THE CORPORATION OF THE TOWNSHIP OF NORTH GLENGARRY

Special Meeting of Council

Monday, July 24, 2023, 5:00 p.m.
Council Chamber
3720 County Road 34
Alexandria, On. K0C 1A0

DRAFT AGENDA

1. CALL TO ORDER
2. DECLARATIONS OF PECUNIARY INTEREST
3. ACCEPT THE AGENDA(Additions/Deletions)
4. ADOPTION OF PREVIOUS MINUTES
5. DELEGATION(S)
6. STAFF REPORTS
    a. Fire Department
        1. Fire Department Fleet – Pumper Station 1
7. UNFINISHED BUSINESS
8. CONSENT AGENDA
9. NEW BUSINESS
10. NOTICE OF MOTION

    Next Regular Public Meeting of Council

    Monday August 14, 2023 at 6 p.m. in the Council Chambers, 3720 County Road 34, Alexandria Ontario.

    Note: Meeting are Subject to Change or cancellation.

11. QUESTION PERIOD

    (Limit of one question per person and subsequent question will be at the discretion of the Mayor)

12. CLOSED SESSION BUSINESS
13. CONFIRMING BY-LAW
14. ADJOURN

STAFF REPORT TO COUNCIL **Report No: FD 2023-06**

July 24, 2023

From: Matthew Roy – Fire Chief

RE: Fire Department Fleet – Pumper Station 1

Recommended Motion:

THAT Council of the Township of North Glengarry authorizes the Fire Department to award the purchase of the Station 1 Pumper in the amount of $802,499 to Commercial Emergency Equipment Co.; and

FURTHER that the replaced equipment is declared surplus upon receipt of the new vehicle; and

FURTHER that the Fire Department is authorized to tender the sale of the surplus equipment via auction, local tender, online auction or other means as deemed most beneficial to the Township.

Background / Analysis:

This report is being provided to Council to authorize the North Glengarry Fire Department to award the purchase of a Pumper for Station 1 through a RFP Canoe/LAS contract #113021-MAX to Commercial Emergency Equipment Co. As per the 2023 budget, Council allocated funds for the replacement of the pumper at Station 1 – Alexandria due to its age and condition. The fire department capital budget for vehicle replacement follows the Fire Underwriters Survey (FUS) Service Schedule for Fire Apparatus for Fire Insurance Grading Purposes. By following the survey, the Department maintains a lower insurance cost, which ensures the Department has reliable vehicles to perform its duties. This purchase will not only ensure operational readiness for Station 1 but will also help the Fire Department in reaching its goals of standardization and safety.

In the last few years, the fire apparatus industry has seen a huge increase in costs which are passed on to fire departments, and there is now a 1-2 year wait to take delivery of a new pumper. In some cases, it may be possible for a fire department to secure a stock model, however, these stock units sell fast.

This tender process was completed through the Canoe Procurement Group – Cooperative Purchasing. The Fire Department conducted a search for approved suppliers and received a quote from Commercial Emergency Equipment Co. for a stock pumper.

QUOTATION
Stock Pierce MaxiSaber INC3704:
List Price: $844,735.79 CAD
Sourcewell 5% Discount (Contract #113021-MAX): $ -42,236.79 CAD
Price After Discount: $ 802,499.00 CAD

Council approved $750,000 in the 2023 budget for this purchase. The Fire Department recommends awarding the purchase to Commercial Emergency Equipment Co. The additional funds from the sale of the current pumper, will offset the additional cost of the new vehicle.

Alternatives:

Option 1 – approve the purchase to Commercial Emergency Equipment Co

Option 2 (not recommended) – do not approve the purchase.

Financial Implications:

The purchase of the pumper was included in the 2023 Capital Budget and will be paid for in 2024 and funded through debt.

Attachments & Relevant Legislation:

Commercial Emergency Equipment Co – Quote and vehicle specifications

Others Consulted:

Sarah Huskinson – CAO
Kimberley Goyette - Treasurer

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Reviewed and Approved by:
Sarah Huskinson, CAO/Clerk

July 12, 2023

Township of North Glengarry
3720 County Road 34
Alexandria, ON
K0C 1A0

Attention: **Matthew Roy, Fire Chief**

Dear Fire Chief Roy,

Thank you for this opportunity to provide you with a proposal for the supply and delivery of one (1) Pierce MaxiSaber Pumper for the Township of North Glengarry.

Commercial Truck Equipment Co. (Commercial) is Canada's largest supplier of truck equipment with over 300 employees in branches across Canada that have technical and engineering expertise. Since 2011, Commercial has been working with fire departments as part of the service and warranty agreement in our branch located in Surrey, BC. As of 2017, Commercial Truck Equipment has partnered with MaxiMetal, the top Canadian Fire Apparatus builder. MaxiMetal has been working with Pierce Manufacturing, the North American leader of innovation in Fire Apparatus, since 2015, to bring the Pierce Saber custom chassis to Canada.

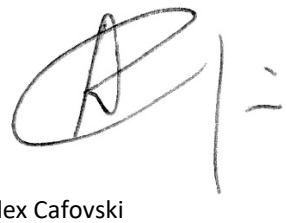
Both MaxiMetal and Commercial are proud of the partnership we can provide to the Township of North Glengarry. Our current procedures from the pre-construction meeting to final inspection, delivery to training brings you the advantage of staying informed at every step of the build process.

After going through the details of this RFP, we have submitted a Pierce MaxiSaber Pumper for your consideration.

The documents included in this proposal will take precedence should there be any discrepancy between our proposal and the RFP package.

Should you have any questions or require clarifications on this proposal please do not hesitate to contact the undersigned.

Regards,



Alex Cafovski
Apparatus Specialist – Emergency Division
O: 519-421-4488 | C: 416-993-6233
acafovski@comtruck.ca

PROPOSAL SUMMARY

PIERCE MAXISABER

MaxiMetal and Pierce Manufacturing have teamed up to offer a great fire apparatus to the Canadian market, the Pierce MaxiSaber. The Pierce MaxiSaber configurations were developed with the value-driven department in mind, with no sacrifice on quality, ergonomics and performance.

The Pierce Saber custom chassis sets the leading edge in the industry standard custom chassis market. The cab interior offers significantly more room for firefighters and features a raised roof transition line moved forward to create a “cathedral ceiling” effect, while a flat floor in the crew cab area provides surer footing. The stair steps are low and offset to function like stairs for easier entry and exit. A one-piece wraparound windshield delivers excellent outward visibility. The Saber chassis offers a medium-block engine with up to 450 hp. while a 50-degree cramp angle offers greater maneuverability along narrow roads, alleys and cul-de-sacs.

FEATURES

Key features on the stock Pierce MaxiSaber INC3704:

- Pierce Saber FR
- Cummins L9 380 hp
- 18,000 lb. Front Axle
- 27,000 lb. Rear Axle
- Waterous CX 1500 GPM Pump
- 1000 Gallon Water Tank
- Comply NFPA 1901, 2016 Edition
- Apparatus Certification, ULC

DELIVERY

- Delivery for the apparatus is estimated for **December of 2023, subject to availability as this is an in production stock unit available for immediate sale.**

QUOTATION

Stock Pierce MaxiSaber INC3704:

List Price:	**$844,735.79 CAD**
Sourcewell 5% Discount (Contract #113021-MAX):	**$ -42,236.79 CAD**
Price After Discount:	**$ 802,499.00 CAD**

NOTE

- Plus Applicable Taxes
- Quote Valid for 15 Days, **subject to availability as this is an in production stock unit available for immediate sale.**
- Payment Terms: 10% deposit at time of booking, balance on delivery
- FOB: North Glengarry, ON
- Training and Orientation of the operation, care, and maintenance of your apparatus
- Parts, Service and warranty are available through our local service centers and mobile service department

Commercial Truck Equipment Corp.
DBA Commercial Emergency Equipment Co.
(part of The Commercial Group of Companies)

1. APPLICATION OF GENERAL CONDITIONS. These general conditions (the "**General Conditions**") govern the supply of goods and services by Commercial Truck Equipment Corp. ("**CTE**") unless modified or supplemented by a term expressly set out in a CTE job order ("J**ob Order**"). These General Conditions, together with a Job Order and invoice, collectively form a legally binding contract between CTE and its customer ("**Customer**") (the "**Supply Contract**"). Any change to the terms of the Supply Contract must be agreed in writing by CTE.

2. ENTIRE AGREEMENT. The Supply Contract is the complete and entire agreement between the parties with respect to the subject matter therein. No understandings or communications between the parties, whether written or verbal, form part of the Supply Contract or will have any legal effect between the parties unless expressly agreed in writing by CTE. If Customer's purchase order is attached as a schedule to the Supply Contract, other than any technical specifications that may be set out therein, it will have no legal effect.

3. SUPPLY OF GOODS AND SERVICES. CTE will supply, and Customer will purchase the goods and services at the price and in accordance with the other terms and conditions of the Supply Contract

4. DELIVERY, PICK UP AND SHIPPING. Goods supplied by CTE and Customer equipment on which CTE services are performed will be deemed to have been delivered to Customer once CTE places such goods or Customer equipment at the disposal of Customer at a CTE branch. Upon delivery by CTE, Customer will be required to immediately pick up such goods and equipment at Customer's risk and expense. CTE may, upon Customer's request, arrange for shipping at Customer's risk and expense. Risk of loss or damage to goods and equipment will transfer to Customer once such goods and equipment are delivered to Customer at a CTE branch.

5. PAYMENT. Customer will pay the price of CTE's goods and services in cash on delivery by CTE. Title to goods shall remain with CTE and shall not pass to Customer until all amounts owing by Customer to CTE, including all applicable taxes, have been paid in full by Customer. If Customer does not fully pay all amounts owing when due, CTE may, without limiting its remedies under the Supply Contract and the law, (a) suspend delivery and other CTE performance until such amounts are fully paid and (b) terminate the Supply Contract.

6. DEPOSIT. If Customer has paid CTE a deposit on the Supply Contract price (the "Deposit") and Customer fails to complete the Supply Contract in accordance with the terms thereof (including, without limitation, failing to pick up goods and equipment and failing to fully pay all amounts when due) through no fault of CTE, CTE may terminate the Supply Contract and in such event the deposit will be absolutely forfeited to CTE on account of damages without limiting CTE's right to pursue Customer for additional damages and other remedies under the Supply Contract and the law.

7. LIMITED WARRANTY.

7.1 Goods – Manufacturer's Warranty. Goods supplied by CTE will be warranted by the manufacturer in accordance with the terms of the manufacturer's warranty (if any). CTE may, in its sole discretion and on terms acceptable to CTE, perform any warranty repair or replacement on goods covered by a manufacturer's warranty and in such event the terms of this Supply Contract (except section 7.2, unless CTE agrees in its sole discretion) will govern the warranty repair or replacement.

7.2 Services – CTE's Limited Warranty. CTE warrants, subject to the following limitations and conditions, that its services will be free from defects in workmanship for 90 days after service completion: (a) CTE will determine, in CTE's sole discretion, whether the workmanship is defective, (b) CTE's sole responsibility will be to repair the defective workmanship and, if necessary as determined by CTE, repair or replace a part that is damaged by the defective workmanship, at a CTE branch during its regular business hours, (c) Customer is responsible for shipping, at Customer's risk and expense, applicable equipment to and from a CTE branch for CTE's assessment and repair, (d) no further warranty is provided on any service warranty work, (e) prior to the discovery of the defect, the applicable equipment was being used and maintained properly by Customer and in accordance with CTE's and the equipment manufacturer's guidelines. All CTE service warranty work will be governed by the terms of this Supply

7.3 No Other Warranty. Other than the warranties expressly provided in sections 7.1 and 7.2 hereof, no other warranties, conditions, guarantees or similar obligations, whether express or implied by fact, by law, including any statute or regulation, by custom or trade usage, or by any course of dealing, including but not limited to any implied warranties or conditions of merchantability or fitness for purpose or fitness for a particular purpose, are applicable to goods and services supplied by CTE.

8. PROPERTY/GOODS LEFT ON CTE PREMISES. Any Customer property and CTE supplied goods left on CTE premises will be left at Customer's risk and expense and if any of the foregoing are left on CTE's premises more than 30 days after delivery at a CTE branch, CTE may store such property and goods at a third party site at Customer's risk and expense. If any Customer property and CTE supplied goods are left more than 90 days after delivery at a CTE branch, CTE may, at Customer's risk and expense, sell such property and goods, apply the proceeds of such sale to any amounts owed by Customer and hold the remaining proceeds (if any) in trust for Customer.

9. FORCE MAJEURE. "Force Majeure" means an event or circumstance that is beyond the reasonable control of a party and that prevents or delays that party in the performance of any of its obligations under the Supply Contract, including but not limited to a delay or failure by a subcontractor, or sub-supplier, in each case of any tier, to perform and complete their obligations in accordance with their respective contracts that is caused by an event that, if it occurred with respect to a party to this Supply Contract, would constitute Force Majeure. If a party is prevented or delayed in performing its obligations (other than a payment obligation) by Force Majeure, that party is not liable to the other party for failure to perform those obligations. The time for performance is deferred to the extent and for so long as performance is prevented or delayed and the completion, delivery and other dates contemplated under the Supply Contract shall be adjusted if necessary to accommodate the effects of Force Majeure.

10. LIMITATIONS OF LIABILITY. CTE is not liable to Customer under or in relation to the Supply Contract for any loss of use, loss of production, loss of profits, loss of markets, additional or incremental costs of operation, economic loss, or special, indirect or consequential loss or damage, or punitive and exemplary damages suffered or incurred by Customer, or by any third party who makes a claim against Customer for which Customer seeks recovery from CTE, whether Customer's claim, or that of the third party, is in contract, or tort, including negligence, or under any other theory of law or of equity. CTE's total liability arising out of or in relation to the Supply Contract, whether in contract, warranty, tort (including negligence), strict liability or otherwise, shall be limited to the price of the goods and services supplied under such Supply Contract.

11. APPLICABLE LAW. The Supply Contract shall be governed by and construed in accordance with the laws of the Province in which the Supply Contract is entered into and the laws of Canada applicable in such Province, excluding any conflict of laws principles or rules that would impose a law of another jurisdiction for the construction of the Supply Contract. The parties to the Supply Contract hereby irrevocably and unconditionally attorn to the non-exclusive jurisdiction of the courts of the Province in which the Supply Contract is entered into and all courts competent to hear appeals therefrom.

The United Nations Convention on Supply Contracts for the International Sale of Goods (1980) shall not apply to the Supply Contract and is hereby excluded in its entirety.

12. MISCELLANEOUS. Any additional supply or work performed by CTE in relation to the original supply of goods or services contemplated under this Supply Contract will be governed by the terms of this Supply Contract. The remedies available to CTE hereunder are in addition to any other remedy available under the law. If any provision of the Supply Contract is determined to be invalid or unenforceable in whole or in part, such invalidity or unenforceability attaches only to such provision and everything else in the Supply Contract continues in full force and effect. Rev. Aug 15/ 2019

Order acceptance:

Customer acknowledges having read the conditions in this document and agrees to purchase

Signature: _____

Print Name: _____

Title: _____

Date (day/month/year**): _____/_____/ 20_____**

P/O#: _____

Upon completion please return to Commercial Emergency Equipment for order processing.

SABER FR CHASSIS

The Pierce Saber FR® is the custom chassis developed exclusively for the fire service. Chassis provided will be a new, tilt-type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy-duty service, with adequate strength, capacity for the intended load to be sustained, and the type of service required. The chassis will be the manufacturer's first line tilt cab.

WHEELBASE

The wheelbase of the vehicle will be 194.00.

GVW RATING

The gross vehicle weight rating will be 45,000.

FRAME

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will be heat-treated steel measuring 10.25" x 3.50" x 0.375".

Each rail will have a section modulus of 16.00 cubic inches, yield strength of 120,000 psi, and a resisting bending moment (rbm) of 1,921,069 inch-pounds.

FRAME REINFORCEMENT

A full-length mainframe "C" liner will be provided.

The liner will be an internal "C" design, heat-treated steel measuring 9.38" x 3.13" x 0.25". Each reinforcement member will have a section modulus of 3.90 cubic inches, yield strength of 120,000 psi and resisting bending moment (rbm) of 938,762 in-lb.

FRONT AXLE

The front axle will be a reverse "I" beam type with inclined king pins. It will be a Dana axle, Model D-2000F, with a rated capacity of 18,000 lb.

FRONT SUSPENSION

The front springs will be a Standens, three (3)-leaf, taper leaf design, 54.00" long x 4.00" wide, with a ground rating of 18,000 lb.

The two (2) top leaves will wrap the forward spring hanger pin. The top leaf will also wrap the rear spring hanger pin. Both the front and rear eyes will be Berlin style wraps that will place the eyes in the horizontal plane within the main leaf. This will reduce bending stress from acceleration and braking.

A steel encased rubber bushing will be used in the spring eye. The steel encased rubber bushing will be maintenance free and require no lubrication.

SHOCK ABSORBERS

To provide a smoother ride, the front axle will be furnished with heavy-duty telescoping shock absorbers.

FRONT OIL SEALS
Oil seals with viewing window will be provided on the front axle.

FRONT TIRES
Front tires will be Goodyear 315/80R22.50 radials, load range L, all position, G751 MSA tread, rated for 18,180 lb maximum axle load and 75 mph maximum speed.

The tires will be mounted on Alcoa 22.50" x 9.00" polished aluminum disc wheels with a ten (10) stud, 11.25" bolt circle.

REAR AXLE
The rear axle will be a Dana, Model S26-190, with a capacity of 27,000 lb.

TOP SPEED OF VEHICLE
NFPA 1901, 2016 edition requires limits on the top speed of vehicles. NFPA 4.15.2 requires that the maximum top speed of fire apparatus with a GVWR over 26,000 lb will not exceed either 68 mph or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower. NFPA 4.15.3 requires that if the combined water tank and foam agent tank on the fire apparatus exceed 1250 gallons or the GVWR of the vehicle is over 50,000 lb, the maximum top speed of the apparatus will not exceed either 60 mph or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower. It is the intention of the standard to improve safety by limiting the speed of all apparatus to 68 mph, and tankers or heavy apparatus to 60 mph. By requesting an exception to this requirement, the purchasing authority is consciously choosing to operate their apparatus at speeds above the limits designated as safe speeds by the NFPA Technical Committee on Fire Department Apparatus.

The top speed of the apparatus as manufactured exceeds the NFPA requirements. Per fire department specification of a top speed that exceeds NFPA requirements, the apparatus will be non-compliant to NFPA 1901 standards at time of contract execution.

A rear axle ratio will be furnished to allow the vehicle to reach an approximate top speed of 75 MPH.

REAR SUSPENSION
The rear suspension will be Standens, semi-elliptical, 3.00" wide x 53.00" long, 12-leaf pack with a ground rating of 27,000 lb. The spring hangers will be castings.

The two (2) top leaves will wrap the forward spring hanger pin, and the rear of the spring will be a slipper style end that will ride in a rear slipper hanger. To reduce bending stress due to acceleration and braking, the front eye will be a berlin eye that will place the front spring pin in the horizontal plane within the main leaf.

A steel encased rubber bushing will be used in the spring eye. The steel encased rubber bushing will be maintenance free and require no lubrication.

REAR OIL SEALS
Oil seals will be provided on the rear axle(s).

DRIVER CONTROL DIFFERENTIAL LOCK (DCDL)
A rear axle will be equipped with a driver controlled differential lock (DCDL).

The control will be located within easy reach of the driver. An indicator light will be provided next to the control switch.

REAR TIRES
Rear tires will be four (4) Goodyear® 12R22.50 radials, 16 ply all season G622 RSD tread, rated for 27,120 lb maximum axle load and 75 mph maximum speed.

The tires will be mounted on Alcoa 22.50" x 8.25" polished aluminum disc wheels with a ten (10) stud 11.25" bolt circle.

TIRE BALANCE
All tires will be balanced with Counteract balancing beads. The beads will be inserted into the tire and eliminate the need for wheel weights.

TIRE PRESSURE MANAGEMENT
There will be a RealWheels LED AirSecure™ tire alert pressure management system provided, that will monitor each tire's pressure. A sensor will be provided on the valve stem of each tire for a total of six (6) tires.

The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor will activate an integral battery operated LED when the pressure of that tire drops 5 to 8 psi.

Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start to flash.

FRONT HUB COVERS
Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.

REAR HUB COVERS
A pair of stainless steel high hat hub covers will be provided on rear axle hubs.

CHROME LUG NUT COVERS
Chrome lug nut covers will be supplied on front and rear wheels.

MUD FLAPS
Mud flaps shall be installed behind the front wheels of the apparatus.

ANTI-LOCK BRAKE SYSTEM
The vehicle will be equipped with a Meritor WABCO 4S4M, anti-lock braking system. The ABS will provide a 4-channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any particular wheel begins to lockup, a signal will be sent to the control unit. This control unit then will reduce the braking of that wheel for a fraction of a second

and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

BRAKES

The service brake system will be full air type by Bendix®.

Front brakes will be Model ADB22X™, disc type with automatic pad wear adjustment and 17.00" rotors for improved stopping distance.

The rear brakes will be Bendix™ 16.50" x 8.63" cam operated with automatic slack adjusters.

BRAKE SYSTEM AIR COMPRESSOR

The air compressor will be a Cummins/WABCO with 18.7 cubic feet per minute output.

BRAKE SYSTEM

The brake system will include:

- Brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system minimum capacity of 4,272 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, with an automatic spring brake application at 40 psi
- A pressure protection valve to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa)
- 1/4 turn drain valves on each air tank

The air tank will be primed and painted to meet a minimum 750 hour salt spray test.

To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

BRAKE SYSTEM AIR DRYER

The air dryer will be a WABCO System Saver 1200 IWT, with internal wet tank, spin-on coalescing filter cartridge and 100 watt heater.

BRAKE LINES

Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.

AUTOMATIC MOISTURE EJECTORS

Bendix, Model DV-2,moisture ejectors for a single axle pumper reservoir capacity will be installed in the brake system.

Each moisture ejector will be equipped with a 12-volt heater, controlled by thermostat and ignition switch.

The moisture ejectors will be provided on all reservoirs.

BRAKE SHIELDS

Dust/gravel shields will be provided on the rear cam brakes.

SPACER, 1.5", AIR TANK

The air tank will be mounted with a 1.5" spacer to allow for a body u-bolt mounting kit. It will be located inside the frame rail towards the center of the chassis.

ENGINE

The chassis will be powered by an electronically controlled engine as described below:

Make:	Cummins
Model:	L9
Power:	380 hp at 2000 rpm
Torque:	1150 lb-ft at 1400 rpm
Governed Speed:	2200 rpm
Emissions Level:	EPA 2021
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	543 cubic inches (8.9L)
Starter:	Delco Remy 39MT™
Fuel Filters:	Spin-on style primary filter with water separator and water-in-fuel sensor. Secondary spin-on style filter.

The engine will include On-board diagnostics (OBD), which provides self diagnostic and reporting. The system will give the owner or repair technician access to state of health information for various vehicle sub systems. The system will monitor vehicle systems, engine and after treatment. The system will illuminate a malfunction indicator light on the dash console if a problem is detected.

HIGH IDLE

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

The high idle will be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle."

ENGINE BRAKE

The variable geometry turbo (VGT) provided on the Cummins ISC8.3 or ISL9 engine will be programmed to function as an engine brake. The brake will be controlled by a switch on the instrument panel located within easy reach of the driver. The brake will activate when the switch is on and the accelerator pedal has been released.

The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle, the brake lights are activated.

The ABS system will automatically disengage the auxiliary braking device, when required.

CLUTCH FAN

A fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and constantly engaged when in "Pump" position.

ENGINE AIR INTAKE

The engine air intake will be located above the engine cooling package. It will draw fresh air from the front of the apparatus through the radiator grille.

A stainless steel metal screen will be installed at the inlet of the air intake system that will meet NFPA 1901 requirements.

The air cleaner and stainless steel screen will be easily accessible by tilting the cab.

EXHAUST SYSTEM

The exhaust system will be stainless steel from the turbo to the engine's aftertreatment device, and will be 4.00" in diameter. The exhaust system will include a single module aftertreatment device to meet current EPA standards. An insulation wrap will be provided on all exhaust pipes between the turbo and aftertreatment device to minimize the heat loss to the aftertreatment device . The exhaust will terminate horizontally ahead of the right side rear wheels. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits.

RADIATOR

The radiator and the complete cooling system will meet or exceed NFPA and engine manufacturer cooling system standards.

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The radiator core will consist of aluminum fins, having a serpentine design, brazed to aluminum tubes.

The radiator core will have a minimum front area of 1060 square inches.

Supply tank will be made of heavy duty glass-reinforced nylon and the return tank will be mode of aluminum. Both tanks will be crimped onto the core assembly using header tabs and a compression gasket to complete the radiator core assembly. There will be a full steel frame around the inserts to enhance cooling system durability and reliability.

The radiator will be compatible with commercial antifreeze solutions.

The radiator assembly will be isolated from the chassis frame rails with rubber isolators to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven terrain.

The radiator will include a de-aeration/expansion tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

A drain port will be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Gates, or Goodyear, rubber hose will be used for all engine coolant lines installed by Pierce Manufacturing.

Hose clamps will be stainless steel constant torque type to prevent coolant leakage. They will expand and contract according to coolant system temperature thereby keeping a constant clamping pressure on the hose.

FUEL TANK

A 65 gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank will be mounted with stainless steel straps.

A 0.75" drain plug will be located in a low point of the tank for drainage.

A fill inlet will be located on the left hand side of the body and is covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

A 0.50" diameter vent will be installed from tank top to just below fuel fill inlet.

The fuel tank will meet all FHWA 393.67 requirements including a fill capacity of 95 percent of tank volume.

All fuel lines will be provided as recommended by the engine manufacturer.

DIESEL EXHAUST FLUID TANK

A 7.5 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the left side crew cab step area.

A 0.50" drain plug will be provided in a low point of the tank for drainage.

A fill inlet will be located on the left side of the crew cab step and be covered with a hinged, spring loaded, polished stainless steel door that is marked "Diesel Exhaust Fluid Only".

The tank will meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing.

The tank will include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.

FUEL PRIMING PUMP
A Cummins automatic electronic fuel priming pump will be integrated as part of the engine.

FUEL FILL
A temporary fuel fill will be provided.

TRANSMISSION
An Allison 6th generation, Model EVS 3000P, electronic torque converting automatic transmission will be provided.

The transmission will be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display will indicate when service is due.

Two (2) PTO openings will be located on both sides of converter housing (positions 4 o'clock and 8 o'clock) as viewed from the rear.

A transmission temperature gauge with red light and audible alarm will be installed on the cab dash.

TRANSMISSION SHIFTER
A six (6)-speed push button shift module will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation.

The transmission ratio will be: 1st - 3.49 to 1.00, 2nd - 1.86 to 1.00, 3rd - 1.41 to 1.00, 4th - 1.00 to 1.00, 5th - 0.75 to 1.00, 6th - 0.65 to 1.00, R - 5.03 to 1.00.

TRANSMISSION COOLER
A Modine plate and fin transmission oil cooler will be provided using engine coolant to control the transmission oil temperature.

DOWNSHIFT MODE (W/ENGINE BRAKE)
The transmission will be provided with an aggressive downshift mode.

This will provide earlier transmission downshifts to 3rd gear from 6th gear, resulting in improved engine braking performance.

TRANSMISSION PROGRAM
The transmission will shift to neutral when parking brake is set.

DRIVELINE
Drivelines will be a heavy-duty metal tube and be equipped with Spicer® 1710 universal joints.

The shafts will be dynamically balanced before installation.

A splined slip joint will be provided in each driveshaft where the driveline design requires it. The slip joint will be coated with Glidecoat® or equivalent.

STEERING

Steering gear will be provided with integral heavy-duty power steering. For reduced system temperatures, the power steering will incorporate an air to oil cooler and Vickers® V20NF hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.

STEERING WHEEL

The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 2-spoke design.

MUD FLAPS

Temporary mud flaps will be provided at the rear of the chassis.

FRAME CUT OFF

The frame cutoff will be 54" from the center of the rear axle to the end of the frame.

BUMPER

A one (1)-piece bumper manufactured from 0.25" formed steel with a 0.38" bend radius will be provided. The bumper will be a minimum of 10.00" high with a 1.50" top and bottom flange, and will extend 19.00" from the face of the cab. The bumper will be 95.28" wide with 45 degree corners and side plates. The bumper will be metal finished and painted job color.

To provide adequate support strength, the bumper will be mounted directly to the front of the C channel frame. The frame will be a bolted modular extension frame constructed of 50,000 psi tensile steel.

Gravel Pan

A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and the cab face. The pan will be properly supported from the underside to prevent flexing and vibration.

CENTER HOSE TRAY

A hose tray, constructed of aluminum, will be placed in the center of the bumper extension.

The tray will have a capacity of 150' of 1.75" double jacket cotton-polyester hose.

Black rubber grating will be provided at the bottom of the tray. Drain holes are also provided.

Center Hose Tray Cover

A bright aluminum treadplate cover will be provided over the center hose tray.

The cover will be attached with a stainless steel hinge.

One (1) D-ring latch will secure the cover in the closed position and a pneumatic stay arm will hold the cover in the open position.

TOW HOOKS

Two (2) chromed steel tow hooks will be installed under the bumper and attached to the front frame members. The tow hooks will be designed and positioned to allow up to a 6,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow hooks will not be used for lifting of the apparatus.

CAB

The cab will be designed specifically for the fire service and manufactured by the chassis builder.

The cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

For reasons of structural integrity and enhanced occupant protection, the cab will be a heavy duty design, constructed to the following minimal standards.

The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts), and rear wall areas. The A-pillar will be constructed of solid A356-T5 aluminum castings. The B-pillar and C-pillar will be constructed from 0.13" wall extrusions. The rear wall will be constructed of two (2) 2.00" x 2.00" outer aluminum extrusions and two (2) 2.00" x 1.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 4.625" x 3.864" x 0.090" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.25" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.13" firewall plate, covered with a 0.090" front skin (for a total thickness of 0.22"), and reinforced with a full width x 0.50" thick cross-cab support located just below the windshield and fully welded to the engine tunnel. The cross-cab support will run the full width of the cab and weld to each A-pillar, the 0.13" firewall plate, and the front skin.

The cab floors will be constructed of 0.125" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.375" of structural material at the front floor area. The front floor area will also be supported with two (2) triangular 0.30" wall extrusions that also provides the mounting point for the cab lift. This tubing will run from the floor wireway of the cab to the engine tunnel side plates, creating the structure to support the forces created when lifting the cab.

The cab will be 96.00" wide (outside door skin to outside door skin) to maintain maximum maneuverability.

The forward cab section will have an overall height (from the cab roof to the ground) of approximately 99.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 109.00". The overall height listed will be calculated based on a truck configuration with the lowest suspension weight rating, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The floor to ceiling height inside the crew cab will be 64.50" in the center and outboard positions.

The crew cab floor will measure 46.00" from the rear wall to the front of the rear facing seat risers.

The engine tunnel, at the rearward highest point (knee level), will measure 61.50" to the rear wall.

The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The cab will be a full tilt cab style.

A 3-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

CAB ROOF DRIP RAIL

For enhanced protection from inclement weather, a drip rail will be furnished on the sides of the cab. The drip rail will be painted to match the cab roof, and bonded to the sides of the cab. The drip rail will extend the full length of the cab roof.

INTERIOR CAB INSULATION

The cab will include 1.00" insulation in the ceiling, 1.50" insulation in the side walls, and 2.00" insulation in the rear wall to maximize acoustic absorption and thermal insulation.

FENDER LINERS

Full circular inner fender liners in the wheel wells will be provided.

PANORAMIC WINDSHIELD

A 1-piece safety glass windshield will be provided with over 2,775 square inches of clear viewing area. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: outer light, middle safety laminate, and inner light. The outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPERS

Three (3) electric windshield wipers with washer will be provided that meet FMVSS and SAE requirements.

The washer reservoir will be able to be filled without raising the cab.

ENGINE TUNNEL

Engine hood side walls will be constructed of 0.375" aluminum. The top will be constructed of 0.125" aluminum and will be tapered at the top to allow for more driver and passenger elbow room.

The engine hood will be insulated for protection from heat and sound. The noise insulation keeps the dBA level within the limits stated in the current NFPA 1901 standards.

The engine tunnel will be no higher than 17.00" off the crew cab floor.

INTERIOR CREW CAB REAR WALL ADJUSTABLE SEATING (PATENT PENDING)

The interior rear wall of the crew cab will have mounting holes every 2.75" to allow for adjustability of the forward facing crew cab seating along the rear wall. Seats will be adjustable with use of simple hand tools allowing departments flexibility of their seating arrangement should their department needs change.

CAB REAR WALL EXTERIOR COVERING

The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.

CAB LIFT

A hydraulic cab lift system will be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

Lift controls will be located on the right side pump panel or front area of the body in a convenient location.

The cab will be capable of tilting 43 degrees to accommodate engine maintenance and removal.

The cab will be locked down by a 2-point normally closed spring loaded hook type latch that fully engages after the cab has been lowered. The system will be hydraulically actuated to release the normally closed locks when the cab lift control is in the raised position and cab lift system is under pressure. When the cab is completely lowered and system pressure has been relieved, the spring loaded latch mechanisms will return to the normally closed and locked position.

The hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located in the tilt position.

For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the left side between the chassis and cab frame when the cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.

Cab Lift Interlock

The cab lift system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.

GRILLE

A single piece polished stainless steel grille and framework will be provided on the front center of the cab.

SIDE OF CAB MOLDING

Chrome molding will be provided on both sides of cab.

MIRRORS

A Retrac, Model 613423, dual vision, motorized, west coast style mirror, with chrome finish, will be mounted on each side of the front cab door with spring loaded retractable arms. The flat glass and convex glass will be heated and adjustable with remote control within reach of the driver.

DOORS

To enhance entry and egress to the cab, the forward cab doors will be a minimum of 37.50" wide x 75.50" high. The crew cab doors will be located on the sides of the cab and will be constructed in the same manner as the forward cab doors. The crew cab door openings will be a minimum of 34.30" wide x 85.50" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.093". The exterior door skins will be constructed from 0.090" aluminum.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The finish of the door handle will be chrome/black. The exterior handle will be designed specifically for the fire service to prevent accidental activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands.

Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, and be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 751. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.

A full length, heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

A chrome grab handle will be provided on the inside of each cab door for ease of entry.

A red webbed grab handle will be installed on the crew cab door stop strap. The grab handles will be securely mounted.

The cab steps at each cab door location will be located inside the cab doors to protect the steps from weather elements.

Door Panels

The inner cab door panels will be constructed out of brushed stainless steel.

MANUAL CAB DOOR WINDOWS

All cab entry doors will contain a conventional roll down window.

CAB STEPS

The forward cab and crew cab access steps will be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps will be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps will be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps will be a minimum 25.00" wide, and the crew cab steps will be 21.65" wide with a 10.00" minimum depth. The inside cab steps will not exceed 16.50" in height.

The vertical surfaces of the step well will be aluminum treadplate.

CAB EXTERIOR HANDRAILS

A 1.25" diameter slip-resistant, knurled aluminum handrail will be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress.

STEP LIGHTS

There will be six (6) white LED step lights with chrome housing installed for cab and crew cab access steps.

- One (1) light for the left access steps.
- Two (2) lights for the left side crew cab access steps.
- Two (2) lights for the right side crew cab access steps.
- One (1) light for the right side access step.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

The lights will be activated when the battery switch is on and the adjacent door is opened.

FENDER CROWNS

Stainless steel fender crowns will be installed at the cab wheel openings.

CREW CAB WINDOWS

One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the front cab door. The windows will be sized to enhance light penetration into the cab interior. The windows will measure 18.70" wide x 23.75" high.

STORAGE COMPARTMENTS

Provided on each side of the cab, to the rear of the crew cab access doors, will be a storage compartment. The compartments will be approximately 12.75" wide x 24.00" high x 15.00" deep.

There will be two (2) double pan doors painted to match the cab exterior with a non-locking D-Ring latch, one (1) on each side of the cab. A rubber bumper for each exterior door will be used as a doorstop. The clear door opening will be 10.50" wide x 22.50" high.

The compartment interior will be painted to match the cab interior.

Compartment Lights
There will be two (2) white LED strip lights provided, one (1) each hinged side of compartment door openings.

CAB DASH
The driver side dash, switch panel located to the right of the driver, and center console will be an easily removable high impact resistant polymer cover.

The instrument gauge cluster will be surrounded with a high impact ABS plastic contoured to the same shape of the instrument gauge cluster.

The officer side dash will be a flat top design with an upper beveled edge to provide easy maintenance and will be constructed out of aluminum and painted to match the cab interior.

MOUNTING PLATE ON ENGINE TUNNEL
Equipment installation provisions will be installed on the engine tunnel.

A .25" smooth aluminum plate will be bolted to the top surface of the engine tunnel. The plate will follow the contour of the engine tunnel and will run the entire length of the engine tunnel. The plate will be spaced off the engine tunnel .75" to allow for wire routing below the plate.

The mounting surface will be painted to match the cab interior.

CAB INTERIOR
The cab interior will be constructed of primarily metal (painted aluminum) to withstand the severe duty cycles of the fire service.

The engine tunnel will be painted aluminum to match the cab interior.

For durability and ease of maintenance, the cab interior side walls will be painted aluminum. The rear wall will be painted aluminum.

The headliner will be installed in both forward and rear cab sections. Headliner material will be vinyl. A sound barrier will be part of its composition. Material will be installed on an aluminum sheet and securely fastened to interior cab ceiling.

The forward portion of the cab headliner will permit easy access for service of electrical wiring or other maintenance needs.

All wiring will be placed in metal raceways.

CAB INTERIOR UPHOLSTERY
The cab interior upholstery will be 36 oz dark silver gray vinyl.

CAB INTERIOR PAINT
The cab interior metal surfaces, excluding the rear heater panels, will be painted fire smoke gray, vinyl texture paint.

The rear heater panels will be painted black, vinyl textured paint.

CAB FLOOR

The cab and crew cab floor areas will be covered with Polydamp™ acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

DEFROST/AIR CONDITIONING SYSTEM

A ceiling mounted combination heater, defroster and air conditioning system will be installed in the cab above the engine tunnel area.

Cab Defroster

A 54,000 BTU heater-defroster unit with 690 SCFM of air flow will be provided inside the cab. The heater-defrost will be installed in the forward portion of the cab ceiling. Air outlets will be strategically located in the cab header extrusion per the following:

- One (1) adjustable will be directed towards the left side cab window
- One (1) adjustable will be directed towards the right side cab window
- Six (6) fixed outlets will be directed at the windshield

The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.

Cab/Crew Auxiliary Heater

There will be one (1) 31,000 BTU auxiliary heater with 560 SCFM of air flow provided in each outboard rear facing seat risers with a dual scroll blower. An aluminum plenum incorporated into the cab structure used to transfer heat to the forward positions.

Air Conditioning

A condenser will be a 59,644 BTU output that meets and exceeds the performance specification will be mounted on the radiator.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 75 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include one (1) high performance heating core, one (1) high performance cooling core with (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.

The evaporator unit will have a 52,000 BTU at 690 SCFM rating that meets and exceeds the performance specifications.

Adjustable air outlets will be strategically located on the forward plenum cover per the following:

- Four (4) will be directed towards the seating position on the left side of the cab
- Four (4) will be directed towards the seating position on the right side of the cab

Adjustable air outlets will be strategically located on the evaporator cover per the following:

- Five (5) will be directed towards crew cab area

A high efficiency particulate air (HEPA) filter will be included for the system. Access to the filter cover will be secured with four (4) screws.

The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

Climate Control

An automotive style controller will be provided to control the heat and air conditioning system within the cab. The controller will have three (3) functional knobs for fan speed, temperature, and air flow distribution (front to rear) control.

The system will control the temperature of the cab and crew cab automatically by pushing the center of the fan speed control knob. Rotate the center temperature control knob to set the cab and crew cab temperature.

The AC system will be manually activated by pushing the center of the temperature control knob. Pushing the center of the air flow distribution knob will engage the AC for max defrost, setting the fan speeds to 100 percent and directing all air flow to the overhead forward position.

The system controller will be located within panel position #12.

Gravity Drain Tubes

Two (2) condensate drain tubes will be provided for the air conditioning evaporator. The drip pan will have two (2) drain tubes plumbed separately to allow for the condensate to exit the drip pan. No pumps will be provided.

SUN VISORS

Two (2) smoked Lexan™ sun visors will be provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

There will be no retention bracket provided to help secure each sun visor in the stowed position.

GRAB HANDLES

A black rubber covered grab handle will be mounted on the door post of the driver and officer's side cab door to assist in entering the cab. The grab handles will be securely mounted to the post area between the door and windshield.

ENGINE COMPARTMENT LIGHTS

There will be one (1) Whelen, Model 3SC0CDCR, 12 volt DC, 3.00" white LED light(s) with Whelen, Model 3FLANGEC, chrome flange kit(s) installed under the cab to be used as engine compartment illumination.

These light(s) will be activated automatically when the cab is raised.

ACCESS TO ENGINE DIPSTICKS

For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface.

The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling.

The door will have a rubber seal for thermal and acoustic insulation. One (1) flush lift and turn latch will be provided on the access door.

SEATING CAPACITY

The seating capacity in the cab will be six (6).

DRIVER SEAT

A seat will be provided in the cab for the driver. The seat design will be a cam action type, with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have an adjustable reclining back. The seat back will be a high back style with side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat will be furnished with a 3-point, shoulder type seat belt.

OFFICER SEAT

A seat will be provided in the cab for the passenger. The seat will be a fixed type with no suspension. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back will be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will be furnished with a 3-point, shoulder type seat belt.

RADIO COMPARTMENT

A radio compartment will be provided under the officer's seat.

The inside compartment dimensions will be 16.00" wide x 7.50" high x 15.00" deep, with the back of the compartment angled up to match the cab structure.

A drop-down door with one (1) flush lift and turn latch will be provided for access.

The compartment will be constructed of smooth aluminum and painted to match the cab interior.

REAR FACING DRIVER SIDE OUTBOARD SEAT

There will be one (1) rear facing seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat will be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back will be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will be furnished with a 3-point, shoulder type seat belt.

REAR FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) rear facing seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat will be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back will be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will be furnished with a 3-point, shoulder type seat belt.

FORWARD FACING CENTER SEATS

There will be two (2) forward facing seats provided at the center position in the crew cab. The seats will be spaced an additional 5.50" apart to provide more room for each occupant. For optimal comfort, the seats will be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back will be an SCBA style with 90 degree back. The SCBA cavity will be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seats will be furnished with a 3-point, shoulder type seat belt.

SEAT UPHOLSTERY

All seat upholstery will be leather grain 36 oz dark silver gray vinyl resistant to oil, grease and mildew. The cab will have six (6) seating positions.

AIR BOTTLE HOLDERS

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the

cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G.

There will be a quantity of five (5) SCBA brackets.

SEAT BELTS

All cab and tiller cab (if applicable) seating positions will have red seat belts. To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length will meet or exceed the current edition of NFPA 1901 and CAN/ULC - S515 standards.

The 3-point shoulder type seat belts will include height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter. The 3-point shoulder type seat belts will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

The 3-point shoulder type belts will also include the ReadyReach D-loop assembly to the shoulder belt system. The ReadyReach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

Any flip up seats will include a 3-point shoulder type belts only.

To ensure safe operation, the seats will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

HELMET STORAGE PROVIDED BY FIRE DEPARTMENT

CAN/ULC-S515, current edition, section 13.2.1.5 requires a location for helmet storage be provided.

There is no helmet storage on the apparatus as manufactured. The fire department will provide a location for storage of helmets.

CAB DOME LIGHTS

There will be four (4) dual LED dome lights with black bezels provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white.

The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

In order to ensure exceptional illumination, each white LED dome light will provide a minimum of 10.1 foot-candles (fc) covering an entire 20.00" x 20.00" square seating position when mounted 40.00" above the seat.

CAB INSTRUMENTATION

The cab instrument panel will include gauges, an LCD display, telltale indicator lamps, control switches, alarms, and a diagnostic panel. The function of the instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in

low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section, forward of the driver. The gauge assembly and switch panels are designed to be removable for ease of service and low cost of ownership.

Gauges

The gauge panel will include the following ten (10) ivory faced metric standard gauges with chrome bezels to monitor vehicle performance:

- Voltmeter gauge (volts):
  - Low volts (11.8 VDC)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - High volts (15.5 VDC)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - Very low volts (11.3 VDC)
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
  - Very high volts (16.0 VDC)
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
- Engine Tachometer (RPM)
- Speedometer KM/H (Major Scale), MPH (Minor Scale)
- Fuel level gauge (Empty - Full in fractions):
  - Low fuel (1/8 full)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - Very low fuel (1/32 full)
    - Red caution indicator on the information center with steady alarm
    - Amber caution light on gauge assembly
- Engine Oil pressure Gauge (kPa):
  - Low oil pressure to activate engine warning lights and alarms
    - Red caution indicator on the information center with steady alarm
    - Amber caution light on gauge assembly
- Front Air Pressure Gauges (kPa):
  - Low air pressure to activate warning lights and alarm
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
- Rear Air Pressure Gauges (kPa):
  - Low air pressure to activate warning lights and alarm
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
- Transmission Oil Temperature Gauge (Celsius):

    - High transmission oil temperature activates warning lights and alarm
        - Amber caution indicator on the information center with intermittent alarm
        - Amber caution light on gauge assembly
- Engine Coolant Temperature Gauge (Celsius):
    - High engine temperature activates an engine warning light and alarms
        - Amber caution indicator on the information center with intermittent alarm
        - Amber caution light on gauge assembly
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):
    - Low fluid (1/8 full)
        - Amber indicator light in gauge dial

All gauges will perform prove out at initial power-up to ensure proper performance.

Indicator Lamps

To promote safety, the following telltale indicator lamps will be located on the instrument panel in clear view of the driver. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

- Low coolant
- Trac cntl (traction control) (where applicable
- Check engine
- Check trans (check transmission
- Aux brake overheat (Auxiliary brake overheat
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- Side roll fault (where applicable)
- Front air bag fault (where applicable)

The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

Alarms

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

Indicator Lamp and Alarm Prove-Out

A system will be provided which automatically tests telltale indicator lights and alarms located on the cab instrument panel. Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

Control Switches

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver. All switches will have backlit labels for low light applications.

Headlight/Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking and headlights. The second switch position will activate the parking lights. The third switch will activate the headlights.

Panel back lighting intensity control switch: A three (3)-position momentary rocker switch will be provided. Pressing the top half of the switch, "Panel Up" increases the panel back lighting intensity and pressing the bottom half of the switch, "Panel Down" decreases the panel back lighting intensity. Pressing the half or bottom half of the switch several times will allow back lighting intensity to be gradually varied from minimum to maximum intensity level for ease of use.

Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will turn off and deactivate vehicle ignition. The second switch position will activate vehicle ignition and will perform prove-out on the telltale indicators and alarms for 3 to 5 seconds after the switch is turned on. A green indicator lamp is activated with vehicle ignition. The third momentary position will temporarily silence all active cab alarms. An alarm "chirp" may continue as long as alarm condition exists. Switching ignition to off position will terminate the alarm silence feature and reset function of cab alarm system.

Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

Hazard switch will be provided on the instrument panel or on the steering column.

Heater, defroster, and air conditioning control panel.

Turn signal arm: A self-canceling turn signal with high beam headlight controls will be provided.

Windshield wiper control will include high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve will be provided.

Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

High idle engagement switch: A momentary rocker switch with integral indicator lamp will be provided. The switch will activate and deactivate the high idle function. The "OK To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

"OK To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

Emergency switching will be controlled by multiple individual warning light switches for various groups or areas of emergency warning lights. An Emergency Master switch provided on the instrument panel that enables or disables all individual warning light switches is included.

An additional "Emergency Master" button will be provided on the lower left hand corner of the gauge panel to allow convenient control of the "Emergency Master" system from inside the driver's door when standing on the ground.

Custom Switch Panels

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the lower instrument console and up to six (6) switch panels in the overhead visor console. All switches have backlit labels for low light conditions.

Diagnostic Panel

A diagnostic panel will be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel will allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches will allow ABS systems to provide blink codes should a problem exist.

The diagnostic panel will include the following:

- Engine diagnostic port

- Transmission diagnostic port
- ABS diagnostic port
- Roll sensor diagnostic port
- Command Zone USB diagnostic port
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

Cab LCD Display

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

The upper right section will display the following, along with other configuration specific information:

- Odometer
- Trip mileage
- PTO hours
- Fuel consumption
- Engine hours

The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light (electronic) will be provided.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

The same circuit that activates the Do Not Move Apparatus indicator will activate a pulsing alarm when the parking brake is released.

SWITCH PANELS

The built-in switch panels will be located in the lower console or overhead console of the cab. Switches will be rocker type with an indicator light, of which is an integral part of the switch.

WIPER CONTROL

Wiper control will consist of a two (2)-speed windshield wiper control with intermittent feature and windshield washer controls.

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery switched power
- The negative wire will be connected to ground
- Wires will be protected to 20 amps at 12 volts DC
- Power and ground will terminate behind location #13
- Termination will be with 3/8" studs and plastic covers
- Wires will be sized to 125% of the protection

This circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be one (1) dual USB fast charge socket mounts installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery switched power.
- The negative wire will be connected to ground.
- Wires will be protected to 4.8 amps at 12 volts DC.
- The USB socket mount will be officer side dash area.
- Termination will be a Blue Sea Systems part number 1045 dual USB charger socket.
- Wires will be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is applied.

STEREO RADIO

A Jensen, heavy duty AM/FM/CD/Weatherband stereo radio, with front auxiliary input will be installed per switch panel layout . There will be 5.25" speakers installed one (1) pair of 5.25" speakers in the cab and one (1) pair of 5.25" speakers in the crew cab. The antenna will be a roof-mounted rubber antenna located in an open space, on the cab roof .

The following features will be included:

- CD Player with Electronic Skip Protection (ESP)
- Full 7-Channel NOAA Weatherband Tuner with SAME technology
- Built-in Clock
- Audio CD, CD-R, R/W, MP3 CD compatible
- Radio Broadcast Data System Text Display
- Front panel USB input
- Front and Rear Auxiliary Audio Input
- Receives audio (A2DP/AVRCP) from Bluetooth enabled device
- Supports Bluetooth HFP to receive phone calls from BT-enabled phones
- Low battery alert (<10.8Vdc)
- Heavy Duty design with Conformal Coated Circuit Boards for maximum durability under all conditions

INFORMATION CENTER

There will be a Weldon, Model Vista IV, touch screen only, panel mount display with black bezel, employing a full color LCD display to interface with the V-Mux multiplexing electrical system.

The information screen will have the following specifications:

- Operating in temperatures from -40 to 180 degrees F
- Control all exterior and interior devices to an apparatus
- Displays multiple temperature zones: outside and interior CAB
- Indicates real-time status of doors, seats, sensors and other conditions of the apparatus
- ABS impact resistant housing and bezel
- Device controls mainly touch screen based with the ability to extend controls to a secondary PODS switch device
- Internal Clock
- Automatically change state between screens based on vehicle status
- Peer to Peer Network
- V-MuxOn board diagnostics with current switch states
- USB port integrated for downloading
- Ability to design unique graphics fitting to the apparatus

Graphical display for:

- Seating Status
- Outrigger position
- Door open/closed
- Apparatus or System Warnings

Support Vehicle Cameras with Four NTSC formatted video channels

- 360 Cameras
- Back Up
- Turn
- Thermal
- Aerial

INFORMATION CENTER TO BE IN ENGLISH

All of the color Weldon touch information center(s) will display with the English language.

COLLISION MITIGATION

There will be a HAAS Alert®, Model HA5 Responder-to-Vehicle (R2V) collision avoidance system provided on the apparatus. The HA5 cellular transponder module will be installed behind the cab windshield, as high and near to the center as practical, to allow clear visibility to the sky. The module dimensions are 5.40" long x 2.70" wide x 1.30" high, and operating temperature range is -40 degree C to 85 degree C.

The transponder will be connected to the vehicle's emergency master circuit and battery direct power and ground.

While responding with emergency lights on, the HA5 transponder sends alert messages via cellular network to motorists in the vicinity of the responding truck that are equipped with the WAZE app.

While on scene with emergency lights on, the HA5 transponder sends road hazard alerts to motorists in the vicinity of the truck that are equipped with the WAZE app.

The HA5 Responder-to-Vehicle (R2V) collision avoidance system will include the transponder and a 5 year cellular plan subscription.

Activation of the HAAS Alert system requires a representative of the customer to accept the End User License Agreement (EULA) via an on-line portal.

VEHICLE DATA RECORDER

There will be a Weldon vehicle data recorder (VDR) capable of reading and storing vehicle information provided.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A CD provided with the apparatus will include the programming to download the information from the VDR. A USB cable can be used to connect the VDR to a laptop to retrieve required information.

The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:

- Vehicle Speed - MPH
- Acceleration - MPH/sec
- Deceleration - MPH/sec
- Engine Speed - RPM
- Engine Throttle Position - % of Full Throttle
- ABS Event - On/Off
- Seat Occupied Status - Yes/No by Position
- Seat Belt Buckled Status - Yes/No by Position
- Master Optical Warning Device Switch - On/Off
- Time - 24 Hour Time
- Date - Year/Month/Day

Seat Belt Monitoring System

A seat belt monitoring system (SBMS) will be provided. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position via a Weldon seat belt monitoring display per the following:

- Seat Occupied & Buckled = Green LED indicator illuminated
- Seat Occupied & Unbuckled = Red LED indicator with audible alarm
- No Occupant & Buckled = Red LED indicator with audible alarm

- No Occupant & Unbuckled = No indicator and no alarm

In addition to the Weldon seat belt monitoring display, the seat belt monitoring screen will become active on the color Weldon touch display when:

- The home screen is active:
    - and there is any occupant seated but not buckled or any belt buckled with an occupant.
    - and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.

The SBMS will include an audible alarm that will be activated when a red illumination condition exists and the parking brake is released, or a red illumination condition exists and the transmission is not in park.

RADIO ANTENNA MOUNT

There will be one (1) standard 1.125", 18 thread antenna-mounting base(s) installed on the right side on the cab roof with high efficiency, low loss, coaxial cable(s) routed to the instrument panel area. A weatherproof cap will be installed on the mount.

ELECTRICAL POWER CONTROL SYSTEM

There will be a Weldon V-Mux electrical system provided.

The primary power distribution will be centrally located on top of the engine tunnel and be easily accessible from inside the cab for simplified maintenance and trouble shooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible for ease of maintenance.

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection will be provided electronically for all circuits powered by the Weldon, V-MUX control system. For circuits not powered by the Weldon, V-MUX control system, circuit protection devices will be provided which conform to SAE standards. All circuit protection will be sized to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting) and conform to SAE J553 or J258. PTO power circuits will be protected by Type-III manual reset non-cycling circuit breakers conforming to SAE J553 or J258 which remain open until manually reset. When required, automotive type fuses conforming to SAE J554, J1284, J1888 or J2077 will be utilized to protect electronic equipment.

SOLID-STATE CONTROL SYSTEM

The electronic control system will operate as a "Peer-to-Peer" system. Each node will hold its own configuration and operate independently of the others. Communication between nodes will occur through Weldon's RS-485 serial network.

The electronic control system will provide the following features:

- 100% solid state technology
- Operating temperature from -40 degree to +85 degree Celsius
- Integrated load shedding and sequencing of HVAC loads
- Diagnostics and troubleshooting capability - "software purchased separately"
- Network access port

DEDICATED RADIO EQUIPMENT CONNECTION POINTS

A 12-volt power stud and grounding stud will be provided in the electrical component compartment for two-way radio equipment.

EMI/RFI PROTECTION

The electrical system proposed will include means to control undesired electromagnetic and radio frequency emissions. State of the art electrical system design and components will be used to ensure radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions are suppressed at their source.

The apparatus proposed will have the ability to operate in the electromagnetic environment typically found in fire ground operations. The contractor will be able to demonstrate the EMI and RFI testing has been done on similar apparatus and certifies that the vehicle proposed meets SAE J551 requirements.

EMI/RFI susceptibility will be controlled by applying immune circuit designs, shielding, twisted pair wiring and filtering. The electrical system will be designed for full compatibility with low level control signals and high powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL

All 12-volt electrical equipment installed by Pierce Manufacturing will conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

(1) All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.

(2) Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.

(3) Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also, a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.

(4) Corrosion preventative compound will be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections will have this compound in the plug to prevent corrosion and for easy separation (of the plug).

(5) All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.

(6) All electrical terminals in exposed areas will have silicon (1890) applied completely over the metal portion of the terminal. All emergency light switches will be mounted on a separate panel installed in the cab. A master warning light switch and individual switches will be provided to allow preselection of emergency lights. The light switches will be "rocker" type with an internal indicator light to show when switch is energized. All switches will be properly identified and mounted in a removable panel for ease in servicing. Identification of the switches will be done by either printing or etching on the switch panel. The switches and identification will be illuminated.

All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection.

Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

The results of the tests will be recorded and provided to the purchaser at time of delivery.

BATTERY SYSTEM

There will be four (4) 12 volt Exide®, Model 31S950X3W, batteries that include the following features will be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Group 31
- Rating of 3800 CCA at 0 degrees Fahrenheit
- 760 minutes of reserve capacity
- Threaded stainless steel studs

Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45 degree tilt capacity.

The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

Due to the location of the DPF tank under the left side of the cab, one (1) battery will be mounted on the left side battery box and three (3) batteries will be mounted on the right side battery box.

BATTERY SYSTEM

There will be a single starting system with an ignition switch and starter button provided and located on the cab instrument panel.

MASTER BATTERY SWITCH

There will be a master battery switch provided within the cab within easy reach of the driver to activate the battery system.

An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

BATTERY COMPARTMENTS

Batteries will be placed on non-corrosive mats and stored in well-ventilated, unpainted stainless steel compartments located under the cab.

Heavy-duty, 2/0 gauge, color coded battery cables will be provided. Battery terminal connections will be coated with anti-corrosion compound.

Battery solenoid terminal connections will be encapsulated with semi-permanent rubberized compound.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers will be included on the battery compartments.

BATTERY CHARGER

There will be a Kussmaul Auto Charge 1200, Model 091-187-12-REMOTE-B1, battery charger provided. A bar graph display indicating the state of charge will be provided.

The charger will have a maximum output of 40 amps and a fully automatic regulation.

The 120-volt air compressor will be installed to maintain the air system pressure when the vehicle is not in use.

The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger.

Battery charger/compressor will be located in the cab behind the driver's seat.

The battery charger indicator will be displayed through the window behind the driver seat. The display will be mounted on a bracket so that it is visible from outside the apparatus in the lower corner of the window.

SHORELINE INLET

There will be one (1) Blue Sea Sure Eject™ part number 7851, 20 amp 120 volt AC shoreline inlet provided to operate the dedicated 120 volt AC circuits on the apparatus.

The shoreline will be connected to battery charger.

The shoreline inlet cover color to be red.

The connector body will be released from the inlet when the apparatus engine start button is activated.

There will be a mating connector body supplied with the loose equipment.

There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency

The shoreline receptacle will be recessed into the driver's side cab, above the front wheel with blister inside the crew cab.

ADDITIONAL SWITCH BATTERY, IGNITION AND GROUND STUDS

The following power and ground studs will be mounted on a fabricated bracket located on the rear right side of the cab lock down cross member. The studs will be available for body builder interface.

One (1) 3/8" switched batter stud. A 2/0 red cable will connect this stud to the switched battery stud on the rear of the right side battery box.

One (1) 3/8" ignition stud. A 2/0 red cable will connect this stud to the ignition solenoid mounted on the rear side of the right battery box.

One (1) 3/8" ground stud. A 2/0 black cable will connect this stud to the ground stud inside the frame across from the right battery box.

BATTERY BOX COVER

A removable cover will be fabricated and installed over the battery box for protection. The cover will be made out of brushed stainless steel.

ALTERNATOR

A Delco Remy®, Model 40SI, alternator will be provided. It will have a rated output current of 320 amps, as measured by SAE method J56. The alternator will feature an integral regulator and rectifier system that has been tested and qualified to an ambient temperature of 257 degrees Fahrenheit (125

degrees Celsius). The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

BODY BUILDER WIRING HARNESS INTERFACE

Two (2) body builder interface connections from the chassis main wiring harness will be provided on a fabricated bracket located on the rear right side of the cab lock down cross member. The mating connectors filled with seal plugs will be provided on the interface connections.

One (1) body builder interface connection from the chassis engine wiring harness will be provided in the left side frame rail. The mating connector filled with seal plugs will be provided on the interface connection.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks.

The system will include the following features:

- System voltage monitoring.
- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Priority levels can be set for individual outputs.
- The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
- ON = not shed
- SHED = shed

SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals.

When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater
- Cab Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Third Evaporator (if applicable)

HEADLIGHTS

There will be four (4) rectangular halogen lights mounted in the front quad style, chrome housings on each side of the cab grille:

- The outside light on each side will contain a halogen low and high beam module.
- The inside light on each side will contain a halogen high beam module only.

FRONT DIRECTIONALS

The front directional's will be Whelen, Model M6T, amber LED arrow lights. The directional's will be housed in the same chrome common bezel as the front warning light and will be located above the headlights.

CAB CLEARANCE/MARKER/ID LIGHTS

There will be seven (7) amber LED lights provided per the following:

- Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield as close to the outside of the apparatus as practical.
- Two (2) amber LED clearance lights will be installed, one (1) on each side of the cab as high and far forward as practical.

The lights will be installed without guards.

FRONT CAB SIDE DIRECTIONAL/MARKER LIGHTS

There will be two (2) Weldon, Model 9186-8580-29, amber LED lights installed front of the cab door, one (1) on each side of the cab.

The lights will activate as marker lights with the headlight switch and directional lights with the corresponding directional circuit.

REAR FMVSS LIGHTING

There will be a pair of Truck Lite, Model 4027, incandescent tail lamp assemblies provided.

Each module will include the following:

- One (1) incandescent stop/tail light
- One (1) incandescent turn light (right or left)
- One (1) incandescent backup light

Each light will be equipped with a quick disconnect plug. The assemblies will be shipped loose with the apparatus.

LICENSE PLATE BRACKET

There will be one (1) Weldon, Model 0J10-0393-00, license plate bracket mounted on the rear of the body.

A Weldon, Model 9186-23882-30, incandescent step light will illuminate the license plate.

BACK-UP ALARM

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

CAB PERIMETER SCENE LIGHTS

There will be four (4) Amdor, Model AY-LB-12HW012, 190 lumens each, 12.00" white LED strip lights provided.

- One (1) under the driver's side cab access step.
- One (1) under the passenger's side cab access step.
- One (1) under the passenger's side crew cab access step.
- One (1) under the driver's side crew cab access step.

The lights will be activated when the battery switch is on and the respective door is open and whenever control has been selected for the body perimeter lights.

12 VOLT LIGHTING

There will be one (1) HiViz Model FT-B-46-*, 2.56" high x 46.00" long x 3.31" deep 12 volt DC LED light with with a combination of flood and spot optics provided on the front visor centered.

The painted parts of the light housing and brackets to be white.

The light will be activated by a switch at the driver's side switch panel.

The light may be load managed when the parking brake is applied.

An apparatus interface wiring harness for the engine will be supplied with the chassis. The midship harness will include a connector for connection to the chassis harness which will terminate in the left frame rail behind the cab for reconnection by the apparatus builder.The midship harness will contain

connectors for a Class1 Total Pressure Governor and a multiplexed gauge. Separate circuits will be included for pump controls, "Pump Engaged" and "OK to Pump" indicator 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. The harness will be designed for a side mount pump panel.

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

AIR PUMP SHIFT

Pump shift engagement will be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab. A manual back-up shift control will also be located on the pump operator's pump panel.

Two (2) indicator lights will be provided adjacent to the pump shift inside the cab. One (1) green light will indicate the pump shift has been completed and be labeled "pump engaged". The second green light will indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light will be labeled "OK to pump".

The pump shift control in the cab will be illuminated to meet NFPA requirements.

The air lines that control the shifting mechanism on the water pump will be extended 10 feet beyond the back of the cab and tied up in the chassis frame rail.

AIR HORN SYSTEM

Two (2) Hadley round air horns with 6.00" bell will be recessed in the front bumper. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.

Air Horn Location

The air horns will be located on each side of the bumper, towards the outside.

Air Horn Control

The air horns will be actuated by a chrome push button located on the officer's side of the engine tunnel and by the horn button in the steering wheel. The driver will have the option to control the air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

ELECTRONIC SIREN

A Whelen®, Model 295SLSA1, electronic siren with noise canceling microphone will be provided.

This siren to be active when the battery switch is on and that emergency master switch is on.

Electronic siren head will be recessed in the driver side inside switch panel.

SIREN CONTROL
The electronic siren will be controllable on the siren head and horn ring only. No foot switches will be required.

The driver will have the option to control the siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

SPEAKER
There will be one (1) Whelen®, Model SA315P, black nylon composite, 100-watt, speaker with through bumper mounting brackets and polished stainless steel grille provided. The speaker will be connected to the siren amplifier.

The speaker will be recessed in the right side of the front bumper, just outside of the frame rail.

LIGHTS, FRONT ZONE LOWER
Two (2) Whelen model M6*C LED flashing warning lights will be installed on the cab face above the headlights, in a common bezel with the directional lights.

The driver's side front warning light to be red.

The passenger's side front warning light to be red.

Both lights will include a clear lens.

There will be a switch located in the cab on the switch panel to control the lights.

DAYTIME RUNNING LIGHTS (HEADLIGHTS)
The headlights will include a feature for daytime running lights which will be automatically activated when the parking brake is released. The daytime running light feature will be deactivated when the primary headlight switch is turned on, when other headlight options are activated or when the parking brake is set. The running lights will be wired through the low beam head lights.

HEADLIGHT FLASHER
The high beam headlights will flash alternately between the left and right side.

There will be a switch installed in the cab on the switch panel to control the high beam flash. This switch will be live when the battery switch and the emergency master switches are on.

The flashing will automatically cancel when the hi-beam headlight switch is activated or when the parking brake is set.

SIDE ZONE LOWER LIGHTING
There will be two (2) Whelen®, Model M6*C, LED flashing warning lights with Model M6FC, chrome flanges located in the following positions:

- Two (2) lights, one (1) each side on the bumper extension
    - The side front lights to be red

All lights will include a clear lens.

There will be a switch located in the cab on the switch panel to control the lights.

SIDE WARNING LIGHTS

There will be two (2) Whelen®, Model M6**, 4.31" high x 6.75" wide x 1.37" deep flashing LED warning light(s) with chrome trim provided, each side of cab rear of crew doors - above comp. door.

The light(s) to include red flashing LEDs.

The warning light lens color(s) to be clear.

There will be a switch in the cab on the switch panel to control the lights.

White LEDs will be deactivated when the parking brake is applied.

Amber, blue, green and red LEDs may be load managed when the parking brake is applied.

PAINT PROCESS

The exterior custom cab and/or body painting procedure will consist of a seven (7) step finishing process. A commercial chassis paint process will follow similar processes as determined by the chassis manufacturer. The following procedure will be used by Pierce:

1. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body will be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces will be removed and sanded to a smooth finish. Exterior seams will be sealed before painting. Exterior surfaces that will not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.
2. Chemical Cleaning and Pretreatment - All surfaces will be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces will be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces will be properly cleaned and treated using a high temperature 3 step process specifically designed for steel or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion. A final pure water rinse will be applied to all metal surfaces.
3. Surfacer Primer - The Surfacer Primer will be applied to a chemically treated metal surface to provide a strong corrosion protective base coat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a critical aesthetic finish. The surfacer primer will be a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.
4. Finish Sanding - The surfacer primer will be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.
5. Sealer Primer - The sealer primer is applied prior to the base coat in all areas that have not been previously primed with the surfacer primer. The sealer primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when top coated.

6. Base coat Paint - Two coats of a high performance, two component high solids polyurethane base coat will be applied. The Base coat will be applied to a thickness that will achieve the proper color match. The Base coat will be used in conjunction with a urethane clear coat to provide protection from the environment.
7. Clear Coat - Two (2) coats of clear coat will be applied over the base coat color. The clear coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style doors will be clear coated to match the body. Paint warranty for the roll-up doors will be provided by the roll-up door manufacturer.

Our specifications are written to define cyclic corrosion testing, physical strengths, durability and minimum appearance requirements must be met in order for an exterior paint finish to be considered acceptable as a quality finish.

Each batch of base coat color will be checked for a proper match before painting of the cab and the body. After the cab and body are painted, the color is verified again to make sure that it matches the color standard. Electronic color measuring equipment will be used to compare the color sample to the color standard entered into the computer. Color specifications are used to determine the color match. A Delta E reading will be used to determine a good color match within each family color.

All removable items such as brackets, compartment doors, door hinges, and trim will be removed and separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.

Environmental Impact

Contractor will meet or exceed all current State regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations will have a 99.99 percent efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98 percent. Water wash systems will be 99.97 percent efficient.
- Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- Paint wastes will be disposed of in an environmentally safe manner.
- Empty metal paint containers will be recycled to recover the metal.
- Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Pierce will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with the state EPA rules and regulations.

PAINT
The cab and the body will be painted #90 red

GALVANIZED CHASSIS FRAME ASSEMBLY
The chassis frame assembly will be hot dip galvanized before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be hot dip galvanized are:

- Frame rails
- Frame liners
- Cross members
- Front frame extension

All galvanized components are inspected for compliance with ASTM specifications.

Battery boxes will be stainless steel.

All components that are not galvanized will be painted primer and gloss black paint.

AXLE HUB PAINT
All axle hubs will be painted to match lower job color.

ONE (1) YEAR MATERIAL AND WORKMANSHIP
A Pierce basic apparatus limited warranty certificate, WA0344, is included with this proposal.

ENGINE WARRANTY
A Cummins **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0181, is included with this proposal.

STEERING GEAR WARRANTY
A TRW **one (1) year** limited steering gear warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.

FIFTY (50) YEAR STRUCTURAL INTEGRITY
The Pierce custom chassis frame limited warranty certificate, WA0013, is included with this proposal.

FRONT AXLE WARRANTY
A Eaton **five (5)-year/100,000 mile** parts and labor warranty will be provided.

REAR AXLE WARRANTY
A Eaton **five (5)-year/100,000 mile** parts and labor warranty will be provided.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY
A Meritor Wabco™ ABS brake system limited warranty certificate, WA0232, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce custom cab limited warranty certificate, WA0012, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this proposal.

VEHICLE MULTIPLEX WARRANTY

The Weldon V-MUX multiplex system is warranted against mechanical, electrical and physical defects for the period defined in the manufacturer's warranty table per module.

A copy of the manufacturer's warranty certificate will be submitted with the bid package.

TRANSMISSION WARRANTY

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

TRANSMISSION COOLER WARRANTY

The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the warranty coverage and will not exceed $10,000 per occurrence. A copy of the warranty certificate will be submitted with the bid package.

VEHICLE STABILITY CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

ENGINE INSTALLATION CERTIFICATION

The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of delivery.

POWER STEERING CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.

CAB INTEGRITY CERTIFICATION

The fire apparatus manufacturer will provide a cab crash test certification with this proposal. The certification will state that a specimen representing the substantial structural configuration of the cab has been tested and certified by an independent third party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer will provide a state licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.

Roof Crush
The cab will be subjected to a roof crush force of 22,500 lb. This value meets the ECE 29 criteria, and is equivalent to the front axle rating up to a maximum of ten (10) metric tons.

Side Impact
The same cab will be subjected to dynamic preload where a 13,275-lb moving barrier is slammed into the side of the cab at 5.50 mph, striking with an impact of 13,000 ft-lb of force. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

Frontal Impact
The same cab will withstand a frontal impact of 32,600 ft-lb of force using a moving barrier in accordance with SAE J2420.

Additional Frontal Impact
The same cab will withstand a frontal impact of 65,200 ft-lb of force using a moving barrier. (Twice the force required by SAE J2420)

The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

CAB DOOR DURABILITY CERTIFICATION
Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION
Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles.* The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

SEAT BELT ANCHOR STRENGTH
Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH
Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify, at time of delivery, that

each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

PERFORMANCE CERTIFICATIONS

Cab Air Conditioning

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 78 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

Cab Defroster

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

Cab Auxiliary Heater

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. An auxiliary cab heater will warm the cab 77 degrees Fahrenheit from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify, at time of delivery, that a substantially similar cab has been tested and has met these criteria.

SPECIFICATIONS INDEX

SECTION 1 TECHNICAL REQUIREMENTS

1.1 DISCLAIMER

1.1.1 This specification document is for reference only and is a general representation of how we propose to build your fire apparatus. Upon placing an order, the customer, dealer and manufacturer will conduct a pre-construction meeting to go through every point of the specification thoroughly and ensure the truck will be built to your precise requirements. Do not hesitate to contact your representative if you have any questions concerning this document.

1.2 GENERAL

1.2.1 This unit will comply with the ULC S515 standard effective November 1, 2014, except for fire department's specifications that differ from ULC specifications. These exceptions will be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing, and walking surfaces will be supplied with delivery of the apparatus.

A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.

All safety warnings will be in French and English.

The manufacturer will have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company will designate, in writing, who is qualified to witness and certify test results..

The apparatus will be in service at an elevation of less than 2000'.

1.2.2 A pump test will be made at the apparatus manufacturer's plant, and all costs incurred to perform this test will be covered by the bidder.

1.2.3 The apparatus will be compliant with all regulations contained within the Canadian Motor Vehicle Safety Standards (CMVSS).

1.2.4 All components used in the manufacture of this apparatus will be brand new and of the highest quality.

The choice of all components used in the construction of this apparatus will correspond with the best recognized quality standards in the fire apparatus manufacturing industry.

When a part number is specified, no substitute will be accepted.

1.3 DOCUMENTATION UPON DELIVERY

1.3.1 Two (2) digital copies of the chassis operator's, service, parts, wiring and troubleshooting manuals.

1.3.2 One (1) digital copy of wiring, for the chassis and the body. The diagram will be « As Built Wiring Diagrams ».

1.3.3 Two (2) digital copies of the ULC or NFPA documentation (USB flash drive).

1.3.4 One (1) copy of warranties, instruction and/or maintenance manuals of equipments added to the vehicle.

1.3.5 Two (2) digital copies of operation manual of the truck, including operation of the pump, the foam system and a troubleshooting guide.

1.3.6 One (1) copy of FAMA of Fire Apparatus Safety Guide.

SECTION 2 CUSTOM CHASSIS

2.1 CUSTOM CHASSIS

2.1.1 A custom fire chassis will be provided. Full chassis specifications are annexed to this document.

SECTION 3 PUMP

3.1 PUMP MODEL

3.1.1 A brand new current year Waterous CX pump NFPA rated at 1500 GPM (1250 IGPM). The pump will be supplied with a C20-gearbox and will have mechanical type seal.

3.1.2 Pump will provide the following ratings at an altitude of less than 600 meters (2000 ft):

- 1500 GPM (1250 IGPM)- 100% of rating at 165 PSI
- 1500 GPM (1250 IGPM)- 100% of rating at 150 PSI
- 1050 GPM (875 IGPM)- 70% of rating at 200 PSI
- 750 GPM (625 IGPM)- 50% of rating at 250 PSI

3.2 PUMP SHIFT

3.2.1 Pump shift will be pneumatically-controlled and activated from inside. All indicators lights and pump engagement will be ULC S515 and NFPA 1901 compliant.

3.3 PRESSURE GOVERNOR

3.3.1 A FRC pressure governor «Pump Boss PBA400» will be installed on the operator control panel.

The pressure governor will be calibrated by the manufacturer in « pressure/preset » mode at a pressure specified by the customer.

3.4 PRIMER

3.4.1 The priming system will be a Trident AirPrime, AutoPrime, 3-barrel with push button control and automatic function.

3.5 COOLER

3.5.1 Water flow from the fire pump will be used to cool the engine coolant. The control, «¼ turn type» will be located on pump panel and equipped with a ¾" valve.

3.6 DRAIN SYSTEM

3.6.1 A manual master drain valve will be installed on the pump panel. The master pump drain assembly will consist of a Trident Emergency bronze master drain with a rubber disc seal. The master drain will have a rubber seal to prevent water from running out on the running board

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

3.6.2 An Innovative Control brand ¾" bleeder valve with lift-up handle will be provided for each inlet and discharge. The drain will be located at the lowest drainage point of the fire pump.

3.7 PLUMBING

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

3.7.2 The pumping system will have an Akron model 59 pressure relief valve for each intake more than 3'' diameter.

3.7.3 All the valves on the truck will be Akron 8800 series, except where otherwise specified.

3.7.4 When flexibility is needed, a "Victaulic" fitting will be installed.

3.7.5 The pump and steel accessories will be painted black. Stainless steel plumbing components are not painted.

3.7.6 All discharges, except the 1½" and 2" discharges will have a 30 degree chrome elbow.

3.7.7 All 2½" discharges will be equipped with a 2½" female chrome-plated reducer to a male 1½" with a 1½" chrome cap retained by a chrome chain.

All caps will be Pressure Relieving hose cap NFPA compliant.

3.7.8 The hoses threads on the vehicle will be:

1½ ": NPSH

2½ ": CSA (3.125" X 5 tpi)

6 ": NH

3.7.9 All storz fitting installed on the truck will be 4".

3.8 INTAKES AND DISCHARGES (GENERAL)

3.8.1 Control handles for discharges that will not be electric, will be push-pull «T» style controls, Innovative Controls brand.

The valve controller will be a chrome push-pull locking "T" handle located at the pump operator`s panel and will visibly indicate the position of the valves at all times. The control will be located directly adjacent to one another and will be mounted in line so they are in the same position when shut off. The control lever will be connected directly to its respective valve by a 0.718" OD rod to form a direct linkage control system.

3.8.2 All discharges and intake located at the sides and rear panels will be provided with Innovative Controls brand, chrome bezel with color identification.

These bezels will be screwed into the panel without nuts at the back.

3.8.3 Color coded pump panel labels will be in accordance with the NFPA standard as follows:

Discharge	**Color**
• Precconect #1	Orange
• Precconect #2	Red
• Preconnect #3 or Discharge #1	Yellow
• Discharge #2	White
• Discharge #3	Blue
• Discharge #4	Black

- Discharge #5 Green
- Deluge/deck gun Silver
- Large-diameter hose Yellow with white border
- Foam Line(s) Red with white border
- Booster Reel(s) Gray
- Inlets Burgundy

3.9 INTAKES

3.9.1 One (1) 6" diameter suction ports with 6" NST male threads and removable zinc screens will be provided on left side of the pump module.

3.9.2 One (1) 6" diameter suction ports with 6" NST male threads and removable zinc screens will be provided on right side of the pump module.

3.9.3 One (1) 2½" suction intake will be installed on the left side of the pump module with a manual lever control integrated to the valve. It will be equipped with a strainer and a chrome plug with a retaining chain.

A ¾" bleeder valve assembly will be installed for this intake.

3.10 DISCHARGES

3.10.1 Two (2) 2½" discharges, with 2½" valves, will be installed on left side of the pump module. These valves will be controlled with a push-pull type handle.

3.10.2 One (1) 2½" discharge, with 2½" valve, will be installed on right side of the pump module. This valve will be controlled with a push-pull type handle.

3.10.3 One (1) LDH discharge, with 3" valve, will be installed on right side of the pump module. The discharge will have a 30 degrees anodized Storz elbow with a cap. This valve will be controlled with a push-pull type handle.

3.10.4 One (1) pre-connect discharge will be located in a front bumper compartment. This outlet will provide a 2" diameter valve and a 90 degree, 1½" swivel that will exit in the middle of the compartment. This valve will be controlled with a push-pull type handle.

There will be a Class 1 automatic drain installed at all lowest points in the plumbing.

3.10.5 One (1) 2½" discharge, with 2½" valve, will be installed at rear, on the upper LHS, just below the hose bed. This valve will be controlled with a push-pull type handle.

3.10.6 Two (2) speedlay discharges will be provided. Each speedlay section will include one (1) 2" brass swivel above each hose compartment with a 1½" hose connection to allow the use of the hose from either side of the apparatus.

These valves will be controlled with a push-pull type handle.

The speedlay piping will consist of two (2) 2" heavy duty hoses coming from the pump discharge manifold to the 2" swivel.

3.10.7 One (1) crosslay discharge will be provided across the top of the pump house, above the speedlays. This outlet will provide a 2-1/2" diameter valve, manual control and a 90 degree, 2-1/2" brass swivel with a 2½" hose connection. This valve will be controlled with a push-pull type handle.

Six (6) 1" stainless steel roller guides will be installed, three (3) on each side of the crosslay compartment. The top of the crosslay compartment will be covered by a hinged aluminum checker plate hinged cover with a vinyl tarp on each end.

3.10.8 One (1) discharge, 3" manual valve will be installed on the top of the truck, for a deck gun, with the control on the pump panel. Discharge will terminate threaded with a cap. Discharge will be located at the front of the body, within the dunnage area.

There will be no monitor supplied

3.11 TANK FILL AND TANK-TO-PUMP

3.11.1 One (1) 2" valve combination tank refill and pump re-circulation line will be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

The adapter on the tank will be in stainless steel.

3.11.2 The tank will be connected to the pump with 4" piping and one (1) 3" valve. This pipe will have a check valve, an anti-swirl mechanism to prevent pump cavitation and will be connected to the tank.

3.12 FOAM

3.12.1 A foam proportioning system will be provided. The system will be an on demand, automatic proportioning, single point, direct injection system suitable for all types of Class A and B foam concentrates, including the high viscosity (6000 cps), alcohol resistant Class B foams. Operation will be based on direct measurement of water flow, and remain consistent within the specified flows and pressures. The system will automatically proportion foam solution at rates from .1 percent to 3.0 percent regardless of variations in water pressure and flow, up to the maximum rated capacity of the foam concentrate pump.

The design of the system will allow operation from draft, hydrant, or relay operation.

3.12.2 The system will have the ability to deliver the following minimum foam solution flow rates at accuracies that meet or exceed NFPA requirements at a pump rating of 150 psi.

- 100 gpm @ 3 percent
- 300 gpm @ 1 percent
- 600 gpm @ 0.5 percent

Class A foam setting in .1 percent increments from .1 percent to 1 percent. Typical settings of 1 percent, .5 percent and .3 percent (Maximum capacity will be limited to the plumbing and water pump capacity).

3.12.3 The system will be equipped with a digital electronic control display located on the pump operator's panel. Push button controls will be integrated into the panel to turn the system on/off, control the foam percentage, and to set the operation modes. The percent of injection will have a preset. This preset can be changed at the fire department as desired. The percent of injection will be able to be easily changed at the scene to adjust to changing demands.

Three (3) .50 tall LEDs will display the foam percentage in numeric characters. Three (3) indicator LEDs will also be included, one (1) green, one (1) red, and one (1) yellow. The LEDs will indicate various system operation or error states.

The indications will be:

- Solid Green - System On
- Solid Red - Valve Position Error
- Solid Yellow - Priming System
- Flashing Green - Injecting Foam
- Flashing Red - Low Tank Level
- Flashing Yellow - Refilling Tank

The control display will house a microprocessor, which receives input from the systems water flow meter while also monitoring the position of the foam concentrate pump. The microprocessor will compare the values of the water flow versus the position/rate of the foam pump, to ensure the proportion rate is accurate. One (1) check valve will be installed in the plumbing to prevent foam from contaminating the water pump.

3.12.4 The foam concentrate pump will be powered by an electric over hydraulic drive system. The hydraulic system and motor will be integrated into one (1) unit.

3.12.5 The foam system will be plumbed to the preconnected discharges and rear left side discharges if applicable.

3.12.6 The foam concentrate pump will be of positive displacement, self priming; linear actuated design, driven by the hydraulic system.

The pump will be constructed of brass body; chrome plated stainless-steel shaft, with a stainless-steel piston. In order to increase longevity of the pump, no aluminum will be present in its construction.

A relief system will be provided which is designed to protect the drive system components and prevent over pressuring the foam concentrate pump.

The foam concentrate pump will have minimum capacity for 3 GPM with all types of foam concentrates with a viscosity at or below 6000 CFP including protein, fluoro-protein, AFFF, FFFP, or ARAFFF.

The system will deliver only the amount of foam concentrate flow required, without recirculating foam back to the storage tank. Recirculating foam concentrate back to the storage tank can cause agitation and premature foaming of the concentrate, which can result in system failure. The foam concentrate pump will be self-priming and have the ability to draw foam concentrate from external supplies such as drums or pails.

3.12.7 An external foam pick-up will be provided to enable use of a foam agent that is not stored on the vehicle. The external foam pick-up will be designed to allow continued operation after the on-board foam tank is empty, or the use of foam different than the foam in the foam tank.

3.12.8 A bronze three (3)-way valve will be provided. The unit will be mounted to the pump panel. The valve unit will function as the foam system tank to pump valve and external suction valve. The external foam pick-up will be one (1) .75" male connection GHT (garden hose thread) with a cap.

3.12.9 A .75" flexible hose with an end for insertion into foam containers will be provided. The hose will be supplied with a .75" female swivel GHT (garden hose thread) swivel connector. The hose will be shipped loose.

3.12.10 The maximum current draw of the electric motor and system will be no more than 55 amperes at 12 VDC.

3.12.11 The foam system's proportioning pump will be used to fill the foam tank. This will allow use of the auxiliary foam pick-up to pump the foam from pails or a drum on the ground into the foam tank. A foam shut-off switch will be installed in the fill dome of the tank to shut the system down when the tank is full. The fill operation will be controlled by a mode in the foam system controller. While the proportioning pump is filling the tank, the controller will display a flashing yellow LED to indicate that the tank is filling. When the tank is full, as determined by the float switch in the tank dome, the pump will stop and the controller will shut the yellow LED off. If it attempted to use tank fill and the refill valve and suction valve are in the wrong position(s), then a red LED will illuminate to indicate the improper valve position(s). When the valves are positioned properly, then filling will commence.

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

The pump system will utilize a stainless-steel discharge manifold system and flexible high-pressure hose with stainless-steel ends that allows a direct flow of water to discharge valves.

3.12.13 The system will be installed in a suitable, accessible location. The system will be installed and calibrated by the manufacturer before delivery.

3.12.14 A label will be placed near the foam concentrate tank fill opening that reads: “DO NOT MIX BRANDS AND TYPE OF FOAM”

3.12.15 A system rating panel placard will be installed near the foam controller.

SECTION 4 PUMP OPERATOR CONTROL PANEL

4.1 CONTROL PANEL

4.1.1 Controls and gauges will be located on driver side.

The side intake/discharge pump panels will be a 1/8'' Aluminum sheet with a Black Zolatone painted finish. Each panel will be removable for easier maintenance access to plumbing components.

Pump operator control panel will be a 1/8'' Aluminum sheet with a Black Zolatone painted finish. The upper panel section will be hinged on one side for easier maintenance access to electrical components.

4.1.2 Innovative Controls gauges reading will be in PSI and kPa. The 4½" pressure gauges will be filled with interlube.

There will be one (1) 4½" diameter, 30"-0-400 psi (100-0-2800 kPa) gauge connected to the pressure manifold and another one (1) connected at the pump inlet in a single assembly with chrome bezel and colored labels.

4.1.3 Innovative Controls gauges reading will be in PSI and kPa. The pressure gauges will be filled with interlube.

There will also be one (1) 2½" diameter, 0-400 psi (0-2800kPa) connected to each discharge.

4.1.4 An FRC model WLA300 water level gauge will be installed on the pump panel.

4.1.5 A vacuum and pressure port for annual pump performance testings and checking the accuracy of pump panel gauges.

4.1.6 A minimum of three (3) rocker switches for pump heater, pump lights and hose bed light will be installed on the pump panel. The heater will have a red pilot light.

4.1.7 A push button identified “Evacuation Alert” will be installed to the pump operator panel and connected to the air horns.

4.2 COLD PACKAGE

4.2.1 A 42,000 BTU heater will be installed in the pump compartment. This heater will use the truck coolant system. The heater will have two (2) fans.

4.2.2 An aluminum heat pan will be installed below the pump house to prevent freezing and will be removable without any tools.

The heat pan will have approximately 48'' wide x 72'' long and cover all the pump and plumbing. The front and the back of the heat pan will be protected by an aluminum plate around the drive shaft.

The clearance between ground and the heat pan will be minimum 10''

SECTION 5 TANK

5.1 GENERAL

5.1.1 A 1000 gallon (U.S.) booster tank and a 30 gallon (U.S.) foam tank will be supplied. The booster tank will be completely removable without disturbing or dismounting the apparatus body structure.

5.1.2 The booster tank will be entirely in ½" thick copolymer polypropylene with 3/8" swash partitions.

The assembly will be welded utilizing thermoplastic welding technology.

The booster tank will have lifting eyelets for facilitating the removal.

5.1.3 The water/foam tank(s) design will be in accordance with ULC S515 and NFPA 1901 requirements.

The foam tank will have one (1) air intake installed on the top of the foam tank. The tank(s) will provide two (2) openings, one (1) for the injection system supply and the second one to allow tank cleaning with a 1" hose with Class 1, model BV10, 1" valve.

5.1.4 At the front, under the tank, there will be a dirt collector with a 1½" drain and a 3" plug.

The drain will be installed at the bottom of the collector to allow fully draining of the tank. This drain control will be on the operator pump panel, not in a compartment.

The valve will be enclosed in the heat pan assembly to prevent freezing.

5.1.5 One (1) manual fill tower will be located to the left forward area of the tank. The tower will be 14"x14" and a 6" vent/overflow pipe will be installed halfway-up the tower.

This pipe will empty behind rear wheels.

5.2 TANK INTAKE AND DISCHARGE

5.2.1 One (1) 2½" inlet for direct tank fill will be installed at the curbside pump panel, as low as possible and clearly labeled. This inlet will be equipped with a 2½" valve less Fireman’s Friend device with a 30-degree 2½" diameter elbow with a threaded connection, filter, cap and retention cable. Piping for the fill will be routed through the rear wall and include a flow deflector to avoid the breaking of the tank when it is being filled.

SECTION 6 BODY GENERALITIES

6.1 GENERAL

6.1.1 The aluminum used to build the body and pump house will be 5052-H32 marine grade and 6061-T6/6063-T5 for aluminum extrusions.

The thickness of the aluminum will be 3/16" for the bottom and the back of each compartment and for the front and back of the body. Only the wall between compartments will be 1/8" thick.

The aluminum tread plates will be 3003-H22, 1/8" thick and will meet NFPA slip resistance, when specified.

6.1.2 The fabrication of the body will be formed sheet metal and the body sub-structure will be made from square aluminum tubing extrusion 2" x 3" x ¼" and 3" x 3".

Formed and welded components will allow the Fire Department to have the body repaired locally in the case where any object has struck the body and caused damage. The use of proprietary extrusions will prevent the Fire Department from such repair and will NOT be used.

6.1.3 All joints that may corrode or degrade by calcium and water infiltration will be sealed by a continuous welding cord outside.

Where there is a possibility of water infiltration between aluminum tread plates and painted aluminum, gray silicon sealer will be applied.

All joints and weldings will be polished and so leave no sharp edge.

6.1.4 The design of the body is such that the water tank of the truck will not be visible outside. Any type of "WET SIDE" design will be refused.

6.1.5 All compartments will be “sweep out” design, which means the floor is raised by at least 1’’ to avoid water infiltration

6.1.6 The aluminum components of the body and pump house will be manufactured by using CNC (Computer Numeric Control) machine tools. Each individual assembly parts will be cut and bended for an optimum precision.

6.2 PUMPHOUSE

6.2.1 A step will be installed each side of the pump house, on its full width. The step will have 11¾" in depth and will be built from aluminum grip-strut.

6.2.2 The top of the pump house will be made of aluminum tread plates and will meet ULC S515 and NFPA 1901 requirements.

The front of the pump house will be covered by tread plates. Between the cab and the pump house there will be an access door to access to the pump without any tools.

6.2.3 The pump module will have a total width of 26” and two upper storage areas. The lower transverse storage area will accommodate two preconnected handlines (150’ of 1¾’’ hose with nozzle). The bottom of this compartment will be at approximately 65” from the ground.

The speedlay areas will include two storage trays. The trays will be constructed of 1/8” (.125”) smooth aluminum plate with an exterior sanded finish. The walls and floor of the tray will be slotted to prevent the accumulation of water and allow for ventilation of wet hose.

A protective strip of 3/16" (0.187") UHMW Polyethylene will be bolted to the bottom of the speeadlay area. Two (2) 1” stainless steel rollers will be installed, one on each side, to facilitate the removal and insertion of the trays in this compartment. Pump service access doors will be provided. There will be four (4) access points to the pump: one (1) in L1, one (1) in R1, one (1) in at the front of the pump house when the cab is raised and one (1) on the top, at the front of the body. The doors will be secured with tool-free hardware.

6.2.4 A «P» shaped rubber gasket of about 1'' will be installed between the pumphouse and the body to avoid friction of the modules.

6.2.5 The pumphouse will be attached to the chassis frame by utilizing rubber isolators.

6.2.6 Above the speedlay hosebed, there will be a crosslay compartment toward front of the module and an enclosed cargo compartment toward rear of the module.

The crosslay storage area will accommodate a preconnected handline of 200’ of 2-1/2’’ hose with nozzle.

Two (2) aluminum tread plate doors will be installed, one (1) on each side of the apparatus, to facilitate easy access to the cargo compartment.

Each door will be equipped with a compression type latch. The doors will be hinged vertically.

6.2.7 The pumphouse will be designed and constructed to be the same height as the body.

6.3 BODY ATTACHMENT

6.3.1 The main body will be attached to the chassis frame rails with six (6) U-bolts.

U-bolts will be made of two (2) 5/8" diameter steel bolts and two (2) ½" thick x 2" width steel plates.

There will be insulation between U-bolts and body.

The mounting will allow easy removal of the body in case of major repair.

6.3.2 There will be rubber insulation installed between the aluminum body and the steel frame rails.

6.4 BODY

6.4.1 Two (2) heavy duty tow eyes made from 2-1/2" diameter steel will be mounted below the body at the rear of the vehicle to allow towing (not lifting).

The tow eyes and subframe assembly will be painted black.

There will be a plate specifying the capacity of the assembly.

6.4.2 The top and the front of the body compartments will be covered by 1/8" thick aluminum bright finish tread plate.

6.4.3 The wheel-well outer face will be made of 3/16" thick aluminum and will be painted the same color as the body.

6.4.4 The wheel-well will have monohull composite full depth wheel-well liner.

6.4.5 A "P" shaped fenderette will be built from polished aluminum semi-circular moulding with a mirror finish.

6.4.6 Rub rails will be mounted along both sides of the body. The rub rail will be C-channel in design and constructed of 3/16" thick aluminum extrusion. The rub rails will be 2-1/2" high x 1-1/2" deep and will extend beyond the width of the body to protect compartment doors and the body sides. The depth of the rub rails will allow for the installation of marker and/or warning lights for their protection.

6.4.7 The rear tires will have a set of black mud flaps mounted behind the rear tires.

6.4.8 Four (4) compartments for SCBA cylinders will be installed in the wheels well.

The rear left compartment will be able to contain two (2) cylinder whereas the three (3) others could each contain three (3) cylinders.

Every cylinder compartment will be built with aluminum tubes and the bottom will be covered with rubber mat according to the ULC S515 and NFPA 1901 requirements.

Every compartment will have an aluminum door of the same color as the vehicle with a “compression type” latch. The doors will be designed to avoid water and dust infiltration with reinforcement inside the door.

6.5 HOSE BED

6.5.1 A hose bed will be fabricated above the water tank and will have a minimum width of 70", a minimum length of 116" and a minimum height of 14".

The sides of the hose bed will be constructed of smooth brushed aluminum.

Hose bed flooring will be easily removed interlocking plastic tiles, minimum 5/8’’ thick.

The area forward of the hose bed will be open dunnage, including the fill towers and the deck gun discharge.

6.5.2 Two (2) adjustable hose bed divider will be provided, constructed of 3/16" brushed aluminum plate with a reinforced aluminum base welded to the bottom. The rear end of the divider will have a 3" radius corner and a handle will be integrated to the divider.

6.5.3 The main hose bed will be covered by two (2) checker plate panels. The panels will not be a walking surface. The panels will be reinforced with aluminum tubing. A combination of gas-shocks and retaining devices will maintain the panels firmly in place when opened (wind resistance).

There will be a black tarp covering the rear of the hose bed. An orange strap will be installed to visually show where to open the tarp.

6.6 COMPARTMENTS

6.6.1 All compartment seams will be sealed using a permanent pliable silicone caulk. The walls of each compartment will have vents for adequate ventilation.

Each compartment will have aluminum extrusion tracks installed for use with adjustable shelves. The tracks will be vertically mounted and attached to the side and/or rear walls of the compartments.

The flooring will have drain holes to prevent the accumulation of water. The flooring will be covered by plastic interlocking tiles 5/8" thick.

6.6.2 Compartments doors will be roll-up type with anodized aluminum finish.

Roll-up doors will be Amdor brand.

Compartments light switches will be located at the top of the door and will be Amdor brand magnetic type.

6.6.3 No drip pan under doors.

6.6.4 A black elastic strap will be installed inside each roll-up door of the full-height compartments and also inside each roll -up door of the compartments that are located above the rear wheels.

6.6.5 Each shelf provided will be built as specified below, unless otherwise specified. Each shelf will be as wide and deep as possible.

- Maximum load capacity of at least 440 lbs
- Constructed of 3/16" aluminum, with a 2" lip and as deep as possible
- Bottom of the shelves are covered by rubber tiles of at least 5/8'' thick.

6.6.6 Each slide out provided will be built as specified below, unless specified otherwise. Each slide out will be as wide and deep as possible.

- Maximum load capacity of at least 440 lbs when fully extended
- Minimum exterior slide extension should be about 20".
- Constructed of 3/16" aluminum, with a 2" lip and as deep as possible
- Will be maintained in open or close position with a gas cylinder or with self locking tray slides when cylinder installation is not possible.
- Bottom of the shelves are covered by rubber tiles of at least 5/8'' thick.
- All trays installed on the bottom of the compartments will have two (2) aluminum runners with nylon cover installed near the center to avoid the tray from collapsing.

6.7 LEFT SIDE COMPARTMENTS

6.7.1 (Front of rear wheels) – L1

The compartment door opening will be approximately 26” wide x 13'' deep x 61” high. This compartment is the pump operator panel.

6.7.2 (Front of rear wheels) – L2

The compartment door opening will be approximately 28” wide x 26" deep x 62” high.

One (1) adjustable shelf will be installed in this compartment.

One (1) slide-out tray will be installed in this compartment.

6.7.3 (Above rear wheels – L3)

The compartment door opening will be approximately 58” wide x 26" deep x 25” high.

One (1) slide-out and tilt-down tray will be installed in this compartment.

6.7.4 (Rear of rear wheels – L4)

The compartment door opening will be approximately 45” wide x 26" deep x 62” high.

One (1) shelf will be installed in this compartment.

One (1) slide-out tray will be installed in this compartment.

6.8 RIGHT SIDE COMPARTMENTS

6.8.1 (Front of rear wheels) – R1

The compartment door opening will be approximately 58" wide x 26"/14" deep x 62" high.

One (1) shelf will be installed in this compartment.

One (1) slide-out tray will be installed in this compartment.

6.8.2 (Above rear wheels) – R2

The compartment door opening will be approximately 58" wide x 14" deep x 25" high.

One (1) shelf will be installed in this compartment.

6.8.3 (Rear of rear wheels) – R3

The compartment door opening will be approximately 45" wide x 26"/14" deep x 62" high.

One (1) shelf will be installed in this compartment.

One (1) slide-out tray will be installed in this compartment.

6.9 REAR COMPARTMENT

6.9.1 B1

The compartment door opening will be approximately 42" wide x 26" deep x 31" high.

One (1) slide-out tray will be installed in this compartment.

6.10 REAR ACCESS

6.10.1 A 10’’ deep step will be built above the rear compartment made of aluminum tread plate meeting ULC S515 and NFPA 1901 requirements.

6.10.2 A tailboard step will be provided at the rear of the body. The tailboard will be 11 ¾" in depth.

The tailboard step will be made with aggressive aluminum grip strut.

6.10.3 All handrails on body will be 1¼" diameter knurled extruded aluminum to provide a positive gripping surface.

Chrome plated end stanchions will support the handrails and plastic gaskets will be used between end stanchions and any painted surfaces.

Drain holes will be provided in the bottom of all vertically mounted handrails.

Handrails will be provided to meet ULC S515 and NFPA 1901 requirements

6.10.4 Six (6) Innovative Controls folding steps will be provided at the rear, three (3) on each side, to allow access to the hose bed. Each step will incorporate two (2) LED light, chrome bezel, to illuminate the stepping surface above and below the steps. The steps can be used as a hand hold with built-in openings wide enough for a gloved hand.

The step light will be activated when the parking brake is set, or when the vehicle marker lights are activated.

6.11 LADDER STORAGE

6.11.1 A ladder compartment will be built on the rear right side. It will be made to contain one (1) 14’ hook ladder and one (1) 2-section 24’ ladder. The ladders (not supplied) will be Duo Safety brand.

This compartment door will be covered by chevron striping.

6.12 SUCTION HOSE STORAGE

6.12.1 Two (2) compartments of about 12" height x 10" wide x 126" depth will be built above left and right sides compartments. Each compartment will be made to contain one (1) 6" x 10’ suction tube.

Each compartment door will be covered by chevron striping.

Refer to section 9 for supplied loose equipment.

6.13 PIKE POLE STORAGE

6.13.1 Storage for the folding 10' attic ladder and up to three (3) pike poles will be located in the ladder compartment described at 6.11.1.

SECTION 7 ELECTRICAL SYSTEM

7.1 GENERAL

7.1.1 The electrical system will meet NFPA 1901 requirements.

The electrical system will also include the following:

1. The wiring in the body will be securely fastened with stainless-steel bolts attached every 8"-10".

2. Electrical terminals in weather exposed areas will have a non-conductive grease or spray applied.

3. Self adhesive device will be not acceptable.

4. Every electrical wiring will be covered by a plastic split sleeve.

5. Any electrical component that is installed in a exposed area will be mounted in a manner that will not allow moisture to accumulate in it.

6. Heat shrink material and sealed connectors will be used to protect exposed connections.

7. A coil of wire will be provided behind an electrical appliance to allow them to be pulled away from mounting area for inspection and service work.

8. All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.

7.1.2 The wiring of the body will be color coded and number coded.

7.1.3 Where applicable, the wiring and permanently connected devices and equipment will be subject to a dielectric voltage withstand test of 900 volts for one minute. The testing will be performed after all body work has been completed. The electric polarity of all permanently wired equipment, cord reels, and receptacles will be tested to verify that wiring connections have been properly made.

7.1.4 Every circuit added to the chassis will be protected by internal electronic circuit breakers with transistor outputs. The system will operate in accordance with the J1939 communication protocol.

The system will have at least two (2) nodes. Each node will have at least 8 inputs and 16 outputs, each node will be protected by an individual breaker Grote model 54-852PL. They will be located to optimize the wiring, one (1) in the body and one (1) in the cab.

The vehicle will have one (1) programming plug installed near the multiplex node in the cab.

7.1.5 The switches in cab and pump panel will have an identification that meets ULC S515 and NFPA 1901.

There will be a single Emergency Master switch which controls all emergency warning lights including lightbars, cab warning lights, body warning lights and high beam flash if applicable.

7.2 WARNING AND EMERGENCY

7.2.1 The warning lights will be as follows:

- Zone A Front Lower Zone, Warning Light, Left Side: One (1) Whelen M6, Red LED,C6, Red LED, Clear Lens
- Zone A Front Lower Zone, Warning Light, Right Side: One (1) Whelen M6, Red LED,C6, Red LED, Clear Lens
- Zone B Side Lower Zone, Each Bumper Extension, Left Side: One (1) Whelen M6, Red LED,C6, Red LED, Clear Lens
- Zone D Side Lower Zone, Each Bumper Extension, Right Side: One (1) Whelen M6, Red LED,C6, Red LED, Clear Lens
- Zone B Side Lower Zone, Above Rear Wheel Well, Left Side: One (1) Whelen M6, Red LED, Clear Lens
- Zone D Side Lower Zone, Above Rear Wheel Well, Right Side: One (1) Whelen M6, Red LED, Clear Lens
- Zone C, Rear Common Bezel with Tail Lights, Left Side: One (1) Whelen M6, Red LED,C6, Red LED, Clear Lens
- Zone C, Rear Common Bezel with Tail Lights, Right Side: One (1) Whelen M6, Red LED,C6, Red LED, Clear Lens
- Zone C Rear Upper Zone, Left Side: One (1) Whelen L31 Beacon, Red LED, Clear Lens
- Zone C Rear Upper Zone, Right Side: One (1) Whelen L31 Beacon, Red LED, Clear Lens

7.2.6 There will be one (1) 81.00" Whelen Freedom IV LED lightbar mounted on the cab roof. The lightbar will include the following:

- One (1) red flashing LED module in the driver's side end position.
- One (1) red flashing LED module in the driver's side front corner position.
- One (1) red flashing LED module in the driver's side first front position.
- One (1) red flashing LED module in the driver's side second front position.
- One (1) red flashing LED module in the driver's side third front position.
- One (1) white flashing LED module in the driver's side fourth front position.
- Open in the driver's side fifth front position.
- Open in the driver's side sixth front position.
- Open in the driver's side seventh front position.
- Open in the passenger's side seventh position.
- Open in the passenger's side sixth front position.
- Open in the passenger's side fifth front position.
- One (1) white flashing LED module in the passenger's side fourth front position.
- One (1) red flashing LED module in the passenger's side third front position.
- One (1) red flashing LED module in the passenger's side second front position.
- One (1) red flashing LED module in the passenger's side first front position.
- One (1) red flashing LED module in the passenger's side front corner position.
- One (1) red flashing LED module in the passenger's side end position.

There will be a switch installed in the cab on the switch panel to control the lightbar.

The two (2) white LED flashing modules will be disabled when the parking brake is applied.

The six (6) red flashing LED modules in the front positions may be load managed when the parking brake is applied.

7.2.7 The alternating headlight option is not covered in this document. Please refer to Pulse chassis configuration detail.

7.2.8 The electronic siren, siren speakers and siren activation are not covered in this document. Please refer to Pulse chassis configuration detail.

7.2.9 An amber directional traffic advisor, six (6) LED light head Whelen model #TAL65 will be provided and recessed at the rear of the body. The control will be located in the cab.

7.3 BACK-UP CAMERA

7.3.1 A Fire Research model BCA111 with night vision rear-view camera will be installed to the rear of the vehicle. The 7" color LCD monitor will be installed close to the driver. A protective cast aluminum cover will be installed above the camera.

7.4 LIGHTING

7.4.1 The clearance/marker lights on the body will be LED, GROTE model 47962 / 47963.

7.4.2 The center top rear marker lights will be a Grote model 253-4400-1 for marker light and for brake light signal.

7.4.3 Turn signal lights, brake lights and backup lights will be of the same brand and series as the emergency light, and will be LED lights.

There will be a total of two (2) brake lights, two (2) backup lights and two (2) turn signal lights. It will be mounted on a 4 space lights bezel with the emergency lights.

The rear part of the lights, visible from the compartment will be entirely covered with a protective aluminum cover which will protect the rear part of the light and the electrical wiring.

Two (2) amber, Grote #47963 LED auxiliary turn lights will be installed, recessed in the rubrail, one each side toward the front of body.

7.4.4 One (1) white LED Grote #60681 licence plate light will be mounted at the rear of the body.

The plate will be mounted with four (4) stainless steel bolts.

7.5 AUXILIARY LIGHTS

7.5.1 Two (2) 12" Amdor Lumabar # AY-9500-012 LED lights will be mounted under the pump module panel light shield, one (1) each side.

These lights will automatically turn on when the pump is engaged or when the “pump light” switch is on and when the park brake is set.

7.5.2 One (1) Amdor AY9220-032 LED light will be installed in the pumphouse and it will be controlled by the “pump light” switch on the pump panel.

7.5.3 Two (2) Amdor Lumabar LED compartment light strips will be mounted in each body compartment.

The length of each light is the same as the door opening height minus 5".

7.5.4 All perimeter lights under cab and body will be Amdor AY-LB-12HW012 lights, as follows:

- Two (2) under cab steps
- Two (2) under pump compartment steps
- One (1) under pump operator panel compartment
- Two (2) under rear bumper

The ground lighting will be activated by the opening of a cab door, or when the parking brake is set and when the marker lights are turned on, or when the transmission is on reverse.

7.5.5 A LED TecNiq model E03 light will be installed under each 6" inlet on pump panel for steps lighting.

The lights will turn on when the parking brake is set and the marker lights are turned on or with the pump light switch.

7.5.6 Amdor strip lights will be recessed to the underside of the hose bed covers. It will be installed in the front of the body.

The hose bed light will turn on when the parking brake is set and when the hose bed switch is turned on.

7.5.7 The cab mounted side scene lights are not covered in this document. Please refer to Pulse chassis configuration detail.

7.5.8 The cab mounted brow scene lights are not covered in this document. Please refer to Pulse chassis configuration detail.

7.5.9 Two (2) HiViz FT-GESM scene lights with chrome bezel will be installed on the rear face of the vehicle. The control of these lights will be as follows:

- They will turn off when the parking brake is not set;
- Turn on when the transmission is on reverse and the E-Master is turned on;
- Turn on with a waterproof switch, located on the rear left side when the parking brake is set.

The rear lights switch will be waterproof and installed in a sealed aluminum box Cast Products on the left rear side.

7.5.10 One (1) Firetech HiViz FT-GESM scene light with chrome bezel will be installed on the upper left side of the body, on front.

One (1) Firetech HiViz FT-GESM scene light with chrome bezel will be installed on the upper right side of the body, on front.

One (1) Firetech HiViz FT-GESM scene light with chrome bezel will be installed on the upper left side of the body, on rear.

One (1) Firetech HiViz FT-GESM scene light with chrome bezel will be installed on the upper right side of the body, on rear.

There will be one (1) waterproof switch for all the side body scene lights. The switch located on the pump panel.

These lights will turn off when the parking brake is not set.

7.6 120V DISTRIBUTION

7.6.11 Two (2) 120 volt, 15-amp (NEMA 5-15) receptacles, will be installed, one (1) in the cab and one (1) in L3 compartment. The final location will be discussed during the pre-construction meeting.

SECTION 8 BODY FINISH DETAILS

8.1 GENERAL

8.1.1 All nuts and rivets installed on the apparatus will be stainless steel.

8.1.2 Where dissimilar metals are to be mounted together, the mounting base material will have an isolation barrier prior to assembly to prevent dissimilar metal reaction.

8.1.3 All Caution, Warning, Danger and other safety related signs will meet the requirements of the FAMA Standard Product Safety Signs for Automotive Fire Apparatus issued October 2015 or more recent.

8.1.4 A rust preventive barrier, Sinto or Tectyl, will be sprayed under the entire body and body substructure, before their installation on the chassis so that no area is left unprotected.

8.1.5 The rear steel sub-frame structure will be painted black.

8.2 BODY AND CHASSIS PAINT

8.2.1 The painting will be conducted in accordance with best practices followed in the heavy equipment industry to ensure the best protection against corrosion and abrasion.

All removable parts such as brackets, lights, doors, and steps will be removed before painting the body and will be painted separately if required.

8.2.2 Paint and primer used will be of good quality and type « base Coat / Clear Coat ». The painting process will be in accordance with the paint manufacturer.

8.2.3 The cab will be painted red Pierce #90.

8.2.4 The body will be painted as the cab primary color.

8.2.5 The exterior of the pump module will be painted the same color as the body color and the interior will be whitened with acid.

8.2.6 The body compartment interiors will have a Zolatone Gray (20-72) finish.

8.2.7 The shelf and slide-out trays will have a Zolatone Gray (20-72) finish.

8.3 LETTERING STRIPING

8.3.1 A reflective stripe, 4" wide with a « Z » and 2 other 1" wide colored stripes will be installed each side according to the NFPA 1901 standard.

8.3.2 The maximum surface of the rear body will be covered by chevron stripes according to NFPA. The stripes will be red and yellow-lime, 3M-983 brand, (models 72 and 23).

8.3.3 The front bumper will be convered with chevrons, matching the brand, model, pattern and color of the rear chevrons.

8.3.4 A 3" wide chevron type stripe will be installed on each cab door. The covering surface will be at minimum 150 square inches.

SECTION 9 LOOSE EQUIPEMENT TO BE SUPPLIED BY BIDDER

9.1 GENERAL

9.1.1 Two (2) NH chrome caps for pump inlets.

9.1.2 One (1) 2.50 lb D.O.T approved fire extinguisher with BC rating.

9.1.3 One (1) emergency safety triangle kit.

9.1.4 Three (3) road flares.

9.1.5 Two (2) folding wheels chocks Zico, 44" diameter tires with brackets will be installed under L1 compartment.

9.1.6 Two (2) NFPA compliant, Kochek suction hoses, 6'' x 10' length, NH threads and long handles will be provided.

9.1.7 One (1) Duo Safety, 10' attic ladder will be provided with the apparatus.

9.1.8 One (1) Duo Safety, 14' roof ladder will be provided with the apparatus.

9.1.9 One (1) Duo Safety, 24' 2-sections ladder will be provided with the apparatus

SECTION 10 WARRANTY

10.1 GENERAL

10.1.1 The warranty is effective upon delivery of the vehicle.

10.1.2 One (1) Year, limited warranty, Material and Workmanship

10.1.3 One (1) Year, chassis manufacturer basic vehicle standard limited warranty will be provided.

The chassis manufacturer fifty (50) year custom chassis frame rail limited warranty will be provided.

10.1.4 A five (5) year/160,000 km limited engine warranty will be provided.

10.1.5 A five (5) year/unlimited km parts and labor warranty will be provided for transmission.

10.1.6 A two (2) years parts and labor warranty will be provided for front axle.

10.1.7 A two (2) years parts and labor warranty will be provided for rear axle.

10.1.8 A Wabco three (3) year parts and labor limited warranty on brake system ABS/ATC/RSC/ESC.

10.1.9 Ten (10) year pro-rated limited warranty on the cab paint.

This warranty will cover the paint and perforations due to corrosion, delaminating and cracking under normal use of the vehicle.

10.1.10 Ten (10) year limited warranty on structural integrity of the cab and body.

This warranty will cover all the structural components of the body and cabin against defects in materials and workmanship. Excluded from this warranty is hardware, mechanical and electrical items or paint finish.

10.1.11 Ten (10) year pro-rated limited warranty on the body paint.

This warranty will cover the paint and perforations due to corrosion, delaminating and cracking under normal use of the vehicle.

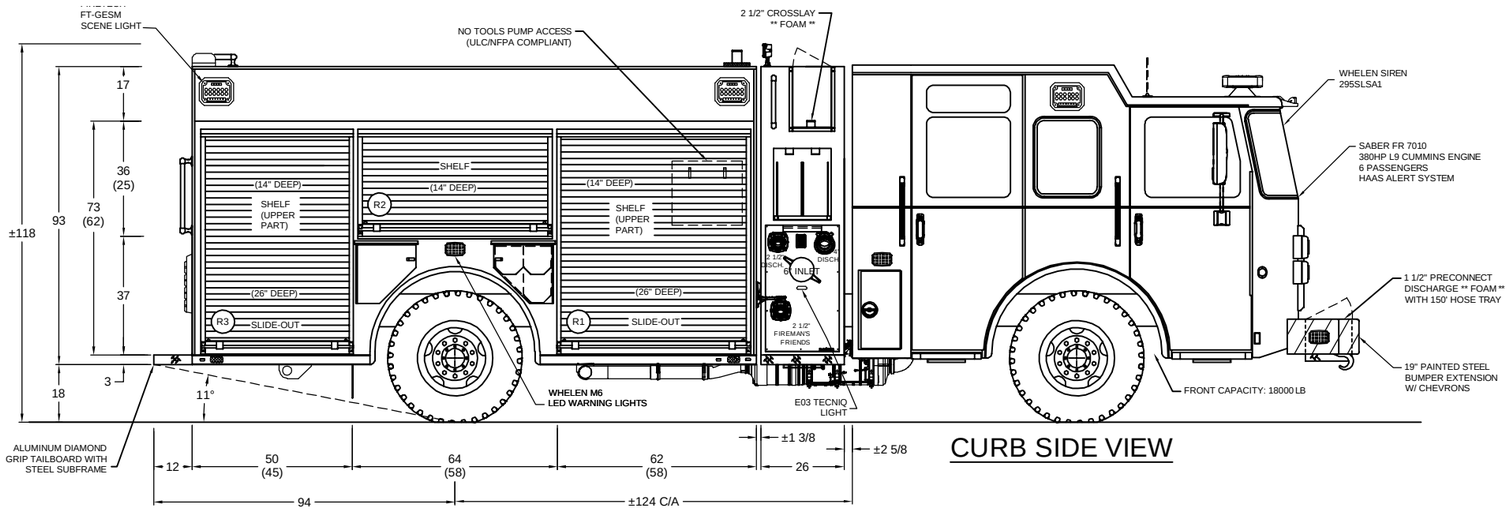
10.1.12 The water/foam tank parts and labor warranty will be provided for life (25 years) against any manufacturing defects.

10.1.13 Ten (10) year pump stainless steel pluming components limited warranty.

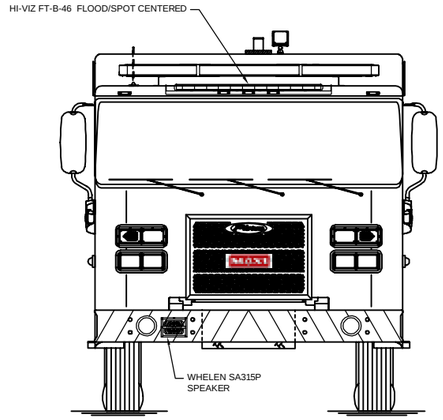
This warranty will cover all components of the pump except the valves against defects in materials and workmanship. Excluded from this warranty are the breakage caused by freezing.

10.1.14 A Waterous TPP-3, 7-year limited warranty covering parts and labor for the first three (3) years and only parts (no labor) for the remaining four (4) years of the warranty.

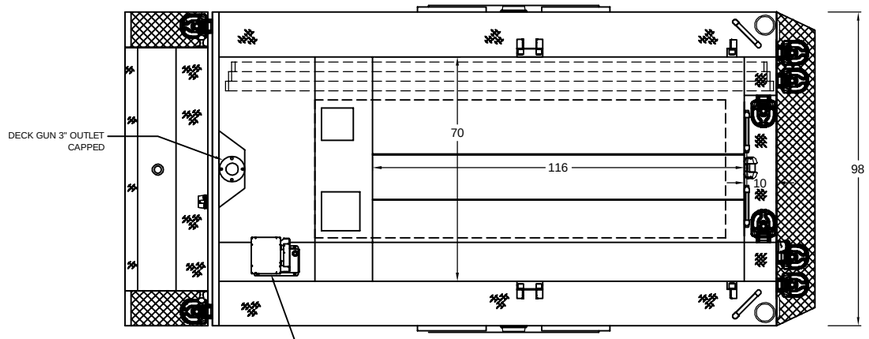
This warranty will cover all components of the pump except the valves against defects in materials and workmanship. Excluded from this warranty are the breakages caused by freezing.



CURB SIDE VIEW



FRONT VIEW



TOP VIEW

WATEROUS CXSC22C 1500 GPM PUMP
WITH HUSKY 3 FOAM SYSTEM

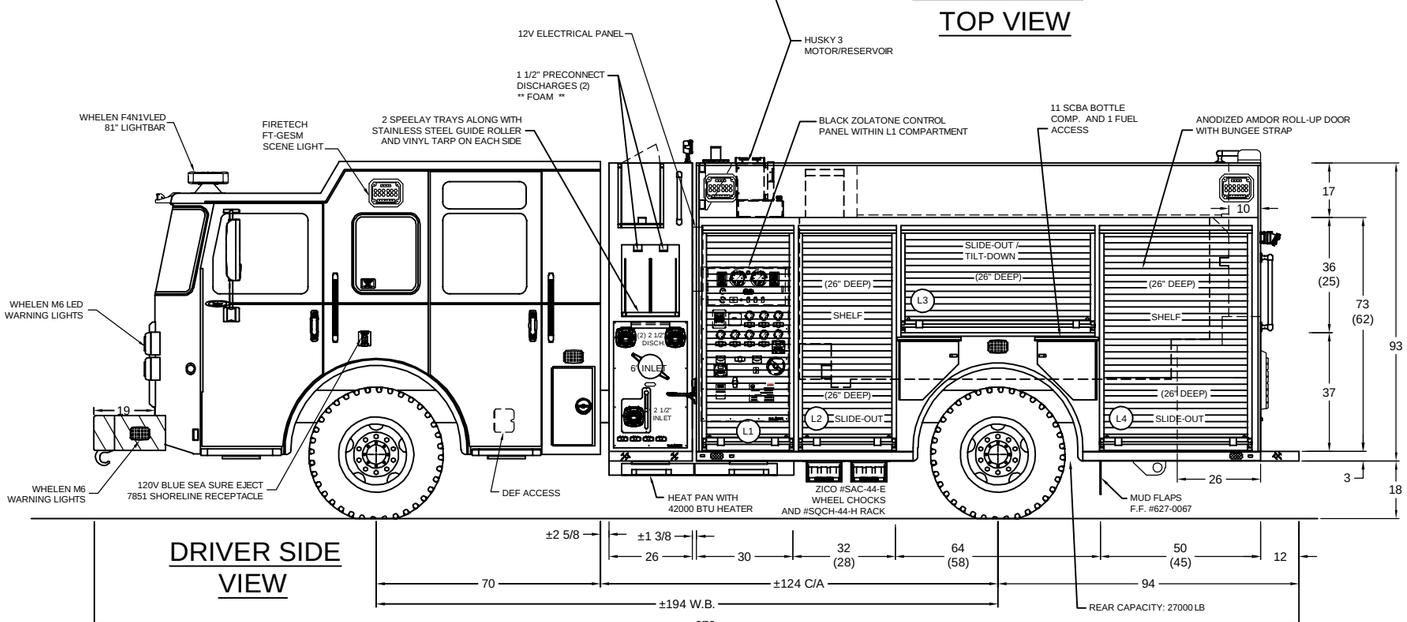
1000 USG WATER / 30 USG FOAM
(840 IMP.) (25 IMP.)

NOTES:

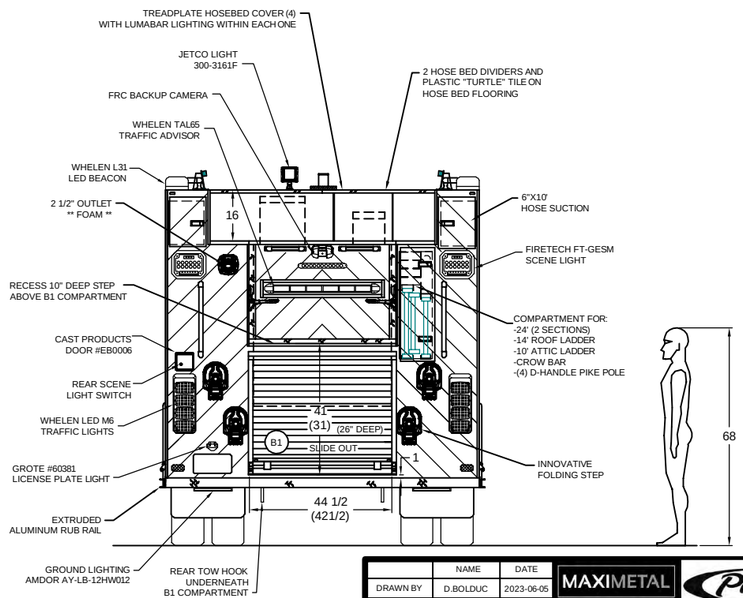
** (2) LUMABAR LIGHTING **
IN EACH COMPARTMENT

** LUMABAR AY-9220-32-C-0 (1) **
WITHIN PUMP HOUSE
(PLUMBING AREA)

ALL COMPARTMENTS: ZOLATONE FINISH 20-72



DRIVER SIDE
VIEW



REAR VIEW

	NAME	DATE
DRAWN BY	D.BOLDUC	2023-06-05
CHECKED BY		

NOTE

DIMENSIONS SHOWN ARE APPROXIMATE AND ARE SUBJECT TO MINOR DEVIATIONS AS MAY OCCUR OR BE NECESSARY IN CONSTRUCTION.
MINOR DETAILS NOT SHOWN.

MAXIMETAL
Optimized Intervention Vehicles

Pierce

CERTIFIED ISO 9001 : 20

MAXI-METAL INC.
9345, 25th AVENUE
SAINT-GEORGES (QUEBEC)
G6A 1L1

PHONE NO.: 418 228-6
1 800 510-6
FAX NO.: 418 228-0

TITLE: GENERAL VIEW

DRAWING NO.:

PROJECT: INC3702-3703-3704

ANSI SCALE:

ZONE	REV.	DESCRIPTION	DATE	APPROVED

EN CAS DE DISPARITE ENTRE CE DESSIN ET LE DEVIS TECHNIQUE, LE DEVIS TECHNIQUE PREVAUDRA.
IN CASE OF DISCREPANCY BETWEEN THIS DRAWING AND THE TECHNICAL SPECIFICATIONS, THE TECHNICAL SPECIFICATIONS SHALL PREVAIL.

06-03-2023