MECHANICAL SIREN INTERLOCK</u>	YES	NO	EXCEPTIONS / NOTES
355.1	The siren shall only be active when the master warning switch is on to prevent accidental engagement.			
356.0	<u>BACK-UP ALARM</u>	YES	NO	EXCEPTIONS / NOTES
356.1	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.			
357.0	<u>INSTRUMENTATION</u>	YES	NO	EXCEPTIONS / NOTES
357.1	<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>			

357.2	<p>One (1) four-movement 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 following 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>			
357.3	<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. 			
357.4	<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 			

357.5	<u>AMBER INDICATORS</u> <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. 			
357.6	<u>BLUE INDICATORS</u> <ul style="list-style-type: none"> • High Beam indicator 			
357.7	<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 			
358.0	<u>BACKLIGHTING COLOR</u>	YES	NO	EXCEPTIONS / NOTES
358.1	The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting.			
359.0	<u>AUXILIARY SPEEDOMETER</u>	YES	NO	EXCEPTIONS / NOTES
359.1	The dash shall include an auxiliary analog speedometer.			

360.0	<u>CAMERA</u>	YES	NO	EXCEPTIONS / NOTES
360.1	<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 installed 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>			
361.0	<u>CAMERA DISPLAY</u>	YES	NO	EXCEPTIONS / NOTES
361.1	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.			
362.0	<u>CAB EXTERIOR PROTECTION</u>	YES	NO	EXCEPTIONS / NOTES
362.1	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.			
363.0	<u>FIRE EXTINGUISHER</u>	YES	NO	EXCEPTIONS / NOTES
363.1	A 2.50-pound D.O.T-approved fire extinguisher with a BC rating shall be provided.			
364.0	<u>ROAD SAFETY KIT</u>	YES	NO	EXCEPTIONS / NOTES
364.1	The cab and chassis shall include one (1) emergency road safety triangle kit.			
365.0	<u>DOOR KEYS</u>	YES	NO	EXCEPTIONS / NOTES
365.1	The cab and chassis shall include a total of four (4) door keys for the manual door locks.			
366.0	<u>WARRANTY</u>	YES	NO	EXCEPTIONS / NOTES
366.1	The manufacturer shall provide a Lifetime Custom Chassis warranty			
367.0	<u>CHASSIS OPERATION MANUAL</u>	YES	NO	EXCEPTIONS / NOTES
367.1	There shall be two (2) digital copies of the chassis operation manual provided with the chassis.			
368.0	<u>ENGINE AND TRANSMISSION OPERATION MANUALS</u>	YES	NO	EXCEPTIONS / NOTES
368.1	<p>The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:</p> <p>(1) Hard copy of the Engine Operation and Maintenance Manual with a digital copy</p> <p>(1) Digital copy of the Transmission Operator's manual</p> <p>(1) Digital copy of the Engine Owner's manual</p>			
368.2	<p>CAB/CHASSIS AS BUILT WIRING DIAGRAMS</p> <p>The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams.</p>			

369.0	<u>MIRROR INSTALL</u>	YES	NO	EXCEPTIONS / NOTES
369.1	There shall be a supplied “look down” mirror installed on the front officer side of the cab.			
370.0	<u>PIVOT POINT AUTO LUBE LINES</u>	YES	NO	EXCEPTIONS / NOTES
370.1	There shall be two (2) lines run from the Groeneveld Auto Lube to the zerks for the cab pivot points on the cab.			
371.0	<u>BATTERY CHARGER</u>	YES	NO	EXCEPTIONS / NOTES
371.1	<p>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.</p> <p>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.</p>			
372.0	<u>12V KUSSMAUL USB DUAL PORTS</u>	YES	NO	EXCEPTIONS / NOTES
372.1	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.			
373.0	<u>12V ACCESSORY OUTLETS</u>	YES	NO	EXCEPTIONS / NOTES
373.1	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.			
374.0	<u>IPAD, IPAD MOUNTING BRACKET AND CHARGING</u>	YES	NO	EXCEPTIONS / NOTES
374.1	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.			
375.0	<u>ENGINE TUNNEL TREAD PLATE SHELF/ELECTRICAL BOX</u>	YES	NO	EXCEPTIONS / NOTES
375.1	<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 USBs and Power Points to be mounted there.</p> <p>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>			

375.2	<p>The following power lead-ins, shall be installed in the lower center portion of this component, about 610 inches up of the floor of the cab:</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>			
376.0	<u>HEATER MOUNTING</u>	YES	NO	EXCEPTIONS / NOTES
376.1	The heater will be housed inside the rear-facing seat box in the crew area. It shall be in the driver-side portion of the box with a guard to protect it from items making contact			
377.0	<u>HOURLY METER</u>	YES	NO	EXCEPTIONS / NOTES
377.1	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.			
378.0	<u>ELECTRICAL DISTRIBUTION</u>	YES	NO	EXCEPTIONS / NOTES
378.1	<ul style="list-style-type: none"> · Receptacle, 120V, 520R Straight Blade, Duplex, Wired to Transfer Switch, Outlet Location, officer's Seat, Behind · Receptacle, 120V, 520R Straight Blade, Duplex, Wired to Transfer Switch, Outlet Location, Driver's Seat, Behind · Receptacle, 120V, 520R Straight Blade, Duplex, Wired to Transfer Switch, Outlet Location, Driver's Seat, Behind <p>The receptacle shall be located forward of the electrical equipment box inside the chassis cab. It shall be installed on the top of the TB tunnel on the chassis cab floor.</p>			
379.0	<u>WATER/FOAM TANKS</u>	YES	NO	EXCEPTIONS / NOTES
379.1	<p>Water Tank, UPF, 500 U.S. Gallons</p> <p>Water Tank Mounting, Pumpers</p> <p>Water Tank Drain, 1 1/2" Valve, Pumpers</p> <p>Water Tank Fill Tower, UPF, Black</p>			
380.0	<u>WATER TANK BAFFLES</u>	YES	NO	EXCEPTIONS / NOTES
380.1	The water tank shall have tank baffles designed to provide maximum water flow and interlock with one another.			
381.0	<u>WATER TANK SUMP</u>	YES	NO	EXCEPTIONS / NOTES
381.1	One (1) sump shall be provided at the bottom of the water tank and an anti-swirl plate shall be located above the sump.			

382.0	<u>WATER TANK LEVEL GAUGES</u>	YES	NO	EXCEPTIONS / NOTES
382.1	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 and the upper rear portion of the cab.			
383.0	<u>WATER TANK FILL CONNECTION</u>	YES	NO	EXCEPTIONS / NOTES
383.1	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.			
384.0	<u>WATER TANK LID</u>	YES	NO	EXCEPTIONS / NOTES
384.1	The tank lid shall be constructed of polypropylene and be designed to allow for individual removal and inspection if necessary.			
385.0	<u>WATER TANK OVERFLOW</u>	YES	NO	EXCEPTIONS / NOTES
385.1	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.			
386.0	<u>WATER TANK MOUNTING</u>	YES	NO	EXCEPTIONS / NOTES
386.1	The water tank cradle shall be an integral part of the body subframe and allow the tank to rest on the subframe cross members spaced as required by the tank manufacturer.			
387.0	<u>FOAM CELL, UPF, 30 U.S. GALLON</u>	YES	NO	EXCEPTIONS / NOTES
387.1	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 foam cell shall be designed for use with Class "B" foam.			
388.0	<u>FOAM TANK LEVEL GAUGE</u>	YES	NO	EXCEPTIONS / NOTES
388.1	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.			
389.0	<u>HOSE BED</u>	YES	NO	EXCEPTIONS / NOTES
389.1	The hose bed shall be located above the water tank. The inside of the hose bed shall be constructed of aluminum. The hose shall be accessible from the rear, and the opening shall be free of obstructions that might interfere with the deployment and loading of the hose. A stainless-steel body trim piece shall be at the rear bottom of the hose bed, to protect the chevron striping when deploying the hose. The floor of the hose bed shall be constructed of fiber reinforced plastic material to prevent the accumulation of water and to allow ventilation to aid in drying the hose.			

389.2	<p>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 apart to allow for drainage and ventilation.</p> <p>Each "T" beam shall be constructed utilizing a core of 250,000 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> <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. The hose bed shall contain the following hose load:</p> <ul style="list-style-type: none"> · 200' of 1 3/4" Key Combat Ready Hose · 600' of double jacket hose Fire Equip 800 2.5" Hose -300' Key Combat Ready 1.75" hose · 1200' of 5" double jacket hose · 250' of 2 1/2" Key TRU ID 2.5" hose · 100' of 1 3/4" Key Combat Ready Hose · 200' of 1 3/4" Key Combat Ready Hose <p>Exact layout to be determined at Engineering</p>			
390.0	<u>HOSE BED COVERING</u>	YES	NO	EXCEPTIONS / NOTES
390.1	<p>There shall be a metal covering on the apparatus that will fully cover the hose bed. The covering will be constructed of treadplate that shall support the weight of a firefighter walking on the cover. The cover will be capable of opening manually in the middle along a longitudinal axis to become individual covers or "doors". This shall be considered a two (2) section bed covering.</p>			

390.2	<p>The covering shall be engineered in a manner to allow for a single firefighter to operate the cover easily and safely into the “Open” position. The same shall apply in the reverse manner and into the “Closed” position. Knurled grab handles will be provided to assist in the opening and closing of the cover.</p> <p>The covering shall be hinged along the top left and top right sides where the body and hose bed form. The hinge shall be a stainless-steel piano style hinge. When in the “Open” position, the doors must not contact the PVC hard suction storage supports. Provision must also be made to not allow the doors to “over stroke” and strike the PVC Hard suction tubes or supports. This could potentially cause unwanted damage to the doors and the PVC Hard suction tubes.</p> <p>The covering shall be capable of latching to prevent unwanted deployment while the vehicle is in motion. There shall be warning sensors to indicate to the operator, a door is ajar, and the vehicle is not safe to operate. There shall be 12V DC LED strip lighting on the underneath side of the covering activated when the park brake is engaged and with a switch at the rear of the apparatus.</p>			
391.0	<u>HOSE BED REAR RESTRAINT</u>	YES	NO	EXCEPTIONS / NOTES
391.1	<p>The hose in the hose bed will be restrained by a black nylon Velcro® strap at the top of the hose bed. The hose at the rear of the hose bed will be restrained by 2.00" black nylon webbing with a 1.50" x 4.00" box pattern split into two sections. The split will be located in the center (top to bottom). The webbing will be attached to the top hose bed frame with (2) two seat belt fasteners for each section. The seat belt fasteners will be mounted with the receiver portions on a bracket at the top. There will be a horizontal bar attached to the seat belt buckles with black tether on each side of the hose bed to allow a single pull release. Web straps will loop through the footman loops located on the outboard corners of the restraint and mounted permanently to the body sheet below the hose bed. A bungee cord restraint will be installed on each section to secure the middle portion of the restraints.</p>			
392.0	<u>HOSE BED DIVIDERS</u>	YES	NO	EXCEPTIONS / NOTES
392.1	<p>There shall be six (6) aluminum dividers. All dividers will be adjustable. A minimum of one (1) adjustable attachment point shall be provided at each, the front wall of the hose bed, in the middle floor of the hose bed, and at the rear of the hose bed. The six (6) hose bed divider(s) will be reinforced by attaching them to the rear upper crossbar with adjustable stanchions.</p>			

393.0	<u>HOSE BED LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
393.1	Hose bed lighting shall be LED lights recessed in the inside of the hose bed, two (2) in the front wall. The lights shall be activated by a switch on the rear body and park brake. The lights must be capable of providing sufficient illumination for working safely in the hose bed in low light conditions.			
394.0	<u>ALUMINUM BODY CONSTRUCTION</u>	YES	NO	EXCEPTIONS / NOTES
394.1	<p>The apparatus body shall be fabricated from a minimum of 1/8" thick 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. The body shall be designed for a single axle chassis.</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 capacity 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 jambs, on both the top and the bottom, shall be solid welded as well. Each main door jamb shall consist 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. The manufacturer may take exception to the body material providing that it performs equal to or greater than the construction listed above. Manufacturer shall provide documentation of performance of construction materials to ensure compliance with specification.</p>			
395.0	<u>SIDE COMPARTMENT DOORS</u>	YES	NO	EXCEPTIONS / NOTES
395.1	Hansen International Inc. roll-up doors shall be installed on each side body compartment, five (5) total. Each door shall be produced by an ISO-9001 certified company and tested to at least 100,000 cycles. Each easy opening door shall be equipped with a pre-tensioned 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) pre-assembled 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.			

395.2	<p>Each roll-up door shall be a “painted” finish with a base coat/clear coat “wet paint” appearance to meet the high-quality standards and procedures of both the apparatus builder and paint manufacturer. Each door shall be chemically prepared, sanded, primed, and painted with a minimum of 5 mil thickness. The paint shall match the apparatus body.</p> <p>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 full-width shelf with anti-slip ribbing on top to assist door closing. The shelf shall have two (2) riveted heavy-duty rubber bumpers to prevent a metal-to-metal impact overhead. The latch bar shall consist of a full width .750” diameter stainless steel tube handle with centrally located knurled anti-slip sections and 1.25” hand clearance between the handle and the door surface.</p>			
396.0	<u>NFPA 1901 WALKWAYS AND OVERLAYS</u>	YES	NO	EXCEPTIONS / NOTES
396.1	All exterior surfaces designated by the manufacturer as stepping, standing, or walking areas shall be overlaid with a 3003 H22 bright tread plate to provide a slip-resistant surface, even when the surface is wet. All interior surfaces designated by the manufacturer as stepping, standing, or walking areas shall be slip resistant when the surface is dry. The degree of slip resistance shall comply with NFPA 1901, current edition.			
396.2	Horizontal walkways shall have .080" aluminum tread plate overlays installed and vertical surfaces shall have .125" aluminum tread plate overlays. Overlays shall be installed that are totally insulated from the apparatus with nylon shoulder washers that extend into holes in the body. Stainless steel cap nuts shall be employed where bolt ends may damage equipment or cause injury. After the apparatus is painted and the overlays are reinstalled, they shall be additionally sealed at the edges with a caulking compound. The exterior top tread plate overlay shall be mounted flush with the outer edges of the apparatus body. Any designated horizontal standing or walking surface higher than 48" from the ground and not guarded by a railing, or structure at least 12" high shall have a "safety yellow line" marking the outside perimeter of the designated standing or walking surface area. Yellow reflective SCENE dots shall be used to create the line along the outside edges of standing and walking surfaces. Steps and ladders shall not be required to have the yellow line.			
397.0	<u>STEPPING SURFACES</u>	YES	NO	EXCEPTIONS / NOTES
397.1	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.			

398.0	<u>DOOR HANDLES</u>	YES	NO	EXCEPTIONS / NOTES
398.1	The door handles on the side body compartments of the apparatus shall be nonlocking style.			
399.0	<u>BODY COMPARTMENT LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
399.1	A total of fourteen white LED compartment lights shall be installed in the body compartments.			
400.0	<u>COMPARTMENT COATING</u>	YES	NO	EXCEPTIONS / NOTES
400.1	The interior of the body compartments shall be coated with a gray bedliner unless otherwise specified.			
401.0	<u>COMPARTMENT FLOORING TILES</u>	YES	NO	EXCEPTIONS / NOTES
401.1	Interlocking plastic squares shall be in all body compartments where applicable.			
402.0	<u>COMPARTMENT AIR RELEASE</u>	YES	NO	EXCEPTIONS / NOTES
402.1	Each compartment shall be vented to help remove trapped air when closing the compartment door. The vent shall be a rubber gasket in the outboard corners of the compartment.			
403.0	<u>COMPARTMENT DRAIN HOLES</u>	YES	NO	EXCEPTIONS / NOTES
403.1	Each body compartment shall be equipped with drain holes to allow standing water to exit underneath the apparatus.			
404.0	<u>SILL PROTECTORS</u>	YES	NO	EXCEPTIONS / NOTES
404.1	An anodized aluminum angle sill protector shall be installed on the bottom sill area of the compartment with lap-style doors			
405.0	<u>POLY BODY RUB RAILS</u>	YES	NO	EXCEPTIONS / NOTES
405.1	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.			
406.0	<u>DRIP TRAYS</u>	YES	NO	EXCEPTIONS / NOTES
406.1	Drip trays with drains shall be provided in the upper section of all body compartments with rollup doors.			
407.0	<u>COMPARTMENT L1</u>	YES	NO	EXCEPTIONS / NOTES
407.1	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.			
407.2	Dimensions” 21” W X 53” H X 14” upper/ 25” D lower			
407.3	Contents: · One (1) aluminum adjustable full depth shelf shall be installed in the compartment. The shelf shall be constructed of a minimum 3/16" thick 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. · 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. The board shall be constructed of plywood and have a gray bedliner finish.			

407.4	<ul style="list-style-type: none"> · 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. · 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. 			
408.0	<u>COMPARTMENT L2</u>	YES	NO	EXCEPTIONS / NOTES
408.1	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			
408.2	Dimensions" 65" W X 21" H X 15" D			
408.3	<p>Contents:</p> <ul style="list-style-type: none"> · One (1) aluminum adjustable shallow depth shelf shall be installed in the compartment. The shelf shall be constructed of a minimum 3/16" thick 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. · 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. The board shall be constructed of plywood and have a gray bedliner finish. · 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. · 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 			
409.0	<u>COMPARTMENT L3</u>	YES	NO	EXCEPTIONS / NOTES
409.1	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 L3.			
409.2	Dimensions: "41" W X 53" H X 14" upper/ 25" D lower			
409.3	<p>Contents:</p> <ul style="list-style-type: none"> · One (2) aluminum adjustable shallow depth shelf shall be installed in the compartment. The shelf shall be constructed of a minimum 3/16" thick 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. 			

409.4	<ul style="list-style-type: none"> · 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 · 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. The board shall be constructed of plywood and have a gray bedliner finish. 			
409.5	<ul style="list-style-type: none"> · The customer-supplied chain saw shall be installed in a special bracket and bolt on sleeve that extends through the back wall of the L3 compartment. The Sleeve will be 14 ½ inches deep X 4 inches wide by 7 inches high. It shall be located on the left side of the compartment. There shall be a PacTrac Strap installed to hold the Chain Saw in place. The compartment shall have additional venting and a rubber one-way valve located in the compartment floor. This will assure proper venting and draining when flammable materials are stored in the compartment. · There shall be an easily removable gas can storage module for two (2) one-gallon plastic gas cans to sit in two separate slots side by side. The gas cans shall be secured with a quick-release buckle. The module shall be located below the transition in compartment L3 towards the forward portion of the compartment. Module needs to be made for a tight fit so that the cans are limited from moving around. The gas cans will be secured in the module with adjustable straps. The module shall be bed liner coated. 			
410.0	<u>DRIVER'S SIDE REAR WHEEL WELL POSITION -WL1 AND WL3</u>	YES	NO	EXCEPTIONS / NOTES
410.1	<p>(WL1) There shall be an air cylinder compartment installed in the forward portion of the rear wheel well area, on the driver's side. The compartment shall be a vertical design. The compartment shall be capable of housing three (3) air cylinders.</p> <p>The compartment door and hinges shall be constructed out of stainless-steel material, and the frame shall be constructed out of aluminum. 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 rotational, molded component that is assembled to the door and frame. The door shall have a brushed stainless steel finish.</p>			

410.2	<p>(WL3) There shall be a dual (2) air cylinder compartment installed in the rearward portion of the rear wheel well area, on the driver's side. The compartment shall be a vertical design.</p> <p>The compartment door and hinges shall be constructed out of stainless-steel material, and the frame shall be constructed out of aluminum. 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 rotational, molded component that is assembled to the door and frame. The door shall have a brushed stainless steel finish.</p>			
411.0	<u>HARD SUCTION HOSE STORAGE</u>	YES	NO	EXCEPTIONS / NOTES
411.1	There shall be a hard suction hose "V" trough located on the officer's side with the capacity to store one (1) 10' section of hard suction hose. The trough shall be fabricated of abraded aluminum plate. Velcro straps shall be supplied to hold the hard suction hose secure. The hard suction shall be mounted above the ladders on the officer's side. An additional "V" trough shall be provided on the Driver's side on top of the body for one (1) additional 10' section of hard suction hose.			
412.0	<u>PVC HARD SUCTION HOSE</u>	YES	NO	EXCEPTIONS / NOTES
412.1	One (1) Firequip MaxiFlex PVC 6" x 10' section of hard suction hose shall be provided. The hose shall terminate with a long handle female and a rocker lug male connection.			
413.0	<u>COMPARTMENT R1</u>	YES	NO	EXCEPTIONS / NOTES
413.1	A 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.			
413.2	Dimensions: "21" W X 27" H X 25" D lower			
413.3	<p>Contents:</p> <ul style="list-style-type: none"> 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. 			
413.4	A sensor shall be installed indicating the door position as either "open" or "closed". This will also be wired into the apparatus audible and visual warning system to alert the operator and occupants of an "open" compartment door prior to operating the apparatus on the roadway.			
414.0	<u>COMPARTMENT R2</u>	YES	NO	EXCEPTIONS / NOTES
414.1	A compartment shall be located behind the rear wheels on the officer's side of the apparatus body. This compartment shall be designated as R2.			
414.2	Dimensions: "41" W X 27" H X 25" D lower			

414.3	<p>Contents:</p> <ul style="list-style-type: none"> -One (1) aluminum adjustable shallow depth shelf shall be installed in the compartment. The shelf shall be constructed of a minimum 3/16" thick 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 · One (1) aluminum adjustable full depth shelf shall be installed in the compartment. The shelf shall be constructed of a minimum 3/16" thick 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. · 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. · 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. · One (1) bolt in vertical partition shall be installed in the standard height compartment. The partition shall match the compartment interior. <p>A sensor shall be installed indicating the door position as either "open" or "closed". This will also be wired into the apparatus audible and visual warning system to alert the operator and occupants of an "open" compartment door prior to operating the apparatus on the roadway.</p>			
415.0	<u>TREADPLATE TRAY</u>	YES	NO	EXCEPTIONS / NOTES
415.1	<p>There will be a quantity of one (1) bright aluminum treadplate box(es) provided on top of the right-side compartmentation. The tray will have four (4) seat belt buckles provided on top of the RS body. This will be dedicated to the storage of firefighting hose.</p> <p>Aluminum grating slats will be provided on the floor of the tray with spacing provided for aeration. Drain holes will be provided.</p>			
416.0	<u>OFFICER'S SIDE REAR WHEEL WELL POSITION WR1</u>	YES	NO	EXCEPTIONS / NOTES
416.1	<p>There shall be a two (2) air cylinder compartment installed in the forward portion of the rear wheel well area, on the officer's side. The compartment shall be a vertical design. The compartment door and hinges shall be constructed out of stainless-steel material, and the frame shall be constructed out of aluminum. 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 rotational, molded component that is assembled to the door and frame. The door shall have a brushed stainless steel finish.</p>			

416.2	A sensor shall be installed indicating the door position as either “open” or “closed”. This will also be wired into the apparatus audible and visual warning system to alert the operator and occupants of an “open” compartment door prior to operating the apparatus on the roadway.			
417.0	<u>OFFICER'S SIDE REAR WHEEL WELL POSITION WR3</u>	YES	NO	EXCEPTIONS / NOTES
417.1	There shall be a two (2) air cylinder compartment installed in the rearward portion of the rear wheel well area, on the officer’s side. The compartment shall be a vertical design. The compartment door and hinges shall be constructed out of stainless-steel material, and the frame shall be constructed out of aluminum. 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 rotational, molded component that is assembled to the door and frame. The door shall have a brushed stainless steel finish. A sensor shall be installed indicating the door position as either “open” or “closed”. This will also be wired into the apparatus audible and visual warning system to alert the operator and occupants of an “open” compartment door prior to operating the apparatus on the roadway.			
418.0	<u>EQUIPMENT RACK ATTACHMENT GROUND LADDER</u>	YES	NO	EXCEPTIONS / NOTES
418.1	There shall be ground ladders stored on the officer’s side with brackets that provide a quick method of removing and reloading the ladders. A quick release shall allow personnel to loosen and unhook the retaining strap to remove the ladders, a ratchet-style mechanism shall securely and easily fasten the ladders back into place. The bracket shall allow a sectional ladder to still be clamped into position when the roof ladder has been removed.			
419.0	<u>LADDER STORAGE, OFFICER’S SIDE</u>	YES	NO	EXCEPTIONS / NOTES
419.1	Ladder (1), Duo–Safety, 28' Aluminum Two Section Extension, 1200–A One (1) DuoSafety, Model 875-DR, 16' aluminum roof ladders with folding roof hooks shall be provided. Hooks shall be on both ends			
420.0	<u>BODY MOUNTED BOX STORAGE COMPARTMENT, OFFICER’S SIDE</u>	YES	NO	EXCEPTIONS / NOTES
420.1	A compartment will be provided behind the ladder brackets storage on the right side. The compartment will be equipped with two (2) aluminum tubes for storage of two (2) pike poles and (1) aluminum trough for storage of (1) folding ladder.			

420.2	An aluminum door will be provided at the rear with a Southco M1 push to close flush mounted black polycarbonate latch. The compartment and door will be painted job color. A sensor shall be installed indicating the door position as either “open” or “closed”. This will also be wired into the apparatus audible and visual warning system to alert the operator and occupants of an “open” compartment door prior to operating the apparatus on the roadway.			
421.0	<u>LADDER BRACKET GUARDS, SS OVERLAY</u>	YES	NO	EXCEPTIONS / NOTES
421.1	There shall be stainless steel overlays installed on the ladder brackets to prevent chaffing of the ladder lanyards.			
422.0	<u>GROUND LADDER RUNG GUARDS</u>	YES	NO	EXCEPTIONS / NOTES
422.1	There shall be fifteen (15) sets of ladder rung guards provided for the ladders on this unit. The rung guards will protect the ladder rungs from the vibration of the ladder extension cables.			
423.0	<u>COMPARTMENT T1</u>	YES	NO	EXCEPTIONS / NOTES
423.1	A full-height compartment shall be located at the rear of the apparatus body. This compartment shall be designated as T1. Contents: · 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. · 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. · The compartment door handle shall be a non-locking stainless steel recessed "D" ring type handle. A single-point latch shall be on the compartment. Dimensions: “44” W X 27” H X 23” D			
424.0	<u>REAR COMPARTMENT DOOR</u>	YES	NO	EXCEPTIONS / NOTES
424.1	One (1) vertically hinged lap type compartment double door shall be installed on the T1 compartment face. The lap door shall be a double panel construction with the outer shell being aluminum treadplate. A sensor shall be installed indicating the door position as either “open” or “closed”. This will also be wired into the apparatus audible and visual warning system to alert the operator and occupants of an “open” compartment door prior to operating the apparatus on the roadway.			
425.0	<u>LICENSE PLATE BRACKET</u>	YES	NO	EXCEPTIONS / NOTES
425.1	A license plate bracket shall be mounted on the rear of the apparatus. A clear 12V DC LED light shall be incorporated into the bracket.			

426.0	<u>HINGED REAR DECK WITH GRIP STRUT INSERT</u>	YES	NO	EXCEPTIONS / NOTES
426.1	<p>A modular, bolt-on, hinged deck shall be installed on the rear of the apparatus to form a fullwidth step area. The rear deck shall be constructed of .125" antislip bright tread plate as well as supported by a structural steel assembly. A Grip Strut insert shall be fabricated into the step area of the rear deck that shall be open below. The outside edges of the rear deck shall have 60-degree angles beginning at the point where the body meets the tailboard at the forward outboard edge angling rearward to the rear edge of the tailboard. The depth of the rear deck will be 15".</p> <p>The tailboard shall be capable of folding upward in the event of a ground strike to minimize potential damage to the tailboard and apparatus.</p> <p>The exterior side will be flanged down and in for increased rigidity of tailboard structure.</p> <p>The tailboard shall be capable of supporting two (2) fully dressed firefighters at the same time.</p> <p>12V DC LED clearance lighting shall be placed in the rear facing edge and the sides of the tailboard.</p>			
427.0	<u>REAR UNDERBODY TOW EYES</u>	YES	NO	EXCEPTIONS / NOTES
427.1	Two (2) rear tow eyes shall be installed directly below the rear of the chassis frame rails, mounted to the subframe. The tow eyes shall be capable of at minimum a combined 15,000 lb. straight pull rating.			
428.0	<u>REAR WHEEL WELLS</u>	YES	NO	EXCEPTIONS / NOTES
428.1	The fenders shall be integral with the body sides and compartments with a seamless appearance. The fenders shall be fitted with bolts 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. A sufficient clearance shall be provided in the wheel well to allow the use of tire chains when the apparatus is fully loaded.			
429.0	<u>RUBBER FENDERETTES</u>	YES	NO	EXCEPTIONS / NOTES
429.1	Two (2) rubber fenderette shall be installed at the outboard edge of the rear wheel well area, one (1) 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.			
430.0	<u>EXHAUST HEAT DEFLECTOR SHIELD</u>	YES	NO	EXCEPTIONS / NOTES
430.1	A 5" 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.			
431.0	<u>FUEL TANK GAUGE ACCESS PANEL</u>	YES	NO	EXCEPTIONS / NOTES
431.1	A removable panel shall be provided in the rear compartment to allow for access to the fuel tank gauge without removing the fuel tank.			

432.0	<u>TRIMRITE STAINLESS STEEL FASTENERS</u>	YES	NO	EXCEPTIONS / NOTES
432.1	Trim Rite 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.			
433.0	<u>ADDITIONAL HARDWARE</u>	YES	NO	EXCEPTIONS / NOTES
433.1	A bag of stainless-steel nuts, bolts, and washers shall be supplied with the apparatus for mounting of equipment.			
434.0	<u>FRONT TREAD PLATE OVERLAYS</u>	YES	NO	EXCEPTIONS / NOTES
434.1	A tread plate overlay shall be located on the front vertical areas of each side of the apparatus body. The overlays shall be located on the front of the body compartments.			
435.0	<u>REAR TREAD PLATE OVERLAYS</u>	YES	NO	EXCEPTIONS / NOTES
435.1	A tread plate overlay shall be on the inboard center vertical area of the body, as well as the area behind the driver's side and officer's side rear body steps. Overlays shall be totally insulated from the apparatus with nylon shoulder washers that extend into the hole that is drilled into the body. Stainless steel cap nuts shall be employed where bolts may damage equipment or cause injury. After painting and final construction, overlays shall be additionally sealed at the edges with a caulking compound.			
436.0	<u>FRONT BODY STEPS AND LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
436.1	Four (4) Cast Products folding steps shall be located on the front of the driver's side body compartments. The steps shall be adequately lit with 12V DC LED lighting. One (1) light shall be located above the steps.			
437.0	<u>REAR TREAD PLATE OVERLAYS</u>	YES	NO	EXCEPTIONS / NOTES
437.1	A tread plate overlay shall be on the inboard center vertical area of the body, as well as the area behind the driver's side and officer's side rear body steps. Overlays shall be totally insulated from the apparatus with nylon shoulder washers that extend into the hole that is drilled into the body. Stainless steel cap nuts shall be employed where bolts may damage equipment or cause injury. After painting and final construction, overlays shall be additionally sealed at the edges with a caulking compound.			
438.0	<u>REAR STEPS</u>	YES	NO	EXCEPTIONS / NOTES
438.1	Bolt-on fold out steps shall be installed on the rear of the apparatus as required to provide sufficient and safe ascending and descending. Each step shall have large open slots to prevent the buildup of ice or mud and to provide a handhold when necessary. Steps shall be on the driver's side rear of the apparatus and shall be on the Officer's side rear of the apparatus.			

438.2	The steps shall be adequately lit with 12V DC LED lighting. One (1) light shall be located above each set of steps on the rear face of the body. Each light shall be located in a manner that shall light all the steps on their respective side.			
439.0	<u>REAR MIDSTEP</u>	YES	NO	EXCEPTIONS / NOTES
439.1	There shall be a wide folding style step installed above T1, and in between the two (2) inboard rear discharges. The step shall be 8" deep when in the folded-down position. The step shall lock into place in the upwards position for transit. The step will be fabricated from treadbrite aluminum.			
440.0	<u>WHEEL CHOCK STORAGE</u>	YES	NO	EXCEPTIONS / NOTES
440.1	The shall be stored in locations that are easily accessible under the front of the body on the driver's side of the apparatus.			
441.0	<u>WHEEL CHOCKS</u>	YES	NO	EXCEPTIONS / NOTES
441.1	One (1) pair of Zico, model SAC44, wheel chocks shall be provided with the apparatus. The wheel chocks shall be mounted in Zico model, SQCH44H, mounting brackets.			
442.0	<u>INDEPENDENT ALUMINUM SIDE MOUNT PUMP MODULE</u>	YES	NO	EXCEPTIONS / NOTES
442.1	The pump module shall be a side mount design fabricated from a 1/8" thick aluminum sheet. The module shall be fabricated as an individual unit independent from the body.			
443.0	<u>PUMP COMPARTMENT LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
443.1	Two (2) LED lights shall be installed in the pump compartment. The lights shall be waterproof and magnesium chloride resistant. The lights shall be enclosed in a tough 5/8" Lexan tube.			
444.0	<u>DRIVER'S SIDE RUNNING BOARD</u>	YES	NO	EXCEPTIONS / NOTES
444.1	<p>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. A floating storage well compartment shall be recessed in the running board. 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, nondefecting step area for personnel.</p> <p>Two (2) PAC, model K5006, straps shall be provided and installed over the top of the compartment.</p>			

445.0	<u>OFFICER'S SIDE RUNNING BOARD</u>	YES	NO	EXCEPTIONS / NOTES
445.1	<p>A modular bolt-on running board, constructed of an anti-slip tread plate, shall be installed on the officer's side of the pump module. A floating storage well compartment shall be recessed in the running board. 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, nondefecting step area for personnel.</p> <p>Two (2) PAC, model K5006, straps shall be provided and installed over the top of the compartment.</p> <p>The floor of the storage wells shall each be covered with DriDek flooring.</p>			
446.0	<u>TREAD PLATE DUNNAGE COMPARTMENT</u>	YES	NO	EXCEPTIONS / NOTES
446.1	<p>A dunnage compartment shall be located above the pump module. The dunnage compartment floor shall be constructed of a tread plate.</p> <p>A hinged cover for the dunnage compartment shall be provided. The cover shall be constructed from anti-slip tread plate material. The cover shall also include weatherproofing provisions for the cover to eliminate and minimize weather intrusion in the dunnage area.</p>			
447.0	<u>FRONT PUMP ACCESS PANEL</u>	YES	NO	EXCEPTIONS / NOTES
447.1	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.			
448.0	<u>REMOVABLE ACCESS PANEL</u>	YES	NO	EXCEPTIONS / NOTES
448.1	There shall be a removable stainless steel access plate located on the pump panel around the left steamer inlet to allow access for service of the inlet valve.			
449.0	<u>CONTROL PANEL</u>	YES	NO	EXCEPTIONS / NOTES
449.1	<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 denote the purpose of each control. The color-coded tags will correspond with discharges throughout the apparatus.</p>			

450.0	<u>INSTRUMENT PANEL</u>	YES	NO	EXCEPTIONS / NOTES
450.1	<p>The surface 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>			
451.0	<u>FUEL TANK GAUGE</u>	YES	NO	EXCEPTIONS / NOTES
451.1	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.			
452.0	<u>OFFICER'S SIDE PUMP PANEL</u>	YES	NO	EXCEPTIONS / NOTES
452.1	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.			
453.0	<u>PANEL SURFACES</u>	YES	NO	EXCEPTIONS / NOTES
453.1	The control panel, instrument panel, and officer's side pump panel shall be fabricated from a minimum of 16-gauge stainless steel with #4 brushed finish.			
454.0	<u>GARNISH RING BEZEL ASSEMBLIES</u>	YES	NO	EXCEPTIONS / NOTES
454.1	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. These UV-resistant polycarbonate graphic inserts shall be subsurface screen printed to eliminate the possibility of wear and protect the inks from fading. All insert labels shall meet UL969 and NFPA standards.			

455.0	<u>VERBIAGE TAG BEZEL ASSEMBLIES</u>	YES	NO	EXCEPTIONS / NOTES
455.1	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. This UV-resistant polycarbonate verbiage 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.			
456.0	<u>SAFETY MESSAGE BEZEL ASSEMBLIES</u>	YES	NO	EXCEPTIONS / NOTES
456.1	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.			
457.0	<u>MIDSHIP MOUNT FIRE PUMP</u>	YES	NO	EXCEPTIONS / NOTES
457.1	<p>The fire pump shall be a Waterous model CMU 2000 GPM two-stage split drive shaft driven fire pump. The pump shall be a two-stage centrifugal class "A" rated fire pump, designed specifically for the fire service.</p> <p>The pump shall be designed with a two-piece, horizontally split body with intake and discharge passageways in a single casting and on the same level.</p>			
457.2	<p>The casing shall be two-piece, horizontally-split, high-tensile, close grained gray iron. All passageways shall be carefully matched to assure the very best hydraulic flow characteristics. The wear rings shall be bronze, reverse-flow, labyrinth-type and replaceable.</p> <p>The pump shall be midship mounted and designed to operate through an integral transmission, including a means for power selectivity to the driving axle or the pump. The pump shall be driven by a driveline from the chassis transmission. The engine, transmission, and driveline components shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance.</p>			

458.0	<u>IMPELLER</u>	YES	NO	EXCEPTIONS / NOTES
458.1	The bronze impellers shall be balanced both mechanically and hydraulically for vibration-free operation. Flame plated impeller hubs shall be standard to assure longer life despite the presence of abrasives in the water supply.			
458.2	The impeller shaft shall be heat-treated stainless steel that is ground at all critical areas and polished under packing. The two-piece design shall allow for separation of the transmission from the pump without disassembling either component. Three deep-groove anti-friction ball bearings shall be located outside the pumping chamber to give support and proper alignment to the impeller shaft assembly. The bearings shall be oil or grease lubricated and shall be separate from the water being pumped. They shall be protected by seal housings, flinger rings and oil seals. Flinger rings shall be located on the impeller shaft between the seal housings and bearing housings. They shall provide added protection and keep water and foreign matter out of the bearings.			
459.0	<u>PUMP TRANSMISSION</u>	YES	NO	EXCEPTIONS / NOTES
459.1	The Waterous C20 pump transmission shall have a high-strength, aluminum, three-piece, horizontally split housing and a high-strength involute form chain drive. It shall have a constant-mesh, two-position sliding collar that engages all teeth simultaneously with an internal locking mechanism to provide a positive lock in PUMP or ROAD position.			
460.0	<u>MECHANICAL SEALS</u>	YES	NO	EXCEPTIONS / NOTES
460.1	Pump will be equipped with a self-adjusting, maintenance-free, mechanical shaft seal. The mechanical seal will consist of a flat, highly polished, spring fed carbon ring that rotates with the impeller shaft. The carbon ring will press against a highly polished stainless steel stationary ring that is sealed within the pump body.			
460.2	In addition, a throttling ring will be pressed into the steel chamber cover, providing a very small clearance around the rotating shaft in the event of a mechanical seal failure. The pump performance will not deteriorate, nor will the pump lose prime, while drafting if the seal fails during pump operation.			
461.0	<u>ALLOY ANODES</u>	YES	NO	EXCEPTIONS / NOTES
461.1	Four (4) OEM-supplied alloy anodes shall be provided with the fire pump. The anodes shall be installed as follows: <ul style="list-style-type: none"> Two (2) in the suction manifold of the fire pump Two (2) in the discharge manifold of the fire pump. 			
462.0	<u>PUMP RATING, 2000 GPM</u>	YES	NO	EXCEPTIONS / NOTES
462.1	The pump shall be rated at 2000 gallons per minute.			

463.0	<u>FIRE PUMP MOUNTING</u>	YES	NO	EXCEPTIONS / NOTES
463.1	<p>The fire pump shall be mounted within a separate body module that is not directly connected to the apparatus body.</p> <p>The pump shall be frame mounted; therefore minimizing the likelihood of the pump casing cracking should the apparatus be involved in a collision.</p> <p>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.</p>			
464.0	<u>TWO-STAGE MANUAL TRANSFER VALVE</u>	YES	NO	EXCEPTIONS / NOTES
464.1	The manual transfer valve shall be a second-stage rotary type, bronze valve, supported with bearings, which operates in a bronze renewable sleeve.			
465.0	<u>FRC PRESSURE GOVERNOR</u>	YES	NO	EXCEPTIONS / NOTES
465.1	<p>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.</p> <p>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.</p>			
465.2	<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 			

465.3	<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.</p> <p>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. 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.</p>			
465.4	<p>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>			
465.5	<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>			
466.0	<u>TRIDENT AUTO PRIMING PUMP</u>	YES	NO	EXCEPTIONS / NOTES
466.1	<p>The priming pump shall be a Trident Emergency Products Automatic three-barrel, compressed air powered, high efficiency, multi-stage, venturi-based Air Prime System. All wetted metallic parts of the priming system are to be of brass and stainless-steel construction. A 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.</p>			

467.0	<u>MASTER DRAIN VALVE</u>	YES	NO	EXCEPTIONS / NOTES
467.1	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".			
468.0	<u>OVERHEAT PROTECTION SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
468.1	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.			
469.0	<u>PAINT PUMP RED/PAINT INTAKES PRIMARY BODY COLOR</u>	YES	NO	EXCEPTIONS / NOTES
469.1	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.			
470.0	<u>HEAT EXCHANGER / HEATED PUMP CORE</u>	YES	NO	EXCEPTIONS / NOTES
470.1	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			
471.0	<u>PUMP AND ENGINE COOLING SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
471.1	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.			

471.2	<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, 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. The pump cooling lines shall be installed with one (1) line going from the discharge side of the water pump through an Innovative Controls, 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>			
472.0	<u>PUMP MANUALS</u>	YES	NO	EXCEPTIONS / NOTES
472.1	Two (2) manuals covering the fire pump transmission and selected options of the fire pump shall be provided with the apparatus.			
473.0	<u>AIR OUTLET ON PUMP PANEL</u>	YES	NO	EXCEPTIONS / NOTES
473.1	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. The air outlet shall include a 1/4 turn valve at the pump panel and 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/adaptor on the other end. The fittings on the air pressure line and the air outlet on the pump panel must be capable of mating together successfully.			
474.0	<u>AUTO LUBE FILL EXTENSION ON PUMP PANEL</u>	YES	NO	EXCEPTIONS / NOTES
474.1	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.			

475.0	<u>FOAM SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
475.1	A Williams Fire and Hazard Control, Inc., model #WATP-1500V-CFD, around the pump foam proportioning system shall be provided to proportion Class B foam concentrates into the suction side of 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.			
476.0	<u>CONTROL PANEL</u>	YES	NO	EXCEPTIONS / NOTES
476.1	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) 			
477.0	<u>FOAM CONCENTRATE EDUCTOR</u>	YES	NO	EXCEPTIONS / NOTES
477.1	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 moving 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.			
478.0	<u>AUX FOAM INLET AND FOAM PICKUP TUBE</u>	YES	NO	EXCEPTIONS / NOTES
478.1	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.			
479.0	<u>METERING VALVE</u>	YES	NO	EXCEPTIONS / NOTES
479.1	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.			
480.0	<u>FOAM SUCTION STRAINER</u>	YES	NO	EXCEPTIONS / NOTES
480.1	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.			
481.0	<u>FOAM SUCTION CHECK VALVE</u>	YES	NO	EXCEPTIONS / NOTES
481.1	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.			

482.0	<u>FOAM OFF TRUCK INLET CHECK VALVE</u>	YES	NO	EXCEPTIONS / NOTES
482.1	A 2" check valve shall be provided and installed for the off-truck foam pickup. The valve shall keep the foam in the foam tank from back feeding into the off-truck tote if personnel forget to close the tank valve when using the on-truck portion of the system.			
483.0	<u>B FOAM CONCENTRATE / FLUSHING INTAKE</u>	YES	NO	EXCEPTIONS / NOTES
483.1	A 2" gated foam concentrates 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 NH cap with 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.			
484.0	<u>MOTIVE WATER CONTROL VALVE</u>	YES	NO	EXCEPTIONS / NOTES
484.1	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.			
485.0	<u>MOTIVE WATER STRAINER</u>	YES	NO	EXCEPTIONS / NOTES
485.1	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			
486.0	<u>FLUSHING WATER VALVE</u>	YES	NO	EXCEPTIONS / NOTES
486.1	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.			
487.0	<u>FOAM SYSTEM PLUMBING</u>	YES	NO	EXCEPTIONS / NOTES
487.1	Piping and fittings outboard of the foam jet pump eductor shall be stainless steel, brass, and/or high-pressure hose fitting. Victaulic or equivalent 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.			

488.0	<u>NFPA #1901 DESIGN AND PERFORMANCE REQUIREMENTS</u>	YES	NO	EXCEPTIONS / NOTES
488.1	<p>The proportioning system shall be capable of proportioning foam concentrate following 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 currently applicable sections under 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 comply with NFPA 1901, current edition compliance as it relates to this specified foam system.</p>			
489.0	<u>FOAM SYSTEM CONTROLS</u>	YES	NO	EXCEPTIONS / NOTES
489.1	<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>			
490.0	<u>LABELS, NAMEPLATES, AND INSTRUCTIONS SPECIFICATION</u>	YES	NO	EXCEPTIONS / NOTES
490.1	<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 type of foam concentrate 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>			
491.0	<u>MANUALS</u>	YES	NO	EXCEPTIONS / NOTES
491.1	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.			
492.0	<u>YELLOW BACKGROUND PLATE</u>	YES	NO	EXCEPTIONS / NOTES
492.1	A yellow painted background plate shall be located on the pump panel directly behind the foam system controls.			

493.0	<u>FOAM PROPORTIONING SYSTEM TESTING</u>	YES	NO	EXCEPTIONS / NOTES
493.1	The foam proportioning system shall be tested and certified after final installation following NFPA 1901, current edition.			
494.0	<u>PLUMBING MANIFOLD</u>	YES	NO	EXCEPTIONS / NOTES
494.1	<p>The plumbing manifold shall consist of the Waterous Twenty First Century Manifold to allow for hydrodynamically controlled water delivery.</p> <p>The manifold shall be mounted perpendicular to the frame rails.</p> <p>All discharges shall be plumbed to the manifold using schedule 40 stainless steel tubing.</p> <p>Rear discharges shall be plumbed using schedule 40 stainless steel 3" tubing.</p> <p>Side discharges shall be plumbed using schedule 40 stainless steel 3" tubing terminated on the Officer's side pump panel.</p> <p>Front discharges shall be plumbed using schedule 40 stainless steel 2.5" tubing.</p> <p>There shall be (1) schedule 40 stainless steel 4" discharge pipe terminated on the Officer's side pump panel.</p> <p>A 3.00" deluge riser will be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping will be rigidly braced and installed securely so no movement develops when the line is charged. The riser will be gated and controlled at the pump operator's panel. The outlet will include an Akron valve with a handwheel control.</p>			
495.0	<u>TELESCOPIC PIPING</u>	YES	NO	EXCEPTIONS / NOTES
495.1	<p>The deluge riser piping will include a 12.00" Task Force Model XG12 Extend-A-Gun extension.</p> <p>This extension will be telescopic to allow the deluge gun to be raised 12.00" increasing the range of operation.</p> <p>A position sensor will be provided on the telescopic piping that will activate the "do not move vehicle" light inside the cab when the monitor is in the raised position.</p>			
496.0	<u>MONITOR</u>	YES	NO	EXCEPTIONS / NOTES
496.1	<p>An Akron Model 3426 monitor will be properly installed on the deluge riser.</p> <p>The monitor will be painted to match the body.</p>			
497.0	<u>NOZZLE, DELUGE</u>	YES	NO	EXCEPTIONS / NOTES
497.1	<p>An Akron Akromatic model 5160 1250 GPM Master Stream Nozzle with 2.50" swivel will be provided. The nozzle will have a range of 250 to 1250 GPM and have a built-in stream shaper.</p> <p>The deluge riser will have a 3.00" four (4)-bolt stainless steel flange for mounting the monitor.</p>			

497.2	<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 as per NFPA 1901.</p>			
498.0	<u>INNOVATIVE CONTROLS DISCHARGE GAUGES 2 1/2" 0-400 PSI</u>	YES	NO	EXCEPTIONS / NOTES
498.1	<p>The standard discharge gauges on the apparatus shall be 2 -1/2" diameter Innovative Controls pressure gauges. The gauges shall have a one-piece 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</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>Highly 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.</p>			
499.0	<u>INNOVATIVE CONTROLS DISCHARGE GAUGES 2 1/2" 0-600 PSI</u>	YES	NO	EXCEPTIONS / NOTES
499.1	<p>The rear high pressure discharge gauges on the apparatus shall be 4" diameter Innovative Controls pressure gauges. The gauges shall have a one-piece 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.</p>			

499.2	<p>The gauges shall exceed ASME B40.100 Grade B requirements with an accuracy of $\pm 1.5\%$ 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>Highly 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 600 PSI.</p>			
500.0	<u>MASTER PRESSURE CENTER ASSEMBLY</u>	YES	NO	EXCEPTIONS / NOTES
500.1	<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 Nylon 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.</p> <p>Each gauge shall exceed ASME B40.100 Grade B requirements with an accuracy of $\pm 1\%$ 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 highly polished stainless-steel bezel shall be provided to prevent corrosion and protect the lens and gauge case.</p>			
500.2	<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 600 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 600 PSI with burgundy graphics on a white background.</p>			

501.0	<u>HARDWARE BRAND</u>	YES	NO	EXCEPTIONS / NOTES
	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.			
501.1	The Storz discharge and intake fittings provided on this apparatus shall be Task Force Tips Brand. For corrosion resistance, the adapter shall be constructed of hard coat anodized aluminum alloy and include a polymer bearing ring. The auxiliary intake(s) shall terminate with NH swivels, and the discharges shall terminate with male NH threads.			
502.0	<u>PAINT 2-STAGE PUMP CONTROL ROD BLACK</u>	YES	NO	EXCEPTIONS / NOTES
502.1	The Waterous 2 stage pump control rod shall be painted black.			
503.0	<u>DISCHARGE, PRECONNECT, AND INTAKE DRAINS</u>	YES	NO	EXCEPTIONS / NOTES
503.1	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 to below the apparatus. A matching color-coded bezel shall be included.			
504.0	<u>AUTOMATIC DRAINS</u>	YES	NO	EXCEPTIONS / NOTES
504.1	A Class 1 automatic drain shall be installed on the deluge valve (if applicable). The drains shall also be in low laying areas (i.e., front discharge) The Drains will open whenever the pressure in the line drops below 6 PSI.			
505.0	<u>PLUMBING LABELS</u>	YES	NO	EXCEPTIONS / NOTES
505.1	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 following NFPA 1901, current edition compliance. The colors and verbiage of the labels shall be determined by the customer. Each discharge label shall have a unique color and shall have verbiage to identify it. The tank plumbing valves and controllers shall have the OEM Standard label package unless stated otherwise. The PumpToTank Fill shall be labeled "TANK FILL" and shall have a light blue label color. The TankToPump shall be labeled "TANK TO PUMP" and shall have a Navy-Blue label color.			

505.2	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.			
506.0	<u>2" TANK FILL</u>	YES	NO	EXCEPTIONS / NOTES
506.1	<p>A 2" tank fill shall be plumbed from the pump to the tank. Installation shall be completed with a 2" rubber hose and stainless-steel hose couplings.</p> <p>An Akron Brass, model 8820, 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 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>			
507.0	<u>PUMP TO TANK FILL HANDLE</u>	YES	NO	EXCEPTIONS / NOTES
507.1	2", Akron 8800 2" manual valve, push pull style handle			
508.0	<u>3" TANK- TO -PUMP</u>	YES	NO	EXCEPTIONS / NOTES
508.1	A 3" tank-to-pump shall be plumbed with a flexible hose from the tank to the suction side of the pump. An Akron Brass, model 8830, 3" 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 self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball.			
508.2	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 warranty by the valve manufacturer.			
508.3	<p>A check valve shall be between the pump suction and the booster tank valve. The check valve shall eliminate back flow into the water tank when the pump is connected to a pressurized source.</p> <p>The valve shall be actuated by a manual actuator. The manual actuator shall be controlled by an Innovative Controls push/pull T-handle.</p>			
509.0	<u>TANK TO PUMP HANDLE</u>	YES	NO	EXCEPTIONS / NOTES
509.1	3", Akron 8800 3" manual valve, push pull style handle			

510.0	<u>6" DRIVER SIDE MAIN INTAKE</u>	YES	NO	EXCEPTIONS / NOTES
510.1	<p>A 6" main intake shall be 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. The intake shall terminate male NH threads.</p> <p>An Akron Brass 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.</p> <p>There shall be one (1) Kocheck 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) Kocheck model CC507, 5" Storz blind cap with chain provided. The cap shall have a KCoat finish.</p>			
511.0	<u>BLEEDER VALVE</u>	YES	NO	EXCEPTIONS / NOTES
511.1	An inline bleeder/drain valve shall be provided on the steamer inlet. The valve shall be used to bleed off air or water per NFPA 1901, current edition.			
512.0	<u>INTAKE RELIEF VALVE</u>	YES	NO	EXCEPTIONS / NOTES
512.1	An Akron Brass intake relief valve shall be installed on the steamer valve. The valve shall be the preset type, adjustable from 75 to 300 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".			
513.0	<u>2 1/2" DRIVER'S SIDE AUXILIARY INTAKE</u>	YES	NO	EXCEPTIONS / NOTES
513.1	<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 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>			

513.2	<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 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>			
514.0	<u>6" OFFICER SIDE MAIN INTAKE</u>	YES	NO	EXCEPTIONS / NOTES
514.1	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.			
514.2	An Akron Brass 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.			
514.3	<p>There shall be one (1) Kocheck 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) Kocheck model CC507, 5" Storz blind cap with chain provided. The cap shall have a KCoat finish.</p>			
515.0	<u>BLEEDER VALVE</u>	YES	NO	EXCEPTIONS / NOTES
515.1	An inline bleeder/drain valve shall be provided on the steamer inlet. The valve shall be used to bleed off air or water per NFPA 1901, current edition.			
516.0	<u>INTAKE RELIEF VALVE</u>	YES	NO	EXCEPTIONS / NOTES
516.1	An Akron Brass intake relief valve shall be installed on the steamer valve. The valve shall be the preset type, adjustable from 75 to 300 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".			

517.0	<u>2 1/2" OFFICER'S SIDE AUXILIARY INTAKE</u>	YES	NO	EXCEPTIONS / NOTES
517.1	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.			
517.2	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. 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.			
517.3	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.			
518.0	<u>2 1/2" FRONT BUMPER DISCHARGES</u>	YES	NO	EXCEPTIONS / NOTES
518.1	There shall be (2) 2 1/2" discharges with 2 1/2" plumbing shall be located on the Captain's and Driver's side of the front bumper. The discharges shall terminate with a male 1 1/2" NH thread. Valve, 2 1/2", Akron, Gear, 8625, Stainless Ball, 5" Handwheel Controller			
518.2	An Akron Brass, model 8625, 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. 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. 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. 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.			

518.3	<p>The discharge shall have a 2 1/2" glass filled nylon 66 case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and pointer.</p> <p>Two (2) 2 1/2" female NH thread swivel rocker lug x 2 1/2" male NH thread 45-degree chrome plated elbow adapters shall be provided.</p> <p>Two (2) 2 1/2" NH thread rocker lug chrome plated vented caps, complete with cable or chain, shall be provided.</p> <p>Two (2) PL15551, ELBOW, 2 ½ NPTX 2 1/2NSTM 90d – Trident brand 01.086.5 One (1) AC10721, ADAPTER, 2 ½ NSTF X 1 1/2 NSTM – Trident brand 01.008.0</p> <p>The discharges shall have Class 1 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>			
519.0	<u>CROSS LAY HOSE BED, 3.00"</u>	YES	NO	EXCEPTIONS / NOTES
519.1	<p>-There will be a cross lay large enough to support 300' of 3.00" high pressure hose.</p> <p>-The customer would like this to be as large possible with openings on both ends.</p> <p>-Webbing on both ends with buckles to secure hose load from self-deployment.</p> <p>-Compartment ceiling will be a tread plate folding hinged panel.</p>			
520.0	<u>2 1/2" REAR FACING HOSEBED DISCHARGE</u>	YES	NO	EXCEPTIONS / NOTES
520.1	<p>A 2 1/2" discharge with 2 1/2" plumbing shall be located on the driver's side of the hose bed and shall terminate with a male NH thread. This discharge will be located high on front wall of the hose bed on the driver's side.</p> <p>An Akron Brass, model 8625, 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. 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>			

520.2	<p>The valve shall be actuated by a push-pull method of controlling the valve.</p> <p>The discharge shall have a 2 1/2" glass filled nylon 66 case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and pointer.</p>			
521.0	<u>2 1/2" OFFICER'S SIDE DISCHARGE</u>	YES	NO	EXCEPTIONS / NOTES
521.1	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.			
521.2	An Akron Brass, model 8625, 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. 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.			
521.3	The valve shall be actuated by a push-pull method of controlling the valve.			
521.4	<p>The discharge shall have a 2 1/2" glass filled nylon 66 case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and pointer.</p> <p>One (1) 2 1/2" female NH thread swivel rocker lug x 2 1/2" male NH thread 45-degree chrome plated elbow adapter shall be provided. One (1) 2 1/2" female NH thread swivel rocker lug x 2 1/2" male NH thread 45-degree chrome plated elbow adapter shall be provided.</p>			
521.5	<p>One (1) 2 1/2" female NH thread rocker lug x 1 1/2" male NH thread rigid chrome plated adapter shall be provided.</p> <p>One (1) 1 1/2" NH thread rocker lug chrome plated vented cap, complete with cable or chain, shall be provided.</p>			
522.0	<u>4" OFFICER'S SIDE DISCHARGE</u>	YES	NO	EXCEPTIONS / NOTES
522.1	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.			

522.2	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. 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.			
522.3	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 following NFPA 1901, the current edition. Opening and closing speed shall comply with the current NFPA standard.			
522.4	<p>The discharge shall have a 2 1/2" glass filled nylon 66 case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and 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>			
523.0	<u>2 1/2" REAR DISCHARGE (DRIVER SIDE)</u>	YES	NO	EXCEPTIONS / NOTES
523.1	<p>A 2 1/2" discharge, with 3" plumbing, shall be located on the driver's side rear of the apparatus.</p> <p>All components, including elbows, shall be rated for pressures up to 600 psi. The discharge shall terminate in the male NH thread.</p>			

523.2	<p>An Akron Brass, model 8630, 3" 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. 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.</p>			
523.3	<p>The discharge shall have a 2 1/2" glass filled nylon 66 case gauge with a bezel and a display range from 0 to 600 PSI. The gauge shall have a black dial graphic and 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" female NH thread rocker lug x 1 1/2" male NH thread rigid chrome plated adapter shall be provided.</p> <p>One (1) 1 1/2" NH thread rocker lug chrome plated vented cap, complete with cable or chain, shall be provided.</p> <p>There shall be a securely mounted metal loop installed at the discharge to provide an anchor point for hose securement during high pressure operations.</p>			
524.0	<u>2 1/2" REAR DISCHARGE (DRIVER SIDE)</u>	YES	NO	EXCEPTIONS / NOTES
524.1	<p>A 2 1/2" discharge, with 3" plumbing, shall be located on the driver's side rear of the apparatus.</p> <p>All components, including elbows, shall be rated for pressures up to 600 psi. The discharge shall terminate in the male NH thread.</p>			

524.2	<p>An Akron Brass, model 8630, 3" 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. 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>			
524.3	<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>			
524.4	<p>The discharge shall have a 2 1/2" glass filled nylon 66 case gauge with a bezel and a display range from 0 to 600 PSI. The gauge shall have a black dial graphic and 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> <p>There shall be a securely mounted metal loop installed at the discharge to provide an anchor point for hose securement during high pressure operations.</p>			
525.0	2 1/2" REAR DISCHARGE (OFFICER SIDE)	YES	NO	EXCEPTIONS / NOTES
525.1	<p>A 2 1/2" discharge, with 3" plumbing, shall be located on the officer's side rear of the apparatus.</p> <p>All components, including elbows, shall be rated for pressures up to 600 psi. The discharge shall terminate in the male NH thread.</p>			

525.2	<p>An Akron Brass, model 8630, 3" 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. 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.</p> <p>The discharge shall have a 2 1/2" glass filled nylon 66 case gauge with a bezel and a display range from 0 to 600 PSI. The gauge shall have a black dial graphic and pointer.</p>			
525.3	<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" female NH thread rocker lug x 1 1/2" male NH thread rigid chrome plated adapter shall be provided.</p> <p>One (1) 1 1/2" NH thread rocker lug chrome plated vented cap, complete with cable or chain, shall be provided.</p> <p>There shall be a securely mounted metal loop installed at the discharge to provide an anchor point for hose securement during high pressure operations.</p>			
526.0	<u>2 1/2" REAR DISCHARGE (OFFICER SIDE)</u>	YES	NO	EXCEPTIONS / NOTES
526.1	<p>A 2 1/2" discharge, with 3" plumbing, shall be located on the officer's side rear of the apparatus.</p> <p>All components, including elbows, shall be rated for pressures up to 600 psi. The discharge shall terminate in the male NH thread.</p>			

526.2	<p>An Akron Brass, model 8630, 3" 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. 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.</p> <p>The discharge shall have a 2 1/2" glass filled nylon 66 case gauge with a bezel and a display range from 0 to 600 PSI. The gauge shall have a black dial graphic and pointer.</p>			
526.3	<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> <p>There shall be a securely mounted metal loop installed at the discharge to provide an anchor point for hose securement during high pressure operations.</p>			
527.0	<u>BOOSTER REEL</u>	YES	NO	EXCEPTIONS / NOTES
527.1	<p>A Hannay steel fabricated electric rewind booster reel, with a capacity of 200' of 1" booster hose, shall be installed on the apparatus. The booster reel shall be painted Hannay Red. An automatic brake and an auxiliary manual rewind crank shall be supplied. One (1) set of rollers shall be installed.</p>			

527.2	<p>The booster reel shall be mounted above the pump in the dunnage compartment.</p> <p>An Akron Brass, model 8620, 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. 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 a push-pull method of controlling the valve.</p> <p>The discharge shall have a 2 1/2" glass filled nylon 66 case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and pointer.</p>			
528.0	<u>BOOSTER HOSE</u>	YES	NO	EXCEPTIONS / NOTES
528.1	<p>Two (2) sections of 100' x 1" of 800 lb. test booster hose coupled with 1" NH thread pyrolite couplings shall be installed on the booster reel.</p> <p>Two (2) rubber-covered push button switches shall be installed for the rewind control of the booster reel. A switch shall be located on both the driver's side and the officer's side pump panels.</p>			
529.0	<u>NOZZLE HOLDER</u>	YES	NO	EXCEPTIONS / NOTES
529.1	A PacTrac nozzle holder, model 10022, shall be provided for the booster nozzle.			
530.0	<u>4" DELUGE RISER DISCHARGE</u>	YES	NO	EXCEPTIONS / NOTES
530.1	<p>A 4" discharge for the deluge shall be located above the pump module. The discharge shall be on the center of the pump module and the riser shall terminate 4" NPT.</p> <p>An Akron Brass, model 8840, 4" 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. 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>			

530.2	<p>Opening and closing speed shall comply with the current NFPA standard to minimize the effects of water hammer.</p> <p>The discharge shall have a 2- 1/2" glass filled nylon 66 case gauge with a bezel and a display range from 0 to 400 PSI. The gauge shall have a black dial graphic and pointer.</p>			
531.0	ELECTRICAL SYSTEM	YES	NO	EXCEPTIONS / NOTES
531.1	<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. 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>			
531.2	<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>			
531.3	<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. 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>			

531.4	<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. 			
532.0	<u>ELECTRICAL MANAGEMENT SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
532.1	<p>The apparatus shall be equipped with a multiplex system.</p> <p>The outputs shall perform all the following items without added modules to perform any of the tasks:</p>			
532.2	<ul style="list-style-type: none"> • Load Shedding: The System shall have the capability to Load Shed with 8 levels of any output. This means you can specify which outputs (barring NFPA restrictions) you would like Load Shed. Level 1: 12.9v, Level 2: 12.5V, Level 3: 12.1V, Level 4: 11.7V, Level 5: 11.3V, Level 6: 10.9V, Level 7: 10.5, Level 8: 10.1. Unlike conventional load shedding devices, you can assign a level to any or all outputs. No add-on modules shall be acceptable; the module with the outputs must perform this function. • Load Sequencing: The System shall be able to sequence from 0 to 8 levels any output. With 0 being no delay and 1 being a 1second delay, 2 being a 2second delay, and so on. Sequencing reduces the number of voltage spikes and drops on your vehicle and can help limit damage to your charging system. No add-on modules shall be acceptable; the module with the outputs must perform this function. • Output Device: The System shall have solid-state output devices. Each solid-state output shall be a MOSFET (Metal Oxide Semiconductor Field Effect Transistors); MOSFETs are solid-state devices with no moving parts to wear out. A typical relay, when loaded to spec, has a life of 100,000 cycles. The life of a FET is more than 100 times that of a relay. No add-on modules shall be acceptable; the module with the outputs must perform this function. 			
532.3	<ul style="list-style-type: none"> • Flashing Outputs: The System shall be able to flash any output in either A or B phase and logic is used to shut down needed outputs in park or any one of several combined interlocks. The flash rate can be selected at either 80, or 160 FPM. This means any light can be specified with a multiplex truck with no need to add flashers. Flashing outputs can also be used to warn of problems. No add-on modules shall be acceptable; the module with the outputs must perform this function. 			

532.4	<ul style="list-style-type: none"> • PWM: The modules shall have the ability to PWM at some outputs so that a Headlight PWM module is not needed. No add-on modules shall be acceptable; the module with the outputs must perform this function. • Diagnostics: An output shall be able to detect either a short or open circuit. 			
532.5	<p>The inputs shall have the ability to be switched by a ground or battery signal.</p> <p>The inputs shall be filtered for noise suppression via hardware and software so that RF or dirty power will not trick an input into changing its status.</p> <p>The multiplex system shall contain a Peer-to-Peer network.</p>			
533.0	<u>12VOLT SYSTEMS TEST</u>	YES	NO	EXCEPTIONS / NOTES
533.1	<p>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:</p> <ul style="list-style-type: none"> • Reserve capacity test • Alternator performance test at idle • Alternator performance test at full load • Low voltage alarm test <p>Certification of the results shall be supplied with the apparatus at the time of delivery.</p>			
534.0	<u>TAILLIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
534.1	<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>			
535.0	<u>REAR WORK LIGHT SWITCH</u>	YES	NO	EXCEPTIONS / NOTES
535.1	<p>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.</p>			
536.0	<u>MIDSHIP TURN SIGNALS</u>	YES	NO	EXCEPTIONS / NOTES
536.1	<p>Two (2) TruckLite model 21 LED midship auxiliary/turn signal lights shall be installed in the rear wheel well area, one (1) on each side of the body.</p>			

537.0	<u>PERIMETER GROUND LIGHTING</u>	YES	NO	EXCEPTIONS / NOTES
537.1	A Firetech, Model FT-AQX-2D 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. The lights shall be activated when the parking brake is engaged.			
538.0	<u>CLEARANCE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
538.1	Grote red LED clearance lights shall be installed in the outside corners and rear middle portion of the rear tailboard. Clearance reflectors shall be placed on the apparatus to be in full compliance with applicable ICC and DOT codes and regulations. 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.			
539.0	<u>BACKUP CAMERA SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
539.1	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.			
540.0	<u>ANTENNA BARS</u>	YES	NO	EXCEPTIONS / NOTES
540.1	There shall be two (2) antenna bars located rearward of the lightbar. They shall be installed one (1) on each side of the chassis roof and parallel to the sides of the cab. They shall be for (2) department-installed antennas each, and they shall be installed 18" apart. Weather-resistant access panels shall be installed on the top of the bars and spaced evenly for antenna installations. The bars shall be painted white to match the roof. There shall be a conduit with fish wires that shall run to the electrical box rearward of the engine tunnel.			
541.0	<u>FIRECOM DIGITAL WIRELESS INTERCOM SYSTEM</u>	YES	NO	EXCEPTIONS / NOTES
541.1	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.			
541.2	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.			

542.0	<u>CAB POSITIONS</u>	YES	NO	EXCEPTIONS / NOTES
542.1	<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.</p> <p>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, an 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>All the headsets shall be ordered with black silicone Ruggedizers.</p> <p>There will be a headset hanger (108067800) 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>			
543.0	<u>RADIO INTERFACE</u>	YES	NO	EXCEPTIONS / NOTES
543.1	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. 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.			
544.0	<u>UPPER ZONE A</u>	YES	NO	EXCEPTIONS / NOTES
544.1	The upper zone A warning lights shall be supplied and installed by the chassis manufacturer.			
545.0	<u>UPPER ZONE C</u>	YES	NO	EXCEPTIONS / NOTES
545.1	There shall be four (4) Whelen 600 Series ROTABEAM Super LED lights with chrome plated flange installed in Upper Zone C, on the upper rear of the apparatus.			
545.2	<p>Two (2) Whelen, model 6RBR Super LED lights with flanges installed. The lights shall have red LEDs and red lenses.</p> <p>Two (2) Whelen, model 6RBA Super LED lights with flanges installed. The lights shall have amber LEDs and amber lenses.</p>			

546.0	<u>UPPER ZONE C LIGHT/ LENS COLOR</u>	YES	NO	EXCEPTIONS / NOTES
546.1	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.			
547.0	<u>UPPER ZONE B/D SIDE WARNING LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
547.1	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.			
548.0	<u>LOWER ZONE WARNING LIGHT PACKAGE</u>	YES	NO	EXCEPTIONS / NOTES
548.1	Lower Zone Light/ Lens Color Two (2) Whelen 600 Series Super LED lights with chrome plated flanges shall be installed in the wheel wells, one (1) on each side, for the lower zones B and D of the apparatus to follow NFPA 1901, current edition compliance. 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.			
548.2	Two (2) Whelen 600 Series ROTABEAM Super LED lights with chrome plated flanges shall be installed in the rear taillight housings in the lower zone C of the apparatus to comply with NFPA 1901, current edition compliance. 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. Light/Lens Color Flash patterns will be as follows: Front of Cab: Red – Rotator 150 Counterclockwise White – Rotator 150 Clockwise Front Bumper: Red – Rotator 150 Clockwise Amber – Rotator 150 Counterclockwise			
549.0	<u>AIR HORN LOCATIONS</u>	YES	NO	EXCEPTIONS / NOTES
549.1	Two (2) air horns shall be recess center mounted on the front bumper.			
550.0	<u>INSTALL CHASSIS SUPPLIED Q2B</u>	YES	NO	EXCEPTIONS / NOTES
550.1	A chassis supplied Q2B siren shall be recess mounted on the center of the front bumper. The bumper shall be notched to accommodate the siren.			

551.0	<u>12V POWER LEAD DROP</u>	YES	NO	EXCEPTIONS / NOTES
551.1	<p>One (1) 12-volt power lead drop with a 6-position 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.</p> <p>This power lead shall be in the following compartments:</p> <ul style="list-style-type: none"> · Compartment L1 · Compartment L2 · Compartment L3 · Compartment R2 			
552.0	<u>12V SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
552.1	There shall be two (2) FTGESM FireTech Guardian Elite LED Surface Mounted Scene lights. The Guardian is a 7×9 900 series-sized fixture that produces 20,000 lumens. The lights shall have a lifetime warranty.			
552.2	The two (2) lights shall be installed forward on the side face of the apparatus body, one (1) on each side.			
552.3	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."			
553.0	<u>12V SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
553.1	<p>There shall be two (2) FTGESM FireTech Guardian Elite LED Surface Mounted Scene lights. The Guardian is a 7×9 900 series-sized fixture that produces 20,000 lumens. The lights shall have a lifetime warranty.</p> <p>The two (2) lights shall be installed on the rear side face of the body, one (1) on each 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>			

554.0	<u>12V SCENE LIGHTS</u>	YES	NO	EXCEPTIONS / NOTES
554.1	<p>There shall be two (2) FTGESM FireTech Guardian Elite LED Surface Mounted Scene lights. The Guardian is a 7×9 900 series-sized fixture that produces 20,000 lumens. The lights shall have a lifetime warranty.</p> <p>The two (2) lights shall be installed on the rear face of the body, one (1) on each side.</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>			
555.0	<u>VERIFIED IDLING REDUCTION TECHNOLOGIES</u>	YES	NO	EXCEPTIONS / NOTES
555.1	A Harrison Hydra-Gen system shall be installed in the apparatus and be wired in a manner to support the emergency lighting while on scene and during main engine shut down times. This will reduce the idling of the main engine when not required. The system shall be installed in a manner that will not interfere with pump operations or times when the main engine shall be required to be operating. The APU shall be capable of maintaining the operation of the 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 Hydra-Gen system shall be provided. The APU shall be adequately enclosed and protected from the elements per Harrison Hydra-Gen specifications.			
555.2	<p>Sufficient audible and visual warning shall be provided to allow ample time to intervene in the event the battery state of charge begins to get low.</p> <p>Systems that require the APU to run continuously in conjunction with the main chassis engine are not desired and shall be immediately rejected.</p>			
556.0	<u>CHASSIS PAINT</u>	YES	NO	EXCEPTIONS / NOTES
556.1	The two-tone chassis cab shall be painted by the chassis manufacturer.			

557.0	<u>BODY PAINT PREPARATION</u>	YES	NO	EXCEPTIONS / NOTES
557.1	<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 before chrome plating. 			
558.0	<u>PAINT PROCESS</u>	YES	NO	EXCEPTIONS / NOTES
558.1	<p>The painting 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 painting process, the body shall be coated with primer to achieve a total thickness of 24 mills. In the second stage of the painting 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 painting process, the body shall be painted with a clear topcoat. A minimum of three coats shall be applied to achieve a total dry film thickness of 23 mills.</p> <p>The painted components shall be baked at 185 degrees for 3 hours to achieve a complete coating cure on the finished product.</p>			
559.0	<u>HAND POLISHED</u>	YES	NO	EXCEPTIONS / NOTES
559.1	<p>After the 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 a 3M super-duty compound to add extra shine to the coated surface. No more than .5 mil of clear shall be removed in this process.</p>			
560.0	<u>BODY PAINT COLOR</u>	YES	NO	EXCEPTIONS / NOTES
560.1	<p>The body shall be painted with AkzoNobel High Solids Polyurethane Base Coat. The single-tone body shall be painted AkzoNobel #31841 red.</p>			
561.0	<u>UNDERCOATING</u>	YES	NO	EXCEPTIONS / NOTES
561.1	<p>The apparatus shall undergo a twostep undercoating process.</p>			
562.0	<u>GOLD LEAF LETTERING 6"</u>	YES	NO	EXCEPTIONS / NOTES
562.1	<p>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.</p>			

563.0	<u>REFLECTIVE LETTERING 4"</u>	YES	NO	EXCEPTIONS / NOTES
563.1	Up to ten (10), reflective letters shall be provided and installed on the apparatus. The letters shall be approximately 4" tall with a black outline and shadow.			
564.0	<u>REFLECTIVE LETTERING 6"</u>	YES	NO	EXCEPTIONS / NOTES
564.1	Up to five (5) reflective letters shall be provided and installed on the apparatus. The letters shall be approximately 6" tall with a black outline and shadow.			
565.0	<u>REFLECTIVE LETTERING 8"</u>	YES	NO	EXCEPTIONS / NOTES
565.1	Up to five (5) reflective letters shall be provided and installed on the apparatus. The letters shall be approximately 8" tall with a black outline and shadow.			
566.0	<u>REFLECTIVE LETTERING 12"</u>	YES	NO	EXCEPTIONS / NOTES
566.1	Up to five (5) reflective letters shall be provided and installed on the apparatus. The letters shall be approximately 12" tall with a black outline and shadow.			
567.0	<u>REFLECTIVE LETTERING 40"</u>	YES	NO	EXCEPTIONS / NOTES
567.1	Up to four (4) reflective letters shall be provided and installed on the apparatus. The letters shall be approximately 40" tall with a black outline and shadow.			
568.0	<u>REFLECTIVE STRIPING FRONT CAB</u>	YES	NO	EXCEPTIONS / NOTES
568.1	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.			
569.0	<u>PAINT BREAK LINE</u>	YES	NO	EXCEPTIONS / NOTES
569.1	22KT engine turned gold leaf striping shall be installed at the two-tone paint break on the apparatus.			
570.0	<u>REFLECTIVE STRIPING</u>	YES	NO	EXCEPTIONS / NOTES
570.1	Striping shall be applied to the exterior of the apparatus and shall conform to the reflectivity requirements following NFPA 1901, current edition. The striping shall consist of: <ul style="list-style-type: none"> • 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. • The main stripe shall be white. 			
571.0	<u>CHEVRON COLOR RED/FLUORESCENT YELLOWGREEN</u>	YES	NO	EXCEPTIONS / NOTES
571.1	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 following NFPA 1901, current edition.			

571.2	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 to produce durable traffic control signs and delineators that are exposed vertically in service.			
572.0	<u>CHEVRON STRIPING REAR BODY</u>	YES	NO	EXCEPTIONS / NOTES
572.1	<p>Retroreflective striping shall cover at least 50% of the rear-facing vertical surfaces following 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 T1 Compartment and any storage compartment doors shall be excluded from the chevron pattern.</p>			
573.0	<u>REFLECTIVE LETTERING 40"</u>	YES	NO	EXCEPTIONS / NOTES
573.1	Up to four (4) reflective letters shall be provided and installed on the apparatus. The letters shall be approximately 40" tall with a black outline and shadow.			
574.0	<u>WARRANTIES</u>	YES	NO	EXCEPTIONS / NOTES
574.1	<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 			