REQUEST FOR PROPOSAL

CITY OF Quesnel

RFP NUMBER: 23-1

Supply of One (1) New Fire Engine

Closing Date: 4:00 pm – Thursday, October 26, 2023

Street and Mailing Address of Closing Location:

City of Quesnel
410 Kinchant Street
Quesnel, B.C.
V2J 7J5

RFP can be submitted electronically by either email to *rrichert@quesnel.ca* or by sealed envelope to City of Quesnel municipal office, located at 410 Kinchant Street, Quesnel, BC V2J 7J5 titled RFP Submission – New Fire Engine.

CONTACT PERSON:
Ron Richert - Fire Chief
250-983-8570
rrichert@quesnel.ca

Part I: General Instruction & Requirements of Bidding Process

A. Introduction and Bid Call Instructions

S**igned, executed, and dated RFP** will be received at the City of Quesnel municipal office, located at 410 Kinchant Street, Quesnel, BC V2J 7J5, before 4:00 P.M. local time on October 26, 2023. RFP will be opened to the public at that time. Bidders shall be solely responsible for the delivery of their bids to the office and time to be considered. The City will **not** accept any responsibility for bid documents delivered to other City facilities and, at the discretion of the Fire Chief, may be rejected.

RFP can be submitted electronically by either email to *rrichert@quesnel.ca* or by sealed envelope to City of Quesnel municipal office, located at 410 Kinchant Street, Quesnel, BC V2J 7J5.

1. Revisions To RFP- Amendments to the submitted tender will be permitted, if received in writing, or by email, prior to bid closing and if endorsed by the same party or parties who signed and sealed the offer. Amendments will be accepted provided that the amendment only is shown and not the total tendered price. Any Revision must be in writing, properly executed, and received by the City at the closing location before the closing time.

2. Taxes: Bidders shall identify all taxes and levies payable in the attached Part III.

3. Currency: All prices shall be submitted in Canadian funds only. No authorization to pay in any foreign currency will be permitted.

4. Form of RFP: Attached Part III, Form of RFP, must be completed properly in order to be considered.

5. Bid Ineligibility:

5.1 Bids that are unsigned, improperly signed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind may, at the discretion of the City, be rejected.

5.2 Bid Forms and enclosures, which are improperly prepared, may at the discretion of the City, be rejected.

5.3 Tenders submitted after the above closing date and time shall be returned to the bidder unopened.

6. Bid Signing - Signing of the Agreement:

By submitting an RFP, the Bidder agrees that, if the RFP is selected by the City, the Bidder will execute the Agreement within fourteen (14) days of the date on which the City requests it to do so in writing.

6.1.1 The Bid Form **shall be signed to be considered.** Any RFP received by the City that is unsigned will be rejected.

6.1.2 Sole Proprietorship: Signature of Sole Proprietor in the presence of a witness who will also sign. Bidders are asked to insert the words “Sole Proprietor” under the signature.

6.1.3 Partnership: Signature of all partners in the presence of a witness who will also sign. Bidders are asked to insert the word “Partner” under each signature.

6.1.4 Limited Company: Signature of a duly authorized Signing Officer(s) in their normal signatures. Bidders are asked to insert the capacity in which the Signing Officer acts, under each signature.

6.1.5 Joint Venture: Each party of the Joint Venture shall execute the bid under their respective seals in a manner appropriate to such party as described above, similar to the requirements of a Partnership.

B. Contract/Bid Documents

1. Availability

Bid documents are made available only for the purpose of obtaining offers for this project. Their use does not confer a license or grant for other purposes.

2. Examination

Upon finding discrepancies or omissions in the Bid Documents, immediately notify the Director of Emergency Services.

3. Inquiries:

3.1 Bidders are advised that if clarification on tender contract issues and/or specifications is required for this tender, bidders are asked to communicate their request(s) by sending an email to the individual shown below. This approach will assist City staff to be aware of bidder's requests, and to facilitate timely responses.

3.2 Questions relating to tender submissions, contractual requirements or technical information must be directed to:

Ron Richert, Fire Chief, Phone: (250) 983-8570, or email: rrichert@quesnel.ca
Information obtained from sources other than the above is not official and may be inaccurate.

4. Addenda

4.1 Addenda may be issued during the bidding period. All addenda become part of the Contract Documents.

4.2 The City of Quesnel reserves the right to modify the terms of this RFP at any time at its sole discretion. Such modifications will be communicated to all bidders through formal addendums.

4.3 Bidders should be advised that the City of Quesnel currently posts all competitive bids and any resulting addendums on the City's website www.quesnel.ca . Where in its sole discretion it considers it to be necessary, the City of Quesnel will issue Addenda to amend any portion of this RFP by posting them on the website. Such an Addenda will become a part of the RFP document and will supersede prior information.

4.4 For those bidders who download any competitive bid directly from the website and who have not contacted the City of Quesnel, it is their sole responsibility to access

the website to determine if any addendums have been posted, and to download them. The City of Quesnel does not maintain a bidders' registry for documents downloaded from the website, and as a result, we're unable to provide addendums in this situation.

4.5 For those bidders who obtained the competitive bid documents from the City of Quesnel Fire Department, and not through the website, the City will formally provide the bidders with the addendum through email or fax transmission.

4.6 If a bidder finds, during examination of the Contract Documents, any errors, discrepancies, omissions, ambiguities, or conflicts in or among RFP Documents, or is in doubt as to their meaning, the bidder shall bring them to the attention of the Contact Person for the City of Quesnel, not later than three (3) days before the tender closing date. Such questions should be forwarded to the Contact Person for the City of Quesnel in writing by hand delivery, courier, mail, facsimile, or electronic mail. At the discretion of the City, the City may determine to respond by clarifying existing RFP documents directly to the inquirer only, by issuing an Addendum to advise all Bidders of additional information, conditions, or essential clarifications, or may elect to decline to respond.

C. Evaluation Criteria

The following criteria identify the key components on which proposals to this RFP will be evaluated. The relative weighting for each criterion is also given.

Criteria	Weight
Custom Cab and Chassis Specification	25
Design and craftsmanship	25
Quality of parts and components	15
Warranties, service	10
Price and Delivery	25

D. Offer Acceptance/Rejection

After acceptance by the City, the Fire Chief will issue the successful bidder a written award notice by email and phone call. The City of Quesnel shall not be obligated in any manner to any bidder whatsoever until a written agreement has been duly executed relating to an approved tender.

E. Dispute Policy

The City of Quesnel will afford bidders an opportunity to meet with the Fire Chief to be debriefed on their RFP submission. In addition, bidders who feel the tendering process was administered inequitably or flawed in some way will be given an opportunity to appeal.

F. Indemnity

Notwithstanding the providing of insurance coverage by the Bidder, the Bidder hereby agrees to indemnify and save harmless the City, its officers, agents, servants and employees and each of them from and against claims, demands, losses, costs, damages,

actions, suits or proceedings by whomever made, brought or prosecuted and in any manner based upon, arising out, related to, occasioned by or attributable to the negligent activities of the Bidder, its servants, agents, and sub-Contractors, in providing the services and performing the work of this Contract, excepting always liability arising solely out of the negligent act or omission of the City.

G. Patent Infringement

Bidders may be required to demonstrate to the City that the material(s) or processes included in their bid do not infringe any Patent, and that if, for any reason, a claim is subsequently made by anyone suggesting that a Patent has been infringed and that the City may be liable, such bidder will indemnify the City in every respect regarding the claim.

H. Environmental Purchasing Statement

The City, whenever possible and economical, will accept alternate bids that contain maximum levels of Post-Consumer waste. The City encourages and promotes bidders to submit bids on Goods and/or Services that may contain elements that may reduce damage to the Environment.

I. Disqualification

If an RFP contains a defect or fails in some way to comply with the specific requirements of the Conditions of Tender, which in the sole discretion of the City is not material, the City may waive the defect and accept the RFP.

The determination of whether to remove any RFP submission from the evaluation process will be made at the absolute discretion of the City. The provisions of the condition regarding Limitation of Damages will also apply to any decision under this section.

J. Withdrawal Of RFP

All RFP are irrevocable at the Closing Time, remain irrevocable for a period of sixty (30) days following the Closing Time, and may not be altered or withdrawn during that period for any cause without the written permission of the City.

If the Bidder does not execute the Agreement within fourteen (14) days of the date on which the City requests it to do so in writing, the City will make demand on the Bid Bond, (If Applicable).

K. Right Not to Award

The lowest or any RFP will not necessarily be accepted. The City reserves the right to reject any or all RFP.

If the City elects to reject all RFP, the City will not be liable to any Bidder for any claims, whether for costs, damages incurred by any Bidder in preparing the RFP, loss of anticipated profit in connection with the Contract, or any other matter whatsoever.

L. Limitation Of Damages

The Bidder, by submitting a RFP, agrees that it will not claim damages more than the reasonable costs incurred by the Bidder in preparing its RFP for matters relating to the Award or in respect of the RFP process, and the Bidder, by submitting a RFP, waives any claim for loss of profits if no Award is made to the Bidder.

M. Delivery

The successful bidder agrees to fully comply with all delivery dates given.

N. Options

Nothing herein prevents a bidder from offering options to reduce cost and/or increase functionality, however, to ensure consistency amongst bids, this RFP document shall remain unchanged, and the bidder shall bid on this RFP in its original form.
Bidders may include options as a separate submission for consideration, within the same bid package. All manufactures' options and suggestions will be considered and included in the evaluation criteria. If a specific item, component, make, model or material cannot be supplied by the bidder, then all options and suggestions will be considered during the evaluation process.

COMPLIANCE
The completed apparatus shall comply with the latest N.F.P.A. 1901 and U.L.C. Standards.

MODEL
The cab and chassis shall be a custom 20 inch raised roof plus or minus 2 inches depending on manufacture raised roof design and include design considerations for one hundred (100) percent on-road applications, a high horsepower engine, including high speed operations and a consideration for above normal starts and stops. This chassis shall be designed and manufactured for heavy duty service with adequate strength and capacity of all components for the intended load to be sustained. The chassis shall be designed for a duty rating of one hundred (100) percent loaded full time.

COUNTRY OF SERVICE
The chassis shall be put in service in the country of Canada and shall meet all Provincial and Federal laws and regulations.

APPARATUS TYPE
The apparatus shall be classified as a Pumper type apparatus and shall be equipped with a permanently mounted fire pump which has a minimum rated capacity of 1750 imperial gallons per minute (8000 L/min). The apparatus shall include a water tank and hose body whose primary purpose is to combat structural and associated fires.

TRUCK TYPE
The chassis shall be manufactured as a truck style and designed to include permanently mounted compartments behind the cab, known as the body. The body of the truck shall be supplied and installed by the apparatus manufacturer.

AXLE CONFIGURATION
The chassis shall offer a single rear drive axle with a single front steer axle configuration (4 X 2).

GAWR FRONT
The gross apparatus weight rating and the gross capacity weight rating shall be adequate to carry the weight of equipment and the apparatus, with water tanks full and other tanks at full capacity, miscellaneous equipment and all personnel weights considered as recommended by the most current edition of NFPA 1901.

The chassis front gross axle weight rating (GAWR) shall be 20,000 pounds.

GAWR REAR
The chassis rear gross axle weight rating (GAWR) shall be 30,000 pounds.

PUMP PROVISION
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 mid-ship location.

WATER TANK CAPACITY
The chassis shall include a carrying capacity of over 1250 imperial gallons (5625 litres). The water tank shall be supplied and installed by the apparatus manufacturer.

CAB STYLE
The cab shall be a custom, enclosed model, built specifically for the fire service by a company specializing in cab and chassis design for all fire service applications.

The cab shall include a driver and officer seating with four seating positions in rear of cab (2 forward facing and 2 rear facing). The cab should have 4 doors total.

The cab shall incorporate a (2) step configuration from the ground to the cab floor for each door opening.

CAB ENGINE TUNNEL
The cab interior shall include a fixed type engine tunnel cover sized to accommodate an the Cummins X15 605hp engine.

The engine tunnel shall be insulated with multi-layer insulating material, consisting of foam, a sound barrier of 1.00 pounds per square foot with a facing which resists heat transfer. This insulation shall be held in place by adhesive, aluminum stick pins and retention caps. Any exposed insulation seams and edges shall be sealed reducing moisture and debris.

CAB ENTRY DOORS
The cab shall include a driver and officer area with two cab door openings which offer a clear door opening of 40.75 inches wide.

The cab shall include four (4) entry doors as high as possible for ease of entry and egress when outfitted with an SCBA.

All cab and crew doors shall be of substantial weight for the optimum strength and rigidity for the best performance in all cab crash testing.

The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab.

The piano style hinge and hidden flush mounted door is the most favorable construction keeping dirt and debris out of the hinge allowing for optimum operation throughout the lifetime of the door.

CAB ENTRY DOOR TYPE
All entry doors shall be of a flush, full height design and shall be located on the sides of the cab.

CAB STRUCTURAL WARRANTY
The cab structure shall be warranted for a period of ten (10) years. Warranty conditions may apply and shall be listed in the detailed warranty document that shall be provided upon request.

CAB PAINT EXTERIOR
The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and maximum corrosion protection of all metal surfaces.

The cab shall then be painted with the upper and lower colors specifically designated by the customer.

CAB PAINT MANUFACTURER
The cab shall be painted with PPG Industries paint or similar.
CAB PAINT PRIMARY/ LOWER COLOR
The lower paint color shall be PPG FBCH 71663 Red or equivalent.
CAB PAINT SECONDARY/ UPPER COLOR
The upper paint color shall be the PPG FBCH Black or equivalent.

CAB PAINT EXTERIOR BREAK LINE
The upper and lower paint shall meet at a break line on the cab which shall fall approximately 1.00 inch under the cab door windows and above the exterior door handles. The break line shall extend in a straight line and drop approximately 6.50 inches under the windshield, above the windshield wipers and below the windshield wipers on the front of the cab. The upper black color will continue the length of the entire truck, front to back.

CAB PINSTRIPE
Where the upper and lower paint colors meet a 0.50-inch black pinstripe shall be applied over this break line to offer a more finished look.

CAB PAINT WARRANTY
The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for 10 years from the first owner's date of purchase or in service or the first 100,000 actual miles, whichever occurs first.

LOW VOLTAGE 12VDC ELECTRICAL SYSTEM
The chassis shall include a single starting electrical system which shall include a 12-volt direct current Weldon brand of multiplexing system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311-degree Fahrenheit 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 275-degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.

APPARATUS WIRING PANEL

An apparatus wiring panel shall be installed on the officer side bulkhead below the dash which shall include (8) each open circuits with three (3) each 20.00 amp, (1) each 30.00 amp, (3) each 10 amp and (1) each 15-amp relay and breaker with trigger wires which shall be connected to the rocker switch panel.

MULTIPLEXING DISPLAY

The multiplexing electrical system shall include (2) Weldon Vista III or equivalent displays which shall be located (1) within the driver side instrument panel ahead of the engine tunnel and (1) in the officer panel. The Vista III or similar displays shall feature full color LCD display screens which include a message bar displaying the time of day, the current ambient outside temperature and important messages requiring acknowledgement 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 for the auto climate control, on-board diagnostics, and video ready for back- up cameras, side view cameras and integrated GPS unit.

The displays shall offer varying fonts and background colors. The displays shall also be fully programmable to the needs of the customer, which offers an infinite amount of flexibility for viewable options.

MULTIPLEX SYSTEM WELDON V-MUX OR EQUIVILANT.

The multiplexing system is defined as a process where multiple analog message signals or digital data streams are combined in one (1) signal. The multiplexing system shall divide the capacity of the low-level communication channel into several higher-level logical channels, one (1) for each message signal or data stream to be transferred. The device which shall perform the multiplexing is called a multiplexer (MUX). Multiplexing is provided by the physical layer of OSI seven (7) layer model while multiple access also involves a media access control protocol, which is part of the data link layer. The system shall offer complete peer to peer network architecture.

The multiplexed system shall feature solid state switching and access points to most of the switching functions for the electrical lighting and climate control on the vehicle and include a backup alarm disable switch, the LED ground lighting below each door control, the control for alternating headlights and the audible alarm for the open door light. The multiplex system shall also feature the priority of sequences and shall shed electrical loads based on the priority list specifically programmed, automatic climate control when the air conditioning option is ordered and three (3) programmable video inputs.

The multiplexed system shall offer a vehicle information menu which allows access to the diagnostic and maintenance menus, in addition to engine, transmission and chassis information menus.

The color LCD display shall also feature the controls for the high idle which shall include activation or deactivation. The system shall offer an unlimited number of virtual switches with selectable fonts, types and colors for optimum user efficiency. The color LED screen shall feature selectable color buttons as well as screen backgrounds.

POWER AND GROUND STUD

A 40-amp battery direct power and ground stud shall be provided and installed in the electrical distribution panel. The stud shall be size #10 and protected with a 40-amp circuit breaker.

AUXILIARY POWER AND GROUND STUDS

An auxiliary set of power and ground studs shall be provided and installed behind the electrical center cover with a 40-amp breaker. The studs shall be .375-inch diameter and capable of carrying up to a 40-amp battery direct load.

AUXILIARY POWER AND GROUND STUDS

An auxiliary set of power and ground studs shall be provided and installed behind the electrical center cover with a 40-amp breaker. The studs shall be .375-inch diameter and capable of carrying up to a 40-amp load switched with the master power switch.

ENGINE

The engine for this vehicle will be the Cummins X15 605HP.

The maximum speed shall be 110km/h. Up to date engine software for troubleshooting and diagnostic adjusting shall be provided. This software will be loaded onto a laptop computer. Any hardware hook-ups for communication purposes to the engine will be provided.

In addition, the engine shall be certified for use in a fire service vehicle and the chassis manufacture shall be able to provide written certification from the engine manufacture stating that the engine installation meets all of the engine manufactures installation parameters.

The engine shall carry the manufacturer's maximum warranty period available.

It is preferred that the components for routine maintenance be accessible without raising the cab (coolant check, engine oil dipstick, window washing fluid, transmission dipstick. DEF fluid check).

ENGINE HIGH IDLE CONTROL WITH V-MUX

The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate 1200 RPM to increase alternator output. This device shall operate only when the master switch is activated, and the transmission is in neutral or park with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in

gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral or park. There shall be an indication on the Vista screen for the high idle speed control.

ENGINE HIGH IDLE SPEED
The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

ENGINE PROGRAMMING
The engine programming which governs the top speed of the vehicle shall be disabled.

AUXILIARY ENGINE BRAKE
An engine compression brake with high and low settings, with brake light actuation and cutout relay when in pump mode shall be installed. The engine brake will activate upon release of accelerator when in operation mode.

AUXILIARY ENGINE BRAKE CONTROL
An engine compression brake control device shall be included. The control device shall be electronic and shall prevent the activation of the engine compression brake during operation wherein undesirable conditions will result if the engine brakes are active. The electronic control device shall monitor various conditions and shall activate the engine brake only if all the following conditions are simultaneously detected: a valid gear ratio is detected; the driver has requested or enabled engine compression brake operation; the throttle is at a minimum engine speed position; and the electronic controller is not presently attempting to execute an electronically controlled final drive gear shift. The compression brake control shall be controlled via the multiplex system.

FORWARD FLUID FILLS
The front of the chassis shall accommodate fluid fills for the engine oil, the windshield washer fluid, and the power steering fluid though the grille. This area shall also accommodate checks for the engine oil, and power steering fluid.

ELECTRONIC LOW ENGINE OIL INDICATOR
The engine oil shall be monitored electronically and shall send a signal to activate a light in the instrument panel when levels fall below normal.

ENGINE BLOCK HEATER
A 1000-watt, 120-volt engine coolant heater with automatic thermostat shall be installed. The block heater shall be connected to the electrical inlet as stated herein.

REMOTE THROTTLE CONTROL
A Class 1 pressure governor pump panel control module or similar and a pressure transducer shall be provided. The pump pressure governor shall be designed to control the engine fuel to maintain a desired pump pressure or engine speed setting along with

displaying diagnostic information. The pump shall include a pre-set switch for selecting a pre-determined pressure or RPM and an emergency return to idle switch.

REMOTE THROTTLE CONTROL HARNESS

An apparatus interface wiring harness for the engine shall be supplied with the chassis. The harness shall include a connector for connection to the chassis harness which shall terminate in the left frame rail behind the cab for reconnection by the apparatus builder. The harness shall contain connectors for a Class 1 pressure governor/ throttle system as well as a multiplexed gauge. Separate circuits shall be included for pump controls, "pump engaged" and "OK to Pump" indication lights, open compartment ground, start signal, park brake ground, ignition signal, master power, customer ignition, air horn solenoid switch, high idle switch, and high idle indication light.

An apparatus interface wiring harness shall also be included which shall be wired to the cab harness interface connectors and shall incorporate circuits with relays to control pump functions. This harness shall control the inputs for the transmission lock up circuits, governor/ hand throttle controls and dash display which shall incorporate "pump engaged" and "OK to Pump" indication lights. The harness shall contain circuits for the apparatus builder to wire in a pump switch.

ENGINE PROGRAMMING REMOTE THROTTLE

The engine remote throttle control harness programmed "ON".

ENGINE WARRANTY

The engine shall carry the manufacturer's maximum warranty period available.

COOLING SYSTEM FAN

The engine cooling system shall incorporate a thermostatically controlled, Horton clutched fan. The fan shall be installed on the engine and shall include an air directive shroud.

When the clutched fan is disengaged it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan control design shall be fail safe.

ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the fire industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. 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. The complete cooling system shall utilize heavy-duty welds and be mounted to isolate the entire system from any vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

ENGINE COOLANT
The cooling package shall include Extended Life Coolant (ELC) installed. The use of ELC provides longer life and change intervals providing improved performance. The coolant shall contain ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -50 degrees F.

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.

COOLANT FILTER
An engine coolant filter with a shut-off valve shall be installed on the chassis. The location of the filter shall allow for easy maintenance.

Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.

ELECTRONIC LOW COOLANT INDICATOR
The engine coolant shall be monitored electronically and shall send a signal to activate a light in the instrument panel when levels fall below normal.

ENGINE PUMP HEAT EXCHANGER
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 coming in contact with the engine coolant. This shall allow the use of water from the discharge side of the pump to assist in cooling the engine.

COOLANT HOSES
The cooling systems hose shall be formed from aluminized steel tubing and include silicone hose with stainless steel constant torque clamps. The charge air cooler hose shall be formed from aluminized steel tubing and include silicone hump hose and stainless steel “constant torque” style clamps meeting the engine manufactures requirements.

ENGINE AIR INTAKE
The engine shall include an air intake filter which shall be in the front of the cab behind the officer side fascia. The dry type of filter, with a replaceable element shall ensure containment of dust and debris safely contained inside the disposable housing, eliminating the chance of contaminating the air intake system during air filter service via a leak-tight seal.

The air flow distribution and dust loading shall be uniform throughout the high-performance filter cone pack, which shall result in increased capacity and lower pressure differential for improved horsepower and fuel economy. The air intake shall be mounted within easy access via a hinged panel behind the headlight module. The air intake system shall include an indicator light in the warning light cluster which shall activate when the air cleaner element requires replacement.

The air intake shall include an ember separator which shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a galvanized steel frame. This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack, while creating only minimal air flow restriction through the system. Periodic cleaning or replacement of the screen shall be all that is required after installation.

Proposals shall include an indication light representative of the need for replacement of the air intake filter and shall be located at the front of the vehicle.

SKIDPLATE FOR AIR CLEANER

A skid plate shall be supplied for the engine air intake system on the underside of the front right side of the cab.

EXHAUST SYSTEM

The exhaust system shall include a diesel particulate filter and a diesel oxidation catalyst to meet current EPA standards. The system shall be designed and installed using 0.65-inch aluminized steel plumbing from the diesel particulate filter to the discharge which shall terminate horizontally on the officer side of the vehicle ahead of the rear tires. The exhaust system shall be mounted on the underside of the frame outboard, maximizing space for the body compartments. All joints along plumbing following the diesel particulate filter shall be connected with lapping band style clamps.

The system shall include a 5.00-inch diameter plumbing which shall be .065-inch-thick stainless-steel exhaust between the engine turbo and the diesel particulate filter. The tubing shall include a thermal cover to retain heat between the engine turbo and diesel particulate filter. The entire exhaust system shall be bolted to the frame and include system joints connected with zero leak clamps between the turbo and diesel particulate filter.

TAIL PIPE CHROME EXTENSION

A straight chrome exhaust tail pipe extension shall be shipped loose with the chassis for installation by the apparatus builder.

TRANSMISSION

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

The transmission shall include two (2) internal oil filters which shall offer synthetic transmission fluid. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission gear ratios shall be aligned with the 110km/h max speed. This is to maximize speed up steep hills around the Quesnel area.

TRANSMISSION MODE PROGRAMMING
The transmission, upon start-up, will automatically select a four (4) speed operation. The fifth speed over drive shall be available with the activation of the mode button on the shifting pad.

TRANSMISSION FEATURE PROGRAMMING
The EVS group package number 127 shall contain the 198 vocational packages in consideration of the duty of this apparatus as a Pumper. This package shall incorporate an automatic neutral with selector override. This feature shall command the transmission to neutral when the park brake is applied, regardless of the drive range requested on the shift selector. This shall require re-selecting the drive range shift out of neutral for the override. This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits used shall allow the vehicle to assist shift split shaft pump and 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 shall be the input speed to the pump. The pump output shall rate the gallons of water the pump is able to provide.

ELECTRONIC LOW TRANSMISSION OIL LEVEL INDICATOR
The transmission fluid shall be monitored electronically and shall send a signal to activate a light in the instrument panel when levels fall below normal.

TRANSMISSION SHIFT SELECTOR
An Allison pressure sensitive range selector touch pad or similar shall be provided and located to the right of the driver within clear view and easy reach.

TRANSMISSION PRE-SELECT WITH AUXILLIARY BRAKE
When the auxiliary brake is engaged, the transmission shall automatically seek shifting to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle speed.

TRANSMISSION WARRANTY
The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

TRANSMISSION COOLING SYSTEM
The transmission shall include an air to oil cooler integrated into the lower portion of cooling package. The transmission cooling system shall meet all transmission manufacturer requirements. The cooling system shall feature a circuit provision located within the hydraulic transmission oil which shall provide for rapid warm up to the optimum transmission operating temperature.

DRIVELINES
All drivelines shall be heavy duty metal tube and equipped with Spicer 1710 series or similar universal joints. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. A splined slip joint shall be provided in each driveshaft and

shall be coated with Glide coat®.

DRIVELINE PUMP
A pump as specified shall be supplied by the apparatus manufacturer and installed by the cab and chassis manufacturer.

DRIVELINE
The driveline jackshaft shall be for a Waterous model pump which shall be installed by the original equipment manufacturer or body builder.

DRIVELINE PUMP RATIO
The ratio for the pump shall be set at 2.27 at the time of driveline installation.

DRIVELINE PUMP CENTER LINE
The pump driveline shall include a centerline of the rear axle to the center line of the suction dimension of 80.00 inches.

DRIVELINE PUMP LOCATION ANGLE
The pump driveline shall be installed at a 4.00-degree angle.

DRIVELINE PUMP SUCTION HEIGHT
The pump driveline shall be installed with a suction height of 4.25 inches above the frame.

FUEL FILTER/WATER SEPARATOR
The fuel system shall have a Fleetguard FS1003 fuel filter/water separator or equivalent with a thermostatically controlled integral heater as a primary filter. The fuel filter shall have a see-through cover to allow visual inspection of fuel and filter condition and a drain valve. This specification is to ensure fleet maintenance standardization.

An instrument panel lamp and audible alarm which indicates when water is present in the fuel-water separator shall also be included.

FUEL LINES
The fuel system lines shall be nylon material rated for diesel fuel with brass fittings installed from the tank to engine.

FUEL SHUTOFF VALVE
A fuel shutoff valve shall be installed in the fuel draw line at the primary fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

FUEL TANK
The tank exterior is painted with a primer and topcoat. This results in a tank which offers the internal and external corrosion resistance and surface characteristics of aluminum with the strength, durability and economy of steel.

The fuel tank capacity shall be no less than 65 US gallons (246 Liters). A larger tank is preferred. The fuel tank shall be mounted behind the rear axle. The tank can be easily lowered and removed for service purposes.

FUEL FILL PROVISIONS
The fuel tank fill port will be on the left side of the vehicle.

FUEL TANK SERVICEABILTY PROVISIONS
The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8 ft. of length shall be located above the fuel tank and shall be coiled and secured.

FRONT AXLE
The front axle shall be an Arvin-Meritor MFS20 or equivalent rated to 20,000 pounds FAWR.

FRONT WHEEL BEARING LUBRICATION
The front axle wheel bearings shall be lubricated with clear oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.

FRONT SHOCK ABSORBERS
Two (2) Bilstein inert, nitrogen gas filled shock absorbers or equivalent shall be provided and installed as part of the suspension system. The shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintaining consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.

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

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

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

FRONT SUSPENSION
The front suspension shall include four (4), 54.00-inch long and 4.00-inch-wide taper leaf springs with a military double wrapped front eye. Both spring eyes shall have a case-hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting. The spring capacity shall be rated at 20,000 pounds.

STEERING COLUMN/ WHEEL
The cab shall include a Douglas Autotech or equivalent steering column or similar shall be a seven (7) position tilt and 2.25-inch telescopic type with an 18.00-inch steering wheel located on the left side of the cab designating the driver's position. The steering wheel shall be covered with black absorbite padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

POWER STEERING PUMP
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.

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR
The power steering fluid shall be monitored electronically and shall send a signal to activate a light in the instrument panel when levels fall below normal.

FRONT AXLE CRAMP ANGLE
The chassis should have a front axle cramp angle of 40-50 degrees to the left and right.

CHASSIS ALIGNMENT
The chassis frame rails shall be cross checked to ensure the length and to make sure each is square. The front and rear axles shall be laser aligned, additionally the tires and wheels shall be aligned and toe-in set on the front tires. The completed apparatus shall be rechecked for proper alignment once the chassis has been fully loaded.

REAR AXLE
The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housings for extra strength and rigidity. The axles shall also include torsion flow axle shafts that feature a surface hardness which resists fatigue and a resilient core which absorbs shock. There shall be unitized pinion seals within the axle helping to prevent leakage and harmful road contaminants from entering the axle components. The axle shall include a rigid differential case for high axle strength and reduced maintenance.

The axle shall include single reduction gearing and shall have a rated capacity of 30,000 pounds.

REAR WHEEL BEARING LUBRICATION
The rear axle wheel bearings shall be lubricated with oil.

REAR AXLE DIFFERENTIAL LUBRICATION
The rear axle differential shall be lubricated with oil.

VEHICLE TOP SPEED
The top speed of the vehicle shall be 110Km/h +/-5 Km/h at max governed engine RPM. This will be achieved by transmission and rear end gearing to maximize low end torque for steep road inclines in the Quesnel area.

REAR SUSPENSION
The single rear axle shall feature an air suspension system.
The rear suspension capacity shall be rated at 30,000 pounds.

FRONT TIRES
The front tires shall be Michelin or equivalent tubeless radial on/off highway tread.
Specify Model _____.
The front tires will meet all vehicle weight and speed specifications.

REAR TIRES
The rear tires shall be Michelin or equivalent tubeless radial on/off highway tread.
Specify Model _____.
The rear tires will meet all vehicle weight and speed specifications.

FRONT WHEELS
The front wheels shall be Alcoa hub piloted or equivalent, 9.00-inch x 22.50-inch aluminum wheels with the Alcoa Dura-Bright® wheel treatment or equivalent as an integral part of the wheel. Alcoa Dura-Bright® wheels keep their shine without polishing; the wheels shall come clean simply by spraying with soap and water. Brake dust, grime and dulling oxidation shall wash off with no scrubbing and no special chemicals required.

REAR WHEELS
The rear wheels shall be 9-inch X 22.50-inch aluminum wheels with the Alcoa Dura-Bright® wheel treatment as an integral part of the wheel. Alcoa Dura-Bright® wheels keep their shine without polishing; the wheels shall come clean simply by spraying with soap and water. Brake dust, grime and dulling oxidation shall wash off with no scrubbing and no special chemicals required.

BALANCE WHEELS AND TIRES
All the wheels and tires, including any spare wheels and tire assemblies, shall be dynamically balanced.

WHEEL TRIM
The front wheels shall include stainless steel lug nut covers and stainless-steel baby moons with cutouts for oil seal viewing (there shall be no cutout on front drive or IFS axles). The covers and baby moons shall feature a mirror shine finish and shall be shipped loose with the chassis for installation by the apparatus builder.

The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats, also in a mirror shine finish, which shall be shipped loose with

the chassis for installation by the apparatus builder.

The lug nut covers, baby moons, and high hats shall be RealWheels® brand or equivalent, and constructed of 304L grade, non-corrosive stainless-steel meeting D.O.T. certification standards.

WHEEL GUARDS
The rear dual wheels shall include a plastic isolator installed between the inner and outer wheel hub to prevent metal to metal contact.

TIRE CHAINS
OnSpot, six (6) strand automatic ice chains shall be installed on the rear axle of the chassis to provide instant traction while traveling on ice and snow at speeds below 55 km/h.

TIRE CHAIN ACTIVATION
The tire chain system shall be controlled through a virtual switch on both multiplex displays. The virtual switch shall display "Active" when the tire chains are engaged. The tire chains shall be controlled through the transmission and shall not engage/disengage when the vehicle is traveling over 50 Km/H.

BRAKE SYSTEM
A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system with a total of 4152 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss.

The rear axle spring brakes shall automatically apply in any situation when the air pressure loss below 25 PSI with a mechanical means for releasing the spring brake chambers exists. An audible alarm shall be designated when system air pressure is below 60 PSI.

A four (4) sensor, four (4) modulator anti-lock braking system (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Automatic traction control which shall be installed on the single rear axle. The automatic traction control system shall apply the anti-lock braking system 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.

Additional handling capabilities shall include roll stability control which shall monitor the vehicles rollover threshold based on the lateral acceleration. The system shall activate a computerized device which shall slow the vehicle when the threshold is exceeded in either direction. Normal vehicle operation shall resume once the problematic conditions cease. Roll stability control shall be integral with the ABS and ATC systems.

A momentary rocker style switch shall be provided and properly labeled “mud/snow”. When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light and the light on the rocker switch shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.

The electronic stability control unit (ESC) is a functional extension of the electronic braking system. It can detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle’s motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle’s lateral acceleration. The CAN bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

FRONT BRAKES
The front brakes shall be Meritor 16.5" x 6" S-cam drum type.

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

PARK BRAKE
A service brake lock-up system shall be installed which shall apply both the front and rear brakes upon application of the push-pull valve in the cab. The air pressure to the brakes shall be limited to 85 PSI.

PARK BRAKE ACTUATION VALVE
A manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color.

The parking brake actuation valve shall be mounted on the driver’s dash within easy access.

FRONT BRAKE SLACK ADJUSTERS
The front brakes shall include Meritor automatic slack adjusters or equivalent. shall be installed on the chassis which features a simple, durable design offering reduced weight. The automatic slack adjusters shall feature a manual adjusting nut which cannot

inadvertently be backed off and threaded grease fittings for easy serviceability.

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

FRONT BRAKE DUST SHIELDS
The front axle shall be equipped with brake dust shields.

REAR BRAKE DUST SHIELDS
The rear brakes shall be equipped with brake dust shields.

AIR DRYER
The brake system shall include a Wabco System Saver 1200 or equivalent air dryer. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be located on the right frame rail behind the officer step.

BRAKE CHAMBERS
The axle shall include TSE 36/36 brake chambers which shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE Type 36 brake chamber shall offer a 36.00 square inch effective area.

AIR COMPRESSOR
The air compressor provided for the engine shall be a two (2) cylinder reciprocating Wabco® SS318 compressor or equivalent which shall be capable of producing a minimum of 18.7 CFM. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. Superior piston and bore finishing technology shall reduce oil consumption up to 90% significantly reducing the system component life. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight, and decrease carbon formation.

AIR GOVERNOR
An air governor which shall cut-in and cut-out pressures on the vehicle shall be provided and shall be adjusted so that the maximum pressure in the air system and the minimum cut-in pressure. The air governor shall be located on the air cleaner bracket on the right frame rail behind the officer step.

AIR SUPPLY MOISTURE EJECTORS
Heated, automatic moisture ejectors with a manual drain provision shall be installed on all reservoirs of the air supply system.

AIR SUPPLY LINES
A dual air system plumbed with color coded reinforced nylon tubing air lines shall be installed on the chassis. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.

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

AIR TANK POSITION
There shall be spacers included which shall move the air tanks 1.00-inch inward towards the center of the chassis.

REAR AIR TANK MOUNTING
The air reservoir located towards the rear of the chassis shall be installed parallel to the frame.

WHEELBASE
The vendor shall state the chassis wheelbase. The chassis wheelbase shall be _____ inches.

REAR OVERHANG
The chassis rear overhang shall be 51.00-inches.

FRAME PAINT
The frame shall be powder coated prior to any attachment of components.

FRAME WARRANTY
The frame and cross members shall carry a lifetime warranty to the original purchaser.

FRONT BUMPER
A one-piece severe duty front bumper shall be provided. The steel bumper shall be painted with chevron striping.

FRONT BUMPER EXTENSION LENGTH
The front bumper shall be extended to accommodate hose and accessories storage.

FRONT BUMPER APRON
The bumper extension shall include a bumper apron. The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the bumper flange.

FRONT BUMPER CENTER HOSEWELL
The bumper shall include a hose well in the front bumper, The hose well shall include a cover constructed of 0.19-inch-thick bright embossed aluminum tread plate. The hose well shall accommodate a preconnected 200 feet of 1 ¾" fire hose.

FRONT BUMPER LEFT SIDE HOSE STORAGE
A separate compartment on left side shall be incorporated in the bumper to accommodate 3 50ft double donut rolled 1 ¾ "hose.

FRONT BUMPER COMPT COVER HARDWARE
The front bumper compartments shall include a cover constructed of bright embossed aluminum tread plate. The covers shall include a hinge at the back of the compartment towards the cab and shall include gas cylinder stays which shall hold the cover open. The cover shall stay in the closed position via a D-ring style latch.

AIR HORNS
The front bumper shall include two (2) Hadley brand or similar air horns. The air horn shall be a trumpet style and shall include a chrome finish.

AIR HORN LOCATION
The air horns shall be recess mounted in the front bumper face.

AIR HORN AIR RESERVOIR
One (1) air tank, with a 1200 cubic inch reservoir, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

FRONT BUMPER TOW EYES
The bumper shall include two (2) removable lock-in tow eyes. Tow eyes shall be installed in the front bumper.

CAB TILT SYSTEM
The entire cab shall be capable of tilting 45.00 degrees to allow for easy maintenance of the engine and transmission. The lift system shall include an ignition interlock and red lock down indicator lamp, which shall illuminate when holding the "Down" switch to indicate safe road operation. It shall be necessary to activate the master battery switch with the park brake set in order to tilt the cab. Two cab tilt cylinders shall be provided with velocity fuses in each cylinder port.

Two (2) spring loaded hydraulic hold down hooks located outboard of the frame which shall be installed designed for holding the cab securely to the frame. A steel safety assembly shall be installed on the right-side cab lift cylinder to prevent accidental cab lowering. The safety assembly shall fall over the lift cylinder when the cab is in the "Up" position. A cable release system shall also be provided to clear the safety assembly from the lift cylinder when lowering the cab.

CAB TILT AUXILIARY PUMP
A manual cab tilt pump module shall be attached to the rear surface of the driver side battery box.

CAB TILT CONTROL RECEPTACLE
The cab tilt shall include a receptacle which shall be temporarily located on the right-hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control pendant. The tilt pump shall include 8.00 feet of cable with a 6-pin Deutsch connector that includes a cap. The remote-control pendant shall also include 20.00 feet of cable which also includes a mating connector.

CAB WINDSHIELD
The cab windshield shall top portion tint.

CAB WINDOWS
All windows rear of drivers/officer's seat shall be tinted to 75% light transmission.

CAB DOOR WINDOWS (Electric Windows)
All door windows will go down completely into door housing and will be operated by electric controls (electric windows). Each door window will have separate controls mounted on doors accessible by seated occupant. There will also be electric controls for all windows mounted on dash between driver and officer.

CAB WALL INSULATION
All seams throughout the entire cab structure shall be completely sealed. The cab walls shall be insulated. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

The cab shall also include additional insulation throughout the interior which shall reduce road noise and offer a quieter interior. The additional insulation shall contribute to higher heating and cooling efficiency and assist in sustaining a more concurrent interior temperature.

ENGINE TUNNEL AND UNDER CAB INSULATION
The exterior of the cab tunnel surrounding the engine shall be insulated. The foam shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation under the tunnel shall act as a noise barrier absorbing noise from the engine as well as assisting in sustaining the desired climate within the cab interior.

Additionally, the entire underside of the cab shall be insulated. The foam shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation under the cab floor shall act as a noise barrier absorbing noise from the road as well as assisting in sustaining the desired climate within the cab interior.

CLIMATE CONTROL
The cab shall be equipped with a heater/defroster/air conditioning system. This system will be controlled through the vista display or similar display.

CLIMATE CONTROL ACTIVATION
The heating and air conditioning controls shall be located on the vista display or similar display.

AUXILIARY CLIMATE CONTROL FRONT UNDERSEAT
Two (2) 13,500 Btu heaters shall be provided and installed in the face of the seat riser storage area for the driver and officer. The fan controls shall be located on the driver and officer multiplex display.

The auxiliary heater system hoses shall be silicone with stainless steel constant torque clamps approved for use with silicone hose. All auxiliary heaters shall be plumbed in series independent of the heater defroster system. One (1) seasonal shut-off valve for the auxiliary heater series shall be supplied at the front of the right-hand corner of the cab.

AUXILIARY CLIMATE CONTROL REAR UNDERSEAT
One (1) 53,500 BTU heater shall be provided and installed in the rear section of the crew cab under the center forward facing seat riser. The fan controls shall be located on the heater unit.

The auxiliary heater system hoses shall be silicone with stainless steel constant torque clamps approved for use with silicone hose. All auxiliary heaters shall be plumbed in series independent of the heater defroster system. One (1) seasonal shut-off valve for the auxiliary heater series shall be supplied at the front of the right-hand corner of the cab.

HEATER HOSE INSULATION
The heater hoses leading from the engine to the cab shall include a foam insulation wrap which runs the length of the hose improving heating in extreme cold climates. The heating hoses which shall be routed inside the cab shall not be insulated.

CAB CIRCULATION FANS FRONT
The cab shall include two (2) individually switched all metal construction 6.00-inch windshield defogger fans which shall be installed in the front cab corners.

INTERIOR TRIM FLOOR MAT
The floor of the cab shall be covered with a multi-layer mat consisting of sound absorbing closed cell foam and non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive with aluminum cornering trim. All exposed seams shall be sealed to reduce moisture and debris.

INTERIOR TRIM VINYL
The cab interior shall include trim on the front and rear crew ceiling, the cab walls and the rear wall of the cab. The trim shall be constructed of insulated vinyl over a hard board backing. The material shall be securely fastened to the interior of the cab utilizing snap style fasteners with a decorative fastener for a more appealing appearance.

CAB INTERIOR TRIM HEADER ABS
The cab interior shall include a header over the driver and officer dash which shall be vacuum formed ABS composite panel with robust styling grooves providing structural integrity. The header shall include (2) vents within the header which are directed at the windshield. Also included will be a drop-down panel for access behind the header for service of electronic components, if necessary. The header shall include (2) cut outs, (1) over the driver and (1) over the officer to accommodate speakers and molded areas to accommodate the sun visors.

INTERIOR TRIM SUN VISOR
The header shall include one (1) sun visor above the driver and officer seating positions and above the windshield spanning the length of each windshield. There shall be an additional extension from the sun visor which shall be high impact resistant, flame resistant, solar dark gray colored Lexan® polycarbonate.

ENGINE TUNNEL ACCESSORIES
The engine tunnel shall include a mounting system with a custom storage box and accessories holders such as brackets for 6 portable radios, gas detector, thermal imaging camera, etc.

DOOR TRIM KICK PLATE
The inner door panels shall include a stainless-steel kick plate which shall be fastened to the lower portion of door panel. The stainless-steel kick plate shall include a number seven mirror polished finish.

CAB DOOR TRIM REFLECTIVE
A reflective chevron sign shall be installed on the lowest portion of the inner door panel, one (1) on each door. A stripe of reflective tape shall be installed at the outer edge of each door.

INTERIOR GRAB HANDLE
A rubber-covered grab handle shall be provided on the inside of the cab on the hinge post at the driver and officer doors. The handle shall assist personnel in exiting and entering the cab.

GRAB HANDLE FRONT DOOR
Each front door shall include one (1) ergonomically contoured cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish and provide ease of access and exiting the cab.

INTERIOR GRAB HANDLE REAR DOOR
A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door the full width of the door below the window glass. The handle shall assist personnel in exiting and entering the cab.

CAB INTERIOR FLOOR MAT COLOR
The cab interior floor mat shall be black in color.

INTERIOR TRIM VINYL COLOR
The cab interior vinyl trim surfaces shall be dark gray in color.

CONTROL PANELS
The dash shall include three removable panels located one (1) to the right of the driver position, one (1) in the center of the dash just ahead of the engine tunnel and one (1) to the right of the officer position.

SWITCH PANEL CENTER
The center dash shall include a blank panel.

SWITCH PANEL IGNITION
The vehicle shall be equipped with a keyless ignition and master, with an "Off/ On" and a second switch for "Off/ Start".

SEATBELT WARNING SYSTEM
A seatbelt warning system shall be installed for each seat within the chassis. The system shall provide visual and audible warning when any seat is occupied (sixty pounds minimum), the corresponding seat belt remains unfastened, and the park brake is released.

Once activated, the visual and audible indicators shall remain active until all occupied seats have seat belts fastened.

CAB SEATING
The following sections referring to seating are specified to our current fleet trucks. We have listed a specified brand, but an alternate equivalent manufacture brand will be considered.

SEAT MATERIAL
The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids.

SEAT COLOR
All seats supplied on the chassis shall be dark gray in color. This material shall be semi-resistant to UV rays and from being saturated or contaminated by fluids.

DRIVER SEAT
The driver's seat shall be a Bostrom type or equivalent.

DRIVER SEAT BACK
The driver's seat shall include a standard seat back incorporating all belts to seat feature

(ABTS) as described above. The seat back shall feature a contoured, adjustable head rest.

SEAT BELT ORIENTATION
The driver seat belt shall follow the standard orientation which extends from the left-hand shoulder extending to the right-hand hip.

OFFICER SEAT
The officer's seat shall be a Bostrom type or equivalent that will allow for a Bostrom or equivalent SCBA bracket to store complete SCBA unit with bottle.
All firefighters' seats in the rear of truck will be Bostrom type seats or equivalent that will allow for Bostrom or equivalent SCBA brackets to store complete SCBA units with bottle.

OFFICER SEAT BACK
The officer's seat back shall include a Bostrom SecureAll self-contained breathing apparatus (SCBA) bracket. The mechanical walk away bracket shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of fire truck cabs.

SEAT BELT ORIENTATION
The officer seat belt shall follow the standard orientation which extends from the right-hand shoulder extending to the left-hand hip.

REAR FACING OUTER SEAT QUANTITY
The crew area shall include two (2) rear facing crew seats, which include one (1) located directly behind the driver seat and one (1) located directly behind the officer seat. Right rear facing seat to have under seat secured storage compartment large enough for Automated External Defibrillator (AED).

REAR FACING OUTBOARD SEAT
The crew area shall include a seat in the rear facing outboard position which shall be a Bostrom type of equivalent. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be hinged and compact in design for additional room and shall remain in the stored position until occupied.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a red, 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 towards the driver position within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall measure at minimum 37.00 inches, from the height adjustment in its lowest position and the suspension inflated and/ or raised to the upper limit of its travel to the cab ceiling.

This model of 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 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, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

REAR FACING OUTER SEAT BACK

The crew area shall include a seat back in the rear facing outer position which shall include a Bostrom Secure All self-contained breathing apparatus (SCBA) bracket. The mechanical walk away bracket shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of fire truck cabs.

SEAT BELT ORIENTATION

The crew position seat belts shall follow the standard orientation which extends from the left-hand shoulder extending to the right-hand hip.

FORWARD FACING CENTER SEAT QUANTITY

The crew area shall include two (2) forward facing center crew seats with both located at the center of the rear wall. There shall be a minimum of 6” space between the two seats.

FORWARD FACING CENTER SEAT

The crew area shall include a seat in the forward-facing center position which shall be a Bostrom type of equivalent. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be hinged and compact in design for additional room and shall remain in the stored position until occupied.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a red, 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 towards the driver position within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall measure at minimum 37.00 inches, from the height adjustment in its lowest position and the suspension inflated and/ or raised to the upper limit of its travel to the cab ceiling.

This model of 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 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, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

FORWARD FACING CENTER SEAT BACK

The crew area shall include a seat back in the forward-facing center position which shall include a Bostrom Secure All self-contained breathing apparatus (SCBA) bracket. The mechanical walk away bracket shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of fire truck cabs.

FORWARD FACING SEAT FRAME

The forward-facing center seating positions shall include an open style seat frame which is located and installed on the rear wall. This seat box shall accommodate the under-seat heater option if chosen. The seat frame shall measure 42.38 inches wide X 12.38 inches high X 15.75 inches deep. The seat frame shall be constructed of 5052-H32 Marine Grade, .190 inch thick, 100 percent primary smooth aluminum plate. The seat box shall be painted the same color as the remaining interior.

The driver under seat storage area shall have a vented aluminum hinged door with latch. The officer under seat storage area shall have a vented aluminum hinged door with latch.

ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

The windshield washer fluid level shall be monitored electronically and shall send a signal to activate a light in the instrument panel when levels fall below normal.

CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves.

The interior latches shall be black flush paddle type, which are incorporated into an upper door panel.

DOOR LOCKS

The cab doors shall be all electric locks operated by a switch by the driver's door. include an independent manual door lock actuated through a toggle switch located on the interior of the cab door near the paddle handle. A single key lock will be installed on drivers along with a numbered keypad to unlock doors.

CAB EXTERIOR GRAB HANDLES

The cab shall include one (1) each 18.00-inch knurled, anti-slip, one-piece exterior assist handle behind each cab door. The assist handle shall be made of 14 gauge 304- stainless steel and be 1.25-inch diameter to enable non-slip assistance with a gloved hand.

REARVIEW MIRRORS
The cab exterior shall include Retrac Aerodynamic style dual vision mirror heads one (1) each on the driver and officer sides of the cab. The mirrors shall be flange mounted to the side of the cab via an aluminum arm and shall measure 7.00 inches wide X 16.00 inches high. The Aerodynamic style mirrors shall be motorized, with horizontal and vertical actuation, part number 613305. The mirrors shall be constructed of a plastic housing with a chrome plated vacuum formed ABS back and shall include a lower mirror offering dual vision for increasing visibility. Each mirror shall be heated for defrosting in severe cold weather conditions. The mirrors shall include the finest quality non-glare glass and shall include a rigid mounting reducing vibration. Both mirrors shall be corrosion free under all weather conditions.

REARVIEW MIRROR HEAT SWITCH
The heated rearview mirrors shall be controlled through a virtual button on the multiplex display.

TRIM LOWER SIDE
A stainless-steel trim band, 10.00 inches high, equal in height to the front bumper, with upper and lower trim affixed without holes and fasteners, shall be installed on the lower exterior sides of the cab and doors.

TRIM LOWER SIDE FRONT
A stainless-steel trim band, 10.00 inch high, equal in height to the front bumper, shall be installed on the front lower sides of the cab and doors. The trim shall be affixed without holes and fasteners.

EXTERIOR TRIM REAR CORNER
There shall be stainless steel scuff plates on the outside corners at the back of the cab. The stainless-steel plate shall be a mirror finish and shall be affixed to the cab via a two (2) step process of adherence in which the cab and the stainless are primed and affixed to the side and rear wall of the cab via two-sided adhesive tape. This shall assist in deterring the stainless steel from separating from the cab.

TRIM REAR WALL
The rear wall of the cab shall include 3003-H22 aluminum tread plate which shall be min.0.072 inches thick. This plate shall cover the entire rear wall of the cab.

CAB FENDERS
Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. The outer fenderette 3.50" wide made of 12-gauge polished aluminum.

MUD FLAPS FRONT
The front wheel wells shall have mud flaps installed on them.

EXTERIOR EMBLEM
Each cab side shall include one manufacturer's emblem installed on the outside of the cab above each front wheel well.

IGNITION
The master starting system, ignition system shall include chrome thumb turn switch which shall be mounted on the driver side of the cab to the left of the steering wheel on the dash. Each switch will be accompanied by (1) green LED indication light which shall light when the ignition is in the "ON" position and (1) for the master battery switch when in the "ON" position. The thumb turn switches shall also be accompanied by a chrome push button which shall only operate when both the master battery and ignition thumb switches are in the "ON" position.

BATTERIES
The single start electrical system shall include (6) Harris CTX31S-9 950 CCA batteries or equivalent with a 210-minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541. The cables shall be sealed and encapsulated in a rubberized compound.

BATTERY BOX
The batteries shall be contained within (2) steel battery box enclosures which shall be located on the driver and officer sides of the chassis, securely attached to the frame rails. The boxes shall include drain holes in the bottom for sufficient drainage of water and shall include non-metallic clamps and a durable, hard plastic non-skid decking in the bottom of the tray under each battery.

BATTERY BOX COVER
The battery box enclosures shall include a steel cover which protects the top of the batteries. The cover shall include flush latches which shall keep the cover secure as well as a handle for convenience when opening.

BATTERY CABLES
The starting system shall include cables which shall be sealed and encapsulated in a rubberized compound and held in place with a double nut configuration to prevent loosening.

BATTERY JUMPER STUDS
The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step. The studs shall allow the vehicle to be jump started or the cab to be raised in an emergency in the event of battery failure.

ALTERNATOR
The starting system shall include a 430-amp 12-volt alternator.

BATTERY CONDITIONER
A Kussmaul 1200 battery conditioner or equivalent shall be supplied. The battery

conditioner shall be mounted in the cab behind the driver's seat.

BATTERY CONDITIONER DISPLAY
A Kussmaul battery conditioner or equivalent display shall be supplied. The battery conditioner display shall be mounted in the cab, viewable through the cab mid side window behind the driver's door.

ELECTRICAL INLET CONNECTION
A Kussmaul or equivalent 20-amp electrical receptacle shall be connected to the battery conditioner and installed on the driver's side of the cab above the wheel well. This receptacle will be controlled by a switch that will run shore power when connected and inverter power when not connected to shore power.

ELECTRICAL INLET COVER
The electrical inlet connection shall include a red cover.

ALL VEHICLE LIGHTING
All vehicle lighting shall be LED. This includes all emergency, scene and vehicle operation lighting.

HEADLIGHTS
The headlights shall be controlled via a virtual button on the Vista display.

HEADLIGHT LOCATION
The headlights shall be located on the front fascia of the cab directly above the front warning lights.

SIDE MARKER/ TURN SIGNALS
The headlight module shall include two (2) LED side turn and marker lights which shall be integral with the headlights.

TURN SIGNALS
The headlamp assembly shall include an LED turn signal and side marker lamp combination within the same module. This light assembly shall be amber in color and shall have a visibility radius of 125 degrees.

CORNERING LIGHTS
Two (2) Whelen model 500 or equivalent steady-on cornering lights with clear lenses shall be provided within the bumper tails, one (1) each side.

MARKER AND ICC LIGHTS
In accordance with FMVSS, there shall be five (5) cab LED marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level.

GROUND LIGHTS
Each door shall include NFPA compliant light mounted to the underside of the cab. The ground lighting shall be activated by the opening of the respective door as well as through the multiplex system.

ENGINE COMPARMENT LIGHT
There shall be two NFPA compliant lights mounted under the engine tunnel for area work lighting on the engine.

SIDE MOUNTED SCENE LIGHTING
The side of the cab shall include two (2) Whelen model 810 scene lights or equivalent, one (1) each side which shall be surface mounted.

SIDE SCENE LIGHT LOCATION
The scene lighting located on the driver and officer sides of the cab shall be mounted in the upper forward portion of the 10.00 inch raised roof of the cab between the front and rear crew doors.

SIDE SCENE LIGHT ACTIVATION
The scene lighting shall be activated via the light's respective door and two (2) virtual buttons on the MUX display located inside the cab, one per side.

INTERIOR CAB LIGHTING
The cab shall include an incandescent dome lamp with a red and white lens located over each door. The dome lamps shall be rectangular in shape and shall measure 9.50 inches in length and approximately 5.00 inches wide including a black colored bezel. The white lamp shall be activated by its respective door when opened and both the red and white lamp shall be activated by an individual switch on the light and via the multiplex display.

A fifth red and clear lamp shall be in the headliner, over the engine tunnel.

INTERIOR AUXILLIARY CAB LIGHTING – FRONT CREW
The cab headliner above the rear facing crew seats shall include two (2) 7.00-inch clear dome lamps. These lamps shall be activated by the rear doors as well as an individual switch located on the side of each lamp.

MAP LIGHT
A gooseneck style instrument panel map light with switch at base shall be shipped with the chassis.

DO NOT MOVE APPARATUS WARNING
The front headliner of the cab shall include a red 500 LED flashing light, located in the center for greatest visibility. The light shall be clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be programmed into the MUX system which shall sound when a door is open, the air brake is released, and the vehicle is shifted into gear.

The light and alarm shall be interlocked for activation when a cab door is not firmly closed, an apparatus cabinet door is not closed, the monitor is extended, the lights are extended, and the parking brake is released.

MASTER WARNING
The optical warning system shall be controlled by a master switch which shall include all "ON" and all "OFF" capability via a virtual button within the MUX display. All warning lights which are "ON" when the master switch is activated shall also activate. This switch shall be clearly labeled for identification.

ALTERNATING HEADLIGHT SYSTEM
An alternating high beam headlamp flashing system shall be installed into the high beam headlamp system which shall allow the high beams to flash alternately from left to right.

The completed system shall be capable of using the high beam selection to override the flashing function which shall then flash the high beams when the low beam headlamps are selected.

ALTERNATING HEADLIGHT FUNCTION
The flashing headlights shall be activated through a virtual button on the MUX display.

INBOARD FRONT WARNING LIGHTS
The cab front fascia shall include dual Whelen series or equivalent LED or warning lights which shall offer 14 flash patterns including a steady burn. The lights shall be surface mounted to the front fascia of the cab within a chrome bezel above the headlights in the inboard position.

INBOARD FRONT WARNING LIGHTS- COLOR
The front warning lights mounted on the fascia for the inboard position shall be red.

OUTBOARD FRONT WARNING LIGHTS
The cab front fascia shall include dual Whelen series or equivalent LED warning lights which shall offer 14 flash patterns including a steady burn. The lights shall be surface mounted to the front fascia of the cab within a chrome bezel in the outboard position.

OUTBOARD FRONT WARNING LIGHTS- COLOR
The front warning lights mounted on the fascia for the outboard position shall be red.

FRONT WARNING CONTROL
The front warning lights shall be controlled through a virtual control on the MUX display. This switch shall be clearly labeled for identification.

INTERSECTION WARNING LIGHTS
Each bumper tail shall include one (1) Whelen series LED warning lights which shall offer 14 flash patterns including a steady burn. The lights shall be surface mounted within a chrome bezel.

INTERSECTOR FRONT WARNING LIGHTS- COLOR
The intersection lights shall be red.

INTERSECTOR FRONT WARNING LIGHTS- POSITION
The intersection lights shall be mounted on the tail position on the side of the bumper.

SIDE WARNING LIGHTS
The cab side shall include a Whelen series or equivalent LED warning lights, one (1) each side, which shall offer 14 flash patterns including a steady burn. The lights shall be surface mounted within a chrome bezel.

SIDE WARNING LIGHTS- COLOR
The warning lights located on the side of the chassis shall be red.

SIDE WARNING LIGHTS- POSITION
The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.

SIDE WARNING CONTROL
The side warning lights shall be controlled through a virtual control on the MUX display. This switch shall be clearly labeled for identification.

SIREN HEAD
A Federal EQ2B 200-watt electronic siren head shall be provided and installed in the switch panel with a location specific to the customer's needs. The siren shall feature "Q" wail, yelp, air horn, PA, radio broadcast and "Q" brake. The siren shall produce 122 decibels at 10 feet away and shall include a noise cancelling microphone.

AIR HORN SELECTOR SWITCH
A virtual button on the MUX display shall allow control to either the air horn or the electric horn from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position which is in accordance with FMVSS requirements.

AIR HORN ACTUATION
The air horn actuation shall be accomplished by the steering wheel horn button and a black push button on the switch panel.

ELECTRONIC SIREN AUXILIARY ACTUATION
The electronic siren actuation shall be accomplished by a driver foot switch.

BACKUP ALARM
An Preco-Matic model 1059 or equivalent dual function, dual sound backup alarm shall be installed at the rear of the chassis with an auto-adjusting output level of not less than 87 dB and up to 107 dB. The alarm will automatically activate when the transmission is placed in reverse.

AIR HORN PLUMBING

The air horns shall be plumbed using nylon hoses and shall include a airline " T " equal distance from each horn.

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. The gauges shall be backlit with red LED lamps. All gauges shall be driven by stepper motor movements. The instrumentation system shall be multiplexed and shall receive engine and transmission information over the J1939 or equivalent data bus to reduce redundant sensors.

The instrument panel shall contain the following gauges:

One (1) electronic tachometer with integral LCD hour meter shall be included. The scale on the tachometer shall read from 0 to 3000 RPM. The hour meter shall display engine hours of operation.

One (1) electronic speedometer with integral LCD odometer/ trip odometer shall be included. The speedometer shall have a dual scale with kilometers per hour (KPH) as the dominant scale and miles per hour (MPH) on the minor scale. The speedometer scale shall read from 5 to 135 KPH (10 to 80 MPH). The odometer shall display up to 9,999,999.9 kilometers. The trip odometer shall display up to 9,999.9 kilometers. The LCD screen shall also be capable of displaying certain diagnostic functions.

One (1) three function gauge with primary system, secondary system and fuel level shall be included. The scale on the air pressure gauges shall read from 0 to 140 pounds per square inch (PSI). The air pressure scales shall be non-linear to expand the scales in the region of normal operation. A red indictor light in the gauge shall indicate a low air pressure. The scale on the fuel level gauge shall read from empty to full. A yellow indicator light in the gauge shall indicate low fuel at the quarter tank level.

One (1) four function gauge with engine oil pressure, coolant temperature, transmission oil temperature and a voltmeter shall be included. The scale on the engine oil pressure gauge shall read from 0 to 140 pounds per square inch (PSI). The engine oil pressure scale shall be non-linear expand the scale in the region of normal operation. A red indicator light in the gauge shall indicate low engine oil pressure. The scale on the coolant temperature gauge shall read from 70 to 120 degrees Celsius (C). A red indicator light in the gauge shall indicate high coolant temperature. The scale on the transmission oil temperature gauge shall read from 40 to 150 degrees Celsius (C). A red indicator light in the gauge shall indicate high transmission oil temperature. The scale on the voltmeter shall read from 8 to 16 volts. A red indicator light shall indicate high or low system voltage.

The instrument panel shall contain an Annunciator Module that contains the following indicator lights. All indicator lights shall contain LED lamps.

RED LAMPS
Stop Engine - indicates critical engine fault. (5)
Park Brake - indicates park brake is set.
Volts - indicates high or low system voltage. (4)
Low Oil Press - indicates low engine oil pressure. (4)
High Coolant Temp - indicates excessive engine coolant temperature. (4)
High Trans Temp - indicates excessive transmission oil temperature. (4)
Low Air - indicates low air pressure in either system one or system two. (4)
Low Coolant Level - indicates low engine coolant level. (1) (5)
Air Filter - indicates excessive engine air intake restriction. (5)
Brake System Fault - indicates a failure in the brake system (hydraulic brake systems only). (5)
Seat Belt Indicator - indicates that a seat is occupied, and the corresponding seat belt(s) remains unfastened.

YELLOW LAMPS
Check Engine - indicates engine fault. (5)
Check Trans - indicates transmission fault. (5)
Wait to Start - indicates active engine air preheat cycle. (2) (5)
ABS - indicates anti-lock brake system fault. (5)
Water in Fuel - indicates presence of water in fuel filter. (1) (5)
Check Message Center – indicates that there is a fault message present in the LCD digital display.
SRS - indicates a problem in the supplemental restraint system. (1) (5)
DPF - indicates restriction of the diesel particulate filter. (3) (5)
HEST - indicates a high exhaust system temperature. (3) (5)
MIL - indicates an engine emission control system fault. (3) (5)
Low Fuel - indicates low fuel. (4)

GREEN LAMPS
Left and Right turn signal indicators.
Aux Brake Active - indicates secondary braking device is active. (1)
High Idle - indicates engine high idle is active. (1)
ATC - indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system. (1) (5)
Ok To Pump - indicates that pump engagement conditions have been met. (1)
Pump Engaged – indicates that pump is currently in use. (1)

BLUE LAMP
High beam indicator.

The instrumentation system shall provide a constant audible alarm for the following situations:
Low air pressure.
Low engine oil pressure.
High engine coolant temperature.

High transmission oil temperature.
Low coolant level. (1)
High or low system voltage
Critical engine fault (Stop Engine).

The Check Message Center icon will illuminate, and a message will be displayed in the LCD screen for the following situations:
Cab Ajar
Low Oil Level
Door Ajar
Engine Communication Error
Transmission Communication Error
ABS Communication Error
High Coolant Temp
Turn Signal Reminder
Low Fuel
Low Oil Pressure
Low Coolant Level
Low Battery Voltage
High Battery Voltage
Low Primary Air Pressure
Low Secondary Air Pressure
High Trans Temp

The instrumentation system will provide a continuous alarm for the following situations:
Stop Engine
Low Coolant Level (1)
Brake System Fault
Check Trans
Check Engine
ABS
Engine Communications Error
Transmission Communications Error
ABS Communications Error
Low Fuel
Low Primary Air Pressure
Low Secondary Air Pressure
Low or High Battery Voltage
High Trans Temp
Low Oil Pressure
High Coolant Temp

The instrumentation system will provide a 160mSec second alarm every 880mSec for the following situations:
Seat Belt
Air Filter

Water in Fuel (1)
Cab Ajar
Low Oil Level
Door Ajar
Monitor extended
Extend-a-lights extended

The instrumentation system will provide a 160 millisecond second alarm every 5 seconds for the following situations:
Turn Signal Reminder

(1) Feature only available when optionally equipped.
(2) Feature only available on engines with preheat capability.
(3) Feature only on vehicles with diesel particulate filter (DPF).
(4) Warning light is present in gauge.
(5) A message on the LCD screen will also be displayed.

AM/FM RADIO/ CD WITH BLUE TOOTH
AM/FM Radio/CD player with blue tooth, four (4) speakers shall be installed in the cab. The radio shall be installed above the driver's position. The speakers shall also be installed inside the cab with two (2) speakers recessed within the headliner of the front of the cab just behind the windshield and two (2) speakers in the upper rear corners of the cab.

POWER WINDOWS
Power windows for all opening doors in the cab.

RECEIVER ANTENNA
A small antenna shall be located on the driver side of the cab roof for AM/FM and weather band reception.

REARVIEW CAMERA SYSTEM
An Audiovox Voyager or equivalent heavy duty rearview camera system shall be supplied. The system shall include one (1) camera which will be shipped for OEM installation in the body to afford the driver a clear view of the rear of the vehicle. The camera shall be wired to a Weldon dual Vista display or equivalent located, one (1) on the driver and one (1) on the officer dash and shall be automatically activated when the vehicle transmission is placed in reverse.

SIDEVIEW CAMERA SYSTEM
An Audiovox Voyager or equivalent heavy duty sideview camera system shall be supplied. The system shall include one (1) camera that will be shipped for OEM installation in the body to afford the driver a clear view of the right side of the vehicle. The camera shall be wired to a Weldon dual Vista display or equivalent located, one (1) on the driver and one (1) on the officer dash and be automatically activated by the right turn signal switch.

FIRE EXTINGUISHER
A 3A10BC certified approved fire extinguisher shall be shipped loose with the cab.

ROAD SAFETY KIT
The cab and chassis shall include one (1) emergency roadside triangle kit.

DOOR KEYS
The cab and chassis shall include a total of Two (2) door keys for the manual door locks on driver's door.

AS BUILT DIAGRAMS
The cab and chassis shall include one (1) complete set of "as-built" wiring schematics and option wiring diagrams.

CHASSIS WARRANTY
The chassis manufacturer shall warrant to the original purchaser the custom fire truck chassis for a period of twelve (12) months. The warranty period shall begin on the date the vehicle is delivered to the original purchaser and commence for twelve (12) months thereafter. The warranty shall include conditional items listed in the detailed warranty document which may be provided upon request.

OPERATORS MANUAL AND PARTS LIST
There shall be one (1) chassis operator's manual which includes a parts list including wiring and air plumbing diagrams provided and shipped loose with the vehicle. All standard wiring and plumbing diagrams shall be created specifically for the chassis model.

ENGINE AND TRANSMISSION OPERATION MANUALS
There shall be one (1) set of engine operation and maintenance manuals and one (1) set of transmission operation manuals specific to the models ordered included with the final vehicle in the ship loose items.

CUMMINS X15 ENGINE SERVICE MANUALS
There shall be one (1) set of the following Cummins X15 engine service reference manuals which shall be provided with the final vehicle.

Engine Troubleshooting and Repair Manual
Electronic Control System Troubleshooting and Repair Manual
Operation and Maintenance Manual
Wiring Diagram

ALLISON EVS TRANSMISSION SERVICE MANUALS
There shall be one (1) set of the following manuals included with the final vehicle relative to the Allison 3000 transmission or equivalent:

Allison Parts Catalog

Allison Service Manual
Allison Technician Manual
Electronic Controls Troubleshooting Manual
Mechanic's Tips

OVERALL HEIGHT AND LENGTH RESTRICTIONS
Apparatus shall not exceed 35 feet in length and 10 feet 6 inches in height.

FUEL FILL DOOR
A flush mounted door with stainless steel hinge and a flush-chromed locking mechanism to secure the door shall be installed over the fuel fill hose. The tank fill opening shall be conspicuously labeled with the words "DIESEL FUEL ONLY" engraved in capital letters, on a permanently attached label. The fill opening shall be installed in compliance with NFPA.

TESTING
The apparatus shall be thoroughly tested by Underwriters Laboratories Canada (U.L.C.) in accordance with the appropriate requirements of the latest edition of NFPA, Standard for Automotive Fire Apparatus.

Upon delivery, the Purchaser may elect to duplicate some or all of these pumping and road tests. The manufacturer shall include all required certification forms in the delivery package.

In event the apparatus fails to meet on-site delivery testing, second trials may be arranged within 30 days following first test failure. Such subsequent trials shall be final and conclusive and failure to meet these requirements shall be cause for rejection.

Failure to make changes deemed necessary by the Purchaser to make apparatus conform to any clause of the specifications within 30 days after notice to the manufacturer shall also be deemed cause for rejection of the apparatus. Permission to keep or store the apparatus by the Purchaser during the testing and re-testing period, if agreeable with manufacturer shall not constitute acceptance of the apparatus.

FIRE PUMP
A Waterous CSU single stage midship fire pump shall be installed. The pump shall be of a size and design and have the capacity of 2000 gallons per minute (U.S. GPM), NFPA 1901 rated performance.

PUMP ASSEMBLY
The pump body shall be close-grained gray iron and shall be horizontally split in two sections for easy removal of the entire impeller shaft assembly. Two-piece design shall allow complete servicing from underneath without disturbing pump mounting on the chassis or piping mounted on the fire pump.

The pump impeller shall be bronze with double suction inlets, fully balanced, and of

mixed flow design with labyrinth type-high efficiency wear rings. Wear rings shall be bronze and easily replaceable when needed.

The impeller shaft shall be stainless steel, accurately ground to size, and properly supported on each end by lubricated ball bearings. For ease of service, the impeller shaft shall be of two-piece construction, allowing the pump transmission to be removed from the pump body without having to disassemble either unit. The entire pump shall be cast, manufactured, and tested at the pump manufacturer's factory.

The entire pump, both suction and discharge passages, shall be hydrostatically tested at the manufacturer's facility to the performance specifications as outlined by the NFPA. Pump shall be free from objectionable pulsation and vibration.

DRIVE UNIT

The pump shall be driven by a driveline from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance.

The pump transmission shall be rigidly bolted to the pump body, and shall incorporate high strength, involutes tooth-form Morse Hy-Vo chain drive or equivalent for smooth, quiet transfer of power. The drive unit shall be manufactured and tested at the pump manufacturer's factory.

The pump drive unit shall be of sufficient size to withstand torque of the drive train components in both road and pump operating conditions. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

FIRE PUMP INSTALLATION

The pump shall be rigidly mounted to the chassis frame rails. Driveline analysis software shall be used to calculate driveline angles, taking into account the specific power train components, wheelbase, and pump location.

FIRE PUMP PAINTING

The fire pump will be painted. This is to include all intakes, discharges, manifolds, and associated valves.

PUMP SHIFT CONTROL

The mid-ship fire pump shift control shall be an electric over air mechanism that shall be located on the left side of the steering column. The shift mechanism shall be wired into the vehicle interface module to interlock the engine rpm control, transmission direct drive hold mode, and pump engage.

The shift switch console shall consist of three-(3) indicator lights. This console shall include a green indicator light that shall be energized when the pump shift has been completed, and shall be labeled, "PUMP ENGAGED".

A second green indicator light in the driving compartment shall be provided and energized when both the pump shift has been completed and the chassis transmission is engaged in pump gear. The light shall be labeled, "OK TO PUMP".

There shall also be a “Throttle Ready” indicator light at the pump operator's position, indicating when the chassis transmission is in the neutral position and the parking brake is engaged.

Electronic signals shall be provided at the firewall to facilitate installation of a warning light at the pump operator's position, indicating when the chassis transmission is in the neutral position and the parking brake is engaged.

A third green indicator light in the driving compartment shall be provided and energized when the pump shift has been completely disengaged, and the chassis drive axle has been engaged, and shall be labeled, "ROAD".

FLAME PLATE IMPELLER HUB

The impeller hub shall receive a flame plating treatment that will impregnate the hub with molten tungsten carbide.

The flame plating treatment shall harden the hub to reduce wear on the impeller wear ring for maximum pump life.

MECHANICAL SEAL

The mid-ship pump shall be equipped with a high quality, spring loaded and self-adjusting mechanical seal capable of providing a positive seal to atmosphere under all pumping conditions. A continuous cooling flow of water from the pump shall be directed through the seal chamber when the pump is in operation.

PRIMING PUMP

One-(1) Waterous fully automatic solenoid actuated model VPO, environmentally safe, oil-less priming pump shall be of the positive displacement type, electrically driven and conform to standards outlined by the NFPA. One-(1) priming control shall both open the priming valve and start the priming motor.

A lever activated manual override shall be provided to permit priming of the fire pump in event of electrical failure.

ENGINE COOLER

An auxiliary engine cooler shall be installed on the apparatus and controlled by a valve on the pump operator's panel. This auxiliary cooler shall allow water from the intake side of the pump to circulate thru a heat exchanger located inline with the engine cooling system without intermixing with the coolant to provide additional engine cooling during sustained periods of pumping.

PUMP COOLING
The pump to tank fill valve shall be used as a recirculation line for the purpose of cooling the fire pump when necessary. The tank fill valve control shall be labeled "Tank Fill/Re circulation".

DRAINS
Individual drain/bleeder valves shall be Class 1 quarter turn style, labeled per NFPA standards for 1-1/2" and larger lines.

MASTER DRAIN VALVE
A master drain valve shall be installed and operated from the pump panel area. The valve shall be located lower than the main pump body.

PUMP ENCLOSURE, TOP MOUNT
The pump enclosure shall be completely fabricated of aluminum.

The fire pump shall be mounted within a separate body module that is not directly connected to the apparatus body. This module shall be mounted to the frame in four locations and in such a manner as to reduce the likelihood of a collision causing the pump casing to crack.

The point where the pump module is mounted to the frame shall be reinforced appropriately to carry the expected load for the life of the apparatus.

The top mount pump enclosure shall provide an area for the installation of cross lays or a dunnage area.

Any pump enclosure constructed using any material other than aluminum or utilizing any other mounting method is not acceptable.

A 24" wide crosswalk/pump operator's area shall be provided. The crosswalk floor shall be manufactured from 3/16" non-skid aluminum tread plate and shall be accessible from both sides of the apparatus using running board steps. The distance from the top surface of the running boards to the top surface of the crosswalk shall not exceed 18" per NFPA standards.

Two (2) clear lens lights shall be installed to illuminate the crosswalk area. Lamps shall be activated when the pump is engaged. A crosswalk warning sign shall be installed centered on the exterior wall of the cab per NFPA standards.

PUMP PANELS
The top left and right pump panels shall be fabricated of 304L brushed stainless steel.

The 3 access for the pump enclosure (right, left and front) shall be constructed using 16-gauge stainless checker plate. The left and right-side panels shall have large openings with trim collars for ease of servicing the side mounted suction and discharge valves,

eliminating disassembly of the lower side panels for routine maintenance. A full width top-hinged service door shall be provided on both sides of the pump enclosure. Trigger latches shall be installed to secure the panel in the closed position. The main access pump panel shall be located below the pump panel on the crosswalk pump operator area.

The master gauges shall be located on the top panel, flanked by the other auxiliary monitoring devices as required. Individual line pressure gauges shall be located on either side of the master gauges.

The line gauges shall be functionally arranged so that all discharge line gauges are in a horizontal plane. The gauges shall be located directly above the corresponding valve control thus eliminating confusion when operating discharges and monitoring discharge pressures. Misaligned or staggered line gauges located on the operator's panel are not acceptable.

Individual drain valve controls and master drain controls shall be located at the lower area of the side pump panels. All gauges and controls shall be installed in accordance with the latest NFPA 1901 standards. The following items shall be included on the panels as well as the other specified items:

Engine Cooler
Discharge Controls
Drain Controls
Gauges
Pressure-Vacuum panel adapters for testing
Underwriter's Certification Plate
Intake Controls
Engine Throttle Control
Tank Fill Control
Tank to Pump Control
Primer Control
Pump Pressure Control

A brushed stainless-steel hood shall be provided above the top console. Pump panels and surface lighting shall be installed in the hood. The light switch shall be located on the pump operator's panel.

All side panels, instrument panels, and bezels shall be deburred to eliminate sharp edges. All edges of the pump enclosure shall be formed over, creating a smooth radius corner to prevent injury when performing maintenance through the access openings.

PUMP ENCLOSURE DIMENSIONS
Overall length shall not exceed 68.00" front to back, plus flex joints.
Overall width shall not exceed 74.00" side to side, plus running boards.

CROSSLAYS/SPEEDLAYS

There shall be two single stacked (2) 1 ¾" cross lays in the walkway in front of the pump compartment, both beside each other in removable aluminum trays. The height of trays shall be 60 inches from ground to middle of trays. Each 1 ¾" cross lay shall be plumbed with a 2" full-flow stainless steel valve. The hose connections will be installed on the outside of pump compartment below hose tray (front tray drivers left side and back tray passenger right side) Verification of hose connections at pre manufacture meeting. Each hose bed can be deployable on either side of the vehicle.
Removable aluminum trays will be sized and constructed the same as other fire department engines, so they are all compatible.

Each of the 1 ¾" cross lays shall accommodate up to 200' of 1-3/4" pre-connected hose.

CROSSLAY/SPEEDLAY COVER
There shall be a vinyl end flap with restraint located on each end of the pre-connected cross lay/speed lay. The flap shall be easily opened with a gloved hand and secured with snaps and Velcro or equivalent. Alternative closure options can be discussed at pre-manufacture meetings.

STORAGE AREA
The area above the pump enclosure shall incorporate an extendable manual controlled monitor, a double stack tray to accommodate 200 feet of 2 ½ inch pre-connected hose with nozzle and a remote operated LED light tower. LED Command Light Tower is detailed in the next section.

LED COMMAND LIGHT TOWER
A remote operated LED light tower similar or equivalent to the KNIGHT SERIES KL415A-FX shall be installed on top of pump compartment enclosure /storage area.

RUNNING BOARDS
Two-(2) 3/16", non-skid polished aluminum tread plate running boards shall be bolted to the pump enclosure substructure. Running boards shall be a minimum of 12" deep and isolated from the pump enclosure with non-metallic material. The design shall incorporate a break formed flange that extends down and returns inward.

HANDRAILS, PUMP ENCLOSURE
Two (2) 18" long extruded aluminum non-slip handrails with black rubber inserts and chrome plated stanchions shall be installed one (1) each side at the top of the pump enclosure. These handrails are provided to assist in accessing the top of pump storage areas and accessories.

HANDRAILS, CROSSWALK
Two (2) 18" long extruded aluminum non-slip handrails with black rubber inserts and chrome plated stanchions shall be installed one (1) each side at the on the front outer corners of the pump enclosure at the crosswalk entrances. These handrails are to provide convenience for pump operator for safe entrance and egress to and from the top console crosswalk.

PUMP COMPARTMENT WORK LIGHTS
Two-(2) manually switched pump compartment work lights shall be installed on one-(1) each side in the pump area. The switch to turn on lights shall be located on the pump panel.

ARCTIC HEAT SHIELD
A custom heat shield shall be installed under the complete pump enclosure. This unit shall be constructed using Aluminum material. The unit shall be designed to trap engine exhaust muffler heat to provide freeze protection for the pump and related piping. For ease of maintenance, the heat shield shall be designed to easily slide out either side of the apparatus by one person.

PUMP HEATER SYSTEM
The pump panel and instruments shall be protected against freezing by a radiant heat tube and fin hot water heating element plumbed into the chassis coolant system. There shall be shut off valves included to isolate the system for warm weather operations.

TAGS
The intakes, discharges, drains, controllers, and gauges shall all be function and color-coded using individual labels as required in the NFPA 1901 section.16.9.1.

"NO STEP" TAGS
There shall be “No Step” tags installed identifying the non-step surfaces in and around the area of the pump enclosure.

MASTER GAUGES
The master pump intake and discharge gauges shall be 4-1/2" diameter Class 1 Sub-Z Interlube filled 30-0-600 PSI compound gauges, with black letters on a white background.

INDIVIDUAL LINE GAUGES
All discharges shall be equipped with an individual 2-1/2" diameter Class 1 premium, Sub-Z Interlube filled 30-0-600 PSI compound gauge with black letters on a white background.

PUMP HOURMETER
There shall be an hour meter located on the pump operator's panel to record the hours that the pump has been engaged. This hour meter shall be activated when the "OK to Pump" light is energized.

AIR HORN CONTROL, PUMP PANEL
There shall be one-(1) air horn push button control provided on the pump panel.

GAUGE HEATER
There shall be MC Products gauge heaters installed on the pump intake and discharge gauges.

PIPING
All plumbing 1-1/2" through 3" shall be either stainless steel or high-pressure flexible piping with a schedule of 40 stainless steel couplings. Where large diameter plumbing is required, a minimum schedule of 10 stainless steel shall be utilized.

Wherever possible, piping shall be flange bolted directly to the multiple port openings on the fire pump body. For ease of service and longer life of plumbing, Victaulic couplings shall be utilized where necessary.

INTAKE AND DISCHARGE VALVES
All intake and discharge valves used in the plumbing of the fire pump shall be either Akron or Elkhart stainless steel ball valves.

VALVE CONTROLS, TOP MOUNT
The top mount-controlled pump panel shall be equipped with lever style manual control valves for intake and discharges up to 2 ½". To improve identification of discharges and intakes, color coded tags should be provided. The tags shall utilize an etching process to provide easy visibility and improved field service life. Tags shall be affixed using an industrial grade adhesive backing, eliminating the need for pop rivets or screws into the panel or control handle.

Discharges and gated intakes 3" and larger shall include a speed regulated mechanism as required by NFPA 1901.

For ease of operation, the push-pull handles shall be positioned directly below the pressure gauges.

INTAKE, MAIN, 6" LEFT NST, GATED
One-(1) 6" NST main gated inlet shall be installed on the left side of the pump. This intake shall be controlled by a 6" electric operated Waterous "Monarch" valve and shall be installed with 7 LED position indicator lights and control located at the pump operator's control panel. The left side intake shall include a drain/bleeder valve. The inlet shall be equipped with a removable screen and terminate with a 5" Storz coupling, cap and a 30-degree droop.

INTAKE, MAIN, 6" RIGHT NST, GATED
One-(1) 6" NST main gated inlet shall be installed on the right side of the pump. This intake shall be controlled by a 6" electric operated Waterous "Monarch" valve and shall be installed with 7 LED position indicator lights and control located at the pump operator's control panel. The right-side intake shall include a drain/bleeder valve. The inlet shall be equipped with a removable screen and terminate with a 5" Storz coupling, cap and a 30-degree droop.

INTAKE RELIEF VALVE
There shall be one-(1) Akron 59 intake pressure relief valve installed on the intake side of the pump. This valve shall be preset to relieve at 150 PSI through 2 ½" plumbing

terminating with a 2 ½" MNST coupling below the running board on the right side of the apparatus.

TANK TO PUMP

One-(1) 4" full flow ball valve tank to pump plumbing with a flexible connection using double stainless steel clamp assemblies and a swing type check valve shall be installed and controlled at the pump operator's panel using an Akron Navigator swing-out valve control style #9313 or equivalent.

INLET, AUXILIARY, LEFT PANEL, 2-1/2"

There shall be one-(1) 2-1/2" gated intake located on the left pump panel, in the forward position. The intake valve shall be located behind the panel and controlled from the top mount panel using an Akron Navigator swing-out valve control style #9313 or equivalent. This inlet shall be terminated with a chrome 2-1/2" Female NST swivel, brass strainer with a plug and chain. A ¾" quarter turn bleeder for this intake shall be in the bleeder/drain panel.

INLET, AUXILIARY, RIGHT PANEL, 2-1/2"

There shall be one-(1) 2-1/2" gated intake located on the right pump panel, in the forward position. The intake valve shall be located behind the panel and controlled from the top mount panel using an Akron Navigator swing-out valve control style #9313 or equivalent. This inlet shall be terminated with a chrome 2-1/2" Female NST swivel, brass strainer with a plug and chain. A ¾" quarter turn bleeder for this intake shall be in the bleeder/drain panel.

PUMP RATING, 1750 IGPM

The pump shall be certified to meet the following deliveries from draft, through two-(2) 20-foot lengths of 6-inch suction hose with an 8-foot lift at a maximum elevation of 2000 feet:

1750	GPM @	150 PSI
1750	GPM @	165 PSI
1225	GPM @	200 PSI
875	GPM @	250 PSI

DISCHARGE, BUMPER, 1-3/4"

A 1 ¾" discharge shall be located inside bumper storage compartment. This discharge shall be plumbed with 2 1/2" plumbing and controlled by a 2 1/2" full flow valve with the control at the pump panel. Drains shall be installed at the lowest point of the plumbing. The discharge hose connection shall be forward facing, officer side on top section of compartment.

DISCHARGE, 2-1/2" LEFT PANEL

One-(1) 2-1/2" full flow, droop snoot (with elbow) discharge valve shall be located at the left side forward area of the pump enclosure and direct connected to the discharge side of the pump. The discharge shall be controlled from the pump operator's panel and terminate with a 2- 1/2" male NST coupling with a cap and chain. A ¾" quarter turn

bleeder for this discharge shall be in the bleeder/drain panel.

DISCHARGE, 2-1/2" LEFT PANEL
One-(1) 2-1/2" full flow, droop snoot (with elbow) discharge valve shall be located at the left side, rearward area of the pump enclosure and direct connected to the discharge side of the pump. The discharge shall be controlled from the pump operator's panel and terminate with a 2-1/2" male NST coupling with a cap and chain. A ¾" quarter turn bleeder for this discharge shall be in the bleeder/drain panel.

RIGHT SIDE 4" LARGE DIAMETER DISCHARGE
There shall be one (1) 4" NST discharge located on the right side forward area of the pump enclosure. The discharge shall be plumbed with a 4" valve electrically controlled. The plumbing shall terminate through the panel with a female 4" NPT x 5" Storz adapter with cap, painted with a red powder coating. The discharge shall be controlled from the operator panel using an Akron Navigator swing-out valve control style #9313 or equivalent.

DISCHARGE, 2-1/2" RIGHT PANEL
One-(1) 2-1/2" full flow, droop snoot (with elbow) discharge valve shall be located at the right side, rearward area of the pump enclosure and direct connected to the discharge side of the pump. The discharge shall be controlled from the pump operator's panel and terminate with a 2-1/2" male NST coupling with a cap and chain. A ¾" quarter turn bleeder for this discharge shall be in the bleeder/drain panel.

DISCHARGE, SPEEDLAY
Two-(2) One on either side 2" valve and full flow plumbing shall be piped to a 1-1/2" NST male outside of pump compartment below trays.

DISCHARGE, 2 ½ INCH ABOVE PUMP COMPARTMENT
ONE (1) on right side 3-inch valve and full flow plumbing shall be piped to a 2 ½ inch male NST outside below 2 ½ speedlay tray.

DISCHARGE, REAR, RIGHT
One-(1) 2 ½' discharge shall be run to the rear outside of the hose bed on the right-hand side of the apparatus. A 2 ½" valve shall be installed and controlled at the pump operator's panel. A ¾" quarter turn bleeder for this discharge shall be in the bleeder/drain panel.

DISCHARGE, DECK GUN
The deck gun discharge shall be directly connected to the pump with an Akron 3" full flow valve with 3" plumbing and controlled from the operators panel using an Akron Navigator swing-out valve control style #9313 or equivalent. This discharge shall be centered above the pump enclosure and terminate with a 3" male pipe thread. A ¾" quarter turn bleeder for this discharge shall be in the bleeder/drain panel.

The outlet will be centered above the pump enclosure for use with the deck gun.

A TFT Extend-a-Gun and a TFT Crossfire Monitor or equivalent shall be installed on the apparatus by the supplier. The deck gun shall be manually controlled with a step designed into the access door below the pump panel. This step will give the pump operator better access to operate the monitor.

BOOSTER HOSE REEL

A booster line with small electric reel shall be located inside the pump compartment area, underneath the 1 ¾ inch hose trays on left driver's side. It will accommodate a ¾ inch 50ft hard jacket hose. The hose reel will have a rewind control button mounted on the outside of panel.

FOAM SYSTEM AND CONTROLS

The system shall be designed for Class A foam concentrates, producing at least 1000 GPM using a 0.5% concentrate setting at 150 PSI.

Foam proportioning shall be automatically based on direct measurement of water flows in the water/foam discharge manifold that supplies the pre-connected discharges. The sensor shall be a paddlewheel type flow meter installed in the manifold. Full flow check valves shall be installed to prevent foam contamination in the fire pump and/or water contamination in the foam tank.

The pump operator foam system control shall be a digital computer push-button module with LED digital displays. Functions include:

Foam setting adjustments from 0.1% to 1.0% in 0.1% increments, 3% and 6%.

Show current IGPM of water flow.

Show total volume of water discharged during and after foam operations.

Show total volume of foam concentrate used.

Simulate flow rates for manual operation.

Perform setup and diagnostic functions for system microprocessor.

Show "low concentrate" warning as foam level runs low.

Flash "no concentrate" when foam tank is empty, shutting down the foam injection pump system to prevent pump damage.

Included in the pump operator's control panel shall be a system operation instruction plate, and a plate showing the foam system piping schematic.

FOAM TANK, A

A 60-gallon polypropylene foam tank "A", with vented fill tower, strainer, and drain shall be installed inside the main water tank on the apparatus. The water tank size shall be increased to compensate for the area required for the installation of the internal foam tank.
Filling the foam tank will be accomplished using a 12-volt electric pump and piping from ground level.

FOAM LEVEL GAUGE, A
One-(1) Tank vision foam level unit shall be installed on the pump operator's panel indicating the foam level in the A foam tank.

FOAM MANIFOLD PLUMBING
The foam system shall be plumbed to the front bumper discharge.
The foam system shall be plumbed to the two (2) – 1 ¾" speed lay.
The foam system shall be plumbed to the (1) 2 ½" rear discharge outlet.
The foam system shall be plumbed to the (1) 2 ½ speed lay above pump compartment.

PUMP MANUALS
There shall be two-(2) pump operation and parts manuals supplied on flash drive included with the apparatus.

INTERMEDIATE STEPS (2)
There shall be (2) intermediate steps installed on the truck (one on the left side of the pump house, and one on the right side of the pump house). They shall be approximately 9 inches deep and formed out of tread plate (NFPA approved). They shall be used for accessing the foam tanks, as well as loading hose.

WATER LEVEL GAUGE
One-(1) Tank vision water level gauge shall be installed on the pump operator's panel indicating the water level in the water tank.

One (2) Strip – Lite Series tank status light with four color LED light shall be mounted on each side of the cab behind the rear cab door.

WATER TANK
The water tank shall have a capacity of 1500 U.S. gallons (approx. 1250 Imperial).

TANK CONSTRUCTION, POLYPROPYLENE
The tank shall be constructed of 1/2" thick polypropylene sheet stock. The tank shall be designed to be completely independent of the body and compartments. All joints and seams shall be nitrogen welded inside and out. The top of the tank shall be fitted with eyes to facilitate easy removal.

The swash partitions shall have vent and air hole openings, at both the top and bottom to permit movement of air and water between the compartments. The longitudinal swash partitions are constructed of 3/8" polypropylene and extend from the floor of the tank

through the cover to allow for positive welding. The transverse swash partitions shall be constructed of 3/8" polypropylene and extend from the floor of the tank to the underside of the top cover. All swash partitions shall interlock with one another and shall be welded to both the floor and the sides of the tank.

The tank cover shall be constructed of 1/2" polypropylene and shall allow for removal and inspections, if necessary. The tank cover shall be recessed 3/8" from the top of the tank and shall be welded to both the sides and longitudinal baffles.

Each one of the covers shall have hold-downs consisting of 2" polypropylene dowels spaced a maximum of 30" apart, fitted, and then welded to the transverse partitions. The dowels shall extend through the cover and be welded.

Two-(2) of the dowels shall be drilled and tapped 1/2" x 13" to accommodate lifting eyes.

SUMP

There shall be one-(1) sump installed in the tank. The sump shall be a minimum of 16 “x 8” x 2” with a 3 /4” bottoms and shall be in the front of the tank. The sump shall have a 3" threaded plug located at the bottom for a tank drain.

MOUNTING

The tank shall rest on cross members and shall be cushioned with a minimum of 1/4" hard rubber strips, 3" wide, with a minimum of 60D hardness. The water tank shall sit on the integral subframe assembly of the apparatus body. The water tank shall be held in place by aluminum stops positioned on the subframe to prevent any fore, aft, or side-to-side movement. The tank shall be designed with the free-floating suspension principle. The tank shall have adequate hold down restraints to minimize vertical movement of the tank. The restraints shall be fabricated with aluminum angles and be insulated with rubber sheet.

TANK DRAIN

There shall be a 1/4 turn ball valve located on the tank sump for quick and easy draining of the tank.

TANK FILL FLANGE

A female flange for the tank fill line shall be bonded into the front bulkhead of the tank with an inner deflection shield. The size of the flange shall be compatible with the specified tank fill valve.

TANK FILL TOWER, POLYPROPYLENE

The tank shall have a vent. The vent overflow shall be scheduled 40 polypropylene pipe, with an I. d. of 6" that shall be designed to run through the tank to behind the rear wheels.

TANK SUCTION PIPING

The tank to pump suction valve connection shall be all polypropylene construction.

BODY DESIGN AND CONSTRUCTION
The body and cab height shall be the same.

MODULAR BODY CONSTRUCTION
The main body and the pump compartment shall be fabricated as individual units. Both the body and pump compartment shall be fabricated using precision holding fixtures to ensure proper dimensions. All attachment points shall be heavily reinforced.

BODY MATERIAL
The body shall be constructed of structural aluminum plate. The compartment floors, ceilings, front panels, side, and rear walls, as well as the wheel wells and hose compartment walls shall be constructed of 3/16" 5052 H32 aluminum panels.

ROLLUP DOORS, ROM
The body side compartment doors shall be extruded red aluminum anodized roll up doors. If red anodized is not available or the color cannot be matched to existing body red then regular aluminum color will be used.

Each door shall have interlocking slats with a co extruded PVC and rubber inner seal to prevent metal-to-metal contact, dirt and moisture from entering the compartment. The low-profile side seal maximizes usable storage space. The bottom seal is “V” shaped double seal to prevent water and debris from entering the compartment. The lift bar is to be one-piece, full width allowing one hand operation of the door.

Compartment light switches for the rollup doors shall be magnetic reed switches. Activation is controlled by magnets and sensors protected and concealed within the door assemblies.

COMPARTMENT SIZES
The compartment sizes listed here are the minimum sizes. Nothing herein prevents the vendor from providing larger compartments provided the overall dimensions are not exceeded.

LEFT SIDE COMPARTMENTS
The side compartments shall be formed from individual compartment assemblies welded together into a unitized structure. The structure shall be designed with minimal parts to reduce the amount of welding required and minimize stress concentrators. Each corner compartment front, rear, outside, and full depth inside wall shall be constructed from a single ***sheet*** of material. The assembly over the wheel shall then span between the corner compartments with a single compartment ceiling across all compartments. The entire side compartment assembly shall be capped with a wire trough for centralized harness routing and a NFPA compliant skid-resistant polished tread plate cap.

Within each corner compartment, the front or rear shall be of double wall construction. This shall provide a protected mounting area for electrical nodes and other recessed components. Easily removable access panels shall be provided for maintenance purposes.

The remaining side shall be of single wall construction between the corner and the wheel well to maximize interior storage volume.

Additionally, each compartment shall include a large sweep out at the outside of the compartment. This sweepout shall create a sealing surface at the bottom of the door and shall prevent any water at the door from running back into the compartment. Compartments without sweep outs may form water traps and are therefore not acceptable.

COMPARTMENT L-1

Compartment L-1, ahead of the rear wheels, shall be 49.0" wide x 63.25" high x 24" deep in the lower 30” section and 12" deep in the upper section. The clear door opening shall be approximately 44” wide by 66” tall. The upper section of the compartment shall have two adjustable shelves. The lower section has a floor mounted tray.

COMPARTMENT L-2, WHEELWELL

Compartment L-2, above the rear wheels, shall be 60.0" wide x 38" high x 12" deep for the top portion. The clear door opening shall be approximately 58” wide by 36” tall. Two adjustable shelves shall be located inside the compartment.

SCBA COMPARTMENTS BELOW L2

There shall be a compartment to accommodate 3 SCBA cylinders in either side of wheel wells.

COMPARTMENT L-3

Compartment L-3, behind the rear wheels, shall be 49.0" wide x 63.25" high x 24" deep in the lower section. The clear door opening shall be approximately 44” wide by 66” tall. The upper section of the compartment shall have two adjustable shelves. The lower section has a floor mounted tray. This compartment must be well vented to accommodate gas powered equipment.

RIGHT SIDE COMPARTMENTS

The side compartments shall be formed from individual compartment assemblies welded together into a unitized structure. The structure shall be designed with minimal parts to reduce the amount of welding required and minimize stress concentrators. Each corner compartment front, rear, outside, and full depth inside wall shall be constructed from a ***single sheet*** of material. The assembly over the wheel well shall then span between the corner compartments with a single compartment ceiling across all compartments. The entire side compartment assembly shall be capped with a wire trough for centralized harness routing and a NFPA compliant skid-resistant polished tread plate cap.

Within each corner compartment, the front or rear shall be of double wall construction. This shall provide a protected mounting area for electrical nodes and other recessed components. Easily removable access panels shall be provided for maintenance purposes. The remaining side shall be of single wall construction between the corner and the wheel well to maximize interior storage volume.

Additionally, each compartment shall include a large sweep out at the outside of the compartment. This sweep out shall create a sealing surface at the bottom of the door and shall prevent any water at the door from running back into the compartment. Compartments without sweep outs may form water traps and are therefore not acceptable.

COMPARTMENT R-1
Compartment R-1, ahead of the rear wheels, shall be 49.0" wide x 63" high x 24" deep in the lower section and 12" deep in the upper section. The clear door opening shall be approximately 45” wide by 66” tall. The upper section of compartment shall have one adjustable shelf. The lower section has one adjustable shelf.

COMPARTMENT R-2 , WHEELWELL
Compartment R-2, above the rear wheels, shall be ? " wide x 36" high x 12" deep. The clear door opening shall be approximately ? ” wide by 33” tall for each compartment. Compartment R-2 to be located behind the Zico ladder hydraulic unit.

SCBA COMPARTMENTS BELOW R2
There shall be a compartment to accommodate 3 SCBA cylinders on the front side of wheel well.

COMPARTMENT R-3
Compartment R-3, behind the rear wheels, shall be 49.0" wide x 63" high x 24" deep in the lower section. The clear door opening shall be approximately 44” wide by 66” tall. The upper section of compartment shall have one adjustable shelf. The lower section has one adjustable shelf. There shall be a 110-volt receptacle installed inside of compartment upper portion.

REAR COMPARTMENTATION, RR1
This door size will be determined by how much room is available between left side folding hose bed access ladder and right-side pre-connected AKRON monitor location.

DECKING IN COMPARTMENTS
Black Turtle Tile self-draining interlocking vinyl tiles or equivalent, with beveled edge caps, shall be provided on the floor, shelves, and trays of each enclosed compartment.

SHELVING
All shelves shall be provided. The shelves shall be constructed of 3/16" smooth aluminum plate. The front and rear edges shall be formed up 2". Adjustable shelves shall be mounted on adjustable track type channels to provide height adjustment with simple standard hand tools.

ADJUSTABLE SHELF TRACK
Adjustable shelf track shall be provided in the compartments for future mounting of vertically adjustable shelves or trays.

TRAYS, 250 POUND CAPACITY
Two-(2) floor-mounted trays shall be provided. The trays shall be constructed of 3/16" smooth aluminum plate with at least a 3" lip formed around the perimeter and the corners welded. Trays shall be mounted on full extension ball bearing slides with a minimum rating of 250# per pair. The trays shall be capable of being locked in both the extended and retracted positions. There will also be a single gas shock mounted to the bottom of the tray, and floor of the compartment to aid in opening and closing the tray.

PROTECTION PANELS
Aluminum tread plate protection (trim) panels shall be furnished as follows:

Front of Body
Full height on the front face of compartments from body side compartment covers down to the pump area running boards.

Body Side Compartments
The tread plate covers shall run the full length and width on top of the side compartments with a built-in drip rail.

Both rear bulkheads
The protection panels shall cover the inside rear face of the bulkheads from the body side compartment covers to the bottom of the compartment.

Rear compartment and Hose bed
The entire rear face of the center rear compartment and the hose bed shall be trim with aluminum tread plate.

RUBRAILS
Extruded aluminum rub rails shall be provided along the lower edge of the apparatus body. The rub rail assemblies shall be spaced-out and isolated from the body with non-metallic materials. Each rub rail shall consist of an anodized aluminum extrusion interlocked with an extruded, UV stable, rubber impact strip.

COMPARTMENT VENTILATION
A minimum of one-(1) louvered vent shall be furnished in each compartment.

WHEEL WELL AREA
The outer wheel well panel shall be an integral part of the overall body design. The wheel well area shall be fabricated of 5052-H32, 3/16" smooth aluminum painted to match the body. The wheel well liner shall be solidly welded to the body skin. Removable polished aluminum fenderettes will be securely fastened to the rear wheel well liners.

FENDERETTES
Two (2) polished stainless steel fenderettes shall be securely fastened to the rear wheel wells, one-(1) each side.

HOSE BED AREA
The hose bed shall be designed and constructed of the same material as the apparatus compartments.

Full height vertical structural shall be fastened to the outer hose compartment sidewalls at each end and in the center if necessary to provide a mounting surface for wall-mounted accessories. The interior of hose bed area shall have a mill finish and shall not be painted.

Polished stanchions shall be installed at the top of the rear channels for the installation of the upper rear warning lights.

HOSE BED DECKING
The hose bed decking shall be slotted, corrosion free, composite material to promote drainage and air circulation in the hose bed.

HOSE BED CAPACITY
The hose bed capacity shall exceed the NFPA hose bed capacity requirements.

HOSE BED DIVIDERS
Two (2) smooth aluminum adjustable hose bed dividers shall be installed in the hose bed to the left side. This will be to accommodate spare 1-3/4 inch and 2-1/2-inch hose. One (1) smooth aluminum adjustable hose bed divider shall be installed in the hose bed to the right side. This will be to accommodate a 2 ½ inch 200ft pre-connected AKRON ground monitor. The middle open section of the hose bed will accommodate up to 800ft of 5-inch-high volume hose.

PRE-CONNECTED 2 ½ INCH AKRON MONITOR
This pre connected portable monitor shall be installed below and in line with hose on back of vehicle, to the right of roll door. A quick release mounting system will be used to house AKRON nozzle. This can be discussed during the pre-meeting.

HOSE BED COVER
The hose bed stage area will be covered with two (2) hinged, power operated aluminum doors. The doors shall be hinged on the outside using full length steel piano style hinges. The doors shall lift upwards with a powered system. The doors will be operated by a switch located in the rear ground level area. This switch will be in a sealed compartment with ladder lifting controls on right lower side. There shall be one (1) LED light strip or bar mounted to the underside of each hose bed door angled downwards in the up position to illuminate entire hose bed and upper compartments. Lights will automatically turn on when doors are in an upright position.

TAILBOARD
A 12” deep tailboard (rear platform) fabricated of NFPA compliant aluminum diamond plate shall be installed at the rear of the body. The tailboard shall be constructed from 3/16” thick plate and shall be a stand-alone structure minimizing the need for underbody support and secured to the body at the floor support extrusions, one on each side. This

shall minimize the chance of impact damage to the tailboard being transferred into the body. It shall also facilitate easy removal and replacement of the tailboard in the event of damage. The tailboard forward lip shall turn downward and be offset slightly from the rear panel to provide drainage.

FOLDING LADDER
A folding ladder system on the rear left side will supply access to the hose bed.

HANDRAILS, VERTICAL
Two-(2) forty-eight-(48) inch long extruded aluminum handrails with non-slip black rubber inserts and chrome-plated stanchions shall be furnished. They shall be vertically mounted on the rear of the body, one-(1) each side.

TOW EYES, REAR
Two-(2) rear tow eyes shall be securely bolted to the chassis frame rail. The tow eyes shall have at least a 3" opening in a half inch thick steel plate. Both plates shall be joined with a welded cross member.

MUD FLAPS, REAR
Two-(2) Mud flaps shall be installed behind the rear wheels and shall be attached with stainless steel fasteners.

LADDER RACK, POWER
The ground ladders shall be mounted above the right-side compartments with a Zico HLAS Hydraulic Ladder Rack. The highest point of the ladder storage rack with all 3 ladders included will not extend higher than the cab. The ladders shall be power operated downward a total of 31" from the stored position for easier deployment by personnel standing on the ground.

The controls for the ladder rack will be located right rear of the engine just above the right rear turn signal inside a sealed compartment with power controls for the hose bed doors. This location will give the operator a full travel view of the ladders to and/or from the stored position to prevent mishaps. An audio-visual alarm system shall be provided at the ladder control switch station and shall be wired to activate the alarm whenever ladder rack is in motion.

For added safety there shall be flashing red lights installed at the front and rear of the ladder rack flashing at all times when the ladder rack is out of the stored position (in use), and outer edges of the rack framing shall be fitted with white reflective trim. Also, a position sensor on the ladder rack shall be wired to the red flashing light and Vista in the cab to alert the driver if the rack is not properly stored for travel.

FOLDING LADDER AND PIKE POLE STORAGE
This will be located behind the right side roll up door mechanism below ground ladder storage. Access will be from the rear of the engine.
Mounting brackets for two-(3) (12ft, 8ft and 6ft) pike poles and folding attic ladder shall

be provided.

INTERMEDIATE STEP, REAR
There shall be a full width; intermediate step located the rear of the truck, over the center rear compartment for accessing the main hose bed and loading hose.

LONG TOOL AND BASKET STRETCHER STORAGE COMPARTMENT
A long storage compartment (same length as hose bed) shall be located above the driver side compartments L-1 to L-3. There will be 2 individual compartments with separate top doors. The front compartment will be used for full basket rescue stretcher and spine board, with inside clearance measurements of 26 inches deep, 12 inches wide and 87 inches long. The rear compartment will be the same measurements except for length which will be remainder of compartment available. It shall be constructed using aluminum diamond plate. The large aluminum hose bed cover door will also cover these compartments.

ELECTRICAL WIRING
Wiring shall be permanently color coded to identify wire function. Wires shall be permanently heating ink embossed with both number and function codes. The function codes shall be the "descriptive" name of the circuit served. The number code shall be the exact purpose of that circuit. This number code shall be completely referenced in a detailed wiring schematic provided with the vehicle.

Wiring installed in the manufacturing process shall be routed in conduit or high temperature loom with a rating of 300 degrees Fahrenheit where necessary to protect it. All added wiring shall be in accessible, enclosed, and protected locations. All conduits, looms, and wiring shall be secured to the body cable straps in order to prevent sagging and movement that result in chafing, pinching, snagging, or any other damage. These cable straps shall be secured to “welded” stud provided as required throughout the harness run to provide security. All apertures on the vehicle shall be properly grommeted and sealed for passing wiring and conform to SAE 1292. All items used for protecting or securing the wiring shall be appropriate for the specific application and be standard automotive, aircraft, marine or electronic hardware.

The body wiring shall be provided with “centralized” ground points. These shall be easily accessible for service. These centralized ground points shall utilize solid connection studs for reliability. The wiring harness shall incorporate a master ground wire to connect to these grounding studs. The internal connections for the ground wires where they feed into this master ground wire shall be an ultrasonic connection. Where they connect to the ground stud the connection shall be a machine crimped, epoxy sealed ring terminal.

Wiring connections from the wiring harnesses to various components or electrical assemblies shall be made using either machine crimped, epoxy sealed ring terminals or self-sealing Deutsch connectors.

REFLECTORS
Chrome trimmed Truck-Lite reflectors shall be installed on the apparatus in compliance with Federal Motor Vehicle Safety Standards and NFPA 1901.

STEP LIGHTS
There shall be four (4) clear lens step lights mounted in a manner that illuminates the pump area running boards and the rear step area. Two (2) lights, one (1) each side shall be installed on the front body bulkheads. Two (2) lights, one (1) on each side shall be installed at the rear step area. These lights shall be installed in compliance with NFPA 1901.

UNDERBODY LIGHTS
Eight-(8) clear lens underbody work-lights shall be installed under the cab & body around the perimeter of the vehicle, in compliance with NFPA 1901. The lights shall be strategically placed to illuminate the immediate ground area around the unit. The cab under body lights shall be switch able but automatically activate when the cab doors are opened the remainder of these lights shall be switched in the cab.

UPPER PUMP AREA ILLUMINATION
Illumination shall be provided for the upper pump enclosure area, in accordance with NFPA requirements.

DECK LIGHTS
There shall be two-(2) LED light strips on the inside of hose bed doors, directed downwards on hose bed.

LED SCENE LIGHTING
LED scene lighting shall be installed to illuminate 360 degrees around truck. Light beam shall illuminate minimum 50 feet.

LICENSE PLATE LIGHT
One-(1) license plate light and bracket shall be installed on the left side rear of the apparatus with the light to be wired to come on with the headlights.

STOP, TURN, AND BACK-UP LIGHTS
Install Whelen 900 series LED lights or equivalent, one-(1) each side on the lower rear body corners. Each light assembly shall be mounted with closed cell neoprene molding around the full perimeter contact surface area of the body to seal out moisture and eliminate electrolysis. The tail lamps shall be installed in the following descending order:

TOP	Red LED Stop/Taillight
CENTER	Amber LED Arrow Turn Signals
BOTTOM	Clear Lens LED Maximum Intensity Back-Up

COMPARTMENT LIGHTS
Dual LED rollup door strip lights shall be installed in each compartment to illuminate the

entire compartment. The lights shall automatically be activated when the compartment door is opened.

TRAFFIC ADVISOR DIRECTIONAL LIGHT
There shall be one-(1) split Whelen Traffic Advisor or equivalate traffic directing light with eight-(8) amber LED lamps, recessed in the upper rear of hose bed doors. The Traffic Advisors four-(4) modes of operation: left arrow, right arrow, center out and all flash, shall be controlled from the cab with an LED status display and control.

MIDSHIP MARKER/TURN INDICATOR LIGHTS
The apparatus shall be equipped with one-(1) LED mid-ship amber incandescent marker/turn indicator light, each side, in compliance with NFPA 1901 and FMVSS.

3000-WATT INVERTER
A 3000-watt inverter will be installed. Two (2) waterproof receptacles shall be located on the outside body of truck.

BACK-UP ALARM
A Code 3 model D50C electronic back-up alarm producing 97 db shall be installed on the apparatus and shall automatically activate when the truck is shifted into reverse gear.

DOUBLE COLOR BODY PAINT
The exterior of the apparatus body shall be painted to match the cab with black above roll up doors and red below.

HOSE BED FINISH
The interior sides of the hose bed area shall have a mill finish and shall not be painted.

BODY UNDERCOATING
The body shall be thoroughly prepared and sprayed with a rust inhibiting undercoating. Areas to be sprayed shall include the backsides and undersides of all compartments. All substructures under the body shall be undercoated thoroughly.

SCOTCHLITE LETTERING
There shall be up to sixty-(60) 3” Scotchlite reflective letters applied to the apparatus as directed by the fire department. Final decision to be discussed at pre-manufactures meeting.

SCOTCHLITE STRIPE
A 10" wide straight Scotchlite stripe shall be applied around the perimeter of the apparatus compliant with NFPA 1901. The color and location shall be determined at the pre-construction conference. Final decision to be discussed at pre-manufactures meeting.

DETAILING
The apparatus shall be thoroughly washed and detailed in preparation for final acceptance.

DELIVERY
The apparatus shall be delivered to 410 Kinchant Street, Quesnel, B.C.
State estimated delivery date: _____.

WARRANTY, BODY (1) YR UNLIMITED HOURS
Warranty coverage includes fire pump panel and controls; foam system and controls; foam system plumbing; body emergency lighting and controls; hinged and rollup compartment doors; body trim; body lighting and controls; body electrical systems; hydraulic ground ladder rack and controls.

WARRANTY, BODY STRUCTURE AND CORROSION (10) YR
Warranty coverage includes compartments and body panels; hinged compartment doors; fire pump closure; body frame and sub-frame, if applicable. Excludes surface corrosion caused by chips or scratches.

WARRANTY, PAINT, (7) YR, UNLIMITED HOURS
Coverage includes all painted exterior body surfaces. Warranted against orange peel; peeling/delaminating; cracking or checking; loss of gloss due to cracking, checking, or hazing. Excludes lack-of-gloss issues on vehicles painted with low gloss colors; the undersides of hoods and roof and side mounted air fairings; and any damage to the paint or painted surface such as chips and scratches.

ELECTRICAL SCHEMATICS
"As Built" Electrical Schematics shall be supplied for the apparatus in compliance with section 4.19.2.3 of the current edition of NFPA 1901.

FIRE PUMP WARRANTY
There shall be a five (5) year Waterous Pump Conditional Warranty. Please refer to the Waterous Standard Limited Warranty Agreement for coverage details.

WARRANTY - WATER TANK
There shall be a Lifetime Warranty for all UPF Tanks provided directly by UPF.

WARRANTY, PLUMBING, TANK to PUMP (3) YR UNLIMITED HOURS
Warranty covers OEM installed pump plumbing and or tank plumbing. Warranted against cracking and breaking of manifold(s); inlet and discharge valves; drain valves; discharge and suction plumbing. Excludes damage to freezing and valve seat leakage due to contaminants.

ENGINE and TRANSMISSION MANUALS
There shall be an Engine and a Transmission Manual supplied with the apparatus in compliance with section 4.19.2.2 of the current edition of NFPA 1901.

OPERATORS and MAINTENANCE MANUALS
Each apparatus shall include operation and service documents compliant with section 4.19.2.1 of the current edition of NFPA 1901.

PRE-CONSTRUCTION AND FINAL CONSTRUCUTION MEETING
Two (2) meetings will be provided for two fire department members. All travel and accommodation will be included.

LADDERS
One-(1) Duo Safety series 35’ 3 section ladder shall be provided. (14 ft roof ladder and 24 ft 2 section ladder already provided).

EQUIPMENT
One-(1) Duo-Safety 8FP, 8' fiberglass handle pike pole shall be provided with the apparatus.

One-(1) Duo-Safety 12FP, 12' fiberglass handle pike pole shall be provided with the apparatus.

Two-(2) wheel chocks with underbody mounting brackets shall be installed under the compartment forward of the left rear wheels.

Two-(2) Hasting Brass HB-10 or equivalent wrench holders, each with two-(2) universal spanners, shall be installed on the apparatus.

Two-(2) Kochek KS34 wrench holders, each with two-(2) universal storz wrenches, shall be installed on the apparatus.

One-(1) Akron Mercury Quick Attack ground monitor shall be mounted at the rear of the apparatus and connected to the right rear 2 ½” discharge pre-connect attack line.

All NFPA 1901 equipment that is required for this apparatus, which is not listed in this proposal, is the responsibility of the fire department to provide.

Part III: Form of RFP
BIDDERS MUST COMPLETE THIS FORM AND SIGN IT.
Print Name of Firm/Company

_____

To supply one (1) new fire engine, pursuant to the terms, conditions and specifications outlined in PARTS I and II herein, FOB Quesnel, freight charges included in the total tendered amount(s) show below, unless otherwise stated.

PRICE	**$**
BC PST TAX 7%	**$**
GST 5%	**$**
Other taxes and environmental levies	**$**
TOTAL RFP PRICE	**$**

Bidders are reminded to complete the pricing section shown above completely in order to be considered.

Name of Firm Bidding:
_____
Authorized Signature: _____
Print Name: _____
Title :_____
Address: _____

City:
Phone #:
Fax #:
E-mail Address: