

Vancouver Fire & Rescue Services

Production Specifications – SVI #935

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LIABILITY INSURANCE

The manufacturer shall furnish with the bid a certificate of insurance for;

Workman's Compensation and Employer's Liability Insurance covering for all employees.

General Liability (each occurrence) of \$1,000,000.00. General Aggregate coverage of \$2,000,000.00. Products Completed / Operations Aggregate coverage of \$2,000,000.00. Medical Expense coverage of \$5,000 (any one person). Personal Injury of \$1,000,000.00.

Automobile liability of \$1,000,000.00 combined single limit (each accident), including any auto, all owned autos, scheduled autos, hired autos, non-owned autos, and garage liability.

Excess Umbrella Liability coverage of \$4,000,000.00 each occurrence, Aggregate of \$4,000,000.00.
Garage Keepers Liability coverage of \$4,500,000.00 combined limit.

All insurance policies must be;

- Maintained for the life of the contract,
- Must provide ten (10) days notice before cancellation,
- Must cover all operations of the contractor, or anyone employed by them.

INTERNET IN-PROCESS SITE

The manufacturer shall post and maintain a website where the Vancouver Fire & Rescue Services will be able to view digital images of their apparatus as its being built. The digital images shall be posted once a week starting when the body begins production or when the cab/chassis arrives and shall continue until the final completion of unit.

VEHICLE STABILITY SUPPLIED WITH CAB/CHASSIS

The cab/chassis shall be equipped with a stability control system. The system shall have, at a minimum, a steering wheel position sensor, a vehicle yaw sensor, a lateral accelerometer and individual wheel brake controls.

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FIRE APPARATUS PERFORMANCE

The fire apparatus shall meet the requirements of this standard at elevations of 2000 ft (600 m) above sea level.

The fire apparatus shall meet all the requirements of this standard while stationary on a grade of 10 percent in any direction.

The fire apparatus shall meet the requirements of this standard in ambient temperature conditions between 32°F (0°C) and 110°F (43°C).

ROADABILITY

The apparatus, when loaded to its estimated in-service weight, shall be capable of the following performance while on dry, paved roads that are in good condition:

- 1) From a standing start, the apparatus shall be able to attain a speed of 35 mph (55 km/hr) within 25 seconds on a level road.
- 2) The apparatus shall be able to attain a minimum top speed of 50 mph (80 km/hr) on a level road.
- 3) The apparatus shall be able to maintain a speed of at least 20 mph (32 km/hr) on any grade up to and including 6 percent.

The maximum top speed of fire apparatus with a GVWR over 26,000 lb (11,800 kg) shall not exceed either 68 mph (105 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

If the combined water tank and foam agent tank capacities on the fire apparatus exceed 1250 gal (4732 L), or the GVWR of the vehicle is over 50,000 lb (22,680 kg), the maximum top speed of the apparatus shall not exceed either 60 mph (85 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

SERVICEABILITY

The fire apparatus shall be designed to allow the manufacturer's recommended routine maintenance checks of lubricant and fluid levels to be performed by the operator without lifting the cab of a tilt-cab apparatus or without the need for hand tools.

Where special tools are required for routine service on any component of the apparatus, such tools shall be provided with the apparatus.

Apparatus components that interfere with repair or removal of other major components shall be attached with fasteners, such as cap screws and nuts, so that the components can be removed and installed with ordinary hand tools. These components shall not be welded or otherwise permanently secured into place.

CONSTRUCTION DOCUMENTATION

The contractor shall supply, at the time of delivery, at least one (1) copy of the following documents:

The manufacturers record of apparatus construction details, including the following information:

- 1) Owner's name and address
- 2) Apparatus manufacturer, model, and serial number
- 3) Chassis make, model, and serial number

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- a) GAWR of front and rear axles and GVWR
 - b) Front tire size and total rated capacity in pounds (kilograms)
 - c) Rear tire size and total rated capacity in pounds (kilograms)
 - d) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
 - e) Engine make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio
 - f) Type of fuel and fuel tank capacity
 - g) Electrical system voltage and alternator output in amps
 - h) Battery make, model, and capacity in cold cranking amps (CCA)
 - i) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
- 4) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
 - 5) Pump transmission make, model, serial number, and gear ratio
 - 6) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
 - 7) Water and Foam tank certified capacity in gallons or liters
 - 8) Paint manufacturer and paint number(s)
 - 9) Company name and signature of responsible company representative
 - 10) If the apparatus is a mobile foam fire apparatus, the certification of foam tank capacity
 - 11) Certification of compliance of the optical warning system
 - 12) Siren manufacturer's certification of the siren
 - 13) Written load analysis and results of the electrical system performance tests
 - 14) Certification of slip resistance of all stepping, standing, and walking surfaces
 - 15) If the apparatus has a fire pump, the pump manufacturer's certification of suction capability
 - 16) If the apparatus is equipped with a fire pump and special conditions are specified by the purchaser, the pump manufacturer's certification of suction capacity under the special conditions
 - 17) If the apparatus has a fire pump, a copy of the apparatus manufacturer's approval for stationary pumping applications
 - 18) If the apparatus has a fire pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed
 - 19) If the apparatus has a fire pump, the pump manufacturer's certification of the hydrostatic test
 - 20) If the apparatus has a fire pump, the certification of inspection and test for the fire pump
 - 21) If the apparatus is equipped with an auxiliary pump, the apparatus manufacturer's certification of the hydrostatic test
 - 22) When the apparatus is equipped with a water tank, the certification of water tank capacity
 - 23) If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy and the final installer's certification the foam proportioning system meets this standard
 - 24) If the system has a CAFS, the documentation of the manufacturer's pre delivery tests
 - 25) If the apparatus has a line voltage power source, the certification of the test for the power source
 - 26) If the apparatus is equipped with an air system, air tank certificates, the SCBA fill station certification, and the results of the testing of the air system installation
 - 27) Any other required manufacturer test data or reports.

OPERATIONS AND SERVICE DOCUMENTATION

The Contractor shall deliver with the fire apparatus at least two (2) sets of complete operation and service documentation covering the completed apparatus as delivered and accepted.

The documentation shall address at least the inspection, service, and operations of the fire apparatus and all major components thereof.

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The Contractor shall also deliver with the fire apparatus the following documentation for the entire apparatus and each major operating system or major component of the apparatus:

- 1) Manufacturer's name and address
- 2) Country of manufacture
- 3) Source for service and technical information
- 4) Parts replacement information
- 5) Descriptions, specifications, and ratings of the chassis, pump (if applicable), and aerial device (if applicable)
- 6) Wiring diagrams for low voltage and line voltage systems to include the following information:
 - j) Pictorial representations of circuit logic for all electrical components and wiring
 - k) Circuit identification
 - l) Connector pin identification
 - m) Zone location of electrical components
 - n) Safety interlocks
 - o) Alternator–battery power distribution circuits
 - p) Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems
- 7) Lubrication charts
- 8) Operating instructions for the chassis, any major components such as a pump or aerial device, and any auxiliary systems
- 9) Precautions related to multiple configurations of aerial devices, if applicable
- 10) Instructions regarding the frequency and procedure for recommended maintenance
- 11) Overall apparatus operating instructions
- 12) Safety considerations
- 13) Limitations of use
- 14) Inspection procedures
- 15) Recommended service procedures
- 16) Troubleshooting guide
- 17) Apparatus body, chassis and other component manufacturer's warranties
- 18) Special data required by this standard
- 19) A material safety data sheet (MSDS) for any fluid that is specified for use on the apparatus

The Contractor shall deliver with the apparatus all manufacturer's operations and service documents supplied with components and equipment that are installed or supplied by the Contractor.

NFPA REQUIRED DOCUMENTATION FORMAT - USB FLASH DRIVE

The vehicle construction details and the operations and service documentation as required per NFPA 1901 latest edition shall be provided on a USB Flash Drive. These manuals shall be divided into sections for ease of reference. There shall be two (2) USB flash drives provided with the completed vehicle.

STATEMENT OF EXCEPTIONS

The Contractor shall deliver with the fire apparatus either a certification that the apparatus fully complies with all requirements of this standard or alternatively, a Statement of Exceptions specifically describing each aspect of the completed apparatus that is not fully compliant with the requirements of this standard at the time of delivery.

The Statement of Exceptions shall contain, for each noncompliant aspect of the apparatus or missing required item, the following information:

- 1) A separate specification of the section of the applicable standard for which compliance is lacking
- 2) A description of the particular aspect of the apparatus that is not in compliance therewith or required

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equipment that is missing

- 3) A description of the further changes or modifications to the delivered apparatus that must be completed to achieve full compliance
- 4) Identification of the entity that will be responsible for making the necessary post delivery changes or modifications or for supplying and installing any missing required equipment to the apparatus to achieve full compliance with this standard

Prior to or at the time of delivery of the apparatus, the Statement of Exceptions shall be signed by an authorized agent of the entity responsible for final assembly of the apparatus and by an authorized agent of the purchasing entity, indicating mutual understanding and agreement between the parties regarding the substance thereof.

An apparatus that is delivered subject to a Statement of Exceptions other than a certification of full compliance shall not be placed in emergency service until the apparatus has been modified as necessary to accomplish full compliance with this standard.

CARRYING CAPACITY

The GAWR and the GCWR or GVWR of the chassis shall be adequate to carry the weight of the completed vehicle when loaded to its estimated in-service weight. The Body Manufacturer shall establish the estimated in-service weight during the design of the vehicle

The estimated in-service weight shall include the following:

- 5) The chassis, body and tank(s)
 - 1) Full fuel, lubricant, and other chassis or component fluid tanks or reservoirs
 - 2) Full water and other agent tanks
 - 3) *250 lb (114 kg) in each seating position
 - 4) Fixed equipment such as pumps, aerial devices, generators, reels and air systems as installed
 - 5) Ground ladders, suction hose, designed hose load in their hose beds and on their reels
 - 6) An allowance for miscellaneous equipment that is the greatest of the values for type of vehicle per NFPA 1901, a Purchaser provided list of equipment to be carried with weights or a Purchaser specified miscellaneous equipment allowance.

The Body Manufacturer shall engineer and design the vehicle such that the completed unit, when loaded to its estimated in-service weight, with all movable weights distributed as close as is practical to their intended in-service configuration, does not exceed the GVWR.

A final Body Manufacturer's certification of the GVWR or GCWR, along with a certification of each GAWR, shall be supplied on a label affixed to the vehicle.

Apparatus Type	Equip. Storage Area	Apparatus Size	Equipment Allowance	
			lb.	kg.
Special Service Fire Apparatus	Minimum of 120 cu ft (3.4 cu mt) of enclosed compartmentation.	60,001 lb and up (27,001 kg) GVWR	10,000	4,500

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TESTING

The completed rescue vehicle shall be third-party, independent, audit-certified through Underwriters Laboratory Canada (ULC) to the current edition of CAN/ULC S515 standards.

ROAD TEST

Road test shall be conducted in accordance with this section to verify that the completed apparatus is capable of compliance with Roadability Section.

The tests shall be conducted at a location and in a manner that does not violate local, state or provincial or federal traffic laws.

The tests shall be conducted on dry, level, paved roads that are in good condition. The apparatus shall be loaded to its estimated in service weight.

The engine shall not operate in excess of the maximum governed speed. Acceleration tests shall consist of two runs in opposite directions over the same route. The fire apparatus shall attain a speed of 35 mph (55 km/hr) from a standing start within 25 seconds. The fire apparatus shall attain a minimum top speed of 50 mph (80 km/hr).

If the apparatus is equipped with an auxiliary braking system, the Body Manufacturer shall road test the system to confirm that the system is functioning as intended by the auxiliary braking system manufacturer.

If the apparatus is equipped with an air brake system, the service brakes shall bring the apparatus, when loaded to its GVWR, to a complete stop from an initial speed of 20 mph (32.2 km/hr) in a distance not exceeding 35 ft (10.7 m) by actual measurement on a paved, level, dry surface road that is free of loose material, oil or grease.

If the apparatus is equipped with a hydraulic brake system, the service brakes shall bring the apparatus, when loaded to its GVWR, to a complete stop from an initial speed of 30 mph (48.2 km/hr) in a distance not exceeding 88 ft (26.8 m) by actual measurement on a paved, level, dry surface road that is free of loose material, oil or grease.

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

The vehicles low voltage electrical system shall be third-party, independent, audit-certified through Underwriters Laboratory (UL) to the current edition of NFPA 1901 standard. The certified test results shall be delivered with the completed vehicle. Tests shall be performed when the air temperature is between 0°F and 110°F (–18°C and 43°C).

TEST SEQUENCE

The following three (3) tests shall be performed in the order in which they appear below. Before each test, the batteries shall be fully charged until the voltage stabilizes at the voltage regulator set point and the lowest charge current is maintained for ten (10) minutes. Failure of any of these tests shall require a repeat of the sequence.

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1. RESERVE CAPACITY TEST

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes.

All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test failure of the battery system.

2. ALTERNATOR PERFORMANCE TEST

TEST AT IDLE

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

TEST AT FULL LOAD

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system shall be permitted during this test.

An alarm sounded by excessive battery discharge, as detected by the warning system required in 13.3.4 or a system voltage of less than 11.8 V dc for a 12 V nominal system, 23.6 V dc for a 24 V nominal system, or 35.4 V dc for a 42 V nominal system for more than 120 seconds shall be considered a test failure.

3. LOW VOLTAGE ALARM TEST

The following test shall be started with the engine off and the battery voltage at or above 12 V for a 12 V nominal system, 24 V for a 24 V nominal system, or 36 V for a 42 V nominal system.

With the engine shut off, the total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals.

The test shall be considered a failure if the alarm does not sound in less than 140 seconds after the voltage drops to 11.70 V for a 12 V nominal system, 23.4 V dc for a 24 V nominal system, or 35.1 V for a 42 V nominal system.

The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

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DOCUMENTATION

The manufacturer shall deliver the following with the fire apparatus:

- 7) Documentation of the electrical system performance tests
- 1) A written electrical load analysis, including the following:
 - 2) The nameplate rating of the alternator
 - q) The alternator rating
 - r) Each of the component loads specified that make up the minimum continuous electrical load
 - s) Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load
 - t) Each individual intermittent electrical load

UL 120/240 VAC CERTIFICATION

The 120/240 volt electrical system shall be third-party, independent, audit-certified through Underwriters Laboratory (UL) to the current edition of NFPA 1901 to perform as listed below;

The prime mover shall be started from a cold start condition, and the unloaded voltage and frequency shall be recorded.

The line voltage electrical system shall be loaded to at least 100% of the continuous rated wattage stated on the power source specification label. Testing with a resistive load bank shall be permitted.

The power source shall be operated in the manner specified by the apparatus manufacturer as documented on instruction plates or in operation manuals. The power source shall be operated at a minimum of 100% of the continuous rated wattage as stated on the power source specification label for a minimum of two (2) hours.

The load shall be adjusted to maintain the output wattage at or above the continuous rated wattage during the entire 2-hour test.

The following conditions shall be recorded at least every 1/2 hour during the test:

- u) The power source output voltage, frequency and amperes
- 1) The prime mover's oil pressure, water temperature and transmission temperature, if applicable
- 2) The power source hydraulic fluid temperature, if applicable
- 3) The ambient temperature and power source air inlet temperature

The following conditions shall be recorded once during the test for power sources driven by dedicated auxiliary internal combustion engines:

- 4) Altitude
- 1) Barometric pressure
- 2) Relative humidity

If the generator is driven by the chassis engine and the generator allows for operation at variable speeds, the chassis engine speed shall be reduced to the lowest rpm allowed for generator operation and the voltage and frequency shall be recorded.

The load shall be removed and the unloaded voltage and frequency shall be recorded.

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Voltage shall be maintained within $\pm 10\%$ of the voltage stated on the power source specification label during the entire test. Frequency shall be maintained within ± 3 Hz of the frequency stated on the power source specification label during the entire test.

The total continuous electrical loads, excluding those loads associated with the equipment defined in NFPA 22.15.7.3.11.2, shall be applied during the testing unless an auxiliary engine drives the power source.

If the apparatus is equipped with a fire pump, the 2-hour certification test of the power source shall be completed with the fire pump pumping at 100% capacity at 150 psi (1000 kPa) net pump pressure. The test shall be permitted to be run concurrently with the pump certification test.

DOCUMENTATION

The Body Manufacturer shall deliver the following with the fire apparatus:

The results of each test shall be recorded on an appropriate form and provided with the delivery of the fire apparatus.

DIELECTRIC VOLTAGE WITHSTAND TEST

The line voltage wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900 volts for one (1) minute. The testing shall be performed after all body work has been completed.

The test shall be conducted as follows:

- 3) Isolate the power source from the panel board and disconnect any solid state low voltage components
- 1) Connect one lead of the dielectric tester to all the hot and neutral buses tied together
- 2) Connect the other lead to the fire apparatus frame or body
- 3) Close any switches and circuit breakers in the circuit(s)
- 4) Apply the dielectric voltage for one (1) minute in accordance with the testing equipment manufacturer's instructions

The electrical polarity of all permanently wired equipment, cord reels and receptacles shall be tested to verify that wiring connections have been properly made.

Electrical continuity shall be verified from the chassis or body to all line voltage electrical enclosures, light housings, motor housings, light poles, switch boxes and receptacle ground connections that are accessible to fire fighters in normal operations.

If the apparatus is equipped with a transfer switch, it shall be tested to verify operation and that all non grounded conductors are switched.

Electrical light towers, floodlights, motors, fixed appliances and portable generators shall be operated at their full rating or capacity for 30 minutes to ensure proper operation.

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WARRANTY

A full statement shall be provided of the warranties for the vehicle(s) being bid. Warranties should clearly describe the terms under which the vehicle manufacturer accepts responsibility for the cost to repair defects caused by faulty design, quality of work or material and for the applicable period of time after delivery.

Cost of repairs refers to all costs related thereto including, but not limited to, the cost of materials and the cost of labor.

The Body Manufacturer shall warrant all materials and accessories used on the vehicle(s), whether fabricated by manufacturer or purchased from an outside source and will deal directly with the Vancouver Fire & Rescue Services on all warranty work.

GENERAL LIMITED WARRANTY - TWO (2) YEARS

The vehicle shall be free of defects in material and workmanship for a period of two (2) years or 36,000 miles (or 57,936 kilometers), whichever occurs first starting thirty (30) days after the original invoice date.

The Contractor must be the "single source" coordinator of all warranties on the vehicle.

LOW VOLTAGE ELECTRICAL WARRANTY - FIVE (5) YEARS

The vehicle low voltage electrical system shall be free of defects in material and workmanship for a period of five (5) years or 60,000 miles (or 96,561 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date.

STRUCTURAL WARRANTY - TEN (10) YEARS

The body shall be free of structural or design failure or workmanship for a period of ten (10) years, or 100,000 miles (or 160,934 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date.

UNDERCOAT WARRANTY

The body undercoating shall have a warranty provided by the manufacturer for the lifetime of the vehicle or twenty (20) years, whichever occurs first. The warranty shall be transferable between vehicle owners. Should the undercoating material applied to the underside of the body and wheel wells of the vehicle ever flake off, peel, chip or crack due to drying out, the damaged area shall be re-sprayed without charge to the vehicle owner.

PAINT LIMITED WARRANTY - TEN (10) YEARS

The body shall be free of bubbling or peeling as a result of a defect in the method of manufacture for a period of ten (10) years or 100,000 miles (or 160,934 kilometers), whichever occurs first, starting thirty (30) days after the original invoice date. **Pro-rated warranties will not be acceptable.**

GRAPHICS LIMITED WARRANTY

The 3M graphics installation shall be warranted for a period of two (2) years. The 3M materials installed on completed vehicle shall be warranted for seven (7) years. The 3M Diamond grade film (if specified) shall be

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warranted for ten (10) years.

CONSTRUCTION PERIOD

The completed vehicle shall be delivered within three hundred sixty (360) days after receipt of a purchase order or contract.

Contractor shall not be held liable for delays of chassis delivery due to accidents, strikes, floods or other events not subject to their control. Contractor shall provide immediate written notice to Vancouver Fire & Rescue Services as to delays and to what extent these delays have in completing vehicle within the stated construction time period.

OVERALL HEIGHT

The overall height (OAH) of the vehicle shall be approximately 140" (11' - 8") from the ground. This measurement shall be taken on flat ground with the tires properly inflated, in the unloaded condition, at that highest point of the vehicle.

OVERALL LENGTH

The overall length (OAL) of the vehicle shall be approximately 496" (41' - 4").

OVERALL WIDTH

The overall width (OAW) of the body at drip rails shall be 102" (8' - 6"), and body shall be 100" (8' - 4").

ANGLE OF APPROACH

The angle of approach for this vehicle shall not be less than eight (8) degrees when it is loaded to the estimated in-service weight as specified by the current edition of NFPA 1901.

ANGLE OF DEPARTURE

The angle of departure for this vehicle shall not be less than eight (8) degrees when it is loaded to the estimated in-service weight as specified by the current edition of NFPA 1901.

PRE-CONSTRUCTION CONFERENCE

A pre-construction conference shall be required at the Contractor's factory for three (3) personnel from the Vancouver Fire & Rescue Services to finalize all construction details prior to manufacturing.

The Contractor shall at his/her expense, provide transportation, lodging, rental car and meal expenses during the pre-construction conference. Any travel distance greater than 250 miles shall be by non-stop commercial air travel.

CAB CHASSIS FINAL CONFERENCE

A cab chassis manufacturer final inspection conference shall be required at manufacturer's factory for two (2) personnel from the Vancouver Fire & Rescue Services to inspect the cab chassis and construction details prior to shipment of the completed vehicle to Contractor.

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The Contractor shall at his/her expense, provide transportation, lodging, rental car and meal expenses during the inspection conference. Any travel distance greater than 250 miles shall be by non-stop commercial air travel.

PRE-PAINT CONFERENCE

A pre-paint conference shall be required at the Contractor's factory for two (2) personnel from the Vancouver Fire & Rescue Services to inspect the vehicle and construction details prior to the painting process.

The Contractor shall at his/her expense, provide transportation, lodging, rental car and meal expenses during the pre-paint conference. Any travel distance greater than 250 miles shall be by non-stop commercial air travel.

EQUIPMENT MOUNTING CONFERENCE

An equipment mounting conference shall be required at Contractor's factory for five (5) personnel from the Vancouver Fire & Rescue Services to layout and locate all equipment to be mounted on unit prior to shipment of the completed vehicle to Vancouver Fire & Rescue Services.

The Contractor shall at his/her expense, provide transportation, lodging, rental car and meal expenses during the inspection conference. Any travel distance greater than 250 miles shall be by non-stop commercial air travel.

FINAL INSPECTION CONFERENCE

A final inspection conference shall be required at the Contractor's factory for two (2) personnel from the Vancouver Fire & Rescue Services to inspect the vehicle and construction details prior to shipment of the completed vehicle. This inspection shall take place after any specified striping and lettering is installed.

The Contractor shall at his/her expense, provide transportation, lodging, rental car and meal expenses during the final inspection conference. Any travel distance greater than 250 miles shall be by non-stop commercial air travel.

DELIVERY AND DEMONSTRATION

The Contractor shall be responsible for the delivery of the completed unit to the Vancouver Fire & Rescue Services's location. On initial delivery of the apparatus, the Contractor shall supply a qualified representative to demonstrate the apparatus and provide initial instruction to representatives of the Vancouver Fire & Rescue Services regarding the operation, care and maintenance of the apparatus and equipment supplied at Vancouver Fire & Rescue Services location.

The Delivery Engineer shall set delivery and instruction schedule with the person appointed by Vancouver Fire & Rescue Services.

After delivery of the apparatus, the Vancouver Fire & Rescue Services shall be responsible for ongoing training of its personnel to proficiency regarding the proper and safe use of the apparatus and associated equipment.

CAB CHASSIS SPECIFICATION

MODEL

The chassis shall be a Gladiator model. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.

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MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2015 model year.

COUNTRY OF SERVICE

The chassis shall be put in service in the country of Canada (CAN).

The chassis will meet applicable Canadian Technical Standards Document per Canadian Motor Vehicle Safety Regulations as clarified in the incomplete vehicle document which accompanies each chassis. Spartan Chassis is not responsible for compliance to provincial, regional, or local regulations. Dealers should identify those regulations and order any necessary optional equipment from Spartan Chassis or their OEM needed to be in compliance with those regulations.

ADDITIONAL VOCATIONAL STANDARD

The cab, chassis, and components shall be audited to Underwriter's Laboratories of Canada (ULC) current published apparatus specification ULCS-515. The global chassis compliance certification shall be provided to the manufacturer. The chassis as specified shall meet applicable criteria of ULCS-515 and shall include the ULC marking.

APPARATUS TYPE

The apparatus shall be a rescue vehicle designed for emergency service use which shall include the functions of a multipurpose vehicle which primarily provides support services at emergency scenes.

VEHICLE TYPE

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

AXLE CONFIGURATION

The chassis shall feature a 6 x 4 axle configuration consisting of a tandem rear drive axle set with a single front steer axle.

GROSS AXLE WEIGHT RATINGS FRONT

The front gross axle weight rating (GAWR) of the chassis shall be 23,000 pounds.

This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be 48,000 pounds.

This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

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CAB STYLE

The cab shall be a custom, fully enclosed, LFD model with a 20.00 inch raised roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to ten (10) seating positions.

The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for aluminum fabrication for construction.

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 0.13 & 0.19 inch thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the “A” pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and lower roof skin shall be 0.13 inch thick; the rear wall and raised roof skins shall be 0.09 inch thick; the front cab structure shall be 0.19 inch thick.

The exterior width of the cab shall be 99.40 inches wide with a minimum interior width of 91.00 inches. The overall cab length shall be 144.60 inches with 67.50 inches from the centerline of the front of the axle to the back of the cab.

The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.

The cab shall offer an interior height of 57.50 inches from the front floor to the headliner and a rear floor to headliner height of 75.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 63.38 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.

The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of 32.25 inches wide X 71.00 inches high, from the cab floor to the top of the door opening.

The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.

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The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.13 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 32.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.

The first step for the crew area shall measure approximately 11.50 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.75 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches.

OCCUPANT PROTECTION

The vehicle shall include the Advanced Protection System™ (APS) which shall secure belted occupants and increase the survivable space within the cab. The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The system components shall include:

- 5) Driver steering wheel airbag
 - Driver dual knee air bags (patent pending) with energy management mounting (patent pending) and officer knee airbag.
 - Large driver, officer, and crew area side curtain airbags
 - APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries
 - Heavy truck Restraints Control Module (RCM) - receives inputs from the outboard sensors, selectively deploys APS systems, and records sensory inputs immediately before and during a detected qualifying event
 - Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM
 - Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel

Frontal impact protection shall be provided by the outboard sensors and the RCM. In a qualifying front impact event the outboard sensors provide inputs to the RCM. The RCM activates the steering wheel airbag, driver side dual knee airbags (patent pending), officer side knee airbag, and advanced seat belts for each occupant in the cab.

The APS frontal impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 208. Frontal impact into a rigid barrier at 25 mph shall be conducted by an independent third party test facility using belted 95th percentile Hybrid II test dummies.

Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the RCM. In qualifying rollover or side impact events the outboard sensors provide inputs to the RCM. The RCM activates the

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side curtain airbags and advanced seat belts for each occupant in the cab. The RCM measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring.

In the event of a qualifying offset or other non-frontal impact, the RCM shall determine and intelligently deploy the front impact protection system, the side impact protection system, or both front and side impact protection systems based on the inputs received from the outboard crash sensors.

The APS side impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 214. Side impact from a moving barrier at 17 mph shall be conducted by an independent third party test facility using belted 50th percentile ES-2re test dummies.

CAB FRONT FASCIA

The front cab fascia shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate which shall be an integral part of the cab. The fascia shall be Sirius styled, offering an aerodynamic look for a stylish appearance. The cab fascia shall encompass the front of the aluminum cab structure from the bottom of the windshield to the lower section of the cab.

The Sirius style cab fascia shall include provisions for headlights, turn signals and warning light assemblies designed to permit easy access for maintenance. The fascia shall include additional intake provisions at the lower portion just above the bumper further enhancing the total free air intake for engine cooling.

Chrome plated molded plastic bezels shall be provided for lighting assemblies located on each side of the cab fascia for optimum visibility.

FRONT GRILLE

The Sirius fascia shall include a two (2) piece front grille. The upper portion of the grille shall be hinged to provide service access behind the grille.

CAB UNDERCOAT

There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.

CAB SIDE DRIP RAIL

There shall be a drip rail along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side.

CAB PAINT EXTERIOR

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

All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

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The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper followed by sealing the seams with SEM brand seam sealer.

The cab shall then be painted the specific color designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene. The paint shall have a minimum thickness of 2.00 mils, followed by a clear top coat not to exceed 2.00 mils. The entire cab shall then be baked at 180 degrees for one (1) hour to speed the curing process of the coatings.

CAB PAINT MANUFACTURER

The cab shall be painted with PPG Industries paint.

CAB PAINT PRIMARY/LOWER COLOR

The lower paint color shall be PPG FBCH 71096 ALT Red.

CAB PAINT SECONDARY/UPPER COLOR

The secondary/upper paint color shall be PPG FBCH 2185 white.

CAB PAINT EXTERIOR BREAKLINE

The upper and lower paint shall meet at a breakline on the cab which shall be located approximately 0.50 inch below the cab door windows on each side of the cab. The breakline shall curve downward at the front cab corners to approximately 6.50 inches below the windshields on the front of the cab ending at either side of the upper grille.

CAB PAINT PINSTRIPE

A 0.50 inch wide gold reflective tape with black borders shall be applied on the break line between the two different colored surfaces.

CAB PAINT WARRANTY

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

CAB PAINT INTERIOR

The visible interior cab structure surfaces shall be painted with a Zolatone #20-71 onyx black texture finish.

CAB ENTRY DOORS

The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum with a nominal thickness of 0.13 inch. The exterior skins shall be constructed of 0.13 inch aluminum plate.

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

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style with a 0.38 inch pin and shall be constructed of stainless steel.

CAB ENTRY DOOR TYPE

All cab entry doors shall be full length in design to fully enclose the lower cab steps.

CAB INSULATION

The cab ceiling and walls shall include 1.00 inch thick foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

LH EXTERIOR REAR COMPARTMENT

The cab shall offer an exterior compartment on the left side of the cab behind the rear door. The compartment opening shall be 10.00 inches wide X 31.19 inches high. The compartment size shall be 11.34 inches wide X 31.19 inches high X 21.19 inches deep. The compartment shall have a 10.63 inch wide, 32.00 inch high and 1.50 inch thick hinged box pan style flush mount door with a bright aluminum tread plate inner panel and a bent D-ring slam latch. There shall be a switch to activate a light inside the compartment and the open compartment warning light in the cab in the event the door is left ajar.

LEFT HAND EXTERIOR REAR COMPARTMENT LIGHTING

There shall be one (1) On-Scene brand Access LED strip light installed to illuminate the exterior rear compartment on the left side of the cab. The strip light shall be 10.00 inches long.

LH EXTERIOR COMPARTMENT INTERIOR FINISH

The interior of the left hand exterior compartment shall have a Zolatone #20-71 onyx black texture finish.

RH EXTERIOR REAR COMPARTMENT

The cab shall offer an exterior compartment on the right side of the cab behind the rear door. The compartment opening shall be 10.00 inches wide X 31.19 inches high. The compartment size shall be 11.34 inches wide X 31.19 inches high X 21.19 inches deep. The compartment shall have a 10.63 inch wide, 32.00 inch high and 1.50 inch thick hinged box pan style flush mount door with a bright aluminum tread plate inner panel and a bent D-ring slam latch. There shall be a switch to activate a light inside the compartment and the open compartment warning light in the cab in the event the door is left ajar.

RIGHT HAND EXTERIOR REAR COMPARTMENT LIGHTING

There shall be one (1) On-Scene brand Access LED strip light installed to illuminate the exterior rear compartment on the right side of the cab. The strip light shall be 10.00 inches in length.

RH EXTERIOR COMPARTMENT INTERIOR FINISH

The interior of the right hand exterior compartment shall have a Zolatone #20-71 onyx black texture finish.

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CAB STRUCTURAL WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN CHASSIS, INC. LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first. The warranty period shall commence on the date the vehicle is delivered to the first end user.

CAB TEST INFORMATION

The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

ELECTRICAL SYSTEM

The chassis shall include a single starting electrical system which shall include a 12 volt direct current Weldon brand of multiplexing system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.

APPARATUS WIRING PROVISION

An apparatus wiring panel shall be installed in the center dash area behind the rocker switch panel which shall include eight (8) open circuits consisting of three (3) 20 amp, one (1) 30 amp, three (3) 10 amp, and one (1) 15 amp circuit, with relays and breakers with trigger wires which shall be routed to the rocker switch panel.

MULTIPLEX DISPLAY

The multiplex electrical system shall include a Weldon Vista IV display which shall be located on the left side of the dash in the switch panel. The Vista IV shall feature a full color LCD display screen which includes a message bar displaying the time of day and important messages requiring acknowledgement by the user which shall all be displayed on the top of the screen in the order they are received. There shall be eight (8) push button virtual controls, four (4) on each side of the display for the on-board diagnostics. The display screen shall be video ready for back-up cameras, thermal cameras, and DVD.

The Vista IV display shall offer varying fonts and background colors. The display shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

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DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Weldon Multiplex electrical system. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.

ACCESSORY POWER

The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud. A 225 amp battery direct power and ground stud shall be provided and installed on the chassis near the left hand battery box for OEM body connections.

EXTERIOR ELECTRICAL TERMINAL COATING

All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.

ENGINE

The chassis engine shall be a Cummins ISX12 engine. The ISX12 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 500 horse power at 1800 RPM and shall be governed at 2100 RPM. The torque rating shall feature 1645 foot pounds of torque at 1200 RPM with 729 cubic inches (11.9 liter) of displacement.

The ISX12 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2013 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CJ4 low ash engine oil which shall be utilized for proper engine lubrication.

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A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

CAB ENGINE TUNNEL

The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade 0.19 of an inch thick aluminum alloy plate. The tunnel shall be a maximum of 46.50 inches wide X 29.00 inches high.

DIESEL PARTICULATE FILTER CONTROLS

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit.

ENGINE PROGRAMMING HIGH IDLE SPEED

The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indicator on the Vista display and control screen for the high idle speed control.

ENGINE PROGRAMMING ROAD SPEED GOVERNOR

The engine shall include programming which will govern the top speed of the vehicle.

ELECTRONIC ENGINE OIL LEVEL INDICATOR

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

FLUID FILLS

The front of the chassis shall accommodate fluid fill for the engine oil through the grille. This area shall also accommodate a check for the engine oil. The transmission, power steering, and coolant fluid fills and checks shall be under the cab. The windshield washer fill shall be accessible through the front left side mid step.

ENGINE DRAIN PLUG

The engine shall include an original equipment manufacturer installed magnetic oil drain plug.

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

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ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

ENGINE PROGRAMMING IDLE SPEED

The engine low idle speed will be programmed at 700 rpm.

ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled, Horton clutched type fan drive.

When the clutched fan is disengaged it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure.

ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall be comprised of a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, a charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing.

The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one piece injected molded polymer eleven (11) blade fan with a fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and sight glass to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements, and allows for expansion and recovery of coolant into a separate integral expansion chamber.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel "constant torque" style clamps meeting the engine manufacturer's requirements.

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ENGINE COOLING SYSTEM PROTECTION

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame color.

ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees Fahrenheit.

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

ENGINE COOLANT FILTER

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

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

ELECTRONIC COOLANT LEVEL INDICATOR

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

COOLANT HOSES

The cooling system hoses shall be blue stripe heater hose with formed silicone radiator coolant hoses and formed aluminized steel tubing. The heater hose, radiator hose, and tubing shall be secured with stainless steel constant torque band clamps.

ENGINE COOLANT OVERFLOW BOTTLE

A remote engine coolant overflow bottle shall be provided in the case of over filling the coolant system. The overflow bottle shall capture the expansion fluid or overfill rather than allow the fluid to drain on the ground. The overflow bottle provided on the cooling system shall only be a catch bottle and shall not return excess coolant back into the surge tank.

ENGINE AIR INTAKE

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

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The engine shall also include an air intake filter which shall be bolted to the frame and located under the front of the cab on the right hand side. The system shall utilize a replaceable dry type filter which ensures dust and debris remains safely contained inside the housing during operation via leak-tight seals. The service cover shall be located on the bottom of the housing, eliminating the chance of contaminating the air intake system during air filter service.

The air flow distribution and dust loading shall be uniform throughout the high-performance filter element, which shall result in pressure differential for improved horsepower and fuel economy. The air intake ember separator shall be mounted within easy access via a hinged panel behind the right hand side headlight module. The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

AIR INTAKE PROTECTION

A light duty skid plate shall be supplied for the engine air intake system below the right front side of the cab. The skid plate shall provide protection for the air intake system from light impacts, stones, and road debris.

ENGINE EXHAUST SYSTEM

The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be injected into the system through the decomposition tube between the DPF and SCR.

The system shall utilize 0.07 inch thick stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF.

The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.

The exhaust system shall be mounted below the frame in the outboard position with the SCR canister in line rearward of the DPF.

DIESEL EXHAUST FLUID TANK

The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a capacity of six (6) usable gallons and shall be mounted on the left hand side of the chassis frame behind the batteries below the frame.

The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.

The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step.

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ENGINE EXHAUST ACCESSORIES

An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.

ENGINE EXHAUST WRAP

The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.

TRANSMISSION

The drive train shall include an Allison model EVS 4000 torque converting, automatic transmission which shall include electronic controls and an output retarder. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters which shall offer Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission gear ratios shall be:

1st	3.51:1
2nd	1.91:1
3rd	1.43:1
4th	1.00:1
5th	0.74:1
6th	0.64:1 (if applicable)
Rev	4.80:1

TRANSMISSION MODE PROGRAMMING

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

TRANSMISSION FEATURE PROGRAMMING

The Allison Gen V-E transmission EVS group package number 127 shall contain the 227 vocational package in consideration of the duty of this apparatus for rescue. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

<u>Function ID</u>	<u>Description</u>	<u>Wire assignment</u>
Inputs		

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C	PTO Request	143
F	Aux. Function Range Inhibit (Special)	101/142
Outputs		
G	PTO Enable Output (See Input Function C)	130
S	Neutral Indicator for PTO	145
	Signal Return	103

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.

TRANSMISSION RETARDER CONTROL

The Allison transmission retarder shall be engaged with the first two-thirds at 0% throttle and the remaining one-third shall be modulated by brake pedal actuation. The system shall include a retarder on/off rocker switch mounted on the dash. The engagement of the retarder shall activate the brake lights. The retarder shall be inactive during pump mode.

TRANSMISSION RETARDER CAPACITY LEVEL

The transmission retarder shall be programmed so the maximum retardation shall be at the low capacity level.

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.

TRANSMISSION COOLING SYSTEM

The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.

TRANSMISSION DRAIN PLUG

The transmission shall include an original equipment manufacturer installed magnetic transmission fluid drain plug.

TRANSMISSION WARRANTY

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

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LH PTO

A PTO shall be installed on the transmission by the OEM.

LH PTO MODEL

A ten (10) bolt Chelsea model 277-SDFJP-B5XD heavy duty transmission driven PTO shall be installed. The clutched shifted PTO is designed specifically for the Allison world transmission and provides torque ranges from 250 to 335 lb. ft.

PTO LOCATION

The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o'clock position and one (1) in the 1:00 o'clock position.

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1810 series universal joints for the main drivelines, and 1710 series for the inter-axle shaft. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®.

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Fuel Pro 382 fuel filter/water separator as a primary filter. The fuel filter shall have a see through cover to allow visual inspection of fuel and filter condition and a drain valve. The fuel lines shall be extended an additional eighteen (18) inches in front and behind the fuel filter to allow the fuel filter to be easily relocated.

A secondary fuel filter shall be included as approved by the engine manufacturer.

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

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall be connected with reusable steel fittings.

FUEL SHUTOFF VALVE

There shall be two (2) fuel shutoff valves which shall be installed, one (1) in the fuel draw line at the primary fuel filter and one (1) in the fuel outlet line at the primary fuel filter to allow the fuel filters to be changed without loss of fuel to the fuel pump.

A third fuel shutoff valve shall be installed in the fuel draw line, near the fuel tank to allow maintenance to be performed with minimal loss of fuel.

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ELECTRIC FUEL PRIMER

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

FUEL TANK

The fuel tank shall have a capacity of one-hundred (100) gallons and shall measure 35.00 inches in width X 15.00 inches in height X 48.00 inches in length. The baffled tank shall be made of 14 gauge aluminized steel. The exterior of the tank shall be painted with a PRP CorSol™ black anti-corrosive exterior metal treatment finish. This results in a tank which offers the internal and external corrosion resistance.

The tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right or left hand fill. A 0.50 inch NPT drain plug shall be centered in the bottom of the tank.

The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with "U" straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

FUEL TANK FILL PORT

The fuel tank fill ports shall be provided with two (2) left fill ports located one (1) in the forward position and one (1) in the middle position and the right fill port located in the rearward position of the fuel tank.

FUEL TANK DRAIN PLUG

A 0.5 inch NPT drain plug shall be centered in the bottom of the fuel tank.

FRONT AXLE

The front axle shall be a Meritor Easy Steer Non drive front axle, model number MFS-20. The axle shall include a 3.74 inch drop and a 71.00 inch king pin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle. The weight capacity for the axle shall be rated to 23,000 pounds. This rating shall require special approvals from the wheel manufacturers.

FRONT AXLE WARRANTY

The front axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

FRONT WHEEL BEARING LUBRICATION

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

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FRONT SHOCK ABSORBERS

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

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

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

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

FRONT SUSPENSION

The front suspension shall include a ten (10) leaf spring pack in which the longest leaf measures 53.38 inch long and 4.00 inches wide. The springs shall be shot peened for long life and include a military double wrapped front eye. The springs shall be bolted in place with M20 10.9 bolts and have replaceable rubber bushings in the spring eyes. The spring capacity shall be rated at 23,000 pounds.

STEERING COLUMN/ WHEEL

The cab shall include a Douglas Autotech steering column which shall include a seven (7) position tilt, a 2.25 inch telescopic adjustment, and an 18.00 inch, four (4) spoke steering wheel located at the driver's position. The steering wheel shall be covered with black polyurethane foam padding.

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

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

POWER STEERING PUMP

The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type.

FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 48-degrees to the left and 44-degrees to the right.

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 85 with an assist cylinder.

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CHASSIS ALIGNMENT

The chassis frame rails shall be measured to insure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer.

REAR AXLE

The rear axle shall be a Meritor model RT-46-160 tandem drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 48,000 pounds.

The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of 0.50 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.

The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR AXLE DIFFERENTIAL CONTROL

The tandem axle chassis shall include an inter-axle differential lock, which will allow both axles to be engaged as drive axles. The differential lock shall be controlled by a locking rocker switch on the switch panel. The light on the switch shall illuminate with positive engagement of the inter-axle differential control.

A driver controlled differential lock shall be installed on one of the tandem rear axles. This feature shall allow the main differential to be locked and unlocked when encountering poor road or highway conditions, where maximum traction is needed, for use at speeds no greater than 25 MPH. The driver controlled differential lock shall be controlled by a separate locking rocker switch on the switch panel. The light on the switch shall illuminate with positive engagement of the differential control.

VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 65 MPH +/-2 MPH at governed engine RPM.

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REAR AXLE EXTERNAL VENT

The rear axle vent shall be remotely located. The axle manufacturer's vent fitting shall be removed and replaced with a 48" vent tube with the vent fitting re-installed at the end of the tube. The body manufacturer shall be responsible for the final routing and positioning of the axle vent tube assembly.

REAR SUSPENSION

The tandem rear axle shall feature a Raydan Air-Link AL-520 air suspension. The Air-Link AL-520 shall offer a unique air ride and walking beam suspension design which combines a super smooth ride with durability. The suspension shall offer (2) moving parts which shall provide long wear and low maintenance. The rear tandem suspension shall include 54.00 inch axle centers.

Dual air height control valves shall be installed to ensure equal frame height on both sides of the vehicle regardless of the load.

The rear suspension is run flat compatible at reduced speeds.

The rear suspension capacity shall be rated at 40,000 to 52,000 pounds.

REAR SHOCK ABSORBERS

Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.

FRONT TIRE

The front tires shall be Michelin 425/65R22.5 "L" tubeless radial XFE regional tread.

The front tire stamped load capacity shall be 22,800 pounds per axle with a speed rating of 65 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Tire Intermittent Service Rating load capacity shall be 24,400 pounds per axle with a speed rating of up to 75 miles per hour when properly inflated to 120 pounds per square inch. The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to one (1) hour of loaded travel with a one (1) hour cool down prior to another loaded run.

REAR TIRE

The rear tires shall be Michelin 11R-22.5 16PR "H" tubeless radial XDN2 all-weather tread designed for exceptional traction and mileage.

The rear tire stamped load capacity shall be 24,020 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Tire Intermittent Service Rating load capacity shall be 24,820 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch. The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to one (1) hour of loaded travel with a one (1) hour cool down prior to another loaded run.

REAR AXLE RATIO

The rear axle ratio shall be 5.63:1.

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TIRE PRESSURE EQUALIZATION SYSTEM

There shall be a voucher provided with the chassis for Crossfire dual tire equalization system provided on both sets of dual tires on the rear axle. The Crossfire pressure system shall equalize and monitor tire pressure through the valve which is mounted between the dual tires. This shall bolt easily to the drive axle end allowing air to flow freely from one tire to the other, maintaining equal tire pressure and load distribution. The Crossfire system shall maximize tire life, decrease rolling resistance for increased fuel mileage and improve stability braking and overall safety.

The Crossfire dual tire equalization system shall be redeemed upon the vehicle manufacturer's receipt of the voucher along with the vehicle in-service weight for each axle.

TIRE PRESSURE INDICATOR

There shall be a voucher provided with the chassis for a pop up style tire pressure indicator at the front tire valve stem. The indicator shall provide visual indication of pressure in the specific tire.

The tire pressure indicators shall be redeemed upon the vehicle manufacturer's receipt of the voucher for installation by the customer.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch LvL One™ polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and shall include Alcoa's Dura-Bright® finish with XBR technology as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water.

REAR WHEEL

The rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment with XBR® technology as an integral part of the wheel. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

SPARE WHEEL FRONT QUANTITY

One (1) spare wheel of the same manufacturer, size, and material as the front wheels shall be provided.

SPARE WHEEL FRONT

An Alcoa brand aluminum Durabright 22.50 inch x 12.25 inch LvL One™ wheel shall be provided for the front spare.

SPARE WHEEL REAR QUANTITY

Two (2) spare wheels of the same manufacturer, size, and material as the outer rear wheels shall be provided.

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SPARE WHEEL REAR

An Alcoa brand aluminum Durabright 22.50 inch x 8.25 inch LVL One™ wheel shall be provided for the rear spare.

AUXILIARY LUBRICATION SYSTEM

A Groeneveld (CPL) automatic lubrication system shall be installed on the chassis. The system shall be capable of lubricating all applicable grease points on the chassis. A park brake interlock is incorporated into the ignition system to keep the system from operating while parked. The system shall be mounted on the left hand frame rail.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include a three (3) air tank, four (4) reservoir system with a total of 6220 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.

The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.

A six (6) sensor, six (6) modulator Anti-lock Braking System (ABS) shall be installed on the front and tandem rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the tandem rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

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

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

FRONT BRAKES

The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors.

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REAR BRAKES

The rear brakes shall be Meritor 16.50 inch X 8.63 inch S-cam drum type.

PARK BRAKE

Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

In addition to the mechanical rear brake engagement, the front service brakes will also engage via air pressure, providing additional braking capability.

PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake.

The parking brake actuation valve shall be mounted to the left side of the engine tunnel integrated into the transmission shift pod console within easy access of the driver.

REAR BRAKE SLACK ADJUSTERS

Haldex rear brake automatic slack adjusters shall be installed on the axle.

REAR BRAKE DUST SHIELDS

The rear brakes shall be equipped with brake dust shields.

AIR DRYER

The brake system shall include a Wabco System Saver 1200 air dryer with an integral heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be mounted behind the battery box on the left hand side.

FRONT BRAKE CHAMBERS

The front brakes shall be provided with MGM type 24 long stroke brake chambers.

REAR BRAKE CHAMBERS

The rear axle shall include TSE 30/36 brake chambers which shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE Type 36 brake chamber has a 36.00 square inch effective area.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall

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feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket on the left frame rail behind the battery box.

MOISTURE EJECTORS

Manual pet-cock type drain valves shall be installed on all reservoirs of the air supply system.

AIR SUPPLY LINES

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

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

AIR INLET CONNECTION

An air connection for the shoreline air inlet shall be supplied.

AIR INLET LOCATION

The air inlet shall be installed in the left hand side lower front step in the forward position.

PLUMBING AIR INLET CONNECTION

The air inlet connector shall be plumbed to the air system with a check valve to prevent air from escaping through the inlet connector.

AIR OUTLET CONNECTION

A quick release air outlet female connector shall be installed in the mid-section of the left lower cab step towards the front of the cab for the use of auxiliary air tools. The air outlet connector shall be compatible with a Milton 787, Parker Hannifin B13 or Meyers 54-410 connector.

PLUMBING AIR OUTLET CONNECTION

The cab mounted air outlet connection shall be plumbed to the chassis auxiliary air system reservoir.

AIR INLET/ OUTLET FITTING TYPE

The air connector supplied shall be a 0.25 inch size Tru-Flate Interchange style manual connection which is compatible with Milton 'T' style, Myers 0.25 inch Automotive style and Parker 0.25 inch 10 Series connectors.

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AIR TANK SPACERS

There shall be spacers included with the air tank mounting. The spacers shall move the air tanks 1.50 inches inward towards the center of the chassis. This shall provide clearance between the air tanks and the frame for body U-bolt clearance.

WHEELBASE

The chassis wheelbase shall be 258.00 inches.

REAR OVERHANG

The chassis rear overhang shall be 113.00 inches.

FRAME

The frame shall consist of double rails running parallel to each other with cross members forming a ladder style frame. The frame rails shall be formed in the shape of a "C" channel, with the outer rail measuring 10.25 inches high X 3.50 inches deep upper and lower flanges X 0.38 inches thick with an inner channel of 9.44 inches high X 3.13 inches deep and 0.38 inches thick. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. Each double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100 inch pounds and have a minimum section modulus of 29.21 cubic inches. The frame shall measure 35.00 inches in width.

Proposals calculating the frame strength using the "box method" shall not be considered.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

A minimum of seven (7) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25 inch thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.

Any proposals not including additional reinforcement for each cross member shall not be considered.

All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall be made available upon request.

Proposals offering warranties for frames not including cross members shall not be considered.

FRAME WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE

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STATEMENT OF THE SPARTAN CHASSIS, INC. LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The frame and cross members shall carry a limited lifetime warranty to the original purchaser. The warranty period shall commence on the date the vehicle is delivered to the first end user.

FRAME CLEAR AREA

The chassis frame shall be left clear of chassis mounted components inside and outside the frame rails within the first 48.00 inches behind the cab to allow space for OEM installed components. Cross members may be installed in the clear area if required for proper frame or driveline configuration.

FRAME PAINT

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

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-cured pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

Any proposals offering painted frame with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above.

FRONT BUMPER

The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be 0.38 thick ASTM A36 steel which shall measure 12.00 inches high with a 3.05 inch flange and shall be 104.50 inches wide with angled front corners.

The bumper shall be primed and painted as specified.

FRONT BUMPER EXTENSION LENGTH

The front bumper shall be extended approximately 18.00 inches ahead of the cab.

FRONT BUMPER EXTENSION FRAME WIDTH

The front bumper extension frame shall feature an overall width of 48.25 inches.

FRONT BUMPER PAINT

The front bumper shall be painted the same as the lower cab color.

FRONT BUMPER WINCH

The front bumper shall include a Warn model 16.5ti electric winch with 16,500 pound rated line pull, 12 volt electric winch shall be installed in the center of the front bumper. The winch shall be equipped with 90.00 feet of 0.4375 inch cable, clevis hook and a 4-way roller fairlead. The winch shall be operated through a 12.00 foot pendant with a hand held control. The winch shall include an automatic direct drive cone brake. It shall feature an easy to use free-spooling rotating ring gear clutch.

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FRONT BUMPER APRON

The 18.00 inch extended front bumper shall include an apron constructed of 0.19 inch thick embossed aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

FRONT BUMPER COMPARTMENT CENTER

The front bumper shall include a compartment in the bumper apron located in the center between the frame rails which may be used as a hose well. The compartment shall be constructed of 0.13 inch 5052-H32 grade aluminum and shall include drain holes in the bottom corners to allow excess moisture to escape. The compartment shall include a raised lip around the opening and a raised cover with weather stripping. The compartment cover shall be constructed of 0.19 inch thick bright embossed aluminum tread plate. The compartment cover shall include a hose provision on the left side to allow hose pass through for quick connect. The provision shall include protection for hose chaffing.


FRONT BUMPER COMPARTMENT COVER HARDWARE

The front bumper compartment cover shall include gas cylinder stays which shall hold the cover open. The cover shall held in the closed position via a flush push button style latch.

AIR HORN

The chassis shall include two (2) Hadley brand E-Tone air horns which shall measure 24.00 inches long with a 6.00 inch round flare. The air horns shall be trumpet style with a chrome finish on the exterior and a painted finish deep inside the trumpet.

AIR HORN LOCATION

The air horns shall be recess mounted in  front bumper face, one (1) on the right side of the bumper in the inboard position relative to the right hand frame rail and one (1) on the left side of the bumper in the inboard position relative to the left hand frame rail. Air horns to be mounted behind bumper (same as Smeal order).


AIR HORN RESERVOIR

One (1) air reservoir, with a 2084 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

ELECTRONIC SIREN SPEAKER

There shall be two (2) Whelen Engineering Inc. model SH314P, 100 watt speakers provided. Each speaker shall measure 6.40 inches tall X 6.17 inches wide X 3.14 inches deep. Each speaker shall be mounted behind bumper and have a natural cast aluminum finish and shall be installed using a polished aluminum trim ring. (Same as VFRS Smeal units.)

ELECTRONIC SIREN SPEAKER LOCATION

The two (2) electronic siren speakers shall be located on  front bumper face outboard of the frame rails with one (1) on the right side and one (1) on the left side in the outboard positions.

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FRONT BUMPER TOW HOOKS

Two (2) heavy duty tow hooks, painted to match the chassis frame, shall be installed in a rearward position out of the approach angle area, bolted directly to the side of the chassis frame with grade 8 bolts.

FRONT BUMPER TOW EYES

The bumper shall include two (2) painted tow eyes shall be installed above the front bumper. The tow eyes shall be fabricated from 0.75 inch thick #1020 ASTM-36 hot rolled steel. The inside diameter of the tow eye shall be 2.00 inches and shall have a chamfered edge. The tow eyes shall be painted to match the frame.

CAB TILT SYSTEM

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.

The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the “Down” button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

Two (2) cab tilt heavy duty capacity cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be a 1.90 inch ball pivot and be anchored to frame brackets with 1.25 inch diameter studs.

A steel safety channel assembly, painted safety yellow shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

CAB TILT AUXILIARY PUMP

A manual cab tilt pump module shall be attached to the cab tilt pump housing.

CAB TILT LIMIT SWITCH

A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The limit adjustment of the switch shall be preset by the chassis manufacturer to prevent damage to the cab or any bumper mounted option mounted in the cab tilt arc. Further adjustment to the limit by the apparatus manufacturer shall be available to accommodate additional equipment.

CAB TILT ALARM

A Preco Matic model 1059 audible alarm shall be installed and shall automatically activate the pulsed warble sounding alarm when the cab tilt is actuated acting as a notification and warning.

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CAB TILT CONTROL RECEPTACLE

A six (6) pin Deutsch receptacle that includes a cap shall be installed in the front bumper tail on the right hand side to provide a place to plug in the cab tilt remote control pendant.

The remote control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote control pendant shall be shipped loose with the chassis.

CAB WINDSHIELD

The cab windshield shall have a surface area of 2969.88 square inches and be of a two (2) piece wraparound design for maximum visibility.

The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.

Each windshield shall be installed using black self locking window rubber.

GLASS FRONT DOOR

The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished using electric actuation. The left and right front door windows shall be controlled using a switch on each respective side inner door panel. The driver's door shall include a switch for each powered door window in the cab.

There shall be an irregular shaped fixed window which shall measure 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as "cozy glass" ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

GLASS TINT FRONT DOOR

The windows located in the left and right front doors shall have a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR RH

The rear right hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the inner door panel and on the driver's control panel.

GLASS TINT REAR DOOR RIGHT HAND

The window located in the right hand side rear window shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

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GLASS REAR DOOR LH

The rear left hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the inner door panel and on the driver's control panel.

GLASS TINT REAR DOOR LEFT HAND

The window located in the left hand side rear door shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS SIDE MID RH

The cab shall include a window on the right side behind the front and ahead of the crew door which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID RIGHT HAND

The window located on the right hand side of the cab between the front and rear doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS SIDE MID LH

The cab shall include a window on the left side behind the front door and ahead of the crew door and above the wheel well which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID LEFT HAND

The window located on the left hand side of the cab between the front and rear doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS SIDE REAR RH

The rear section of the cab on the right hand side behind the crew door shall include a window which shall measure 8.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be oblong in shape. The window shall be mounted using a black self locking window rubber.

GLASS TINT SIDE REAR RIGHT HAND

The window located on the rear wall on the right hand side shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

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GLASS SIDE REAR LEFT HAND

The rear section of the cab on the left hand side behind the crew door shall include a window which shall measure 8.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be oblong in shape. The window shall be mounted using a black self locking window rubber.

GLASS TINT SIDE REAR LEFT HAND

The window located on the rear wall on the right hand side of the cab behind the crew door shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS UPPER SIDE FRONT

The raised roof on the left and right sides of the cab shall include a triangular shaped window which shall be 12.00 inches wide X 11.00 inches high. These windows shall be fixed within this space. These windows shall be mounted to the cab using black self-locking window rubber.

GLASS TINT UPPER SIDE FRONT

The windows located in the upper section on the left and right side towards the front of the cab shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS UPPER SIDE MID

The middle section of the raised roof on the left and right sides of the cab shall include a window which shall measure 16.00 inches wide X 14.00 inches high. These windows shall be fixed within this space. These windows shall be mounted using black self-locking window rubber.

GLASS TINT UPPER SIDE MID

The windows located in the upper section on each side in the middle of the cab shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS UPPER SIDE REAR DOOR

Windows shall be provided in the upper portion of each rear door of the raised roof cab. Each window shall measure 27.00 inches wide X 14.00 inches high and be installed above the lower door window. The windows shall be rectangular in shape and fixed within this space. The windows shall be mounted using black self-locking window rubber.

GLASS TINT UPPER SIDE REAR DOOR

The window located in the upper section on the crew doors of the cab shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

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GLASS UPPER SIDE REAR

The upper portion on the left and right sides towards the rear of the cab shall include a window which is 8.00 inches wide X 14.00 inches high. These windows shall be fixed within this space. The windows shall be oblong in shape and be mounted using black self-locking window rubber.

GLASS TINT UPPER SIDE REAR

The window located in the upper section on the side of the cab towards the rear shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

CLIMATE CONTROL

The cab shall be equipped with a ceiling mounted combination defrost / heating and air-conditioning system mounted above the engine tunnel in a central location.

The system shall offer sixteen (16) adjustable louvers. Six (6) of the louvers shall face forward towards the windshield, offering 45,000 BTU of heat at 320 CFM for defrosting. The system shall include six (6) rearward facing louvers to direct air for the crew area and four (4) for driver and officer comfort. The HVAC system shall be designed to produce 60,000 BTU of heat and 32,000 BTU of cooling. The HVAC cover shall be made of aluminum which shall be coated with a customer specified interior paint, or protective coating.

All defrost/heating systems shall be plumbed with one (1) seasonal shut-off valve at the front corner on the right side of the cab.

The air conditioner lines shall be a mixture of custom bent zinc coated steel fittings and Aero-quip GH 134 flexible hose with Aero-Quip EZ-Clip fittings.

CLIMATE CONTROL DRAIN

The climate control system shall include a venturi pump for water management. The venturi pump drain shall remove condensation from the air conditioning system.

CLIMATE CONTROL ACTIVATION

The heating, defrosting and air conditioning controls shall be located on the Vista display and control screen. The HVAC shall default to auto mode and set the temperature to 70 degrees Fahrenheit when the ignition switch is turned on.

HVAC OVERHEAD COVER PAINT

The overhead HVAC cover shall be painted with a Zolatone #20-71 onyx black texture finish.

A/C CONDENSER LOCATION

A roof mounted A/C condenser shall be installed centered on the cab forward of the raised roof against the slope rise.

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A/C COMPRESSOR

The air-conditioning compressor shall be a belt driven, engine mounted, open type compressor that shall be capable of producing a minimum of 32,000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil.

CAB CIRCULATION FANS FRONT

The cab shall include two (2) all metal 6.00 inch air circulation fans installed outer front cab corners. Each fan shall be controlled by an individual virtual button on the Vista display and control screen or a toggle switch on each fan. The fans shall automatically activate whenever the HVAC is in defrost mode. The fans can be used to help defog the windshield or to increase air circulation for passenger comfort.

UNDER CAB INSULATION

The underside of the cab tunnel surrounding the engine and the underside of the entire cab floor shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments.

The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. As an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior.

The engine tunnel insulation shall measure approximately 0.75 inch thick including a vertically lapped polyester fiber layer, a 1.0 lb/ft² PVC barrier layer, an open cell foam layer, and a moisture and heat reflective foil facing reinforced with a woven fiberglass layer. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The cab floor insulation shall measure 0.56 inch thick including a 1.0#/sf PVC barrier and a moisture and heat reflective foil facing, reinforced with fiberglass strands. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed MVSS 302 flammability test.

The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by 3 mils of acrylic pressure sensitive adhesive and aluminum pins with hard hat, hold in place fastening heads. In addition, the insulation on the underside of the cab floor shall have an expanded metal overlay to assist in retaining the insulation tight against the cab.

INTERIOR TRIM FLOOR

The floor of the cab shall be covered with a multi-layer mat consisting of 0.25 inch thick sound absorbing closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive and aluminum trim molding. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.

INTERIOR TRIM

The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing.

REAR WALL INTERIOR TRIM

The rear wall of the cab shall be trimmed with vinyl.

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HEADER TRIM

The cab interior shall feature header trim over the driver and officer dash constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum.

TRIM CENTER DASH

The main center dash area shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation.

TRIM LH DASH

The left hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate for a perfect fit around the instrument panel. For increased occupant protection the extreme duty left hand dash utilizes patent pending break away technology to reduce rigidity in the event of a frontal crash. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.

TRIM RH DASH

The right hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door and a Mobile Data Terminal (MDT) provision. The glove compartment size will measure 14.00 inches wide X 6.38 inches high X 5.88 inches deep. The MDT provision shall be provided above the glove compartment.

ENGINE TUNNEL TRIM

The cab engine tunnel shall be covered with a multi-layer mat consisting of 0.25 inch closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance.

ENGINE TUNNEL ACCESSORIES

The engine tunnel shall include a mounting shelf for accessories such as brackets for flashlights, etc.

POWER POINT DASH MOUNT

The cab shall include two (2) 12 volt cigarette lighter type receptacles in the switch panel to provide a power source for 12 volt electrical equipment. The cab shall also include one (1) Blue Sea dual universal serial bus (USB) charging receptacle in the cab dash to provide a power source for USB chargeable electrical equipment. The USB port shall be capable of a 5 Volt-500 milliampere output. The receptacles shall be wired battery direct.

STEP TRIM

Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of 14 gauge 304 stainless steel with indented perforations. The perforations shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The stainless steel material shall have a number 7 mirror finish. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed in 0.08 inch thick 3003-H22 embossed aluminum tread plate.

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UNDER CAB ACCESS DOOR

The cab shall include an access door in the left crew step riser constructed of 14-gauge 304 stainless steel with a push and turn latch. The under cab access door shall include a brushed finish and shall provide access to the diesel exhaust fluid fill.

INTERIOR DOOR TRIM

The interior trim on the doors of the cab shall consist of a two (2) piece panel constructed of 14-gauge 304 stainless steel. The stainless steel shall have a brushed finish.

DOOR TRIM CUSTOMER NAMEPLATE

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their Department.

CAB DOOR TRIM REFLECTIVE

The interior of each door shall include high visibility reflective tape. A white reflective tape shall be provided vertically along the outer rear edge of the door. The lowest portion of each door skin shall include a reflective tape chevron with red and lime green stripes. The chevron tape shall measure 6.00 inches in height.

INTERIOR GRAB HANDLE "A" PILLAR

There shall be two (2) rubber covered 11.00 inch grab handles installed inside the cab, one on each "A" post at the left and right door openings. The left handle shall be located 7.88 inches above the bottom of the door window opening and the right handle shall be located 2.88 inches above the bottom of the door window opening. The handles shall assist personnel in entering and exiting the cab.

INTERIOR GRAB HANDLE FRONT DOOR

Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab.

INTERIOR GRAB HANDLE REAR DOOR

A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00 inch long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.

INTERIOR REAR WALL COMPARTMENT LIGHTING

There shall be one (1) On Scene brand LED strip light installed to illuminate the interior seat box compartment at the rear wall inside the crew area of the cab. The strip light shall be 36.00 inches long.

INTERIOR REARVIEW MIRROR

The cab shall include a flip down rectangular rearview style mirror on the left side of the cab over head.

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INTERIOR SOFT TRIM COLOR

The cab interior soft trim surfaces shall be gray in color.

INTERIOR TRIM SUNVISOR

The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield. Each sun visor shall be constructed of Masonite and covered with padded vinyl trim.

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be black in color.

HEADER TRIM INTERIOR PAINT

The metal surfaces in the header area shall be coated with Zolatone #20-71 onyx black texture finish.

TRIM CENTER DASH INTERIOR PAINT

The entire center dash shall be coated with Zolatone #20-71 onyx black texture finish. Any accessory pods attached to the dash shall also be painted this color.

TRIM LEFT HAND DASH INTERIOR PAINT

The left hand dash shall be painted with Zolatone #20-71 onyx black texture finish.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right hand dash shall be painted with Zolatone #20-71 onyx black texture finish.

ENGINE TUNNEL ACCESSORIES PAINT

The engine tunnel accessories shall be painted with Zolatone #20-71 onyx black texture finish.

DASH PANEL GROUP

The main center dash area shall include three (3) removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The center panel shall be within comfortable reach of both the driver and officer.

SWITCHES CENTER PANEL

The center dash panel shall include six (6) switch positions in the upper left portion of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

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SWITCHES LEFT PANEL

The left dash panel shall include five (5) switches in a three (3) over two (2) staggered switch configuration. Two (2) rocker switches, one (1) headlight switch, one (1) windshield wiper/washer control switch and one (1) instrument lamp dimmer switch shall be provided.

A rocker switch with a blank legend installed directly above shall be provided for any position not designated by a specific option. The non-designated switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

SWITCHES RIGHT PANEL

The right dash panel shall include three (3) rocker switch positions in the upper right hand portion of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

SEAT BELT WARNING

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the Vista display and control screen(s), an indicator light in the instrument panel, and an audible alarm.

The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have the seat belts fastened.

SEAT MATERIAL

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.

SEAT COLOR

All seats supplied with the chassis shall be black in color. All seats shall include red seat belts.

SEAT BACK LOGO

The seat backs shall include the VFRS logo at NO additional charge (per Bev Lowry). The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

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SEAT DRIVER

The driver's seat shall be an H.O. Bostrom Firefighter Sierra model seat. The seat shall feature eight-way electric positioning. The eight positions shall include up and down, fore and aft with 8.00 inches of travel, back angle adjustment and seat rake adjustment. The seat shall feature integral springs to isolate shock.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt, automatic retractor and buckle as an integral part of the seat assembly.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches measured with the seat height adjusted to the lowest position of travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK DRIVER

The driver's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.

SEAT MOUNTING DRIVER

The driver's seat shall be installed in an ergonomic position in relation to the cab dash.

OCCUPANT PROTECTION DRIVER

The driver's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The driver's seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the driver, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.
- Large side curtain airbag - protects the driver's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the driver in a qualifying event by covering the window and the upper portion of the door.
- Dual knee airbags (patent pending) with energy management mounting (patent pending) - protects the driver's lower body from dangerous surface contact injuries, acceleration injuries, and from intrusion as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

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Steering wheel airbag - protects the driver's head, neck, and upper torso from contact injuries, acceleration injuries, and contact points with intrusive surfaces as a result of a collision.

SEAT OFFICER

The officer's seat shall be an H.O. Bostrom Firefighter model seat. The seat shall feature eight-way electric positioning. The eight (8) positions shall include up and down, fore and aft and front and rear tilt. The seat shall also feature integral springs to isolate shock.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt, automatic retractor and buckle as an integral part of the seat assembly.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches measured with the seat height adjusted to the lowest position of travel.

This model of seat shall have successfully completed the static load tests by FMVSS 207, 209, 210 and 302 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK OFFICER

The officer's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.

SEAT MOUNTING OFFICER

The officer's seat shall be installed in an ergonomic position in relation to the cab dash.

OCCUPANT PROTECTION OFFICER

The officer's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The officer's seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the officer, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.
- Large side curtain airbag - protects the officer's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the officer in a qualifying event by covering the window and the upper portion of the door.

Knee airbags - protects the officer's lower body from dangerous surface contact injuries, acceleration injuries, and from contact points with intrusive surfaces as a result of a collision as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

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POWER SEAT WIRING

The power seat or seats installed in the cab shall be wired directly to battery power.

SEAT BELT ORIENTATION CREW

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip.

SEAT FORWARD FACING OUTER LOCATION

The crew area shall include two (2) forward facing outboard seats, which include one (1) located next to the outer wall of the cab on the left side of the cab and one (1) located next to the outer wall on the right side of the cab.

SEAT CREW FORWARD FACING OUTER

The crew area shall include a seat in the forward facing outer position which shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat back and cushion. The bottom cushion shall be hinged and compact in design for additional room and shall remain in the stored position until occupied.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK FORWARD FACING OUTER

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

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The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING FORWARD FACING OUTER

The forward facing outer seat shall be mounted inboard from the side wall for additional clearance facing the front of the cab.

OCCUPANT PROTECTION FFO

The forward facing outer seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

Each forward facing outer seating position APS shall include:

- APS advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

Side curtain airbag - protects each occupant's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to each seating position with an airbag custom designed for each cab configuration.

SEAT FORWARD FACING CENTER LOCATION

The crew area shall include one (1) forward facing center crew seat located directly behind the engine tunnel in the center of the cab.

SEAT CREW FORWARD FACING CENTER

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

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of

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materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK FORWARD FACING CENTER

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

OCCUPANT PROTECTION FFC

The forward facing center seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

Each forward facing center seating position APS shall include:

- APS advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

Side curtain airbag - provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to crew seating with an airbag custom designed for each cab configuration.

SEAT FRAME FORWARD FACING

The forward facing center seating positions shall include a full width seat frame located and installed at the rear wall. The seat frame shall span the available space on the rear wall. The seat frame shall be 12.38 inches high X 22.00 inches deep. The seat frame shall be constructed of Marine Grade 5052-H32 0.19 inch thick aluminum plate. The seat box shall be painted with the same color as the remaining interior.

SEAT FRAME FORWARD FACING STORAGE ACCESS

There shall be two (2) access points to the storage area centered on the front of the seat frame. Each access point shall be covered by a hinged door to allow access for storage in the seat box.

SEAT MOUNTING FORWARD FACING CENTER

The forward facing center seats shall be installed facing the front of the cab.

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SEAT FRAME EXTERIOR REAR COMPARTMENT ACCESS

The seat frame shall be open to the exterior rear compartment on both the right hand side and the left hand side. This shall allow interior access to the left and right exterior rear compartments.

CAB FRONT UNDERSEAT STORAGE ACCESS

The left and right under seat storage areas shall have a solid aluminum hinged door with non-locking latch.

SEAT COMPARTMENT DOOR FINISH

All underseat storage compartment access doors shall have a Zolatone #20-71 onyx black texture finish.

WINDSHIELD WIPER SYSTEM

The cab shall include a dual arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers which shall be affixed to a radial wet arm. The system shall include a single motor which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position.

ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message.

CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of a fiber reinforced plastic composite with a black matt finish.

The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

DOOR LOCKS

The cab entry doors shall include a Controller Area Network (CAN) based electronic door lock system which shall include two (2) external keypads, one (1) located on the left side next to the front grab handle and one (1) on the right side next to the front grab handle. There shall be one (1) red rocker switch provided on the inside of each front cab entry door to actuate the cab door locks. Each door lock may also be manually actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door. The electronic door lock system shall include four (4) key fobs for actuation with buttons for cab entry door locks and for compartment door locks.

When the doors are unlocked using the external keypad or the key fobs the interior dome lights shall illuminate and remain on for a period of twenty (20) seconds. The interior dome safety feature shall require the interior lighting power to be battery direct.

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Wiring shall also be provided for up to four (4) exterior cab compartments and up to four (4) body compartments.

DOOR LOCK LH REAR CAB COMPARTMENT

The left hand side rear compartment shall feature a power door lock actuator.

DOOR LOCK RH REAR CAB COMPARTMENT

The right hand side rear compartment shall feature a power door lock actuator.

POWER DOOR LOCK COMPARTMENT ACTIVATION

The power door lock feature shall include activation for exterior compartment door locks through the key fob, keypads and through a virtual switch on the multiplex display.

GRAB HANDLES

The cab shall include one (1) 24.00 inch knurled, anti-slip, one-piece exterior assist handle behind each cab door. The grab handle shall be made of 14 gauge 304- stainless steel and be 1.25 inch diameter to enable non-slip assistance with a gloved hand.

REARVIEW MIRRORS

Retrac Aerodynamic West Coast style dual vision mirror heads model 613305 shall be provided and installed on each of the front cab doors.

The mirrors shall be mounted via 1.00 inch diameter tubular stainless steel arms to provide a rigid mounting to reduce mirror vibration.

The mirrors shall measure 8.00 inches wide X 19.00 inches high and shall include an integral convex mirrors installed in the mirror head below the flat glass to provide a wider field of vision. The flat and convex mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The flat and convex mirrors shall be heated for defrosting in severe cold weather conditions.

The mirrors shall be constructed of a vacuum formed chrome plated ABS plastic housing that is corrosion resistant and shall include the finest quality non-glare glass.

REARVIEW MIRROR HEAT SWITCH

The heat for the rearview mirrors shall be controlled through a virtual button on the Vista display and control screen and shall automatically turn on when the defroster is activated.

CAB FENDER

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 3.50 inches wide made of 14 gauge 304 polished stainless steel.

MUD FLAPS FRONT

The front wheel wells shall have mud flaps installed on them. The mud flaps shall extend from the outer edge of the wheel well to the inner edge of the wheel well to provide additional protection from road spray.

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IGNITION

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a one-quarter turn Cole Hersee switch, both of which shall be mounted to the left of the steering wheel on the dash. A chrome push type starter button shall be provided adjacent to the master battery and ignition switches.

Each switch shall illuminate a green LED indicator light on the dash when the respective switch is placed in the “ON” position.

The starter button shall only operate when both the master battery and ignition switches are in the “ON” position.

A hidden toggle switch with protective cover shall be provided. The switch shall be located so it can be activated at the driver's discretion. The switch shall be wired in such a manner so if the parking brake is released and the transmission is placed in gear, electrical power will be cut to disable the engine to prevent unauthorized personnel from commandeering the vehicle.

BATTERY

The single start electrical system shall include six (6) Harris BCI 31 950 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541.

BATTERY TRAY

The batteries shall be installed within two (2) steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.

BATTERY BOX COVER

Each battery box shall include a hinged steel cover which protects the top of the batteries. Each cover shall include flush latches which shall keep the cover secure as well as a black powder coated handle for convenience when opening.

BATTERY CABLE

The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed at the ends with heat shrink and sealant.

The battery terminals shall not be utilized for auxiliary connections. The only acceptable auxiliary connections shall be for the cross over link from the left bank to the right bank, power for jumper studs and starter cables. All other auxiliary connections will use remote studs mounted in the battery box area. There shall be four (4) remote studs labeled as Common Power, Common Ground, Clean Power, and Clean Ground.

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BATTERY JUMPER STUD

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

ALTERNATOR

The charging system shall include a 270 amp Leece Neville 12 volt alternator. The alternator shall include a self-excited integral regulator.

BATTERY CONDITIONER

A Kussmaul Auto Charge 40/20 battery conditioner shall be supplied. The battery conditioner shall provide a 40 amp output for the chassis batteries and a 20 amp battery saver output. The battery conditioner shall be mounted in the cab in the LH rear facing outer seating position.

BATTERY CONDITIONER DISPLAY

A Kussmaul battery conditioner display shall be supplied. The battery conditioner display shall be mounted in the cab, viewable through the cab mid side window behind the left front door.

ELECTRICAL INLET

A Kussmaul 20 amp electrical receptacle shall be supplied.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it's connected to.

Amp Draw Reference List:

Kussmaul 1000 Charger - 3.5 Amps

Kussmaul 1200 Charger - 10 Amps

Kussmaul 35/10 Charger - 10 Amps

1000W Engine Heater - 8.33 Amps

1500W Engine Heater - 12.5 Amps

120V Air Compressor - 4.2 Amps

ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left hand side of cab over the wheel well.

ELECTRICAL INLET CONNECTION

The electrical inlet shall be connected to the battery conditioner.

ELECTRICAL INLET COLOR

The electrical inlet connection shall include a red cover.

HEADLIGHTS

The cab front shall include four (4) rectangular halogen headlamps with separate high and low beams mounted in bright chrome bezels.

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FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model 600 4.00 inch X 6.00 inch programmable amber LED turn signals which shall be installed in polished aluminum housing above and outboard of the front warning and head lamps.

HEADLIGHT LOCATION

The headlights shall be located on the front fascia of the cab directly below the front warning lights.

SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners.

MARKER AND ICC LIGHTS

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

HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlights and marker lights shall be controlled through a rocker switch within easy reach of the driver. There shall be a dimmer switch within easy reach of the driver to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights to 80% brilliance when the battery master switch is in the "On" position and the parking brake is released.

CORNERING LIGHTS

The cab side shall include two (2) Whelen 400 LED steady-on cornering lights with clear lenses, one (1) each side. The lights shall be mounted rearward from the front cab corner radius ahead of the cab doors. The light heads shall illuminate when the turn signals are activated.

GROUND LIGHTS

Each door shall include an NFPA compliant LED ground light mounted to the underside of the cab step below each door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life. The ground lighting shall be activated by the opening of the door on the respective cab side, when the parking brake is set and through a virtual button on the Vista display and control screen.

LOWER CAB STEP LIGHTS

The middle step located at each door shall include a recess mounted 4.00 inch round LED light which shall activate with the opening of the respective door.

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ENGINE COMPARTMENT LIGHT

There shall be two (2) LED NFPA compliant lights mounted under the engine tunnel for area work lighting on the engine. The lights shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. The lights shall activate automatically when the cab is tilted.

FRONT SCENE LIGHTS

The front of the cab shall include one (1) Fire Research Focus model FCA800-M12 contour roof mount scene light installed on the brow of the cab.

The lamp head shall have one (1) quartz halogen 240 volt 1000 watt bulb. The bulb shall draw 4.2 amps and generate 22,000 lumens. The lamp head shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. The lamp head shall be no more than 4.75 inches in height X 15.00 inches in width. The lamp head and brackets shall be powder coated white.

FRONT SCENE LIGHTS ACTIVATION

The front scene lighting shall be pre-wired to be activated by the OEM.

FRONT SCENE LIGHT LOCATION

There shall be one (1) scene light mounted center on the front brow of the cab.

SIDE SCENE LIGHTS

The side of the cab shall include two (2) Whelen 900 series 9SC0ENZR model scene lights, one (1) each side which shall be surface mounted with a chrome bezel. The Whelen lights shall offer LED lighting at a gradient 32-degree angle.


SIDE SCENE LIGHT LOCATION

The scene lighting located on the left and right sides of the cab shall be mounted in the upper forward portion of the 20.00 inch raised roof of the cab between the front and rear crew doors.

SIDE SCENE ACTIVATION

The scene lights shall be activated by two (2) virtual buttons on the Vista display and control screen(s), one (1) for each light, and by opening the respective side cab doors.

INTERIOR OVERHEAD LIGHTS

The cab shall include a two-section, red and clear Weldon LED dome lamp located over each door. The dome lamps shall be rectangular in shape and shall measure approximately 7.00 inches in length X 3.00 inches in width with a black colored bezel. The clear portion of each lamp shall be activated by opening the respective door, and both the red and clear portion can be activated by individual push lenses on each lamp 

An additional separately functioning red or clear Whelen LED dome lamp shall be provided over the engine tunnel. Each individual function can be activated dependently by switches on the lamp.

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AUXILIARY DOME LIGHT RH

The cab shall include one (1) 7.00 inches diameter auxiliary LED clear auxiliary dome light above the right hand front seat position. The light shall be activated by door and rocker switch on the dash panel

MAP LIGHTS

A Sunnex SL9 LED swivel map light shall be provided. The light shall have a clear lens and a control switch on the base. The light shall be mounted on the overhead HVAC cover on the right hand side.

SPOTLIGHT

The cab shall include one (1) 12 volt Collins Magnum hand-held spotlight. The spotlight shall provide 1,250,000 candlepower of illumination and shall include a coil cord and a momentary switch. The spotlight shall be shipped loose with the chassis.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include a flashing red Whelen 500 Series 5mm LED light clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, a chime tone audible alarm shall be included which shall sound while the light is activated.

The flashing red light shall be 5.40 inches long X 1.70 inches wide X 0.90 inches high and shall be located centered left to right for greatest visibility.

The light and alarm shall be interlocked for activation when either a cab door is not firmly closed or an apparatus compartment door is not closed, and the parking brake is released.

MASTER WARNING SWITCH

A master switch shall be included, as a virtual button on the Vista display and control screen which shall be labeled "E Master" for identification. The button shall feature control over all devices wired through it. Any warning device switches left in the "ON" position when the master switch is activated shall automatically power up.

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen 600 series Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel.

INBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the inboard positions shall be clear.

OUTBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen 600 series Super LED front warning lights in the left and right outboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel.

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OUTBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the outboard position shall be red with a clear lens.

FRONT WARNING SWITCH

The front warning lights shall be controlled through a virtual control on the Vista display and control screen. This switch shall be clearly labeled for identification.

INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen 600 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors.

INTERSECTOR WARNING LIGHTS COLOR

The intersection lights shall be red/clear with a clear lens. The clear half of each lamp shall be positioned towards the front of the apparatus.

INTERSECTION WARNING LIGHTS LOCATION

The intersection lights shall be mounted on the side of the cab rearward from the front cab corner radius ahead of the cab doors.

SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen 600 series Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel.

SIDE WARNING LIGHTS COLOR

The warning lights located on the side of the cab shall be red with clear lens.

SIDE WARNING LIGHTS LOCATION

The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.

SIDE AND INTERSECTION WARNING SWITCH

The side warning lights shall be controlled through a virtual button on the Vista display and control screen. This button shall be clearly labeled for identification.

INTERIOR DOOR OPEN WARNING LIGHTS

The interior of each door shall include one (1) red 4.00 inch diameter Truck-Lite LED warning light located on the door panel. Each light shall activate with a flashing pattern when the door is in the open position to serve as a warning to oncoming traffic.

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SIREN CONTROL HEAD

A Whelen 295HFSA7 electronic siren control head with remote dual amplifier shall be provided and flush mounted in the switch panel with a location specific to the customer's needs. The siren shall feature 200-watt output, radio broadcast, public address, wail, yelp, or piercer tones and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected.

HORN BUTTON SELECTOR SWITCH

A virtual button on the Vista display and control screen shall be provided to allow control of either the electric horn or the air horn from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position to meet FMCSA requirements.

AIR HORN ACTIVATION

The air horn activation shall be accomplished by the steering wheel horn button for the driver and two (2) black momentary push buttons on the switch panel. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

ELECTRONIC SIREN AUXILIARY ACTIVATION

The electronic siren shall include activation by a left hand foot switch. The siren foot switch shall only be active when the emergency master warning switch is in the on position with Rap feature with bracket (like 5515-026).

BACK-UP ALARM

A Preco-Matic model 1059 dual function, dual sound backup alarm shall be installed at the rear of the chassis with an auto-adjusting output level of 87 dB to 112 dB. The alarm shall automatically activate when the transmission is placed in reverse. A virtual button shall be provided on the Vista display and control screen to disable the alarm.

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring.

The instrument panel shall contain the following gauges:

One (1) electronic speedometer shall be included. The primary scale on the speedometer shall read from 0 to 160 KM/H, and the secondary scale on the speedometer shall read from 0 to 100 MPH.

One (1) electronic tachometer shall be included. The scale on the tachometer shall read from 0 to 3000 RPM.

One (1) two-movement gauge displaying primary system, and secondary system air volumes and integral LCD odometer/trip odometer shall be included on the lower portion of the LCD. The scale on the air pressure gauges shall read from 0 to 1030 kilopascals (kPA). The air pressure scales shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate a low air pressure, as well as a message on the LCD screen. The odometer shall display up to 9,999,999.9 kilometers. The trip odometer shall display 9,999.9 kilometers. The

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LCD shall display Transmission Temperature in degrees Celsius on the upper portion of the LCD. The LCD screen shall also be capable of displaying certain diagnostic functions.

One (1) four-movement gauges displaying engine oil pressure, coolant temperature, fuel level, voltmeter, and an indicator bar displaying Diesel Exhaust Fluid (DEF) LED bar shall be included. The scale on the engine oil pressure gauge shall read from 0 to 830 kilopascals (kPA). The engine oil pressure scale shall be linear to operate with an accuracy of 1 degree of the measured data. A red indicator light in the gauge shall indicate a low engine oil pressure, as well as a message on the LCD screen. The scale on the coolant temperature gauge shall read from 40 to 120 degrees Celsius (C). The coolant temperature scale shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate high coolant temperature, as well as a message on the LCD screen. The scale on the fuel level gauge shall read from empty to full as a percentage of fuel remaining. An amber indicator light shall indicate low fuel at 25% tank level. The scale on the voltmeter shall read from 10 to 16 volts with a red indication zone on the gauge showing critical levels of battery voltage. A red indicator light shall indicate high or low system voltage, as well as a message on the LCD screen. The scale on the DEF LED bar will consist of four (4) 4 LEDs displaying levels in increments of 25% of useable DEF in green. Upon decreasing levels, the indicator bar will change colors to notify the driver of decreasing levels of DEF and action will be required. An amber indicator light shall indicate low levels of DEF, as well as a message on the LCD screen and an audible alarm.

The instrument panel shall include a light bar that contains the following LED indicator lights and produce the following audible alarms in applicable configurations:

RED LAMPS

Stop Engine-indicates critical engine fault

Air Filter Restricted-indicates excessive engine air intake restriction

Park Brake-indicates parking brake is set

Seat Belt Indicator-indicates when a seat is occupied and corresponding seat belt remains unfastened

Low Coolant-indicates engine coolant is required

AMBER LAMPS

MIL-indicates an engine emission control system fault

Check Engine-indicates engine fault

Check Trans-indicates transmission fault

High Transmission Temperature-indicates excessive transmission oil temperature

ABS-indicates anti-lock brake system fault

HEST-indicates a high exhaust system temperature

Water in Fuel-indicates presence of water in fuel filter

*DPF-indicates a restriction of the diesel particulate filter

*Regen Inhibit-indicates regeneration has been postponed due to user interaction

Range Inhibit-indicates a transmission operation is prevented and requested shift request may not occur.

*SRS-indicates a problem in the RollTek supplemental restraint system

Check Message-Turn Signal On

Check Message-Door Ajar

Check Message-Cab Ajar

*Check Message-ESC Active

*Check Message-DPF Regen Active

Check Message-No Engine Data

Check Message-No Transmission Data

Check Message-No ABS Data

Check Message-No Data All Communication With Vehicle Systems Has Been Lost

Check Message-Check Engine Oil Level

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Check Message-Check Washer Fluid Level
Check Message-Check Power Steering Fluid Level
Check Message-Low Transmission Fluid Level
Check Message-Check Coolant Level

GREEN LAMPS

Left and Right turn signal indicators

*ATC-indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system

High Idle-indicates engine high idle is active.

Cruise Control-indicates cruise control is active

OK to Pump-indicates the pump engage conditions have been met

Pump Engaged-indicates the pump is currently in use

Auxiliary Brake-indicates secondary braking device is active

BLUE LAMPS

High Beam Indicator

WHITE LAMP

Wait to Start-indicates active engine air preheat cycle

AUDIBLE ALARMS FROM GAUGE PACKAGE

High Trans Temp

High or Low Voltage

Seatbelt

Check Engine

Check Transmission

Stop Engine

Low Air Pressure

Fuel Low

Water in Fuel

*ESC

High Coolant Temperature

Low Engine Oil Pressure

Low Coolant Level

*Low DEF Level

Air Filter Restricted

Extended Left and Right Turn Remaining On

ABS System Fault

Seatbelt Indicator

EXTERNAL AUDIBLE ALARM

Air Filter

Check Engine

Stop Engine

Low Air Pressure

Low Oil Pressure

Water in Fuel

*Low DEF

ABS System Fault

Seatbelt Indicator

*Items marked with an asterisk are provided only in applicable configurations.

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LCD MESSAGES

Transmission Temperature
Battery Voltage
Engine Hours
Vehicle Speed
Engine RPMs
Fuel Level
DEF Level
Engine Oil Pressure
Ammeter (If quipped)
Auxiliary Ammeter (If quipped)
Engine Coolant Temp
Primary System Air Pressure
Secondary System Air Pressure
Turbo Boost Pressure
Exhaust Temperature
Engine Load
Engine Torque
Instant Fuel Economy
Average Fuel Economy

STANDARD GUAGES WITH METRIC SPEEDO AND OMIT OPEN DOOR WARNING.

BACKLIGHTING COLOR

The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting.

BRAKE APPLICATION PRESSURE GAUGE

Within the instrument panel, a brake application pressure gauge shall be installed which shall measure the application air pressure when the brakes are applied.

CAMERA

An Audiovox Voyager heavy duty rearview camera system shall be supplied. One (1) box shaped camera shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear of the vehicle and one (1) box shaped camera shall be mounted on the officer side of the cab above the front door. The officer side camera shall have a stainless steel brush shield mounted around the perimeter of the camera.

The cameras shall be wired to a single Weldon Vista display located on the driver's side dash. The rear camera display shall activate when the vehicle's transmission is placed in reverse. The side camera display shall activate when the respective side turn signal is activated. The camera system display can also be activated through the Vista display panel

CAB EXTERIOR PROTECTION

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

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FIRE EXTINGUISHER

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

ROAD SAFETY KIT

The cab and chassis shall include one (1) emergency road safety triangle kit.

DOOR KEYS

The cab and chassis shall include a total of six (6) door keys for the manual door locks.

DIAGNOSTIC SOFTWARE OCCUPANT PROTECTION

Diagnostic software for the Spartan Advanced Protection System shall be available for free download from the Spartan Chassis website to Spartan authorized OEMs, dealers and service centers, as well as the vehicle owner.

The software has been validated to be compatible with the following RP1210 interface adapters:

- Dearborn Group DPA4 Plus
- Noregon Systems JPRO® DLA+
- Cummins INLINE5
- Cummins INLINE6
- NexIQ™ USB-Link™

The software and adapter utilize the SAE J1939-13 heavy duty nine (9) pin connector which is located below the driver's side dash to the left of the steering column.

WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN CHASSIS, INC. LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of twenty-four (24) months, or the first 36,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the first end user.

CAB AND CHASSIS LABELING LANGUAGE

The cab and chassis shall include the applicable caution, warning, and safety notice labels with text to be written in both English and French.

CHASSIS OPERATION MANUAL

There shall be two (2) digital copies of the chassis operation manual provided with the chassis. The digital data shall include a parts list specific to the chassis model.

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ENGINE AND TRANSMISSION OPERATION MANUALS

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:

(2) Hard copies of the Engine Operation and Maintenance manual with CD

(2) Digital copies of the Transmission Operator's manual

(2) Digital copies of the Engine Owner's manual

CAB/CHASSIS AS BUILT WIRING DIAGRAMS

The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams.

SHOP NOTES

List: \$339,816.00

Discount: -15%

Net Price: \$288,844.00

F. Axle Weight: 17,131

R. Axle Weight: 8,732

CAB TO AXLE DIMENSION

Cab to axle to center of rear tandems will be 190.5".

CAB/CHASSIS PREPAYMENT

The specified cab/chassis shall be prepaid by Vancouver Fire & Rescue Services within 30 days of invoice. Vancouver Fire & Rescue Services understands that if payment is made after 30 days, additional interest charges may apply.

CHASSIS MODIFICATIONS

LUBRICATION AND TIRE DATA PLATE

A permanent label in the driving compartment shall specify the quantity and type of the following fluids used in the vehicle and tire information:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid . . (if applicable)
- Pump priming system fluid, if applicable . . (if applicable)
- Drive axle(s) lubrication fluid
- Air conditioning refrigerant . . (if applicable)
- Air conditioning lubrication oil . . (if applicable)

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- Power steering fluid
- Cab tilt mechanism fluid . . (if applicable)
- Transfer case fluid . . (if applicable)
- Equipment rack fluid (if applicable)
- CAFS air compressor system lubricant . . (if applicable)
- Generator system lubricant . . (if applicable)
- Front tire cold pressure
- Rear tire cold pressure
- Maximum tire speed ratings

VEHICLE DATA PLATE

A permanent label in the driving compartment which indicates the following:

- Filter part numbers for the;
 - Engine
 - Transmission
 - Air
 - Fuel
- Serial numbers for the;
 - Engine
 - Transmission
- Delivered Weights of the Front and Rear Axles
- Paint Brand and Code(s)
- Sales Order Number

OVERALL HEIGHT, LENGTH DATA PLATE (METRIC)

The fire apparatus manufacturer shall permanently affix a high-visibility label in a location visible to the driver while seated.

The label shall show the height of the completed fire apparatus in meters (to nearest 1/10th), the length of the completed fire apparatus in meters (to nearest 1/10th), and the GVWR in kilograms.

Wording on the label shall indicate that the information shown was current when the apparatus was manufactured and that, if the overall height changes while the vehicle is in service, the fire department must revise that dimension on the plate.

ACCIDENT PREVENTION

There shall be a placard in the cab seating area which reads, "**ALL OCCUPANTS MUST BE SEATED AND BELTED WHEN THE APPARATUS IS IN MOTION**".

PERSONNEL CAPACITY

A label that states the number of personnel the vehicle is designed to carry shall be located in an area visible to the driver.

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ACCIDENT PREVENTION

If the rear bumper is 8" deep or more, there shall be a placard on the rear face of the body, in clear sight from the ground, which reads, **"WARNING - DO NOT RIDE ON STEPS OR DECK AREAS WHILE THE APPARATUS IS IN MOTION. DEATH OR SERIOUS INJURY MAY RESULT"**.

WEARING HELMET WARNING

A label stating **"DO NOT WEAR HELMET WHILE SEATED"** shall be visible from each seating location.

FINAL STAGE MANUFACTURER VEHICLE CERTIFICATION

A final stage manufacturer vehicle certification label shall be provided and installed in the driver cab door jamb area.

FRONT BUMPER

The front bumper shall be as provided by the cab/chassis manufacturer. No other alteration or modifications are required.

BUMPER GRAVELSHIELD

The bumper extension gravel shield shall be provided by the cab/chassis manufacturer.

AIR HORN(S)

The air horn(s) shall be supplied and installed by the cab/chassis manufacturer.

FRONT WINCH

The front winch shall be supplied and installed by the cab/chassis manufacturer.

GROUND LIGHTS

There shall be three (3) OnScene 8" Access LED lights, two (2) installed below bumper, and one (1) inside winch compartment capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the vehicle in areas designed for personnel to climb onto or descend from the vehicle to the ground level.

Lighting shall be switchable but activated automatically when the vehicle park brake is set.

FRONT TOW PROVISIONS

The front tow provisions shall be supplied and installed by the cab/chassis manufacturer.

AIR INTAKE SYSTEM

An air filter shall be provided in the engine's air intake system.

Air inlet restrictions shall not exceed the engine manufacturer's recommendations.

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The air inlet shall be equipped with a means of separating water and burning embers from the air intake system.

This requirement shall be permitted to be achieved by either of the following methods:

- Provision of a device such that burning particulate matter larger than 0.039 in. (1.0 mm) in diameter cannot reach the air filter element.
- Provision of a multi screen ember separator capable of meeting the test requirements defined in the Parker Hannafin, Racor Division, publication LF 1093-90, *Ember Separation Test Procedure*, or an equivalent test.

EXHAUST DIVERTER

An exhaust diverter valve shall be located in-line of exhaust tubing and controlled from driver's position to re-route exhaust discharge. Exhaust diverter valve shall be constructed from 14 gauge stainless steel material with air actuated control.

As a default, the exhaust shall always discharge to curbside just ahead of rear wheels, and when selected the exhaust shall discharge to streetside just ahead of rear wheels.

The exhaust piping and discharge outlet shall be located or shielded so as not to expose any portion of the apparatus or equipment to excessive heating. Provide at least 1.5" of clearance between rub rail and tail pipe.

Exhaust pipe discharge shall be directed away from any operator's position.

Where parts of the exhaust system are exposed so that they are likely to cause injury to operating personnel, protective guards shall be provided.

NEDERMAN EXHAUST ANCHOR PLATE

A Nederman exhaust anchor plate shall be provided and mounted in fender area near chassis engine exhaust tail pipe for use with Nederman exhaust extraction system. Center of anchor plate to center of exhaust pipe should be 24".

COMPUTER MOUNT

A Havis Shields computer mount with power supply with locking mount shall be provided and mounted on top of cabinet on driver side in rear cab area for Vancouver Fire & Rescue Services supplied Lenovo T530 (verify make/model) computer at rear cab desk area. Power shall be battery direct. A CAT 6 cable shall also be provided for internet.

FIVE (5) POSITION ANTENNA RAIL

One (1) radio antenna rail(s) shall be provided and installed on roof of vehicle. Each rail be constructed of aluminum, forming a two piece box design. The top section shall be removable for easy access to the individual antenna wiring. Five (5) antenna bases shall be provided and installed in each rail. Each antenna base shall include enough cable to reach radio location plus a service loop of at least 10' of LMR195 flexible communications cable. The antenna wiring shall enter the vehicle roof at a single point under the end of the rail. The end of each radio antenna shall be routed to radio mounting locations, or as determined by the Vancouver Fire & Rescue Services.

Due to the various configurations of antenna whips, the contractor shall provide the antenna base only, and Vancouver Fire & Rescue Services shall provide the antenna whip.

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PAINT ANTENNA RAIL

Antenna rail shall be provided with a powder coat paint finish, white color.

SEAT BELT COLOR

Section 14.1.3.4 of the NFPA 1901 Standards, 2009 edition, requires all seat belt webbing in cab to be bright red or bright orange in color, and the buckle portion of the seat belt shall be mounted on a rigid or semi rigid stalk such that the buckle remains positioned in an accessible location.

SEAT BELT WEB LENGTH - CUSTOM CAB

Sections 14.1.3.2 and 14.1.3.3 of the NFPA 1901 standards, 2009 edition, require the effective seat belt web length for a Type 1 lap belt for pelvic restraint to be a minimum of 60", and a Type 2 pelvic and upper torso restraint-style seat belt assembly to be a minimum of 110".

The chassis seat belt web length as supplied by the custom chassis manufacturer shall be compliant to NFPA Standards 14.1.3.2 and 14.1.3.3.

SEAT BELT / VDR SYSTEM - CUSTOM CAB

The seat belt warning and vehicle data recorder systems shall be provided by the cab/chassis manufacturer.

SHOP NOTES

Available on Custom cab/chassis and only IH cab/chassis at this time. Must select an SVI installed system to meet NFPA, if available.

HELMET STORAGE, DRIVING AREA

Two (2) OnScene Solutions Talon model helmet storage bracket(s) shall be provided and installed in the cab driving area. The helmet mounting will comply with the 9G NFPA requirements.

1. Two (2) helmet bracket(s) shall be mounted overhead on the driver and officer sides of the raised roof slope of the cab.

HELMET STORAGE, CREW AREA

Three (3) OnScene Solutions Talon model helmet storage bracket(s) shall be provided and installed in the rear crew area. The helmet mounting will comply with the 9G NFPA requirements.

2. Three (3) helmet bracket(s) shall be mounted on the rear wall area adjacent to seating. Mounting shall not interfere with air bag systems, if specified. All helmet bracket locations to be approved prior or determined at pre-paint inspection.

CAB CRASH TEST CERTIFICATION

A cab crash test certification from the fire apparatus manufacturer shall be provided with the equipment. A copy of this certification shall be included with the bid.

NOTE: There shall be no exception to any portion of the cab integrity certification requirements. Nonconformance shall lead to immediate rejection of bid.

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The certification shall state that the cab does 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.

CAB MIRRORS, DRIVER ADJUSTABLE

Section 14.3.5 of the NFPA 1901 Standards, 2009 edition, requires all primary rear view mirrors used by the driver to be adjustable from the driver's position.

HUB AND NUT COVERS

Front and rear wheels shall be provided with stainless steel hub caps and wheel nut covers.

MUDFLAPS

There shall be 1/4" rubber mudflaps provided and installed behind each set of tires to prevent throwing road debris and lower road spray.

MUDFLAPS

There shall be 1/4" rubber mudflaps provided and installed at front of body directly behind the front axle tires to lower the road spray under body area.

AIR BRAKE SYSTEM QUICK BUILD-UP

The air brake quick build-up system shall be supplied from the specified automatic electric compressor in order to maintain full operating air pressure while the vehicle is not running.

The quick buildup system shall provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the 60-second buildup time.

CHASSIS AIR TANK VALVES

The cab/chassis air brake system tank drains shall be extended to Class 1 brass petcock valves with chrome plated zinc handle located on forward streetside lower body. Each air tank and valve shall be inter-piped with color coded reinforced nylon tubing. Brass compression type fittings shall be used on the nylon tubing, meeting all DOT requirements where applicable.

Each handle shall be properly labeled with colored tag to identify each tank.

ELECTRIC DOOR LOCK INTERFACE

Electric door locks shall be provided and interfaced as follows;

The electric cab door locks shall be provided by the cab/chassis manufacturer.

The body electric door locks shall be interfaced with the chassis electric door lock system.

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CAB INTERIOR CABINET - CURBSIDE REAR WALL



There shall be one (1) storage cabinet with outside hinged bi-fold door located in rear cab area. The cabinet shall be fabricated from 1/8" smooth aluminum and finished with a dark gray hammer tone powder coat paint for a hard and durable finish. The cabinet shall be approximately 23" wide x 48" high x 21" deep.

There shall be one (1) OnScene Solutions 36" Access LED light(s) mounted inside the cabinet.

- 1) Cabinet shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.
 - 2) There shall be four (4) adjustable shelf/shelves in the above cabinet(s). Each shelf shall have a 1.25" vertical lip at front to contain items while vehicle is in motion.
- There shall be one (1) 120 VAC outlet(s) located inside cabinet against the back wall.
 - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
 - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.

CAB CABINET WITH UPPER SLIDING COMMAND DESK

The rear crew area of cab directly behind engine tunnel shall be provided with a lower cabinet with hinged double bi-fold doors. A command desk with lift-up slanted surface with storage area below shall be provided on top of lower cabinet. Cabinet shall be approximately 46" wide x 28" high x 21" deep.

The lift-up slanted surface desk top shall have a stainless steel hinged top to gain access to the storage area below with an approximate 30" height from floor at front of desk. Cabinet shall be approximately 46" wide x 4" high at back and 2" high at front x 24" deep and slide-out toward rear cab seating approx. 21".

Both the cabinet and desk shall be fabricated of .125" smooth aluminum. A 1" vertical lip shall be provided at the lower edge of the writing surface to prevent items from sliding off. The cabinet shall be painted with a dark gray hammer tone powder coat paint finish for a hard and durable surface. The desk inside and outside writing surface shall be painted with a white smooth dry-erase finish.

- There shall be one (1) 100 amp Blue Sea Systems ST Series blade type fuse block with screw type terminals for both positive and negative buss with cover provided for distribution of up to six (6) 30 amp, 12 VDC circuits. Fuse block shall be located per required circuits and be protected from damage.
- Cabinet shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.
- There shall be two (2) adjustable shelf/shelves in the above cabinet(s). Each shelf shall have a 1.25" vertical lip at front to contain items while vehicle is in motion.
- There shall be one (1) 120 VAC outlet(s) located under desk against the back edge.
 - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).

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- There shall be one (1) approximate 2' long 120 VAC outlet strip(s) with straight blade household type outlets provided.
 - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.

CAB INTERIOR CABINET - STREETSIDE REAR WALL



There shall be one (1) storage cabinet with outside hinged bi-fold door located in rear cab area. The cabinet shall be fabricated from 1/8" smooth aluminum and finished with a dark gray hammer tone powder coat paint for a hard and durable finish. The cabinet shall be approximately 23" wide x 48" high x 21" deep.

There shall be one (1) OnScene Solutions 36" Access LED light(s) mounted inside the cabinet.

- Cabinet shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.
 - There shall be four (4) adjustable shelf/shelves in the above cabinet(s). Each shelf shall have a 1.25" vertical lip at front to contain items while vehicle is in motion.
- There shall be one (1) 120 VAC outlet(s) located inside cabinet against the back wall.
 - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
 - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.

Provide VFR approval drawing of rear cabinet arrangement prior to building.

INTERIOR LED LIGHTS

One (1) OnScene Solution model #70156, 10" x 10" x 7/8", 10-30 VDC, surface mount dual red and white LED light(s) with clear lens shall be provided ceiling of rear crew cab. Each light shall be individually switched with a high/low intensity setting switchable at the entry door(s). In addition light(s) will be capable of a five (5) second delay after switching off.

FUEL FILL

There shall be one (1) fuel fill door located in the streetside exterior wheel well panel, behind the rear axle. The fill door shall be fabricated from brushed stainless steel. There shall be a permanent label with the text "DIESEL FUEL ONLY" located adjacent to the fuel fill access.

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BODY DESIGN

The importance of public safety associated with emergency vehicles requires that the construction of this vehicle meet the following specifications. These specifications are written to establish the minimum level of quality and design. All Bidders shall be required to meet these minimum requirements.

It is the intent of these specifications to fully describe the requirements for a custom built emergency type vehicle. In order to extend the expected service life of this vehicle, the body module shall be removable from the chassis frame and be capable of being installed on a new chassis.

The sheet metal material requirements, including alloy and material thickness, throughout the specifications are considered to be a minimum. Since such materials are available to all Manufacturers, the material specifications shall be strictly adhered to.

The fabrication of the body shall be formed sheet metal. Formed components shall allow the Vancouver Fire & Rescue Services 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 Vancouver Fire & Rescue Services from such repair and shall NOT be used.

Following construction of the subframe, which supports the apparatus body, the sheet metal portion of the body shall be built directly on the subframe. The joining of the subframe and body shall be of a welded integral construction.

The sheet metal fabrication of the body shall be performed using inert gas continuous feed welders only. The entire body shall be welded construction. The use of pop rivets in any portion of structural construction may allow premature failure of the body structure. Therefore, pop rivets shall NOT be used in the construction of the structural portions of the body. This includes side body sheets, inner panels of compartment doors, and any other structural portions of the body.

EXTERIOR ALUMINUM BODY

The fabrication of the body shall be constructed from aluminum 3003H-14 alloy smooth plate. This shall include compartment front panel, vertical side sheets, side upper rollover panels, rear panels and compartment door frames.

The body compartment floors and exterior panels shall be constructed with not less than 3/16" (.187) aluminum 3003H-14 smooth plate. Interior compartment dividing walls shall be constructed with not less than 1/8" (.125) aluminum 3003H-14 smooth plate. Lighter gauge sheet metal will not be acceptable in these areas.

The door side frame openings shall be formed "C" channel design. An electrical wiring conduit raceway running the full length of exterior compartments shall be provided. This raceway shall contain all 12 volt wiring running to the rear of the apparatus, permitting easy accessibility to wiring.

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Individual compartment modules, with dead air space voids between compartments, shall not be an acceptable method of compartment construction.

The compartments shall be an integral part of the body construction. Compartment floors from front of body to ahead of rear axle, also from rear axle to rear of body shall be single one-piece sections. Compartment floors shall be preformed, then positioned in body and welded into final position.

Compartment floors shall have a "sweep-out" design with door opening threshold positioned lower than compartment floor, permitting easy cleaning of compartments. Angles, lips, or door moldings are not acceptable in the base of compartment door opening. One-way rubber drain valves shall be provided in compartment floors so that a water hose may be used to flush-out compartment area.

All exterior seams in sheet metal below frame, and around the rear wheel well area shall be welded and caulked to prevent moisture from entering the compartments. All other interior seams and corners shall be sealed with silicone based caulk prior to painting.

Only stainless steel bolts, nuts, sheet metal screws and/or aluminum screws shall be used in mounting exterior trim, hardware and equipment.

Exterior compartments shall have louvers in lower back wall of compartment for ventilation.

ROOF CONSTRUCTION

The roof shall be integral with the body and shall be all welded construction. The roof shall be constructed from 3/16" (.188) aluminum 3003H-14 alloy treadplate and supported with 2" x 2" x 1/4" tubing running the full width of the body. The supports shall be welded in place on approximate 16" centers.

All seams in the roof area shall be welded to the radius and supports prior to paint to prevent entry of moisture. All roof seams shall be continuously welded.

A 2" formed radius shall be provided along the body sides. The use of extrusions will not be acceptable, No Exceptions.

BODY SUBFRAME

The chassis frame rails shall be fitted with 1/4" custom extruded UHMW polyethylene rail cap to isolate the body frame members from direct contact with chassis frame rails.

The body subframe shall be constructed from 6061T6 aluminum alloy tubing. Subframe shall consist of two (2) 2" x 6" x 1/4" aluminum tubes, the same width as the chassis frame rails, NO EXCEPTION. Welded to this tubing shall be cross members of 2" x 6" x 1/4" aluminum. These cross members shall extend the full width of the body to support the compartments. Cross members shall be located at front and rear of the body, below compartment divider walls, and in front and rear of wheel well opening. Additional aluminum cross members shall be located on 16" centers, or as necessary to support walkway or heavy equipment.

To form the frame, the tubing shall be beveled and welded at each joint using 5356 aluminum alloy welding wire.

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BODY MOUNTING

The body subframe shall be fastened to the chassis frame with a minimum of six (6) spring loaded body mounts. Each mount shall be configured using a two-piece encapsulated slide bracket. The two (2) brackets shall be fabricated of heavy duty 1/4" thick steel and shall have a powder coat finish to prevent any corrosion. Each mounting assembly shall utilize two (2) 3/4" diameter x 6" long grade 8 bolts and two (2) heavy duty springs. The assembly design shall allow the body and subframe to act as one (1) component, separate from the chassis. As the chassis frame twists under driving conditions, the spring mounting system shall eliminate any stress from being transferred into the body. The spring loaded body mounts shall also prevent frame side rail or body damage caused by unevenly distributed stress and strains due to load and chassis movement.

Body mountings that do not allow relief from chassis movement will not be acceptable.

12" REAR STEP BUMPER

The full width rear bumper shall be constructed from 2" x 2" x 1/4" aluminum tubing frame and covered with 3/16" NFPA compliant aluminum tread plate. The bumper shall extend from the rear vertical body panel 12" and provide a rear step with a minimum of 1/2" space at body for water drainage.

Rear bumper shall be provided with three (3) aluminum Grip-Strut inserts for improved slip resistance, One (1) below each upper lumber compartment, and one (1) centered on rear stairway.

REAR TOW EYES

There shall be two (2) heavy duty rear mounted tow eyes securely attached to the chassis frame and mounted above the rear bumper. The tow eyes shall be fabricated from 1" thick steel plate and shall have a black powder coat finish.

TRAILER HITCH

A Class III, 7,500 lbs. weight carrying capacity (gross trailer weight) rear hitch receiver shall be provided below the rear bumper. The receiver shall be attached to the apparatus body frame.

The hitch shall be complete with a 2" square receiver. Without the use of a "weight distribution" ball hitch the Class III receiver shall have a capacity of 5,000 lbs. gross trailer weight and a maximum tongue weight of 500 lbs.

A label shall be provided in a location in which it is visible to an operator making trailer connections. The label shall state the maximum GVWR and tongue weight of the trailer that can be safely towed with the hitch system.

Two (2) safety chain attachment points shall be provided near the hitch point for hitches designed to use safety chains, each designed with an ultimate strength of not less than the maximum GVWR specified on label.

TRAILER ELECTRICAL RECEPTACLE

For hydraulic brake equipped or electric brake equipped trailer towing capability, a primary electrical receptacle shall be provided near the hitch point and shall match the umbilical cable specified. Receptacle shall be a 7-Way Blade Type socket, the same as used on most Light Duty Trucks and RV's.

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TRAILER AUXILIARY ELECTRICAL RECEPTACLE

An auxiliary electrical receptacle shall be provided near the hitch point and shall match the umbilical cable specified for optical warning lights. Receptacle shall be a 7-Way Pin Type Socket, ISO3731 compliant with a reverse ground terminal.

GROUND LIGHTS

There shall be two (2) OnScene 8" Access LED lights installed below bumper capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the vehicle in areas designed for personnel to climb onto or descend from the vehicle to the ground level.

Lighting shall be switchable but activated automatically when the vehicle park brake is set.

WHEEL WELL EXTERIOR PANEL

The exterior panel of the body wheel well enclosure shall be constructed from 3/16" smooth aluminum panels.

STAINLESS STEEL BODY FENDERS

The body wheel well openings shall be provided with round radius, polished stainless steel fenderettes. The fenderettes shall be bolted and easily replaceable if damaged. The fenderettes shall be installed using nylon washers to space them slightly away from the body to reduce buildup of moisture and/or debris.

WHEEL WELL LINERS

The wheel wells shall be provided with an easily removable polymer, circular inner fender liner. The inner liner shall be bolted to the wheel well with stainless steel bolts and spaced away from the wheel well so the liner will not accumulate dirt or water.

SCBA CYLINDER COMPARTMENTS

There shall be seven (7) SCBA cylinder storage compartments located, four (4) on curbside, and three (3) on streetside of rear tandem wheel well area. Each compartment shall have a brushed stainless door assembly with a positive catch latch. Each compartment shall have a 8" diameter tube behind the wheel well panel, attached to the door assembly. Each compartment shall allow the storage of an SCBA cylinder or a fire extinguisher up to 7-3/4" in diameter and 22" deep. The door shall activate the "Hazard Warning Light" in the cab when not in the closed position.

BODY PAINT SPECIFICATIONS

BODY PAINT PREPARATION

After the body and components have been fabricated they shall be disassembled so when vehicle is complete there shall be finish paint beneath the removable components. The body shall be removed from chassis during the paint process to insure proper paint coverage. The body and components shall be metal finished as follows to provide a superior substrate for painting.

The exterior (and interior, if painted) body shall undergo a thorough cleaning process starting with a biodegradable phosphoric acid solution to begin the etching process followed by a complete clear water rinse.

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The next step shall consist of a chemical conversion coating applied to seal the metal substrate and become part of the metal surface for greater film adhesion.

All bright metal fittings, if unavailable in stainless steel or polished aluminum, shall be chrome plated. Iron fittings shall be copper under plated prior to chrome plating.

PAINT PROCESS

The paint process shall follow the strict standards set forth by PPG Industries guidelines. Painters applying PPG products will be PPG Certified Commercial Technicians, and re-certified every two (2) years. The body shall go through the following paint process;

- Clean bare metal with a wax and grease remover using low lint rags.
- Inspect, straighten, and hammer high points, grind all seams, sharp edges, and welds. DA sand entire paintable surfaces using 24-180 grit dry paper. Plastic fill all low spots and DA sand fill areas using 36-180 grit dry paper. Apply pinhole filler and DA sand areas using 80-180 grit dry paper.
- 1) Re-clean bare metal using a wax and grease remover and low lint rags.
- 2) Within 24 hours, a PPG Delfleet® epoxy color primer with proper hardener for corrosion resistance using a pressure pot spray gun and applying 2-5 full wet coats or 1.5-8.0 dry mils max. achieving full hiding and allow to air dry 60 minutes @ 70°F or bake for 45 minutes @ 140°F degree.
- 3) Inspect, putty fill, and dry guild coat entire body surface and DA sand using 180-400 grit dry paper.
- 4) Re-clean bare metal using a wax and grease remover using low lint rags.
- 5) A PPG Delfleet® primer sealer with proper hardener and thinner shall be sprayed using a pressure pot spray gun and applying 1 full wet coat or 1.0-2.0 dry mils achieving full hiding and allow to flash off in spray booth for minimum of 60 minutes @ 70°F.
- 6) A PPG Delfleet® FBCH basecoat (color) with proper hardener and dry additive shall then be sprayed using a pressure pot set @ 45-60 PSI and achieving full hiding or 1.5-2.0 wet mils and allow to flash off in spray booth 45-60 minutes before applying clearcoat.
- 7) A PPG Delfleet® clearcoat with proper hardener and thinner shall be sprayed using a pressure pot spray gun and applying 2-3 full wet coats or 5.0 wet mils for a uniform gloss and allow to flash off in spray booth 10 minutes and bake for 120-140 minutes @ 125°F (surface temp.).
- 8) After cooling, DA sand heavy orange peel or runs using 1000 grit dry sand paper and final DA sand using 1500-2000 grit dry sand paper. Wipe off all surfaces to remove dust and debris. Buff unit as needed using 3M rubbing compound and a white wool pad and inspect until all sand scratches are removed.
- 9) Polish as needed using 3M Perfect-It-Polish and a black foam pad, repeat as necessary and inspect until all sand scratches are removed.

PAINT - ENVIRONMENTAL IMPACT

The contractor shall meet or exceed all current State (his) regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. PPG Delfleet® Evolution paint shall be free of all heavy metal (lead & chromate) components. Paint emissions from sanding and painting shall be filtered and collected. All paint wastes shall be disposed of in an environmentally safe manner. Solvents used in cleanup operations shall be collected, sent off-site for distillation and returned for reuse.

PAINT FINISH - SINGLE COLOR

The body shall be painted with a single color of PPG Delfleet® Evolution per Vancouver Fire & Rescue Services approved paint spray out provided.

A small touch-up bottle of paint shall be provided with completed vehicle.

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FASTENERS

Prior to the assembly and reinstallation of exterior components; i.e. warning and DOT lights, handrails, steps, door hardware, and miscellaneous items, a mylar isolation tape, or gasket shall be used to prevent damage to the finish painted surface. These components shall be fastened to body using either a plastic insert into body metal with stainless steel screws or zinc coated nutserts into body surface using stainless steel bolts to prevent corrosion from dissimilar metals.

ELECTROLYSIS CORROSION CONTROL

The vehicle shall be assembled using ECK brand or similar corrosion control compound on all high corrosion potential areas.

ECK protects aluminum and stainless steel against electrolytic reaction, isolates dissimilar metals and gives bedding protection for hardware and fasteners. ECK contains anti-seizing lubricant for threads. ECK is dielectric and perfect for use with electrical connectors.

10) Paint Color: Match cab/chassis supplied paint color.

BODY UNDERCOATING

The entire underside of body shall be sprayed with black automotive undercoating. Undercoating shall cover all areas underside of body and wheel well area to help prevent corrosion under the vehicle.

UNDERCOAT WARRANTY

The body undercoating shall have a warranty provided by the manufacturer for the lifetime of the vehicle or twenty (20) years, whichever occurs first. The warranty shall be transferable between vehicle owners. Should the undercoating material applied to the underside of the body and wheel wells of the vehicle ever flake off, peel, chip or crack due to drying out, the damaged area shall be re-sprayed without charge to the vehicle owner.

PAINT WARRANTY

The vehicle shall be provided with a ten (10) year non-prorated warranty to the original owner. Warranty is provided by PPG Inc. A warranty sheet with all conditions and maintenance procedures shall be provided with the delivered vehicle. **Pro-rated warranties will not be acceptable.**

COMPARTMENT INTERIOR FINISH

The compartment interior paintable surfaces shall be prepared and DA sanded using 80-120 grit dry paper and cleaned with a wax and grease remover. A PPG Delfleet® primer topcoat of either a solids epoxy primer or an etch primer shall be applied.

A PPG Delfleet® color primer with proper hardener and thinner mix shall then be sprayed using a pressure pot spray gun and applying 2 wet coats achieving full hiding on entire compartment surface and allow to air dry for 30 minutes @ 70°F before applying texture coat.

A PPG Delfleet® F3985 White/F3986 Gray top coat/texture coat with proper hardener and dry additive shall then be sprayed using a pressure pot and reducing the atomizing air pressure and turn fan pattern all the way in on the

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gun. Apply the first color texture coat as needed and allow to air dry @ 70°F over night before assembly and 7 days before putting into full service.

ROOF COMPARTMENT INTERIOR FINISH

The roof compartment interior paintable surfaces shall be prepared and DA sanded using 80-120 grit dry paper and cleaned with a wax and grease remover. A PPG Delfleet® primer topcoat of a either a solids epoxy primer or an etch primer shall be applied.

A PPG Delfleet® color primer with proper hardener and thinner mix shall then be sprayed using a pressure pot spray gun and applying 2 wet coats achieving full hiding on entire compartment surface and allow to air dry for 30 minutes @ 70°F before applying texture coat.

A PPG Delfleet® F3985 White/F3986 Gray top coat/texture coat with proper hardener and dry additive shall then be sprayed using a pressure pot and reducing the atomizing air pressure and turn fan pattern all the way in on the gun. Apply the first color texture coat as needed and allow to air dry @ 70°F over night before assembly and 7 days before putting into full service.

REFLECTIVE STRIPE REQUIREMENTS

Material

All retroreflective materials shall conform to the requirements of ASTM D 4956, *Standard Specification for Retroreflective Sheeting for Traffic Control*, Section 6.1.1 for Type I Sheeting.

All retroreflective materials used that are colors not listed in ASTM D 4956, Section 6.1.1, shall have a minimum coefficient of retroreflection of 10 with observation angle of 0.2 degrees and entrance angle of -4 degrees.

Any printed or processed retroreflective film construction used shall conform to the standards required of an integral colored film as specified in ASTM D 4956, Section 6.1.1.

Minimum Requirements

A retroreflective stripe(s) shall be affixed to at least 50 percent of the cab and body length on each side, excluding the pump panel areas, and at least 25 percent of the width of the front of the apparatus.

The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.

The 4 in. (100 mm) wide stripe or combination of stripes shall be permitted to be interrupted by objects (i.e., receptacles, cracks between slats in roll up doors) provided the full stripe is seen as conspicuous when approaching the apparatus.

GRAPHICS PROOF

A color graphics proof of the reflective striping layout shall be provided for approval by Vancouver Fire & Rescue Services prior to installation. The graphics proof shall be submitted to Vancouver Fire & Rescue Services on 8.5" x 11" sheets with front, sides, rear and plan views, each on one (1) sheet. In addition if there is any special art work an additional sheet shall be provided showing all details.

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REFLECTIVE STRIPE - CAB SIDE

The reflective stripe material shall be 6" wide, 3M Scotchcal 680 series.

11) This reflective stripe shall be white in color.

There shall be a 1" Scotchcal reflective stripe located 1" above and a second 1" Scotchcal reflective stripe located 1" below the main stripe.

12) This reflective stripe shall be blue in color.

REFLECTIVE STRIPE - CAB FRONT

The reflective stripe material shall be 6" wide, 3M Scotchcal 680 series.

- This reflective stripe shall be white in color.

CHEVRON STRIPE - CAB BUMPER

A reflective stripe shall be affixed to the front of cab. The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.

The approximate 10" wide Chevron retroreflective stripe shall be affixed to at least 25 percent of the width of the front of the apparatus with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees. Each stripe shall be 6" width. Chevron panels shall have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use. Chevron panels shall have a minimum 10 year warranty for material failure, and colorfastness.

- The stripe material shall be 3M Scotchlite Diamond Grade.

All retroreflective materials required shall conform to the requirements of ASTM D 4956, *Standard Specification for Retroreflective Sheeting for Traffic Control*, Section 6.1.1 for Type I Sheeting.

This reflective chevron stripe shall alternate red and fluorescent yellow-green in color.

REFLECTIVE STRIPE - BODY SIDES

The reflective stripe material shall be 6" wide, 3M Scotchcal 680 series.

- This reflective stripe shall be blue in color.

There shall be a 1" Scotchcal reflective stripe located 1" above and a second 1" Scotchcal reflective stripe located 1" below the main stripe.

- This reflective stripe shall be blue in color.

The stripe shall extend straight from front of cab, then ahead of the rear wheels, it shall form a "Z" shape and extend straight back to the rear of the body.

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MURAL - CANADIAN FLAG

A mural of the Canadian flag shall be provided on each side of the upper body, full length and from drip rail above top of compartment doors to bottom of roof radius. Flag shall be printed in full color on white 3M Scotchcal 680CR retroreflective material.

Mural shall have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use, and shall have a minimum 7 year warranty for material failure, and colorfastness.

CHEVRON REFLECTIVE STRIPE - REAR SIDES PANELS

At least 50 percent of the rear-facing vertical surfaces, visible from the rear of the apparatus, excluding any pump panel areas not covered by a door, shall be equipped with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees. Each stripe shall be 6" width.

The rear side panels of the body on each side of a rear stairway or compartment shall have a chevron style reflective stripe, extending from bumper height up to full body height. Each chevron panel shall be a full sheet and shall have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use. Chevron panel shall have a minimum 10 year warranty for material failure, and colorfastness.

The stripe material shall be 3M Diamond Grade.

This reflective chevron stripe shall alternate red and fluorescent yellow-green in color.

LETTERING

GRAPHICS PROOF

A color graphics proof of the lettering layout shall be provided for approval by Vancouver Fire & Rescue Services prior to installation. The graphics proof shall be submitted to Vancouver Fire & Rescue Services on 8.5" x 11" sheets with front, sides, rear and plan views, each on one (1) sheet. In addition if there is any special art work an additional sheet shall be provided showing all details.

The following lettering shall be provided and installed on the completed unit as follows;

SIDE CAB DOOR LETTERING

UPPER BODY SIDE LETTERING

There shall be fifty (50) 10" high reflective letters furnished and installed on upper body sides.

"VANCOUVER FIRE & RESCUE"

- This reflective lettering shall be black in color with white outline.

There shall be fifty (50) 8" high reflective letters furnished and installed on the vehicle.

"TECHNICAL RESCUE OPERATIONS"

- This reflective lettering shall be gold in color with black outline.

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REAR BODY LETTERING

There shall be seventeen (17) 4" high reflective letters furnished and installed on the vehicle.

"KEEP"
"150"

"BACK"
"METERS"

- This reflective lettering shall be white in color with black outline.

FRONT OF CAB LETTERING

There shall be twenty five (25) 8" high reflective letters furnished and installed on cab raised roof section.

"TECHNICAL RESCUE OPERATIONS"

- This reflective lettering shall be gold in color with black outline.

CAB ROOF LETTERING

There shall be twenty two (22) 22" high reflective letters furnished and installed on the vehicle.

"TECHNICAL"
"RESCUE SUPPORT"

- This reflective lettering shall be black in color.

CUSTOM DECAL LOGO - 12" -18"

One (1) custom designed 12" - 18" Scotchcal type retroreflective logo matching current Vancouver Fire & Rescue Services shall be provided and located on the completed vehicle. The exact design and/or artwork shall be provided by the Vancouver Fire & Rescue Services prior to construction.

One (1) copy of the above custom logo shall be provided and located on the completed vehicle as directed by Vancouver Fire & Rescue Services.

EXTERIOR COMPARTMENT DOORS

ROLL-UP DOOR CONSTRUCTION - ROBINSON (ROM)

The apparatus shall be equipped with Robinson ROM Series IV (if available) roll-up exterior compartment doors. Robinson roll-up doors shall be complete with the following features;

- Doors shall be front roll with drum positioned at upper front portion of compartment to afford maximum clearances and head room for mounting equipment to ceiling of compartment
- There shall be a non-abrasive side brush seals
- Every slat must have interlocking end shoes to prevent slat from moving side-to-side and binding the door
- Between each slat must be a co-extruded PVC inner seal to prevent metal-to-metal contact and to repel moisture. This inner seal is not visible to detract from appearance of door
- Slat are to have interlocking joints with a folding locking flange to provide security and prevent penetration by sharp objects

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- Slats to be double-wall extrusion 1.366" high by .315" thick. Exterior surface to be flat and interior surface to be concave to prevent loose equipment from interfering with door operation
- Latch system to be a full width one piece lift bar operable by one hand
- A 2" wide finger pull integrated into bottom rail extrusion for easy one hand opening and closing
- Clip system that connects the curtain slats to the operator drum which allows for easy tension adjustment without tools
- Each roll-up door shall have a 4" diameter counterbalance operator drum to assist in lifting the door.
- Track shall be one-piece aluminum that has an attaching flange and finishing flange incorporated into its design
- Drip rail will have specially designed seal that prevents the seal from scratching the door
- Bottom rail extrusion must have smooth back to prevent loose equipment from jamming the door
- Bottom rail to have "V" shaped double seal to prevent water and debris from entering the compartment
- Standard replacement parts to be shipped from the United States and available in as little as 48 hours
- Will be free from manufacturing defects for a period of up to 7 years from date of purchase provided that the Product is used under conditions of normal use, that regular periodic maintenance and service is performed and that the product was installed in accordance with R•O•M's instructions.

Each roll-up door framework shall decrease the compartment door opening by approximately 2.25" and 4.5" in height for standard bottom rail and 6.0" in height for tall bottom rail option.

ROM DOOR BOTTOM RAIL


All exterior compartment doors shall have the standard 3.0" tall bottom rail extrusion for easy one (1) hand opening and closing.

The specified retroreflective stripe material shall be applied on the roll-up compartment doors. The stripe shall be precision machine cut for each door slat of the roll-up doors. Under no circumstance will the stripe material be cut on roll-up door surface.

BODY HEIGHT MEASUREMENTS

The vertical body dimensions shall be as follows:

AHEAD OF REAR AXLE

	<u>Description</u>	<u>Dimension</u>
A	Bottom of Subframe to Top of Body	93.7"
B	Bottom of Subframe to Bottom of Body	22.5"
C	Total Body Height	116.2"
D	Compartment Height Above Frame	54.0"
E	Compartment Height Below Frame	25.0" 
F	Vertical Door Opening: -with roll-up door	67.0"

ABOVE REAR AXLE

	<u>Description</u>	<u>Dimension</u>
G	Vertical Door Opening - Above Rear Wheel -with roll-up door	34.0"

BEHIND REAR AXLE

	<u>Description</u>	<u>Dimension</u>
H	Bottom of Subframe to Bottom of Body	20.0"

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I	Compartment Height Above Frame	54.0"
J	Compartment Height Below Frame	22.5"
K	Vertical Door Opening: -with roll-up door	64.5"

GENERAL

	<u>Description</u>	<u>Dimension</u>
L	Top of Body to Bottom of Drip Rail	36.7"

(Dimensions are approximate and subject to change during the actual design process.)

SEVEN (7) UPPER BODY COMPARTMENTS (OPEN)

The forward transverse compartment shall be 90.0" long x 36.0" wide x 30.0" deep. There shall be six (6) compartments parallel to the sides of the body, three (3) on each side. Each of these compartments shall be 80.0" long x 28.0" wide x 30.0" deep. The side compartments shall be open under each door sill to allow for long equipment. Each compartment shall be integral with the body construction, and will not be bolted or add-on modules. The outside walls of each compartment will be double walled to prevent equipment from denting the outside painted surface.

Each compartment shall have a lift-up type compartment door hinged on the outboard side. Each door shall be fabricated from 3/16" aluminum tread plate. Each door shall have two (2) pneumatic type cylinders, one (1) at each end, attached to cast aluminum brackets mounted to the interior surface of the door to hold the door in both the opened and closed positions. Each door shall be mounted using multiple 16" long, equally spaced, 14 gauge stainless steel hinges, with 1/4" stainless steel pin. A polyester barrier film gasket shall be placed between stainless steel hinge and the body mounting surface as necessary to prevent corrosion caused by dissimilar metals.

Each compartment door shall overlap a 2" vertical lip on the body roof to prevent entry of moisture and sealed with automotive type rubber molding to provide a weather resistant seal.

Each roof compartment door shall have a chrome 7" handle bolted to center of each door.

Each compartment shall have a 13/16" drain hole located in floor of compartment with a 1" flexible drain tube that terminates below body.

Each compartment shall have a horizontally mounted OnScene Solutions LED light on the underside of the door. The light and NFPA door ajar system shall be automatically activated by an individual switch per compartment.

TRANSVERSE ROOF COMPARTMENT - SHELF TRAC

There front transverse roof compartments shall be provided with four rows of horizontally mounted aluminum shelf trac welded to the walls for vertical partition installation and adjustability.

ROOF COMPARTMENT - VERTICAL PARTITION

There shall be two (2) vertical partition(s) provided in the roof compartment(s). The partitions shall be designed for holding equipment in place during travel. Each partition shall be fabricated from 3/16" smooth aluminum and bolted to specified Shelf Trac for ease of adjustment.

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SIDE ROOF COMPARTMENT - SHELF TRAC

There shall be four rows of horizontally mounted aluminum shelf track welded to the walls of the side upper body compartments for vertical partition installation and adjustability.

ROOF COMPARTMENT - VERTICAL PARTITION

There shall be ten (10) vertical partition(s) provided in the roof compartment(s). The partitions shall be designed for holding equipment in place during travel. Each partition shall be fabricated from 3/16" smooth aluminum and bolted to specified Shelf Trac for ease of adjustment.

UPPER BODY WALKWAY

A 34" wide, upper body walkway shall be provided at the center of body and recessed into the roof structure. The walkway shall be fabricated from NFPA compliant 3/16" aluminum tread plate with continuously welded cross seams to prevent moisture penetration into apparatus body, No Exceptions. The walkway shall be supported with 2" x 2" tubing on 14" - 22" centers.

13/16" drains shall be installed at front of walkway connected to 1" flexible drain tubes that will terminate below the body.

WALKWAY/STEP LIGHTS

There shall be four (4) OnScene Solutions Rough-Service 9" LED lights provided to illuminate the walkway or step area. The lights shall be activated when the parking brake is set.

Each light shall be mounted in an extruded aluminum housing to protect against damage from personnel or equipment.

Lighting shall provide illumination at a minimum level of 2 fc (20 lx) on all work surfaces, steps, and walkways. Lighting shall be switchable but activated automatically when the vehicle park brake is set.

ROOF ACCESS STAIRWAY

The rear of the body shall be provided with a minimum 34" wide roof access stairway recessed into the side rear compartments. Stairs treads shall be 9 1/2" minimum depth and formed from 3/16" NFPA compliant aluminum tread plate with uniformed riser height design. Stair treads will be continuously welded into side walls. Bolt-in tread design will not be acceptable.

Roll-out ladder design requiring set-up time and 8 plus feet behind apparatus or vertical ladders that do not allow firefighter to safely ascend or descend with equipment will not be acceptable.

STAIRWAY HANDRAILS

There shall be two (2) handrails provided, one (1) on each side wall of recessed center stairway providing three-points of contact at all times for safer access to roof compartments. The handrails shall be angled for optimum use during ingress or egress of the upper walkway area.

Handrails shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions.

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WALKWAY/STEP LIGHTS

There shall be two (2) OnScene Solutions Rough-Service 9" LED lights provided to illuminate the walkway or step area. The lights shall be activated when the parking brake is set.

Each light shall be mounted in an extruded aluminum housing to protect against damage from personnel or equipment.

Lighting shall provide illumination at a minimum level of 2 fc (20 lx) on all work surfaces, steps, and walkways. Lighting shall be switchable but activated automatically when the vehicle park brake is set.

STEP COMPARTMENT(S) - LOWER

There shall be two (2) compartment(s) located in the roof access stairway area below frame level. Each compartment shall have a horizontally hinged brushed stainless steel door with a D-ring handle. Each compartment shall be manufactured to prevent road debris, dirt and moisture from entering the enclosure. Each compartment(s) shall be 33" wide x 12" high x maximum depth based on chassis mounted components and requirements for structural integrity of the body.

Each compartment shall have an OnScene LED light that shall automatically activate when the door is opened and wired to the NFPA required hazard warning light provided in the cab.

- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latch shall be a single point latch flush mounted to exterior door panel.

STEP COMPARTMENT(S) - INTERMEDIATE

There shall be one (1) compartment(s) located in the roof access stairway area above frame level. Each compartment shall have a horizontally hinged brushed stainless steel door with a D-ring handle. Each compartment shall be manufactured to prevent road debris, dirt and moisture from entering the enclosure. The compartment(s) shall be 33" wide x 12" high x depth up to the front wall of the rear transverse compartment.

Each compartment shall have an OnScene LED light that shall automatically activate when the door is opened and wired to the NFPA required hazard warning light provided in the cab.

- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latch shall be a single point latch flush mounted to exterior door panel.

STEP COMPARTMENT - UPPER

There shall be one (1) upper compartment located directly below walkway area. The compartment shall have a horizontally hinged brushed stainless steel door with a D-ring handle. The compartment shall be manufactured to prevent road debris, dirt and moisture from entering the enclosure. The compartment shall be approximately 26" wide x 8" high x maximum depth available

Each Compartment shall have an OnScene LED light that shall be automatically activated when the door is opened and wired to the NFPA required hazard warning light provided in the cab.

Devices to secure equipment, compartment dividers, or UHMW plastic angles, or sheeting will be used for storage of specified equipment as required to prevent damage to equipment.

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- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latch shall be a single point latch flush mounted to exterior door panel.

FOLD-DOWN STEP

There shall be one (1) fold-down step located at the bottom of the roof access stairway mounted on top of bumper to reduce the distance from the ground to the first step. The step surface shall be NFPA compliant aluminum treadplate and shall manually fold up into the stairway with an over-center gas shock to hold step in position during travel. The step shall activate the "Hazard Warning Light" in the cab when not in the stowed position.

REAR BODY HANDRAILS

There shall be two (2) 24" vertical handrails on the rear of the body. Handrails shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions.

BODY WIDTH DIMENSIONS

The body shall be 100.0" wide, not including drip rail or non-permanent fixtures. Interior compartment depth dimensions shall be approximately:

<u>Area Description</u>	<u>Dimension</u>
Transverse Area above Subframe	95.0"

Compartment Depth below Subframe 24.5"

STREETSIDE COMPARTMENT - FRONT (S1)

The interior useable compartment width shall be approximately 64.0" wide.

The compartment door opening shall be approximately 57.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The roll-up doors shall be equipped with an electric power lock system. All doors shall be locked or unlocked with activation from a single switch located in the cab.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

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COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) OnScene Solutions 83 series aluminum tray base with 70% extension, and rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 94" deep and as wide as the compartment layout or door opening permits, capable of extending out either side of the body located above the level of the chassis frame rails. Each slide base shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed, 40% extended and 70% extended positions. Each tray top shall be fabricated from 3/16" 3003 aluminum sheet shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
 - Two (2) vertical partition(s) shall be provided on slide-out tray base dividing the tray into left and right sides. Each vertical partition shall be horizontally adjustable; mounted on aluminum Shelf Trac on tray floor. The vertical partition(s) shall be 3/16" (.188) 3003H-14 alloy smooth aluminum sheet.
- There shall be one (1) transverse module fabricated from 3/16" (.188) 3003H-14 aluminum alloy smooth sheet. The module will be designed for the following long tools and equipment:
 - Three (3) Vancouver Fire & Rescue Services supplied pike pole(s). See equipment list for make/model.
 - Two (2) Vancouver Fire & Rescue Services supplied stokes basket(s). See equipment list for make/model.
 - Two (2) Vancouver Fire & Rescue Services supplied backboard(s). See equipment list for make/model.
- There shall be three (3) OnScene Solutions velcro cargo straps provided to secure the stored equipment.
- The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.
- Two (2) OnScene 64" Access LED compartment lights, vertically mounted.
- One (1) OnScene 36" Access LED compartment light, horizontally mounted 24" from door opening at the top of the compartment.
- The controls for the specified light tower(s).
- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.
- The 12 volt electrical distribution panel shall be located in the front lower compartment.

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STREETSIDE COMPARTMENT - AHEAD OF REAR WHEELS (S2)

The interior useable compartment width shall be approximately 64.0" wide.

The compartment door opening shall be approximately 57.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The roll-up doors shall be equipped with an electric power lock system. All doors shall be locked or unlocked with activation from a single switch located in the cab.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT




- There shall be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) OnScene Solutions 81 series aluminum tray base with 100% extension, and rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 24" deep and as wide as the compartment layout or door opening permits located below the level of the chassis frame rails. Each slide base shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and shall have welded corners to form a box type tray surface with an internal depth of approximately 3 1/2". Specified Stanley GT23B02 hydraulic power unit will be located on left side of tray leaving right side open.
- There shall be one (1) overhead electric winch with a 500 lb. capacity. The winch shall be mounted to an OnScene Solutions 46" deep slide-out mechanism with locking latch assembly. The winch shall be used only for loading and unloading heavy equipment from the specified trays and/or ground only.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY

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(non-extended floor).

- Two (2) OnScene 64" Access LED compartment lights, vertically mounted.
 - One (1) OnScene 36" Access LED compartment light, horizontally mounted 24" from door opening at the top of the compartment.
 - The specified portable winch shall be mounted on lower tray using a heavy duty "U" shaped channel. Winch receiver tube and mounting pin shall be utilized to hold in place during travel.
 - A permanent shelf shall be provided above winch storage for VFRS supplied wheel chock storage.
 - A Bauer model BP-13H-E3 air compressor with a recharging rate of 13.0 SCFM @ 6,000 PSI shall be provided, . Compressor skid shall include 13 HP, 3-phase soft start electric motor, P5 Securus purification system, electronic CO monitor with calibration kit, and fill station inter-connecting harness. Compressor module shall be approximately 53.5" L x 33.5" W x 37.5" H and weigh 700 pounds.
- 
- An Appleton inlet and base shall be provided in compartment near compressor. The compressor shall have a 2/00 AWG SO cord with a matching Appleton plug for operating compressor from the on-board generator system. Another matching Appleton plug shall be provided with completed vehicle for operating the compressor from an in-house electrical system. All required building wiring shall be responsibility of Vancouver Fire & Rescue Services.
 - Air storage consisting of two (2) ASME 491 SCF @ 6,000 PSI, (does not require hydrostatic testing) air storage cylinders with gauges and valves. Each cylinder shall be 9.6" dia. x 55" long and weigh 400 lbs.
 - There will be a welded reinforcement above the body frame to carry specified DOT or ASME cylinders. The mounting of the cylinders will be with adjustable track and powder coated steel band straps to securely hold all cylinders in place.
 - The Bauer compressor shall be free from defects in material and workmanship for a period of two (2) years. The foregoing warranty period shall be extended to five (5) years from the date of shipment from Bauer for Customers that are Municipal Fire Departments with respect to the compressor block (breathing air application), provided that such extended warranty period shall only apply to product parts with proof of proper maintenance being completed in accordance with published Bauer factory recommendations. To be eligible for this limited warranty to cover Customer's product, Customer must return a properly completed start-up/warranty registration form to Bauer within ninety (90) days from the date of start-up.
 - Training and instruction shall be provided by compressor manufacturer at Vancouver Fire & Rescue Services location on proper use of complete air compressor system.
 - The NFPA required air quality test shall be completed by manufacturer prior to delivery. Complete results of test shall be provided to Vancouver Fire & Rescue Services upon delivery.
 - One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.
 - Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

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STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S3)

The interior useable compartment width shall be approximately 56.0" wide.

The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The roll-up doors shall be equipped with an electric power lock system. All doors shall be locked or unlocked with activation from a single switch located in the cab.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be a transverse plywood storage module for full 4' x 8' sheets of plywood without altering the size. The module shall be fabricated from 3/16" (.188) 3003H-14 aluminum alloy sheet and shall have hinged retainer doors at each end to hold plywood in place. Storage module shall hold the following sheets of plywood;
 - Eight (8) Vancouver Fire & Rescue Services supplied sheets of 4' x 8' x 3/4" sheets of plywood.
- There shall be one (1) air bag storage module(s). The module shall be fabricated from 1/8" (.125) 3003H-14 aluminum alloy sheet. Circular notches shall be provided along the front edge to ease the access to the air bags. Each bay shall be sized to hold the air bags as follows;
 - Two (2) HLB12, 16" x 16"
 - Two (2) HLB20, 20" x 20"
 - Two (2) HLB24, 39.4" x 12.2"
 - Two (2) HLB40, 28" x 28"
 - One (1) Control DCS 10U
 - One (1) Lift Bag Hose, Yellow 83FR-6

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- There shall be four (4) OnScene Solutions velcro cargo straps provided to secure the stored equipment.
- One (1) Hannay EF1520-17-18 low pressure air hose reel(s) shall be provided in this compartment. Reel shall be designed to hold 110% of the capacity needed.
 - Power rewind control(s) shall be in a position where the operator can observe the rewinding operation and shall be marked with a label indicating its function and shall be guarded to prevent accidental operation.
 - A label shall be provided in a visible location adjacent to reel with following information: (1) Utility air or breathing air, (2) Operating pressure, (3) Total hose length, (4) Hose size (ID).
 - The hose reel shall equipped with 200' of 3/8" Parker Series 7092 GST II low pressure air hose rated for 300 PSI maximum pressure. A molded plastic ball clamp shall be provided on the hose to stop it at the 4-way roller. The hose shall be Red in color.
 - The air supply shall be from the mobile breathing air system.
 - A reel shut-off valve, pressure regulator, and 0-150 psi gauge shall be provided on an aluminum control panel in Compt. S2, not exceeding 72" from ground.
- The fairlead roller shall be mounted directly to the reel.
- Two (2) OnScene 36" Access LED compartment lights, vertically mounted.



STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S4)

The interior useable compartment width shall be approximately 56.0" wide.

The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The roll-up doors shall be equipped with an electric power lock system. All doors shall be locked or unlocked with activation from a single switch located in the cab.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.

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- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) OnScene Solutions 81 series aluminum tray base with 100% extension, and rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 46" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails. Each slide base shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
- There shall be one (1) OnScene Solutions 81 series aluminum tray base with 100% extension, and rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 46" deep and as wide as the compartment layout or door opening permits located above the body subframe and shall be vertically adjustable in height. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
- There shall be one (1) OnScene Solutions 84 series aluminum tray base with 90% extension, and rating of 150 lbs. Slide-out tray(s) base shall be approximately 46" deep and as wide as the compartment layout or door opening permits. It shall be located above the level of the chassis frame rails and shall be vertically adjustable in height. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will hold the tray in the closed position. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
- Two (2) OnScene 36" Access LED compartment lights, vertically mounted.
- One (1) OnScene 36" Access LED compartment light, horizontally mounted 24" from door opening at the top of the compartment.

STREETSIDE COMPARTMENT - REAR (S5)

The interior useable compartment space shall be approximately 70.0" wide.

The compartment door opening shall be approximately 63.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.

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- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The roll-up doors shall be equipped with an electric power lock system. All doors shall be locked or unlocked with activation from a single switch located in the cab.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep located on left side of vertical partition. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep located on left side of vertical partition. Each tray shall be vertically adjustable. Each tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 30" deep located on left side of vertical partition. Each tray shall be vertically adjustable. Each tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions. Specified Honda EG6500 generator will be located on this tray.
- There shall be two (2) slide-out smooth aluminum vertical tool board(s) approximately 24" deep located on right side of vertical partition. Each tool board(s) vertical exterior edge shall have a double 90 degree formed edge to provide an easy grip handle. The top and bottom of tool board(s) shall be provided with Accuride 9300 series slide tracks. Each board shall be rated for a maximum 200 lbs. evenly distributed load. Each tool board shall utilize a pneumatic cylinder to hold the tool board in both the opened and closed positions.
 - The vertical tool board material shall be 3/16" (.188) 3003H-14 aluminum alloy sheet.
 - Each tool board shall be horizontally adjustable; mounted on aluminum shelf trac on compartment floor.

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- There shall be one (1) overhead electric winch with a 500 lb. capacity located on left side of vertical partition. The winch shall be mounted to an OnScene Solutions 46" deep slide-out mechanism with locking latch assembly. The winch shall be used only for loading and unloading heavy equipment from the specified trays and/or ground only.
- There shall be one (1) bolt-in vertical compartment partition(s) provided dividing the compartment into left and right sides. The vertical partition(s) shall be 3/16" (.188) 3003H-14 alloy smooth aluminum sheet.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- One (1) Hannay ECR1618-17-18 electric cable reel(s) capable of storing 200' of 10/3 electric cable. Reel(s) shall be designed to hold 110% of the capacity of cord length, with fully enclosed 45 amp, three (3) conductor collector rings. Reel(s) shall be mounted to channel structure that allows for side-to-side adjustment of reel position.
 - Power rewind control(s) shall be in a position where the operator can observe the rewinding operation and not be more than 72 in. (1830 mm) above the operator's standing position, and shall be marked with a label indicating its function.
 - A label shall be provided in a visible location adjacent to reel with following information: Current rating, Current type, Phase, Voltage, and Total cord length.
 - The cable reel shall equipped with 200' of 10/3 SEOW yellow cable, a molded plastic ball clamp, and a single heavy duty L5-30 twist-lock female plug at the end.
- One (1) Akron model EJB series, cast aluminum electrical power distribution box with yellow powder coat painted finish shall be provided. The power distribution box shall meet all requirements described in NFPA 1901. The power distribution box shall include the following outlets mounted on a backlit face plate;
 - The electric junction box shall be direct wired to cable on the cord reel. The outlet configuration shall include:
 - One (1) 120 VAC, 5-20 GFCI duplex straight-blade receptacle wired to protect all outlets in box.
 - One (1) 120 VAC, 5-15 duplex straight-blade receptacle.
 - One (1) 120 VAC, L5-20 single twist lock receptacle.
 - One (1) 120 VAC, L5-20 single twist lock receptacle.
- One (1) Akron formed aluminum treadplate vertical mounting bracket shall be provided for specified power distribution box.
- The fairlead roller shall be mounted directly to the reel.
- Two (2) OnScene 64" Access LED compartment lights, vertically mounted.
- One (1) OnScene 36" Access LED compartment light, horizontally mounted at the top of the compartment toward the door opening.

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- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

CURBSIDE COMPARTMENT - FRONT (C1)

The interior useable compartment width shall be approximately 64.0" wide.

The compartment door opening shall be approximately 57.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The roll-up doors shall be equipped with an electric power lock system. All doors shall be locked or unlocked with activation from a single switch located in the cab.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
- There shall be one (1) OnScene Solutions 83 series aluminum tray base with 70% extension, and rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 94" deep; capable of extending out either side of the body located above the level of the chassis frame rails. (Specified in opposite side compartment.)

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- Two (2) vertical partition(s) shall be provided on slide-out tray base dividing the tray into left and right sides. Each vertical partition shall be horizontally adjustable; mounted on aluminum Shelf Trac on tray floor. The vertical partition(s) shall be 3/16" (.188) 3003H-14 alloy smooth aluminum sheet.
- There shall be a transverse storage module which extends from the opposite side of the body (specified in opposite side compartment).
- There shall be two (2) OnScene Solutions velcro cargo straps provided to secure the stored equipment.
- There shall be two (2) removable aluminum tool box(s) with handles. Each box shall be fabricated from 3/16" (.188) 3003H-14 aluminum alloy sheet and be approx. 12" wide x 10" high x 23" deep (stack on lower tray).
- The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.
- Two (2) OnScene 64" Access LED compartment lights, vertically mounted.
- One (1) OnScene 36" Access LED compartment light, horizontally mounted 24" from door opening at the top of the compartment.
- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.

CURBSIDE COMPARTMENT - AHEAD OF REAR WHEEL (C2)

The interior useable compartment width shall be approximately 64.0" wide.

The compartment door opening shall be approximately 57.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The roll-up doors shall be equipped with an electric power lock system. All doors shall be locked or unlocked with activation from a single switch located in the cab.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

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COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- Two (2) OnScene 64" Access LED compartment lights, vertically mounted.
- One (1) OnScene 36" Access LED compartment light, horizontally mounted 24" from door opening at the top of the compartment.
- One (1) 120/240 VAC load center.
- The generator gauge panel.
- A 100 ampere, 240 VAC, single phase shore power receptacle shall be located in this compartment.
- The controls for the specified awning(s).
- One (1) Bauer model CFS5.5 2M, NFPA 1901 compliant containment type two (2) cylinder filling station with compressor controls rated for cylinder pressures up to 5,500 PSI shall be provided with proper reinforcement for weight of fill station and venting thru floor opening. Fill station will be approximately 35.5" wide x 50.25" high x 21" deep, and weigh approximately 863 lbs.
 - Filling operation shall be controlled with manual controls mounted on front of fill station. An air flow selector valve to fill from either compressor or storage, and manual valves and gauges for each air storage cylinder (maximum of four (4)).
 - An air storage refill port shall be provided on the fill station.
 - The fill station fill whip(s) shall terminate in a high pressure CGA-347 threaded connectors for 4,500 - 5,500 PSI air pack cylinders.
- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

CURBSIDE COMPARTMENT - ABOVE REAR WHEEL (C3)

The interior useable compartment width shall be approximately 56.0" wide.

The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a ROM roll-up door.


- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.

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- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The roll-up doors shall be equipped with an electric power lock system. All doors shall be locked or unlocked with activation from a single switch located in the cab.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) OnScene Solutions 84 series aluminum tray base with 90% extension, and rating of 150 lbs. Slide-out tray(s) base shall be approximately 46" deep and as wide as the compartment layout or door opening permits. It shall be located above the level of the chassis frame rails and shall be vertically adjustable in height. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will hold the tray in the closed position. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
- There shall be one (1) storage module fabricated from 3/16" (.188) 3003H-14 aluminum alloy smooth sheet. The module will be designed for the following long tools and equipment:
 - One (1) specified Little Giant model 22 ladder.
- There shall be one (1) OnScene Solutions velcro cargo straps provided to secure the stored equipment.
- There shall be a transverse plywood storage module which extends from the opposite side of the body (specified in opposite side compartment).
- Two (2) OnScene 36" Access LED compartment lights, vertically mounted. 
- One (1) OnScene 36" Access LED compartment light, horizontally mounted 24" from door opening at the top of the compartment.

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CURBSIDE COMPARTMENT - ABOVE REAR WHEEL (C4)

The interior useable compartment width shall be approximately 56.0" wide.

The compartment door opening shall be approximately 49.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The roll-up doors shall be equipped with an electric power lock system. All doors shall be locked or unlocked with activation from a single switch located in the cab.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) OnScene Solutions 81 series aluminum tray base with 100% extension, and rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 46" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails. Each slide base shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and shall have welded corners to form a box type tray surface with an internal depth of approximately 3 1/2".
- There shall be one (1) OnScene Solutions 84 series aluminum tray base with 90% extension, and rating of 150 lbs. Slide-out tray(s) base shall be approximately 46" deep and as wide as the compartment layout or door opening permits. It shall be located above the level of the chassis frame rails and shall be vertically adjustable in height. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will hold the tray in the closed position. Each tray

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shall be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".

- Two (2) OnScene 36" Access LED compartment lights, vertically mounted.
- One (1) OnScene 36" Access LED compartment light, horizontally mounted 24" from door opening at the top of the compartment.



CURBSIDE COMPARTMENT - BEHIND REAR AXLE(C5)

The interior useable compartment space shall be approximately 70.0" wide.

The compartment door opening shall be approximately 63.0" wide.

This compartment shall have a ROM roll-up door.


- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The roll-up doors shall be equipped with an electric power lock system. All doors shall be locked or unlocked with activation from a single switch located in the cab.
- One (1) nylon strap shall be provided to assist in closing the door. The strap shall be fastened to the left side of the lower inside door sill. The strap shall extend from the left side of the lower inside door sill to a footman loop attached to the center of the left side of the door frame.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) adjustable shelf/shelves approximately 60" deep (up to back of S5) located on right side of vertical partition. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep located on right side of vertical partition. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions. This tray will be used to store VFRS specified Holmatro SR40P andSPU16 power units.

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- There shall be one (1) OnScene Solutions 81 series aluminum tray base with 100% extension, and rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 60" deep (up to back of S5) located on right side of vertical partition. Each slide base shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
- There shall be two (2) slide-out smooth aluminum vertical tool board(s) approximately 24" deep located on left side of vertical partition. Each tool board(s) vertical exterior edge shall have a double 90 degree formed edge to provide an easy grip handle. The top and bottom of tool board(s) shall be provided with Accuride 9300 series slide tracks. Each board shall be rated for a maximum 200 lbs. evenly distributed load. Each tool board shall utilize a pneumatic cylinder to hold the tool board in both the opened and closed positions.
 - The vertical tool board material shall be 3/16" (.188) 3003H-14 aluminum alloy sheet.
 - Each tool board shall be horizontally adjustable; mounted on aluminum shelf trac on compartment floor.
- There shall be one (1) bolt-in vertical compartment partition(s) provided dividing the compartment into left and right sides. The vertical partition(s) shall be 3/16" (.188) 3003H-14 alloy smooth aluminum sheet.
- A storage hopper shall be provided in this compartment. The hopper shall be loaded from a hinged hatch in the upper portion of the compartment and shall dispense below the extended floor. A PVC 1/4-turn valve shall be provided in the lower section of the body compartment to control floor-dry flow.
-  – The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.
- One (1) Hannay ECR1618-17-18 electric cable reel(s) capable of storing 200' of 10/3 electric cable. Reel(s) shall be designed to hold 110% of the capacity of cord length, with fully enclosed 45 amp, three (3) conductor collector rings. Reel(s) shall be mounted to channel structure that allows for side-to-side adjustment of reel position.
 - Power rewind control(s) shall be in a position where the operator can observe the rewinding operation and not be more than 72 in. (1830 mm) above the operator's standing position, and shall be marked with a label indicating its function.
 - A label shall be provided in a visible location adjacent to reel with following information: Current rating, Current type, Phase, Voltage, and Total cord length.
 - The cable reel shall equipped with 200' of 10/3 SEOW yellow cable, a molded plastic ball clamp, and a single heavy duty L5-30 twist-lock female plug at the end.
- One (1) Akron model EJB series, cast aluminum electrical power distribution box with yellow powder coat painted finish shall be provided. The power distribution box shall meet all requirements described in NFPA 1901. The power distribution box shall include the following outlets mounted on a backlit face plate;
 - The electric junction box shall be direct wired to cable on the cord reel. The outlet configuration shall include:
 - One (1) 120 VAC, 5-20 GFCI duplex straight-blade receptacle wired to protect all outlets in box.

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- One (1) 120 VAC, 5-15 duplex straight-blade receptacle.
- One (1) 120 VAC, L5-20 single twist lock receptacle.
- One (1) 120 VAC, L5-20 single twist lock receptacle.
- One (1) Akron formed aluminum treadplate vertical mounting bracket shall be provided for specified power distribution box.
- The fairlead roller shall be mounted directly to the reel.
- Two (2) OnScene 64" Access LED compartment lights, vertically mounted.
- One (1) OnScene 36" Access LED compartment light, horizontally mounted 24" from door opening at the top of the compartment.
- One (1) Vancouver Fire & Rescue Services supplied Holmatro SR40P gas powered hydraulic power unit, 20" x 19" x 20" H and weigh 82 lbs. and a SPU16 battery powered power unit, 21" x 10" x 15.3" H and weigh 39 lbs.
- Mounts will be supplied and installed for five (5) Vancouver Fire & Rescue Services supplied Holmatro model (3) 4330, (1) 4340, and (1) 4350 hydraulic ram(s).

SHOP NOTES

Make:_____ Model:_____

- Mounts will be supplied and installed for one (1) Vancouver Fire & Rescue Services supplied Holmatro model 4050-NCT hydraulic cutter(s).

SHOP NOTES

Make:_____ Model:_____

- Mounts will be supplied and installed for one (1) Vancouver Fire & Rescue Services supplied Holmatro model 4260-UL hydraulic spreader(s).

SHOP NOTES

Make:_____ Model:_____

- Mounts will be supplied and installed for two (2) Vancouver Fire & Rescue Services supplied Holmatro model (1) 4050 NCT 11, and (1) battery unit model BCT 3120 hydraulic combination tool(s).

SHOP NOTES

Make:_____ Model:_____

- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

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UPPER BODY COMPARTMENT - STREETSIDE

Above the exterior streetside compartments shall be an upper body compartment for storage of long equipment. The compartment shall be integral with the body construction, and will not be bolted or added on modules. The outside walls of compartment will be double walled to prevent equipment from denting the outside painted surface. The compartment shall be approximately (insert actual dimensions).

Access to the compartment shall be from a rear facing lift-up compartment door. Door shall be fabricated from 3/16" smooth aluminum with full length 14 gauge stainless steel hinge, with 1/4" stainless steel pin, 6" non-locking stainless steel "D" ring handle, and a gas cylinder door holder. A polyester barrier film gasket shall be placed between stainless steel hinge and any dissimilar metals as necessary to prevent corrosion. Door shall overlap body surface to prevent entry of moisture and sealed with automotive type rubber molding to provide a weather resistant seal.

Compartment shall have a flush mounted light near door opening that will be automatically activated when door is opened, and wired to compartment door ajar warning light provided in cab.

Devices to secure equipment, compartment dividers, or UHMW plastic angles, or sheeting will be used for storage of specified equipment as required to prevent damage to equipment.

The compartment will be designed to store the following equipment:

- Ten (10) pieces of 4 x 4 x 10'

UPPER BODY COMPARTMENT - CURBSIDE

Above the exterior curbside compartments shall be an upper body compartment for storage of long equipment. The compartment shall be integral with the body construction, and will not be bolted or added on modules. The outside walls of compartment will be double walled to prevent equipment from denting the outside painted surface. The compartment shall be approximately (insert actual dimensions).

Access to the compartment shall be from a rear facing lift-up compartment door. Door shall be fabricated from 3/16" smooth aluminum with full length 14 gauge stainless steel hinge, with 1/4" stainless steel pin, 6" non-locking stainless steel "D" ring handle, and a gas cylinder door holder. A polyester barrier film gasket shall be placed between stainless steel hinge and any dissimilar metals as necessary to prevent corrosion. Door shall overlap body surface to prevent entry of moisture and sealed with automotive type rubber molding to provide a weather resistant seal.

Compartment shall have a flush mounted light near door opening that will be automatically activated when door is opened, and wired to compartment door ajar warning light provided in cab.

Devices to secure equipment, compartment dividers, or UHMW plastic angles, or sheeting will be used for storage of specified equipment as required to prevent damage to equipment.

The compartment will be designed to store the following equipment:

- Ten (10) pieces of 2 x 6 x 10'

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PLASTIC FLOOR AND SHELF TILE

All compartment floors, shelves, and trays shall be covered with Dri-Dek plastic interlocking grating.

- The plastic floor tile shall be red.
- The plastic edge trim shall be red.

ROPE ANCHOR OR PORTABLE WINCH RECEIVERS

The completed unit shall have an integrated receiver system for use with removable rope anchor point and/or a portable electric winch, when specified.

Side receiver(s) (if specified) shall have the following load rating:

	<u>STRAIGHT PULL</u>	<u>SAFETY FACTOR</u>
Rope Tie Off:	600 Lbs.	15:1
Winch:	5,000 Lbs.	2:1

Front and/or rear receiver(s) (if specified) shall have the following load rating:

	<u>STRAIGHT PULL</u>	<u>SAFETY FACTOR</u>
Rope Tie Off:	600 Lbs.	15:1
Winch:	Winch Load Rating (9,000 Lbs. Max)	2:1

The following items shall be provided to accomplish rope rescue and/or portable winch operation;

- Two (2) rope anchor point receiver(s) shall be provided and located on body roof area. The receiver(s) shall be manufactured using 2" x 2" x 1/4" wall steel trailer style receiver tube and 1/2" steel plate. The receiver assembly shall be powder coat painted gray. Each receiver location shall have a stainless steel scuff plate to protect paint on upper body. Reinforcements to body shall be added as necessary to increase the structural integrity and to provide a working weight rating of 600 lbs., with a 9,000 lbs. maximum load based upon using a 15:1 safety factor to match typical 1/2" rescue rope ratings.

SHOP NOTES

New Style To Accept Rope Accessory Tube

- Four (4) removable rope anchor(s) shall be provided with completed vehicle. Each rope anchor shall be fabricated from 3/4" steel, 2" high x 11.5" long with a 3" OD/2" ID eyelet. Eyelet end shall have radiused edge to prevent damage to rope or carabineer. Each rope anchor shall have a powder coat paint finish and a steel 5/8" hitch pin to lock it in place. An aluminum mounting bracket shall be provided to store rope anchor(s) inside a body compartment as close to receiver location as possible.
- One (1) Warn model XD9000i, 9,000 lb. 12 volt electric winch shall be furnished with the completed unit. It shall be capable of being stored in a compartment and mounted to the apparatus by inserting the mounting point into a properly rated receiver. A minimum of 125' of 5/16" stranded galvanized steel cable with pinned utility hook shall be installed on the drum. A 12' remote control shall be provided with the assembly that permits the operator to stand at a safe operating distance from the cable and winch.

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- There shall be one (1) 2" x 2" x 1/4" wall steel receiver tube(s) with powder coat paint finish located on the streetside of the body in the forward wheel well panel area for use with removable rope anchor and/or a portable electric winch (when specified).
 - There shall be one (1) 12 VDC plug(s) with quick connect provided to power a Warn portable winch. All 12 VDC cables to be sized according to Warn and installation for intended use.
 - The receiver(s) shall have one (1) rubber cover(s) provided.
- There shall be two (2) 2" x 2" x 1/4" wall steel receiver tube(s) with powder coat paint finish located on streetside below body ahead of rear wheels (50" center-center from roof tie-off location) for use with removable rope anchor and/or a portable electric winch (when specified).
 - There shall be two (2) 12 VDC plug(s) with quick connect provided to power a Warn portable winch. All 12 VDC cables to be sized according to Warn and installation for intended use.
 - The receiver(s) shall have two (2) rubber cover(s) provided.
- There shall be one (1) 2" x 2" x 1/4" wall steel receiver tube(s) with powder coat paint finish located on the curbside of the body in the forward wheel well panel area for use with removable rope anchor and/or a portable electric winch (when specified).
 - There shall be one (1) 12 VDC plug(s) with quick connect provided to power a Warn portable winch. All 12 VDC cables to be sized according to Warn and installation for intended use.
 - The receiver(s) shall have one (1) rubber cover(s) provided.
- There shall be two (2) 2" x 2" x 1/4" wall steel receiver tube(s) with powder coat paint finish located on the curbside below body ahead of rear wheels (50" center-center from roof tie-off location) for use with removable rope anchor point and/or a portable electric winch (when specified).
 - There shall be two (2) 12 VDC plug(s) with quick connect provided to power a Warn portable winch. All 12 VDC cables to be sized according to Warn and installation for intended use.
 - The receiver(s) shall have two (2) rubber cover(s) provided.
- The specified rear trailer hitch shall be compatible with the removable rope anchor point and/or a portable electric winch (when specified).
 - There shall be one (1) 12 VDC plug(s) with quick connect provided to power a Warn portable winch. All 12 VDC cables to be sized according to Warn and installation for intended use.
 - The receiver(s) shall have one (1) rubber cover(s) provided.

SIDE BODY PROTECTION - RUB RAIL

OnScene Solutions rub rails shall be provided below the compartment door openings on both the streetside and curbside.

The rub rail shall be fabricated from 6063 extruded aluminum, measuring approximately 2-3/4" high x 1-3/8" thick

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with tapered aluminum end caps. The rub rail shall be bolted to the body using stainless steel bolts and 1-1/2" diameter x 5/8" thick rubber mount isolators to prevent damage to the body.

The rails shall incorporate LED clearance marker lighting recessed into the rail fascia to avoid damage to the light in case of impact. The rub rail shall have an accessory mounting track integrated into the backside of the rail to allow mounting of accessories such as ground lighting.

3M™ Diamond Grade™ Conspicuity striping shall be provided in the rub rail. The striping shall be red/white in color.

FRONT GRAVEL GUARDS

Gravel guards shall be provided on front lower body corners. Guards shall be 12" high, extend from behind cab or step and wrap around to the front compartment door opening fabricated from 20 gauge brushed stainless steel.

LUMBER ACCESS HANDRAIL

There shall be two (2) 24" horizontal handrails provided, one (1) below each lumber compartment to assist in lumber compartment access. Handrail shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions.

ROLL-OUT AWNING CURBSIDE

A Carefree Mirage, 110 Volt AC powered, Lateral Arm Acrylic Patio Awning with Direct Response Electronics shall be installed on the apparatus body. The Direct Response Electronics includes easy-to-use controls and a Motion Detection System. The awning shall have a system to detect canopy motion, the most important element to prevent wind/weather damage. The awning shall automatically retract when the canopy reaches a certain level of movement - you determine the movement level on the control panel.

The awning shall activate the door ajar warning system in the cab when not in the stowed position.

The 110V motor shall be completely sealed and UL approved. The awning pitch shall be adjusted to up to 30"

The awning shall be 16' wide with a 10' projection. (Size refers to box length; actual fabric length will be 8" shorter.)

The Mirage shall be covered by a "Two and Four" Limited Warranty - Two years 100% parts, labor, & freight on canopy, four years 100% parts, labor, and freight on motor, electronics, roller & hardware. Warranty covers manufacturer's defects only. Wind and rain damage are not covered.

– The awning fabric color shall be ivory.

The specified awning above shall be recess mounted into upper body side. An aluminum box enclosure shall be fabricated and recessed into upper body side for awning mounting and painted same color as upper body choice. The recessed awning shall add approximately 1.5" to body width.

AWNING HOUSING COLOR

The awnings standard Polar White vinyl housing color shall be re-painted to match upper body color.

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LOW VOLTAGE ELECTRICAL SYSTEM- 12 VDC

General

Any low voltage electrical systems or warning devices installed on the fire apparatus shall be appropriate for the mounting location and intended electrical load.

Where wire passes through sheet metal, grommets shall be used to protect wire and wire looms. Electrical connections shall be with double crimp water-tight heat shrink connectors.

All 12 VDC wiring running from front to back of vehicle body shall be run in full length electrical wiring raceway down each side of body.

Wiring

All electrical circuit feeder wiring supplied and installed by the fire apparatus manufacturer shall meet the requirements of NFPA Chapter 13.

The circuit feeder wire shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 % of the maximum current for which the circuit is protected. Voltage drops in all wiring from the power source to the using device shall not exceed 10 %. The use of star washers for circuit ground connections shall not be permitted.

All circuits shall otherwise be wired in conformance with SAE J1292, *Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring*.

Wiring and Wire Harness Construction

All insulated wire and cable shall conform to SAE J1127, *Low Voltage Battery Cable*, or SAE J1128, *Low Voltage Primary Cable*, type SXL, GXL, or TXL.

All conductors shall be constructed in accordance with SAE J1127 or SAE J1128, except where good engineering practice dictates special strand construction. Conductor materials and stranding, other than copper, shall be permitted if all applicable requirements for physical, electrical, and environmental conditions are met as dictated by the end application. Physical and dimensional values of conductor insulation shall be in conformance with the requirements of SAE J1127 or SAE J1128, except where good engineering practice dictates special conductor insulation. The overall covering of conductors shall be moisture-resistant loom or braid that has a minimum continuous rating of 194°F (90°C) except where good engineering practice dictates special consideration for loom installations exposed to higher temperatures. The overall covering of jacketed cables shall be moisture resistant and have a minimum continuous temperature rating of 194°F (90°C), except where good engineering practice dictates special consideration for cable installations exposed to higher temperatures.

All wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection. The wiring connections and terminations shall be installed in accordance with the device manufacturer's instructions. All ungrounded electrical terminals shall have protective covers or be in enclosures. Wire nut, insulation displacement, and insulation piercing connections shall not be used.

Wiring shall be restrained to prevent damage caused by chafing or ice buildup and protected against heat, liquid contaminants, or other environmental factors.

Wiring shall be uniquely identified at least every 2 ft (0.6 m) by color coding or permanent marking with a circuit function code. The identification shall reference a wiring diagram.

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Circuits shall be provided with properly rated low voltage overcurrent protective devices. Such devices shall be readily accessible and protected against heat in excess of the overcurrent device's design range, mechanical damage, and water spray. Circuit protection shall be accomplished by utilizing fuses, circuit breakers, fusible links, or solid state equivalent devices.

If a mechanical-type device is used, it shall conform to one of the following SAE standards:

- SAE J156, *Fusible Links*
- SAE J553, *Circuit Breakers*
- SAE J554, *Electric Fuses (Cartridge Type)*
- SAE J1888, *High Current Time Lag Electric Fuses*
- 1) SAE J2077, *Miniature Blade Type Electrical Fuses*

Switches, relays, terminals, and connectors shall have a direct current (dc) rating of 125 % of maximum current for which the circuit is protected.

Power Supply

A 12 V or greater electrical alternator shall be provided. The alternator shall have a minimum output at idle to meet the minimum continuous electrical load of the vehicle, at 200°F (93°C) ambient temperature within the engine compartment, and shall be provided with full automatic regulation.

Minimum Continuous Electrical Load

The minimum continuous electrical load shall consist of the total amperage required to simultaneously operate the following in a stationary mode during emergency operations:

- 2) The propulsion engine and transmission
- 3) All legally required clearance and marker lights, headlights, and other electrical devices except windshield wipers and four-way hazard flashers
- 4) The radio(s) at a duty cycle of 10 percent transmit and 90 % receive (for calculation and testing purposes, a default value of 5 A continuous)
- 5) The lighting necessary to produce 2 fc (20 lx) of illumination on all walking surfaces on the apparatus and on the ground at all egress points onto and off the apparatus, 5 fc (50 lx) of illumination on all control and instrument panels, and 50 percent of the total compartment lighting loads
- 1) The minimum optical warning system, where the apparatus is blocking the right-of way
- 2) The continuous electrical current required to simultaneously operate any fire pumps, aerial devices, and hydraulic pumps
- 3) Other warning devices and electrical loads defined by the purchaser as critical to the mission of the apparatus

If the apparatus is equipped to tow a trailer, an additional 45 A shall be added to the minimum continuous electrical load to provide electrical power for the federally required clearance and marker lighting and the optical warning devices mounted on the trailer.

The condition of the low voltage electrical system shall be monitored by a warning system that provides both an audible and a visual signal to persons on, in, or near the apparatus of an impending electrical system failure caused by the excessive discharge of the battery set.

The charge status of the battery shall be determined either by direct measurement of the battery charge or indirectly by monitoring the electrical system voltage.

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If electrical system voltage is monitored, the alarm shall sound if the system voltage at the battery or at the master load disconnect switch drops below 11.8 V for 12 V nominal systems, 23.6 V for 24 V nominal systems, or 35.4 V for 42 V nominal systems for more than 120 seconds.

A voltmeter shall be mounted on the driver's instrument panel to allow direct observation of the system voltage.

Electromagnetic Interference

Electromagnetic interference suppression shall be provided, as required, to satisfy the radiation limits specified in SAE J551/1, *Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 18 GHz)*.

Wiring Diagram

A complete electrical wiring schematic of actual system shall be provided with finished apparatus. Similar or generic type electrical schematics shall NOT BE ACCEPTABLE.

Low Voltage Electrical System Performance Test

A low voltage electrical system test certification shall be provided with delivered apparatus.

12 VOLT MULTIPLEX CONTROL CENTER

The apparatus shall be equipped with a Weldon V-MUX multiplexed 12 volt electrical system that will provide complete diagnostic capability, No Exception. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The system shall be node based to maximize stability so that failure of one node does not affect the operation of the other nodes. The system shall use shielded twisted-pair wire for transmission of system function signals. The shielded wire shall provide protection against EMI and RFI noise interruptions.

The multiplex system shall be responsible for providing power management functions as well as load shedding. The warning light system shall be controlled by the multiplex system. The system shall be capable of displaying text and/or graphic messages on a display module. The system shall be based on solid-state technology and shall include self-contained diagnostic indicators.

WELDON CERTIFICATION

A letter shall be provided with bid submittal that the Contractor has successfully completed the Weldon training requirements for Level 1 of the V-MUX Certified Supplier Program and is authorized to design, build, and service V-MUX electrical systems.

The apparatus shall be equipped with a Weldon V-MUX multiplexed 12 volt electrical system that will provide complete diagnostic capability, No Exception. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The system shall be node based to maximize stability so that failure of one node does not affect the operation of the other nodes. The system shall use shielded twisted-pair wire for transmission of system function signals. The shielded wire shall provide protection against EMI and RFI noise interruptions.

The multiplex system shall be responsible for providing power management functions as well as load shedding. The warning light system shall be controlled by the multiplex system. The system shall be capable of displaying

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text and/or graphic messages on a display module. The system shall be based on solid-state technology and shall include self-contained diagnostic indicators.

MULTIPLEX SYSTEM COLOR DISPLAY

The Weldon multiplex system display(s) shall be provided by the cab/chassis manufacturer. The display panel(s) shall be the point of interaction with the entire 12 volt electrical system. The display(s) shall respond with text and graphic images to provide fault and condition messages to the operator.

BATTERY SYSTEM

The battery connectors shall be heavy duty type with cables terminating in heat shrink loom. Heavy duty battery cables shall provide maximum power to the electrical system. Where required, the cables shall be shielded from exhaust tubing and the muffler. Large rubber grommets shall be provided where cables enter the battery compartment.

Batteries shall be of the high-cycle type. With the engine off, the battery system shall be able to provide the minimum continuous electrical load for 10 minutes without discharging more than 50 percent of the reserve capacity and then to restart the engine. The battery system cold cranking amps (CCA) rating shall meet or exceed the minimum CCA recommendations of the engine manufacturer. The batteries shall be mounted to prevent movement during fire apparatus operation and shall be protected against accumulations of road spray, snow, and road debris. The batteries shall be readily accessible for examination, testing, and maintenance.

A means shall be provided for jump-starting the engine if the batteries are not accessible without lifting the cab of a tilt-cab apparatus.

Where an enclosed battery compartment is provided, it shall be ventilated to the exterior to prevent the buildup of heat and explosive fumes. The batteries shall be protected against vibration and temperatures that exceed the battery manufacturer's recommendation.

A master load disconnect switch shall be provided between the starter solenoid(s) and the remainder of the electrical loads on the apparatus. The starter solenoids shall be connected directly to the batteries.

Electronic control systems and similar devices shall be permitted to be otherwise connected if so specified by their manufacturer.

The alternator shall be wired directly to the batteries through the ammeter shunt(s), if one is provided, and not through the master load disconnect switch.

A green "battery on" pilot light that is visible from the driver's position shall be provided.

A sequential switching device shall be permitted to energize the optical warning devices and other high current devices required in minimum continuous electrical load, provided the switching device shall first energize the electrical devices required in minimum continuous electrical load within five (5) seconds.

BATTERY SWITCH

One (1) battery "On/Off" switch in cab located within easy reach of Driver with green "BATTERY ON" pilot light that is visible from the driver's position shall be provided. The switch and pilot light shall be supplied and installed by the cab/chassis manufacturer.

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BATTERY SOLENOID

Battery switch shall consist of a minimum 200 ampere, constant duty solenoid to feed from positive side of battery.

BATTERY CONDITIONER

The battery conditioner shall be supplied and installed by the cab chassis manufacturer.

ENGINE COMPARTMENT LIGHT

Engine compartment light(s) shall be supplied and installed by the cab chassis manufacturer.

REAR SCENE LIGHTS (BACK-UP LIGHTS)

There shall be a switch on the left side rear to convert backup lights and rear step lights to scene lights during night operations. The switch shall be of momentary style and shall be connected to a bi-stable relay, allowing multiple switching locations. The scene/reverse lights shall automatically shut off when the parking brake is disengaged.

CAB HAZARD WARNING LIGHT

A red flashing or rotating light, located in the driving compartment. The light shall be furnished by the cab/chassis manufacturer. The light shall be illuminated automatically whenever the vehicles parking brake is not fully engaged and any of the following conditions exist:

- 4) Any passenger or equipment compartment door is not closed.
- 5) Any ladder or equipment rack is not in the stowed position.
- 6) Stabilizer system is not in its stowed position.
- 7) Powered light tower is not stowed.
- Any other device permanently attached to the apparatus is open, extended, or deployed in a manner that is likely to cause damage to the apparatus if the apparatus is moved.

Compartments and equipment meeting all of the following conditions shall be permitted to be exempt from being wired to the hazard light:

- The volume is less than or equal to 4 ft³ (0.1 m³).
- The compartment has an opening less than or equal to 144 in.² (92,900 mm²).
- The open door does not extend sideways beyond the mirrors or up above the top of the fire apparatus.
- All equipment in the compartment is restrained so that nothing can fall out if the door is open while the apparatus is moving.
- Manually raised pole lights with an extension of less than 5 ft (1.5 m).

The hazard light shall be labeled "DO NOT MOVE APPARATUS WHEN LIGHT IS ON".

BACK-UP ALARM

An electronic back-up alarm shall be supplied and installed by the cab/chassis manufacturer. The back-up alarm shall actuate automatically when the transmission gear selector is placed in reverse.

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REAR VIEW CAMERA

The cab chassis provided rear view camera shall be installed on the rear of the body.

SONAR BACKUP SYSTEM

A Poron Micro 4S backup warning system shall be provided and installed in cab. System shall also be connected to Sigtronics intercom system.

TAIL LIGHTS

Rear body tail lights shall be vertically mounted and located per Federal Motor Vehicle Safety Standards, FMVSS and Canadian Motor Vehicle Safety Standards CMVSS. The following lights shall be furnished;

- Two (2) Whelen 900 Series 90A00TAR amber LED turn signal lights
- Two (2) Whelen 900 Series 90R00XRR red LED stop/tail lights
- Two (2) Whelen 900 Series 9SC0ENZR LED back-up lights with clear lens



Each of the lights above shall be mounted in a 9EFLANGE, chrome finish bezel.

MIDSHIP MARKER/TURN SIGNAL

Two (2) Whelen model T0A00MAR 2" round amber LED midship body clearance marker/turn signal lights shall be provided and installed, one (1) light on each side of the body, in forward wheel well of rear axle. Midship marker/turn lights shall be wired to the headlight circuit of the chassis.

MARKER LIGHTS

The body shall be equipped with all necessary clearance lights and reflectors in accordance with Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS) regulations. All body clearance lights shall be Truck-Lite Model 18 LED to reduce the need for maintenance and lower the amp draw. Clearance lights shall be wired to the headlight circuit of the chassis.

REAR BUMPER MARKER LIGHTS

Two (2) Britax style dual face flexible mounted rear bumper markers shall be located, one (1) each side lower rear corner of body visible from driver mirrors.

CAB STEP LIGHTS / GROUND LIGHTS

The step lights and/or ground lights shall be supplied and installed by the cab/chassis manufacturer. Light(s) shall be capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the vehicle in areas designed for personnel to climb onto or descend from the vehicle to the ground level.

Lighting designed to provide illumination on areas under the driver and crew riding area exits shall be switchable but activated automatically when the exit doors are opened.

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LICENSE PLATE MOUNTING BRACKET

There shall be one (1) Cast Products aluminum license plate mounting with chrome shielded license plate light mounted on the rear of the body.

ELECTRONIC SIREN

The siren control head shall be supplied and installed by the cab/chassis manufacturer. Siren power shall be wired through the master warning light switch.

SIREN SPEAKER

The siren speaker(s) shall be supplied and installed by the cab/chassis manufacturer.

SIDE SCENE LIGHTS

There shall be four (4) Whelen Super LED 900 series (9" x 7") recess mounted scene lights (9SC0ENZR) provided on the upper body. Light quantity shall be divided equally per side. Each light will have twenty-four LED diodes that draw a total of 4.0 amps, with 3,000 lumens. The light shall be an 8-32 degree gradient lens and chrome flange.

Two (2) switches shall be provided, one (1) for the streetside scene lights, and one (1) for the curbside scene lights.

The lights shall be switched at the Vista display in the cab.

REAR SCENE LIGHTS

Two (2) Whelen Super LED 900 series (9" x 7") recess mounted scene lights (9SC0ENZR) shall be provided on the upper rear body to light the work area immediately behind the vehicle to a level of at least 3 fc (30 lx) within a 10 ft x 10 ft (3 m x 3 m) square. Each light will have twenty-four LED diodes that draw a total of 4.0 amps, with 3000 Lumens. The light shall be an 8-32 degree gradient lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

The rear scene lights shall also be activated when the apparatus is in reverse.

SIGTRONICS INTERCOM SYSTEM

One (1) Sigtronics US-67-S intercom system will be supplied and installed powered by the master switch. The system will come complete with six (6) plug-in modules, six (6) headsets and all necessary equipment for two-way radio access and monitoring. All cables utilized will be manufactured by Sigtronics.

- One (1) US-67-S master station will be flush mounted in the dash
- Six (6) SE-2 headsets
- Two (2) push to talk plug-in modules will be made available for the driver and officer
- Three (3) plug-in modules will be made available for the rear crew area
- One (1) push to talk plug-in module with splash cover will be made available at the SCBA air fill station
- One (1) mobile radio interface adapter.
- Headset hooks will be supplied and installed at all seating positions

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- The Poron backup safety system shall also be connected to intercom system (US-67S “Special” c/w additional “receive only input” – per Tim at Sigtronics).

INTERCOM SYSTEM INSTALLATION

The above listed intercom system shall be installed in the cab locations as follows;

Front of Cab

- Driver's – Mounted above the right shoulder position on ceiling.
- Officer's – Mounted above the left shoulder position on ceiling.

Rear Crew Area

- Driver's side forward facing – Above the right shoulder on the rear wall or ceiling.
- Driver's side forward facing center – Above the left shoulder on the rear wall or ceiling.
- Officer's side forward facing – Above the left shoulder on the rear wall or ceiling.
- Officer's side forward facing center – Above the right shoulder on the rear wall or ceiling.

WARNING LIGHT PACKAGE

Each apparatus shall have a system of optical warning devices that meets or exceeds the requirements of this section.

The optical warning system shall consist of an upper and a lower warning level. The requirements for each level shall be met by the warning devices in that particular level without consideration of the warning devices in the other level.

For the purposes of defining and measuring the required optical performance, the upper and lower warning levels shall be divided into four (4) warning zones. The four zones shall be determined by lines drawn through the geometric center of the apparatus at 45 degrees to a line drawn lengthwise through the geometric center of the apparatus. The four (4) zones shall be designated A, B, C, and D in a clockwise direction, with zone A to the front of the apparatus.

Each optical warning device shall be installed on the apparatus and connected to the apparatus's electrical system in accordance with the requirements of this standard and the requirements of the manufacturer of the device.

A master optical warning system switch that energizes all the optical warning devices shall be provided.

The optical warning system on the fire apparatus shall be capable of two (2) separate signaling modes during emergency operations. One (1) mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right-of-way. One (1) mode shall signal that the apparatus is stopped and is blocking the right-of-way. The use of some or all of the same warning lights shall be permitted for both modes provided the other requirements of this chapter are met.

A switching system shall be provided that senses the position of the parking brake or the park position of an automatic transmission. When the master optical warning system switch is closed and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for the right-of-way shall be energized. When the master optical warning system switch is closed and the parking brake is on or the

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automatic transmission is in park, the warning devices signaling the blockage of the right-of-way shall be energized. The system shall be permitted to have a method of modifying the two (2) signaling modes.

The optical warning devices shall be constructed or arranged so as to avoid the projection of light, either directly or through mirrors, into any driving or crew compartment(s). The front optical warning devices shall be placed so as to maintain the maximum possible separation from the headlights.

UPPER LEVEL OPTICAL WARNING DEVICES

The upper-level optical warning devices shall be mounted as high and as close to the corner points of the apparatus as is practical to define the clearance lines of the apparatus. The upper-level optical warning devices shall not be mounted above the maximum height, specified by the device manufacturer.

ZONE A - FRONT WARNING LIGHTS

There shall be one (1) Whelen Edge FN72QLED LED 72" lightbar permanently mounted to the cab roof.

The lightbar configuration (streetside to curbside) shall be:

<u>SECTION</u>	<u>INTERNAL COMPONENTS</u>	<u>LENS COLOR</u>
1	Red Side Linear LED	Clear
2	Red Front Corner Linear LED	Clear
3	Blank	Clear
4	Clear Linear LED	Clear
5	Blank	Clear
6	Red Linear LED	Clear
7	Blank (Opticom if specified)	Clear
8	Blank (Opticom if specified)	Clear
9	Red Linear LED	Clear
10	Blank	Clear
11	Clear Linear LED	Clear
12	Blank	Clear
13	Red Front Corner Linear LED	Clear
14	Red Side Linear LED	Clear

All clear lights shall shut down when the parking brake is set to comply with "Blocking" mode requirements as outlined in NFPA 1901.

SHOP NOTES

Add MK8H lightbar mount on Wecad program if there is a brow light on cab

The lightbar shall be separately switched at the vista display in the cab.

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ZONES B AND D - SIDE WARNING LIGHTS

UPPER REAR CORNER WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") Red Linear Super-LED lights (90RR5FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

UPPER FORWARD CORNER WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") Red Linear Super-LED lights (90RR5FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

ZONE C - REAR WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") Red Linear Super-LED lights (90RR5FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

LOWER LEVEL OPTICAL WARNING DEVICES

To define the clearance lines of the apparatus, the optical center of the lower-level optical warning devices in the front of the vehicle shall be mounted on or forward of the front axle centerline and as close to the front corner points of the apparatus as is practical.

The optical center of the lower-level optical warning devices at the rear of the vehicle shall be mounted on or behind the rear axle centerline and as close to the rear corners of the apparatus as is practical. The optical center of any lower-level device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground for large apparatus, and 18 in. and 48 in. (460 mm and 1220 mm) above level ground for small apparatus.

A midship optical warning device shall be mounted right and the left sides of the apparatus if the distance between the front and rear lower-level optical devices exceeds 25 ft (7.6 m) at the optical center. Additional midship optical warning devices shall be required, where necessary, to maintain a horizontal distance between the centers of adjacent lower-level optical warning devices of 25 ft (7.6 m) or less. The optical center of any midship mounted optical warning device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground.

ZONE A - FRONT WARNING LIGHTS

The warning lights shall be supplied and installed by the cab/chassis manufacturer. They shall be Whelen lights to complete an NFPA compliant lower level warning light system.

The lights shall be switched at the Vista display in the cab.

ZONES B AND D - CAB INTERSECTOR LIGHT (CAB FRONT CORNERS)

The warning lights shall be supplied and installed by the cab/chassis manufacturer. They shall be Whelen lights to complete an NFPA compliant lower level warning light system.

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The lights shall be switched at the Vista display in the cab.

ZONES B AND D - BODY INTERSECTOR LIGHT (BODY WHEELWELL AREA)

There shall be four (4) Whelen 500 series (5" x 2") TIR6 Super-LED lights (50R03ZRC) provided, two (2) each side. Each light shall have a clear lens and chrome finished flange.

The lights shall be switched at the Vista display in the cab.

ZONES B AND D - BODY INTERSECTOR LIGHT (BODY REAR CORNERS)

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

There shall be two (2) Whelen 900 series (9" x 7") red Linear Super-LED lights (90RR5FCR) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be switched at the Vista display in the cab.

LINE VOLTAGE ELECTRICAL SYSTEM

ONAN PTO GENERATOR

The vehicle shall be equipped with an Onan Protec PTO generator system with a capacity of 32,000 watts at 120/208 VAC, three phase. Current frequency shall be stable at 60 hertz.

The transmission's PTO port and PTO, or the split shaft PTO, and all associated drive shaft components shall be rated to support the continuous duty torque requirements of the generator's continuous duty rating as stated on the power source nameplate.

Where the generator is driven by the chassis engine and transmission through a split shaft PTO, the driving compartment speedometer shall register when the generator drive system is engaged.

Where the generator is driven by the chassis engine and transmission through a split shaft PTO and a chassis transmission retarder is furnished, it shall be automatically disengaged for generator operations.

The direct drive generator shall be mounted so that it does not change the ramp breakover angle, angle of departure, or angle of approach as defined by other components, and it shall not extend into the ground clearance area.

The direct drive generator shall be mounted away from exhaust and muffler areas or provided with a heat shield to reduce operating temperatures in the generator area.

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GENERATOR BONDING

A minimum of four (4) 16" x 2 gauge copper ground straps shall be bolted to body sub-frame and chassis sub-frame for proper bonding of high voltage system. The conductor shall have a minimum amperage rating, as defined in 310.15, "Ampacities for Conductors Rated 0–2000 Volts," of *NFPA 70*, of 115 percent of the rated amperage on the power source specification label.

GENERATOR ENGAGEMENT

A "Generator Engaged" indicator shall be provided in the driving compartment to indicate that the generator shift has been successfully completed.

An "OK to Operate Generator" indicator shall be provided in the driving compartment to indicate that the generator is engaged (if not always engaged), the transmission is in the proper gear (if required, automatic transmissions only), and the parking brake is engaged (if applicable).

An interlock system shall be provided to prevent advancement of the engine speed in the driving compartment or at any operator's panel unless the parking brake is engaged, and the transmission is in neutral or the output of the transmission is correctly connected to a pump or generator instead of the drive wheels.

WARRANTY PERIOD

Provided such goods are operated and maintained in accordance with Onan's written instructions, Onan warrants that the Protec YDCR series PTO generators shall be free from defects in material and workmanship for a period of five (5) years or one thousand (1,000) hours, whichever comes first, from the date of delivery to the first purchaser.

GENERATOR SPLASH GUARD

A powder coat painted splash cover shall be installed to reduce the amount of road spray on the frame mounted PTO generator. A V-ring seal shall also be installed in the cover to provide additional protection against contaminants reaching the generator front seals.

The generator shall be engaged at the 12 volt control panel in the cab.

GENERATOR MOUNTING

The generator shall be mounted between the chassis frame rails. The generator mounting brackets shall be fabricated using heavy duty steel tubing, or structural channel. The generator mounting shall be bolted and removable so that the generator can be lowered from under apparatus for service, if necessary. The generator case shall not extend below the bottom edge of the apparatus body.

MANUALS AND SCHEMATICS

Two (2) complete manuals on parts list, maintenance, wiring schematics, hydraulic schematics, circuit boards, voltage regulator board and other components shall be provided on delivery.

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POWER-TAKE-OFF GENERATOR DRIVE

There shall be a "Hot Shift" power-take-off (PTO) installed on the transmission PTO opening of the chassis. The "Hot Shift" PTO is provided to allow the engagement of the PTO at higher engine RPM speeds. The PTO output shall be connected to the generator through hollow tube type driveline with heavy duty universals.

The engagement of the PTO shall be in the chassis cab with a rocker switch and red pilot light to note engagement of the PTO or via the V-Mux screen if so equipped.

The power supply to the PTO engagement control shall be wired to the parking brake and a neutral position transmission switch to prevent engagement unless the vehicle is stopped and transmission has been placed in neutral.

The installation of the engine, transmission, driven accessories (power takeoffs (PTO), etc.) shall meet the engine and transmission manufacturers' installation recommendations for the service intended.

Model part number shall be Chelsea 277SGFJP-B5XV, 147% Ratio.

ENGINE SPEED CONTROL

An engine speed auxiliary control device (high idle switch or throttle) shall be installed to maintain a stable cycle output from generator when the apparatus is parked.

An interlock shall prevent the operation of the engine speed auxiliary control device unless the parking brake is engaged and the transmission is in neutral or park, or the parking brake is engaged and the engine is disengaged from the drive wheels.

The engine shall be prevented from regulating its own engine speed during times when engine rpm control is critical for consistent apparatus functions such as generator, water pump, or aerial operation.

LOADCENTER

The loadcenter shall be a Cutler Hammer, BR Series, specifically designed for protection and distribution of 120/208 volt AC, such as lighting and small motor branch circuits. The loadcenter enclosure shall be made of 16 gauge galvanized sheet steel. The galvanized coating provides corrosion protection and as such does not require paint. All trims used on the BR Loadcenter shall be chromate sealed and finished with electro disposition epoxy paint (ASA61) which exceeds requirements for outdoor and indoor applications. A combination surface/flush cover with integral door shall be supplied.

The loadcenter shall be UL / CSA listed, **NO EXCEPTIONS** will be allowed.

GENERATOR MONITORING PANEL

To properly monitor the generator performance and load demand during operation, the generator installation shall be equipped with a full instrument monitor panel.

- Generator frequency in hertz

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- Line voltage, phase to neutral or phase to phase, in volts
- Line current in amperes

Individual line current and voltage shall be displayed at the push of a button.

The program shall support the accumulation of elapsed generator hours. Generator hours shall be displayed.

SHORE POWER INLET - BATTERY CHARGER

The above mentioned shore power inlet, and battery conditioner shall be specified in the 12 volt section.

OUTLETS AND CIRCUITS

The generator and or shore power shall supply the 120/240 volt electrical equipment and outlets outlined below. Proper circuit protection shall be installed as noted:

- Two (2) 120 volt exterior outlets, one (1) each side near rear wheel well area.
 - The outlet receptacle(s) shall be 20 amp, twist-lock (NEMA L5-20R).
- One (1) 120 volt exterior outlet rear of body.
 - The outlet receptacle(s) shall be 20 amp, twist-lock (NEMA L5-20R).

LINE VOLTAGE ELECTRICAL SYSTEM

GENERAL REQUIREMENTS

Stability

Any fixed line voltage power source producing alternating current (ac) shall produce electric power at 60 Hz, ± 3 Hz when producing power at all levels between no load and full rated power. Any fixed line voltage power source shall produce electric power at the rated voltage ± 10 percent when producing power at all levels between no load and full rated power.

The maximum voltage supplied to portable equipment shall not exceed 275 volts to ground. Higher voltage shall be permitted only when used to operate fixed wired, permanently mounted equipment on the apparatus.

Conformance with National Electrical Code

All components, equipment, and installation procedures shall conform to *NFPA 70, National Electrical Code*, except where superseded by the requirements of this chapter. Where the requirements of this chapter differ from those in *NFPA 70*, the requirements in this chapter shall apply.

Where available, line voltage electrical system equipment and materials included on the apparatus shall be listed and used only in the manner for which they have been listed. All equipment and materials shall be installed in accordance with the manufacturer's instructions.

Location Ratings

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Any equipment used in a dry location shall be listed for dry locations. Any equipment used in a wet location shall be listed for wet locations.

Any equipment, except a PTO-driven generator, used in an underbody or under chassis location that is subject to road spray shall be either listed as Type 4 or mounted in an enclosure that is listed as Type 4.

If a PTO-driven generator is located in an underbody or under chassis location, the installation shall include a shield to prevent road spray from splashing directly on the generator.

Grounding

Grounding shall be in accordance with 250.34(A) and 250.34(B) of *NFPA 70*. Ungrounded systems shall not be used.

Only stranded or braided copper conductors shall be used for grounding and bonding.

The grounded current-carrying conductor (neutral) shall be insulated from the equipment-grounding conductors and from the equipment enclosures and other grounded parts.

The neutral conductor shall be colored white or gray in accordance with 200.6, "Means of Identifying Grounded Conductors," of *NFPA 70*.

Any bonding screws, straps, or buses in the distribution panel board or in other system components between the neutral and equipment-grounding conductor shall be removed and discarded.

Bonding

The neutral conductor of the power source shall be bonded to the vehicle frame. The neutral bonding connection shall occur only at the power source. In addition to the bonding required for the low voltage return current, each body and each driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor.

The conductor shall have a minimum ampere rating, as defined in 310.15, "Ampacities for Conductors Rated 0–2000 Volts," of *NFPA 70*, of 115 percent of the rated ampere on the power source specification label.

A single conductor that is sized to meet the low voltage and line voltage requirements shall be permitted to be used.

Ground Fault Circuit Interrupters

In special service vehicles incorporating a lavatory, sink, toilet, shower, or tub, 120 V, 15 or 20 A receptacles within 6 ft (1.8 m) of these fixtures shall have ground fault circuit interrupter (GFCI) protection. GFCIs integrated into outlets or circuit breakers or as stand-alone devices shall be permitted to be used in situations.

Power Source General Requirements

All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.

The power source shall be shielded from contamination that would prevent the power source from operating within its design specifications.

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Power Source Rating

For power sources of 8 kW or larger, the power source manufacturer shall declare the continuous duty rating that the power source can provide when installed on fire apparatus according to the manufacturer's instructions and run at 120°F (49°C) air intake temperature at 2000 ft (600 m) above sea level.

The rating on the power source specification label shall not exceed the declared rating from the power source manufacturer.

Access shall be provided to permit both routine maintenance and removal of the power source for major servicing. The power source shall be located such that neither it nor its mounting brackets interfere with the routine maintenance of the fire apparatus.

Instrumentation

If the power source is rated at less than 3 kW, a "Power On" indicator shall be provided. If the power source is rated at 3 kW or more but less than 8 kW, a voltmeter shall be provided.

If the power source is rated at 8 kW or more, the following instrumentation shall be provided at an operator's panel:

- Voltmeter
 - Current meters for each ungrounded leg
- Frequency (Hz) meter
 - Power source hour meter

The instrumentation shall be permanently mounted at an operator's panel. The instruments shall be located in a plane facing the operator. Gauges, switches, or other instruments on this panel shall each have a label to indicate their function.

The instruments and other line voltage equipment and controls shall be protected from mechanical damage and not obstructed by tool mounting or equipment storage.

An instruction plate(s) that provides the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the apparatus at any point where such operations can take place.

Operation

Provisions shall be made for placing the generator drive system in operation using controls and switches that are identified and within convenient reach of the operator.

Where the generator is driven by the chassis engine and engine compression brakes or engine exhaust brakes are furnished, they shall be automatically disengaged for generator operations.

Any control device used in the generator system power train between the engine and the generator shall be equipped with a means to prevent unintentional movement of the control device from its set position in the power generation mode.

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If there is permanent wiring on the apparatus that is designed to be connected to the power source, a power source specification label that is permanently attached to the apparatus at the operator's control station shall provide the operator with the information required.

The power source, at any load, shall not produce a noise level that exceeds 90 dBA in any driving compartment, crew compartment, or onboard command area with windows and doors closed or at any operator's station on the apparatus.

Power Supply Assembly

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device shall not exceed 12 ft (4 m) in length.

All power supply assembly conductors, including neutral and grounding conductors, shall have an equivalent ampere rating and shall be sized to carry not less than 115 percent of the ampere rating of the nameplate current rating of the power source.

If the power supply assembly connects to the vibrating part of a generator (not a connection on the base), the conductors shall be flexible cord or other fine-stranded conductors enclosed in metallic or nonmetallic liquid tight flexible conduit rated for wet locations and temperatures not less than 194°F (90°C).

Overcurrent Protection

Manually resettable over current devices shall be installed to protect the line voltage electrical system components.

Power Source Protection

A main over current protection device shall be provided that is either incorporated in the power source or connected to the power source by a power supply assembly.

The size of the main over current protection device shall not exceed 100 percent of the rated ampere rating stated on the power source specification label or the rating of the next larger available size over current protection device, where so recommended by the power source manufacturer.

If the main over current protection device is subject to road spray, the unit shall be housed in a Type 4-rated enclosure.

Branch Circuit Overcurrent Protection

Over current protection devices shall be provided for each individual circuit and shall be sized at not less than 15 amps in accordance with 240.4, "Protection of Conductors," of *NFPA 70*.

Any panel board shall have a main breaker where the panel has six or more individual branch circuits or the power source is rated 8 kW or larger.

Each over current protection device shall be marked with a label to identify the function of the circuit it protects.

Dedicated circuits shall be provided for any large appliance or device (air conditioning units, large motors, etc.) that requires 60 percent or more of the rated capacity of the circuit to which it is connected, and that circuit shall serve no other purpose.

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Panelboards

All fixed power sources shall be hardwired to a permanently mounted panel board unless one of the following conditions exists:

- 1) All line voltage power connections are made through receptacles on the power source and the receptacles are protected by integrated over current devices.
- 2) Only one circuit is hardwired to the power source, which is protected by an integrated over current device.

The panel shall be visible and located so that there is unimpeded access to the panel board controls. All panel boards shall be designed for use in their intended location. The panel(s) shall be protected from mechanical damage, tool mounting, and equipment storage.

Where the power source is 120/240 V and 120 V loads are connected, the apparatus manufacturer or line voltage system installer shall consider load balancing to the extent that it is possible.

Wiring Methods

Fixed wiring systems shall be limited to the following:

- 3) Metallic or nonmetallic liquid tight flexible conduit rated at temperatures not less than 194°F (90°C) with stranded copper wire rated for wet locations and temperatures not less than 194°F (90°C)
- 4) Type SOW, SOOW, SEOW, or SEOOW flexible cord rated at 600 V and at temperatures not less than 194°F (90°C)

Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring and shall be arranged as follows:

- 1) Separated by a minimum distance of 12 in. (300 mm) from exhaust piping or shielded from such piping
- 2) Separated from fuel lines by a minimum distance of 6 in. (150 mm)

A means shall be provided to allow “flexing” between the driving and crew compartment, the body, and other areas or equipment whose movement would stress the wiring.

Electrical cord or conduit shall be supported within 6 in. (150 mm) of any junction box and at a minimum of every 24 in. (600 mm) of run.

Supports shall be made of nonmetallic materials or of corrosion-resistant or corrosion-protected metal. All supports shall be of a design that does not cut or abrade the conduit or cord and shall be mechanically fastened to the apparatus.

Only fittings and components listed for the type of cord or conduit being installed shall be used.

Splices shall be made only in a listed junction box.

Additional Requirements for Flexible Cord Installations

Where flexible cord is used in any location where it could be damaged, it shall be protected by installation in conduit, enclosures, or guards.

Where flexible cord penetrates a metal surface, rubber or plastic grommets or bushings shall be installed.

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Wiring Identification

Each line voltage circuit originating from the main panel board shall be identified.

The wire or circuit identification either shall reference a wiring diagram or wire list or shall indicate the final termination point of the circuit.

Where pre-wiring for future power sources or devices exists, the un-terminated ends shall be marked with a label showing their wire size and intended function.

Wiring System Components

Only stranded copper conductors with an insulation rated for temperatures of at least 194°F (90°C) and wet locations shall be used. Conductors in flexible cord shall be sized in accordance with Table 400.5(A) of *NFPA 70*. Conductors used in conduit shall be sized in accordance with 310.15, "Ampacities for Conductors Rated 0–2000 Volts," of *NFPA 70*. Aluminum or copper-clad aluminum conductors shall not be used.

All boxes shall conform to and be mounted in accordance with Article 314, "Outlet, Device, Pull, and Junction Boxes; Conduit Bodies; Fittings; and Manholes," of *NFPA 70*. All boxes shall be accessible using ordinary hand tools. Boxes shall not be permitted behind welded or pop-riveted panels.

The maximum number of conductors permitted in any box shall be in accordance with 314.16, "Number of Conductors in Outlet, Device, and Junction Boxes, and Conduit Bodies," of *NFPA 70*.

All wiring connections and terminations shall provide a positive mechanical and electrical connection. Connectors shall be installed in accordance with the manufacturer's instructions. Wire nuts or insulation displacement and insulation piercing connectors shall not be used.

Each switch shall indicate the position of its contact points (i.e., open or closed) and shall be rated for the continuous operation of the load being controlled. All switches shall be marked with a label indicating the function of the switch. Circuit breakers used as switches shall be "switch rated" (SWD) or better. Switches shall simultaneously open all associated line voltage conductors. Switching of the neutral conductor alone shall not be permitted.

Line voltage circuits controlled by low voltage circuits shall be wired through properly rated relays in listed enclosures that control all non-grounded current-carrying conductors.

Receptacles and Inlet Devices

Wet and Dry Locations

All wet location receptacle outlets and inlet devices, including those on hardwired, remote power distribution boxes, shall be of the grounding type, provided with a wet location cover, and installed in accordance with Section 406.8, "Receptacles in Damp or Wet Locations," of *NFPA 70*.

All receptacles located in a wet location shall be not less than 24 in. (600 mm) from the ground. Receptacles on off road fire apparatus shall be a minimum of 30 in. (750 mm) from the ground. All receptacles located in a dry location shall be of the grounding type and shall be at least 12 in. (300 mm) above the interior floor height. No receptacle shall be installed in a face-up position.

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The face of any wet location receptacle shall be installed in a plane from vertical to not more than 45 degrees off vertical.

Receptacle Label

Each receptacle shall be marked with a label indicating the nominal line voltage (120 volts or 240 volts) and the current rating in amps of the circuit. If the receptacle is DC or other than single phase, that information shall also be marked on the label.

All receptacles and electrical inlet devices shall be listed to UL 498, *Standard for Safety Attachment Plugs and Receptacles*, or other recognized performance standards.

Receptacles used for DC voltages shall be rated for DC service.

Wiring Schematics

An "As-Built" Wiring diagrams for line voltage systems shall be provided to include the following information;

- 1) Pictorial representations of circuit logic for all electrical components and wiring
- 2) Circuit identification
 - 1) Connector pin identification
 - 2) Zone location of electrical components
 - (a) Safety interlocks
 - (b) Alternator–battery power distribution circuits
 - (c) Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems

120/240 VAC SCENE LIGHTING

FRONT CAB-MOUNTED SCENE LIGHT(S)

Floodlight(s) shall be provided on the front of the cab by the cab/chassis manufacturer. Each light shall be mounted in a brow-style mounting flange with a lens or a means for preventing damage from water spray and listed for wet location usage.

Each light shall be wired directly to the electrical generator system with Carflex conduit and stranded copper wire. The floodlights shall be protected with circuit breakers rated at the proper amperage and wire size.

The lights shall be switched at the Vista display in the cab.

SIDE UPPER RECESSED SCENE LIGHTS

Four (4) Fire Research Focus, model FCA200-M12, recessed light(s) shall be installed. They shall be equally divided between the curbside and streetside. The housing shall incorporate internal heat-dissipating fins and have cutout dimensions not to exceed 2" deep by 4 1/4" high by 16 1/8" wide. The lamphead shall protrude no more than 1 1/2" from the housing flange. Wiring shall extend from the bottom of the recessed housing.

The lamp head shall have one (1) quartz halogen 1000 watt 240 volt bulb. The bulb shall draw 4.2 amps and generate 22,000 lumens. The bulb shall be accessible through the front. The lamphead shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. Lamphead and housing shall be powder coated white. The floodlight shall be UL listed as a scene light for fire service use.

Scene lights shall be provided with a lens or a means for preventing damage from water spray and shall be listed

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for wet location usage.

SHOP NOTES

Make: Fire Research

Model: Focus

P/N: FC200-M12

(d) The above lights shall be controlled by two (2) switch(es) in the lower portion of compartment S1.

LIGHT TOWER

One (1) Command Light, CL Series light tower(s) shall be provided and installed on the completed unit. A flashing warning light shall be provided in cab, indicating when a light tower is not in nested position as required by NFPA 1901.

The Command Light shall be covered by a five (5) year limited warranty from defects in materials and workmanship. An operation, maintenance, and parts manual shall be provided with the completed unit.

The light tower shall extend 131" above the mounting surface and shall extend to full upright position in less than 15 seconds. The overall size of nested light tower shall be approximately 42" wide x 74" long x 12" high and weigh approximately 300 pounds.

Light Tower Construction and Design

The Command Light assembly shall be of aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance.

The electrically controlled unit shall not require usage of the vehicle's air supply for operation, thereby eliminating the chance for air leaks in the vehicle braking system. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the specified all electric light tower.

The light tower shall be tested to in wind conditions of 90 mph (150 kph) minimum. Light towers that have not been tested to these conditions are not acceptable.

The light tower shall be capable of overhanging the side or back of the vehicle to provide maximum illumination to the vicinity adjacent to the vehicle for the safety of emergency personnel in high traffic conditions. Light towers that are only capable of rotation at the top of a pole are not acceptable to the specified light tower.

Light Tower Electrical System

The light tower shall be a two-stage articulating device with a lighting bank on top of the second stage capable of continuous 360 degree rotation. The light shall be elevated by electric linear actuators, one (1) actuator shall elevate the light bank and one (1) actuator shall adjust the light bank angle from 0 to 110 degrees. Power for the light bank shall be supplied through power collecting rings thus allowing continuous 360 degree rotation in either direction.

The tower base shall have a light that illuminates the envelope of motion during any movement of the light tower mast as required by NFPA 1901.

Light Tower Floodlights

The Command Light model CL615 shall be equipped with the following bank of floodlights:

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Floodlight manufacturer:	Hubbell Quartzliter
Number of lamp heads:	Six (6)
Voltage:	240 volts
Watts of each lamp head:	1,500 watt
Total watts of light tower:	9,000 watts
Total lumens of light tower:	214,000 lumens
Configuration:	The light heads shall be mounted with three (3) on each side of the light tower, giving two (2) vertical lines of three (3) when the lights are in the upright position.

Light Tower Backlight Option

A backlight option shall be provided on the light tower. The lower pair of light heads shall be capable of being rotated about a horizontal axis 180 degree, providing light down on the vehicle or to the opposite side of the vehicle while allowing the fixed lights to remain pointed at the scene.

The hand-held remote control shall have an additional switch supplied for the backlight rotation option.

Light Tower Paint

The light tower shall be electrostatically powder coated with a hammer tone gray color.

Light Tower Controls

The light tower(s) shall be operated with a hand-held 15-foot umbilical line remote control. The storage station for the remote control unit shall be equipped with a button to activate the "Auto-Park" automatic nesting feature. The remote control shall be located per the itemized compartment list and include;

Three (3) switches; one (1) for each pair of lights.

One (1) switch for light bank rotation.

One (1) switch for elevating lower stage.

One (1) switch for elevating upper stage.

One (1) switch for optional light bank rotation.

One (1) switch for the optional strobe.

One (1) indicator light to indicate when light bank is out of the roof nesting position.

One (1) indicator light to indicate when light bank is rotated to proper nesting position.

Light Tower Mounting

The light tower shall be mounted to roof of the custom cab which shall be reinforced as necessary to support weight of the light tower.

LIGHT TOWER TREE LIMB GUARD

A three sided tree limb guard shall be provided fabricated from 1/8" aluminum and painted to match the upper paint color to provide protection to the specified light tower from small tree branches.

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EQUIPMENT PAYLOAD WEIGHT ALLOWANCE

In compliance with NFPA 1901 standards, the special service vehicle shall be designed for an equipment loading allowance of 10,000 lbs. of Vancouver Fire & Rescue Services provided equipment based on a 60,001 pound and up gross vehicle weight rating.

EQUIPMENT

The following equipment shall be furnished with the completed special service vehicle;

(e) One (1) container of assorted stainless steel nuts, bolts, screws and washers used in the construction of the apparatus shall be provided with the completed apparatus.



(f) Four (4) Streamlight Survivor, LED yellow flashlight(s) shall be provided. Each flashlight shall be orange in color and have a 12 volt DC charger and vehicle mount kit. Each flashlight shall have an LED spotlight style bulbs and reflectors. The flashlight(s) shall be wired to battery direct unless otherwise specified by Vancouver Fire & Rescue Services.

(g) Four (4) flashlight(s) shall be mounted in location determined at pre-paint inspection.

- Four (4) Streamlight Fire Vulcan LED orange flashlight(s) shall be provided. Each flashlight shall be orange in color and have a 12 volt DC charger and vehicle mount kit. Each flashlight shall have an LED spotlight style bulbs and reflectors. The flashlight(s) shall be wired to battery direct unless otherwise specified by Vancouver Fire & Rescue Services.
- Four (4) flashlight(s) shall be mounted in location determined at pre-paint inspection.
- The completed unit shall be provided with an Air Shore, A-Frame kit and assembly capable of being quickly mounted and dismounted from the specified 2" x 2" receiver tubes on unit. All tube receivers and rope anchoring points shall be adequately reinforced to prevent any damage or deflection of the body when used to its specified capacity. Easy access shall be provided to all receiver pin connections.

The kit shall include the following items;

- Two (2) Air Shore, model ART-F, 93" - 144", A-Frame Legs
- One (1) Air Shore, model ART-AFK-Centr, A-Frame Kit (Head, Pivots)
- One (1) Skedco, model SK-710, 3" double cammed pulley device
- One (1) Skedco, model SK-711, 3" double pulley without becket
- Two (2) SVI, A-Frame leg mounts, powdercoat painted black
- Two (2) SVI, Screw Jack Sleeves with Screw Base plate, powdercoat painted black
- One (1) SVI, 6-hole Anchor Bar (50" center-center), powdercoat painted black
- One (1) PMI, model RR125BW061E, 12.5 mm (1/2") NFPA static rope, E-Z blend, blue with white, 61M (200')
- One (1) PMI, model RB44043, standard rope bag (black)

The above items will be shipped complete with all pins and hardware necessary to attach A-Frame to apparatus receivers.

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The complete unit, when assembled shall have a weight rating of 600 lbs. work load and 9,000 lbs. maximum load using a 15:1 safety factor to match 12.5 mm (1/2") diameter rope ratings.

EQUIPMENT MOUNTING

The following list of equipment shall be provided by SVI Trucks or Vancouver Fire & Rescue Services indicated by gray shading. All equipment shall be mounted in a secure and safe way on completed unit while allowing easy access. Mounting brackets such as PAC, Zico, or approved equivalent will be used.

EQUIPMENT LIST

NOTE: ALL GRAY FIELDS ARE VFRS SUPPLIED EQUIPMENT.

SVI Master Pricing

Current City of Vancouver Equipment						Vendor Proposed Equipment		
Item	Current Make/Model	Part #	Description	Dimension (inches unless otherwise specified)	Unit Weight (lbs)	Offered Make/Model	Part #	Qty
1.00			In Cab Equipment					
1.01	Draeger	xam 1/2/5000	Air Monitor docking station			X-Dock 5300 X-am 125	8321880	1
1.02	Draeger	xam 2000	Four-gas detectors	48X130X4 4 mm	0.55	X-am 5000 CS	4543760	3
1.03	Draeger	xam 1/2/5000	Bump Test station		4.41	X-am 5000	8319131	1
1.04	Draeger		Print out station	4.25X2.25 X8.125	0.88	Inc. w/dock		1
1.05	Draeger	pump 1/2/5000	Various lengths of air monitor hoses			Viton X Dock	1203150	1

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1.06	Draeger		Air monitor harnesses (For X-am 5000)			Daeger	4543755	3
1.07	Draeger	cal gas un1956	Bump Test gas Cylinder		2.20	Draeger	4597160	1
1.08	Bushnell	Pinseeker 1500	Bushnell Range Finder	2 X 2.5 X 4.5	0.75	Bushnell	Pinseeker 1500	1
1.09	Bushnell	Field 6.8	Bushnell Binoculars	6.5 X 2.8 X 7.2	1.60	Bushnell Legend Ultra HD	8x42	1
1.10			Lock out box - Spare keys	2 1/2" x 10" x 12"		Masrterlock	7131D	1
1.11	Streamlight	80926-444451	Fire Vulcan Orange LED Handlamp.		1.65	Inc. w/ truck		4
1.12	MSA	Evolution 5000	TIC Camera		2.80			1
1.14			Lock box with lock box keys			Masrterlock	7149D	1
1.15			I/C command kit and status board			Command Concepts	Fire-Rescue	1
1.16			Bus compartment keys			NOT PROVIDED		1

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1.17			Set of Elevator Keys			Sparrows	Elevator Keys	1
1.18	Optronic Blue Eye	KB-4001	Hand held spotlight with dash plug-in			Inc. w/ truck		1
2.00			Air / Communi cations Line Bags	39" x 16 x 9" 100 Ft. E.	24.25			6
2.01	Greenline(air)	Made in shop	Red			CMC	Lassen, Red	3
2.02	CMC	540110	Blue			CMC	Lassen, Navy	3
3.00			Con / Space Communication Box					
3.01	Con Space	540014	USAR Task Force Kit		65.00	CMC	Con-Space	1
4.00			Supplied Air	25" x 20" x 8 1/2"	43.21			1
4.01	Greenline		Whips					4
4.02	Greenline		Quick Connects					6
5.00			THIS SECTION HAS BEEN REMOVED					
6.00			Black Pelican case	19 1/4 x 15 1/2 x 7"	17.64			1

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6.01			Blue Hold locks with 1 key				20
6.02			Lock out scissors				7
7.00			Orange Pelican case	19 1/4 x 15 1/2 x 7"	16.76		1
7.01			Team Locks - Red				13
7.02			Non Tech Locks - Purple				6
7.03			Safety Officer Lock - Green				1
7.04			Lock Out scissor				1
8.00			Rit Bags	24" x 14" x 9"	23.15		2
8.01			Face Piece				
8.02			Multiple Whips				
9.00			Escape Bottles & Harnesses	24" x 16" x 8"	13.23		4
9.01			with face pieces				

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9.02	Pelican	PTTEC8LN Y	Princeton Tec Shockwave LED Flashlight					2
9.03	Pelican	2010	Pelican SabreLite LED Flashlight					2
10.00			Grey APR Container	24 1/2" x 20 1/2 x 8 3/4	27.56			1
10.01	North	76008A	Full face Air purifying respirators					8
10.02	North	7581P100	APR Canister Filter Sets OV/P 100					8
11.00			Lead Climb Kit - Pelican Case	19 1/2 x 15 1/2 x 7 3/4	28.00			1
11.01			Gri Gri					4
11.02			SMC Stainless Carbiners					3
11.03			Black Gecko 30 k. Caribiners					23

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11.04			Petzel Ascenders				4
11.05			Shoulder Slings				4
11.06			1" Pre sewn loops (20 black -24 blue)				44
12.00			Red Rigging Equipment Bag	19" x 19" x 8"	30.86		1
12.01			Side A				
12.02			Brake Bar Rack				1
12.03			Large Steel Carabiners (Locking)				5
12.05			Omi Sling				1
12.06			8 ft Prusik				1
12.07			Figure 8 with ears				1
12.08			Gibbs				1
12.09			Rigging Plate				1
12.10			Utility Straps				2
12.11			2" Single Pulley Petzel CE 0197				1

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12.12			2" Double Pulley with becket (petzel)				1
12.13			PMI Rope Guard				1
12.14			25" 1/2 Static Kernmantle Rope				1
12.15			50" 1/2 Static Kernmantle Rope				1
12.16			24" 1 " Red Webbing				1
12.17			30" 1" Green Webbing				1
12.18			24"x 36" Canvas red				1
12.19			Roll Duct Tape				1
12.20			LRH With PMP Pulley				1
12.21			Large Steel carabiners				2
12.22			Prusiks				2
12.23			33' 9mm Cord				1

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13.00			Blue Rescue Bag	19" x 19" x 8	28.66			1
13.01			Side A					
13.02			Braker Bar Rack					1
13.03			Large Steel Carabiners (Locking)					5
13.04			Tri Link					1
13.05			Omi Sling					1
13.06			Side B					
13.07			Pick off Strap					1
13.08			Gibbs					1
13.09			Swivel					1
13.10			Petzel ID					1
13.11			PMI Rope					1
13.12			Line Transfer Haul Safe					1
13.13			Bee Suit	6 1/2 x 6 1/2 x 16"	Stuff Bag			1
13.14			24 ft Webbing Red	1"				1
13.15			30 ft Webbing Green	1"				1
13.16			Canvas Pad	27" x 32"				1

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14.00			High Angle First Aid Back Pack	24" x 12" x 10"	17.64			1
14.01			Mechanical Advantage Bag	25: x 12" x 12"	33.07			1
14.02			300' 1/2 Static Kermantle Rope					1
14.03			Double Prusik Minding Pulley's (PMP)					2
14.04			Single PMP					1
14.05			Blue Prusik	5"				1
14.06			Large Steel Locking Carabiners					4
14.07			Utility Belts					2
15.00			Safety Bag	25" x 12" x 12"	34.17			1
15.01			300 Ft 1/2 Static Kernamantle Rope					1
15.02			PMP (Prusik Minding Pulleys)					2

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15.03			Large Steel Locking Carabiners					5
15.04			Utility Belts					2
15.05			Blue Prusik	5"				1
15.06			Red Prusik	6"				1
15.07			Metres of 9mm Cordage					10
15.08			Shock absorber					1
15.09			Anchor Strap					1
15.10			Petzel I.D.					1
16.00			Mainline Bag	25" x 16"x 12"	33.07			1
16.01			300' 1/2 Static Kermnoth Rope					1
16.02			Large Steel Locking Carabiners					4
16.03			Single PMP					2
16.04			Utility Belts					2
16.05			Petzel ID					1
16.06			Rigging Plate					1
16.07			5ft Blue Prusik					1

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16.08			6 ft Red Prusik				1
17.00			Individual Team Rescue Bags	19" x 19" x 18"	27.56		
17.01			Class III Rescue Harness				8
17.02			Radio Harness				8
17.03			Double Fall Protection Lanyards				8
17.04			Red 1' Webbing	24'			8
17.05			Red Prusiks	12"			8
17.06			Green Prusiks	8"			8
17.07			Red Prusiks	6"			8
17.08			Blue Prusiks	5"			8
17.09			Large Steele Locking Carabiners				40
17.10			PMP Single				8
17.11			Sets of Elbow Pads				8
17.12			Sets of knee Pads				8

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17.13			Pairs of Goggles				8
17.14	Princeton Tec	EOS 11	Helmet Lights				8
17.15	Pro Tec	8816	Sets of insulated winter coveralls				8
18.00			Webbing and Rope				
18.01	CMC	CMC 200111	Flat webbing Orange	SUPPLIED			200'
18.02	CMC	CMC 200113	Flat webbing Red	FOR			200'
18.03	CMC	CMC 200112	Flat webbing Green	INVENTORY			200'
18.04	CMC	CMC 200116	Flat webbing Blue				200'
18.05	CMC	CMC 200117	Flat webbing Yellow				200'
18.06	Blue Water		300' spool of Yellow 1" tubular webbing	8 x 10 Spool	9.61		1
18.07	CMC	CMC 294465	300' 1/2 Ropes (dynamic) with bag	25 x 12 x 12	21.16		2

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18.08	CMC	K00140	100ft 1/2 utility ropes with bags	25 x 12 x 12	5.29			2
19.00			Rescue Stretchers and Equipment					
19.01	CMC	FROST-1	Wrap EVAC	48" x 12" x 5"	41.89	Wrap EVAC	FROST-1	1
19.02	CMC	752001	Pre Rigged SKED	37" x 13 1/2 x 9	17.64	CMC	752001	1
19.03	CMC	726112	Basket Stretcher	84" x 23 1/2 x 7"	33.07	CMC	726112	1
19.04	CMC		Spine Board & Spider Straps	72" x 16" x 2:"	19.84	CMC	726477	1
19.05	CMC		Vertical Bridle & Horizontal Bridle	11" x 9" x 9"	3.31	CMC	721923	1
19.06	CMC	726125	Ferno Stretcher	87" x 24 1/4 x 7 1/2	25.35	CMC	726125	1
19.07	CMC	740000	Plastic Stretcher Head Shield	24 1/2 x 18" x 8"	3.31	CMC	740000	1
19.08	CMC	N/A	Foam Stretcher Head bed	16" x 10" x 6"	2.20	BTM	262002	1
19.09	CMC	sk701	Skedoo Sked. Evac. Tripod	86 1/2 x 11 1/2	57.76	CMC	757000	1

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19.10	Conterra	RHP1	Rigging Hitch Plate	6 x1.5 x12	3.31	Conterra	RHP1	1
19.11	MSA	FP675-009	MSA Reach Pole Rescue Tool. Extends 6-12'. Self Locking Carabiners & Strap	78 1/4" x 3"	4.10	MSA	FP675-009	1
19.12	Ram Fan	ub20xxef7002	Ventilation Fan for confined space	23" x 19" x 19"	71.65	Ram Fan	UB20XX EF7002	1
19.13	Ram Fan	quick connect	Ventilation Hose	35 1/2 x 10 3/4 x 14 1/2	34.61	Ram Fan	FDT 2121624046	1
19.14	Ram Fan	manhole entry	Ventilation Saddle	53" x 14 1/2 x 15"	9.70	Ram Fan	MED 5100	1
20.00			Power tools and parts					
20.01	Dewalt	DW364	Circular saw with blades	20 x 14 x 14	13.01	Dewalt	DEW-DC3908	2
20.02	Milwaukee	6538-21	Reciprocating saw 15 amp with metal and wood blades	24 x 15 x 6	9.79	Milwaukee	MLK 6538-21	2

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20.03	Milwaukee	K119	Spare wood reciprocating blades			Milwaukee	MLK-48-01-6036	1
20.04	Milwaukee	K119	Spare metal reciprocating blades			Milwaukee	MLK-48-01-7187	1
20.05	Milwaukee	K119	Lubricating oil			Milwaukee		2
20.06	Milwaukee	0244-1/K119	1/2 " 0-6000rpm drill (600 rpm)			Milwaukee	0244-1	1
20.07	Bosch	bob-1375a	Angle grinder with blades	12 12 x 6	3.97	Bosch	1375A	1
20.08	Banner / Newman	DC20WH #6	Rebar cutter ¾ inch capable & replacement blades	16 x 4 x 8.5	25.35	BW	DC-20WH	1
20.09	Stihl	MSF 220	20 inch electric chain saw			Stihl	MSE 220	1
20.10	Stihl		Spare chain			Stihl		2
20.11	Stihl		Spare Bar			Stihl		1
20.12	Milwaukee		28V Reciprocating saw			Milwaukee	0719-20	2

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20.13	Milwaukee		28V Spare batteries			Milwaukee	48-11-2830	6
20.14	Milwaukee		28V 1/2" drills (Right Angle)			Milwaukee	0721-21	2
20.15	Milwaukee		28V Battery charger ((2) 3 bay chargers)			Milwaukee	48-59-0280	2
20.16	Hilti	bd1 00010048	Concrete Nail gun (N/A in USA)			Hilti	DX36	2
20.17	Hilti		Boxes 2 1/2" Concrete Nails			Hilti	2F 62 P8	2
20.18	Hilti		Boxes 3" Concrete Nails			Hilti	X-CP 72 P8	2
20.19	DeWalt	DW715	12 inch Single - bevel compound miter saw	40.1 x 22 x 26	42	DeWalt	DW715	2
20.20	SuperVac	SV3-16	Ventilation chain saw with full wrap depth guard and spare chain	35 x 12 x 14	14.00	Super Vac	SV3-16	2

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20.21	SuperVac	SVC3-14	Cut off saw and spare blade		13.23	Super Vac	SVC3-14	2
20.22	Stihl	MSE 220 16"	Chainsaw, electric, corded	35 x 10 x 12	13.67	Stihl	MSE 220	1
20.23	Stihl	Pro Mark	Chainsaw Chaps	36 x 1			Pro Mark 9/36"	2
20.24	Husqvarna	K960 Saw C/W blade	Concrete cutting saws with water attachment and blades	33 x 12 x 19	29.98	Husqvarna	K960	2
20.25	Husqvarna	K760-cut and break	Concrete cutting saws with water attachment and blades (K750 Cut & Break)			Husqvarna	K750	2
20.26	Husqvarna	5036 32 63-02	Water pump cans for concrete saws	3.5 gal. 27 x 10	2.20	Husqvarna		1

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20.27	Hilti	TE 80-ATC	Combi-hammers drills with bits (Model Discontin ued)	24 x15 x 6	22.49	Hilti	TE 7-C	2
20.28	Hilti	TE1000-AVR	Hilti breakers with chisel and flat bits	27 x 16 x 6	26.01	Hilti	TE 1000-AVR	2
20.29	Grainger/Eagle		2 1/2 gallon Pre-mixed fuel metal cans			Eagle	UI-25FS	2
20.30	Grainger/Eagle		5 gallon gasoline metal cans			Eagle	U25ISX5	2
21.00			Air/Hydraulic rescue tools					
21.01	Ajax	811RK	Ajax rescue kit (air chisel)	20 x 9 x 9	33.95	Ajax	811-RK	1
21.02	Westward	37C63	Bottle jacks (min 10 ton capacity 20 ton recomme nded)	10 x 10	28.00	Westward	13X034	2

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21.03	Scott	805825-01	Mobile air cart	18.5 x 15.25 x 27.3	41.12	Scott	805825-01	1
21.04	Holmatro	DPU 60PH	Hydraulic pump	19.5" x 18.4" x 22.5"	105.40			1
21.05	Holmatro	C20 OU	20m orange Core hose		20.10			2
21.06	Holmatro	C20 BU	20m blue Core hose		20.10			2
21.07	Holmatro	4050 NCT 11	Genral purpose cutter	30.7 x 10.6 x 8.6"	39.70			1
21.08	Holmatro	4260-UL-Spreader	Spreader	34.8 x 12.4 x 8.8"	52.70			1
21.09	Holmatro	4340-Telescoping Ram	Ram 2 Stage	11.9 x 5.2 x 13.8"	23.80			1
21.10	Holmatro	4350-Telescoping Ram	Ram 2 Stage	21 x 5.2 x 13.8"	35.90			1
21.11	Holmatro	4330 Ram	Rams	29.3 x 4.8 x 13.3"	34			3
21.12	Holmatro	BCT 3120	Battery Combi Tool Kit					1
21.13	Holmatro	DCS 10 U	Lift Bag Air Control Set (Double)					1
21.14	Holmatro	83FR-6	Lift Bag Yellow Hose					1

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21.15	Holmatro	HLB 12	Lift bag 12 ton	16" x 16" 408 x 408 mm	11			2
21.16	Holmatro	HLB 20	Lift Bag 20 ton	20" x 20" 508 x 508 mm	15			2
21.17	Holmatro	HLB 40	Lift Bag 40 ton	28" x 28" 714 x 714 mm	33			2
21.18	Holmatro	HLB 40	Lift Bag 24 ton	39.4" x 12.2" 1000 x 310 mm	20.9			2
21.19	Big Red	TR-8021	2 ton come-along with straps and chain kit	32 x 8 x 6	14.99			1
21.20	Paratech US&R Rescue Strut System	22-796900	US&R Rescue Strut System		2178.17	Paratech	22-796900	1
21.21			Ram support (B-Post) door sill					
21.22	Petrogen	6000/1006	Petro-gen torch, tips and safety gear	19 x 12 x 25	44.97	Petrogen	6000	1
22.00			Stanley Tools					

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22.01	Stanley	GT 23B02	Hydraulic Power unit (Model not compatible with specified tools.)	35x21.5x29" 90x55x74 cm	330.00	Stanley	GT 23B02	1
22.02	Stanley	BR 87	Hydraulic Breaker	29 x 16" 73.5 x 40cm	83.00	Stanley	BR 87	1
22.03	Stanley	DS 113000	Diamond Chain Saw	38 x 9" 97 x 23cm	26.00	Stanley	DS 113000	1
22.04	Stanley	TP 08013	Trash pump TP 4"	19 x 15" 48.3 x 38cm	65.00	Stanley	TP 08013	1
22.05	Stanley	TP 0300301	Trash pump TP 3"	14 x 12" 35.5 x 30.4cm	32.00	Stanley	TP 0300301	1
23.00			Hand Tools					
23.01		Standard Issue	Axe (peen head) with fiber glass handle		7.30	Darley	BG300	2
23.02		Standard Issue	Axe (flat head) with fiber glass handle		4.85	Darley	BG139FG28	2
23.03			Pike poles	8ft	7.00	Darley	T98002	3

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23.04			Bolt cutters Small size 18 inch length	18"	3.68	Darley	BK242	1
23.05			Bolt cutters Medium size 24 inch length	24"		Darley	BK243	1
23.06			Bolt cutters large size 36 inch length	36"	8.49	Darley	BK244	1
23.07	Rigid	31123	Rigid snake eye cams (Model N/A)	7 x 7 x 3	3.31	Rigid	Micro CA- 100	2
23.08	Stanley		Sledge hammer 4lb	15.2"	5.95	Stanley	FMHT560 09	2
23.09	Stanley	MRF64E	Sledge hammer 10lb	34"	11.99	Stanley	56019	2
23.10	Stanley	J14386	Sledge hammer 16lb	34"	17.86	Stanley	56816	2
23.11	Graintex	SH1620	Sledge hammer 20lb	36"	22.05	Graintex		2
23.12			Pick Axe	36"	8.49	Darley	AW187	2
23.13			Halligan tool	36"	11.02	Paratech	22-00601	2
23.14	Stanley	55-104	Wrecking bars	36"	8.40	Stanley	55-104	4

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23.15			pry bars	60"	17.86	Mayhew	40024	4
23.16			Round point shovels - D handle	45 x 10	4.30	Union	43106	4
23.17			long handled Scoop shovel			Remco	69825	4
23.18			Rebar shorts	5/8" 20 @ 3'				20
23.19	Sensors and Software	Conquest	Rebar locator and hot stick	4 x 8 x 2		Sensors and Software	Conquest	1
23.20	Stanley	34-813	100' tape measure		4.85	Stanley	34-812	2
23.21	Westward	WSWWPC 25R	Chisel and punch set	Round Nose 25 Piece	5.29	Westward	WSWWPC 25R	1
23.22	Westward	WSWDSB 29	Drill bit set	1/16-1/2 29 Piece	3.97	Westward	WSWDSB 29	2
24.00			Carpenters belts					
24.01	Westward	5M2P5	Carpenter s belts	18 x 10 x 8	1.98	Westward	5MZL1	2
24.02	Stanley	43-500	24" Level	24	1.39	Stanley	43-525	2
24.03	Stanley	15-087	Handsaw 20"	28	1.41	Stanley	15-087	2
24.04	Estwing	E3-28SM	24 oz framing hammers	16	1.50	Estwing	E3-28SM	2
24.05	Swanson	S0101	Speed squares		0.55	Swanson	S0101	2
24.06	Stanley	33-725	Tape measures imperial	25'	0.88	Stanley	33-725	2

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24.07	Swanson	TS157	Framing squares	16 x 24	2.20	Swanson	TS157	2
24.08	Estwing	proclaw 3-1	Nail-pullers	18	1.98	Estwing	OFJ1157	2
24.09	Stanley	10425	Utility knives		0.44	Stanley	10425	2
24.10	Stanley	47 099	Chalk lines		0.88	Stanley	47 099	2
24.11	Stanley	47-502	Chalk 5lb			Stanley	47-502	1
24.12			Lumber crayons					2
25.00			Trench Panels					
25.01	finnform		4'x8'x3/4"		70.00	FinnForm		4
25.02			2'x8'x3/4"		34.99	FinnForm		4
25.03			2'x8'x40 Schedule pipe		11.99			4
25.04	Ellis	C-2	Ellis clamps 2x4 post	2" x 10"	2.87	Ellis	C-2	6
25.05	Ellis	C-4	Ellis clamps 4x4 post	4" x 10"	6.61	Ellis	C-4	6
25.06	Ellis	C-6	Ellis clamps 6x6 post	6" x 16"	24.25	Ellis	C-6	6
25.07	Ellis	H-2	Ellis jack wrench 2x4	12 inch handle	10.63	Ellis	H-2	2
25.08	Ellis	H-4	Ellis jack wrench 4x4	12 inch handle	16.98	Ellis	H-4	2
25.09	Ellis	H-6	Ellis jack wrench 6x6	12 inch handle	29.98	Ellis	H-6	2

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25.10	Ellis	SJ-4	Ellis post screw 4x4	14.5 x 3.5 x 3.5	11.90	Ellis	SJ-4	10
25.11	Ellis	SJ-6	Ellis post screw 6x6	15.5 x 5.5 x 5.5	22.05	Ellis	SJ-6	10
25.12	Jacks		Hi-Lift jack-alls	48"	29.98	Hi-Lift	FR485	2
25.13	Binks		1/2 Air Hose 50 feet			Speedaire	5Z331	6
25.14		fir @ 25% moist	Cribbing 2x4x24"	24"	3.00			30
25.15			Cribbing 4x4x24"	24"	6.99			30
25.16			Wedges 2x4x24"	24"	1.50			30
25.17			Wedges 4x4x24"	24"	3.48			30
25.18			4"x4"x10'	36 x 36 x10	32.98			10
25.19			2"x6"x10'	22 x 12 x 10	7.98			10
25.20			Step chaulks 7.5"x5.5"x 22"	7.5"x5.5"x22" Doubled				4
26.00			Building Marker Kit					
26.01			Spray paint, orange, downward marking	12" x 12" x 8"	22.05			8

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26.02			Spray paint, orange, regular	12" x 12" x 8"	22.05			8
26.03			Lumber chalk		1.10			6
26.04			Lumber crayon, red		2.20			12
26.05			Lumber crayon, yellow		2.20			12
26.06			Lumber pencils		1.10			12
26.07			Flagging Tape 1", red		2.20			8
26.08			Flagging Tape 1", yellow		2.20			8
26.09			Flagging Tape 1", pink		2.20			8
26.10			duct tape		2.20			8
26.11			Fireline tape, red		0.66			6
26.12			Fireline tape, yellow		0.66			6
26.13			Chem light sticks, red, 8 hour		0.66			12
26.14			Chem light sticks, green, 8 hour		0.66			12

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26.15			Chem light sticks, yellow, 8 hour		0.66			12
27.00			Chisels and Bits					
27.01			TE 80 Bits					
27.02	Hilti	206509	Masonry drill bit 1/2"x13"	1/2' x 8"	0.30	Hilti	206509	6
27.03	Hilti	293472	Masonry drill bit 3/4"x13"	3/4" x 13"	0.40	Hilti	293472	6
27.04	Hilti	292979	Masonry drill bit 1"x13"	1 1/8" x 10 1/4"	0.50	Hilti	292979	6
27.05	Hilti	282263	Chisel bit, point,short	11"	0.60	Hilti	282263	6
27.06	Hilti	282266	Chisel bit, point, long	27 9/16"	3.31	Hilti	282266	6
27.07	Hilti	282270	Chisel bit,flat,short	1' x 27 9/16"	0.60	Hilti	282270	6
27.08	Hilti	282267	Chisel bit,flat,long	1" x11"	3.31	Hilti	282267	6
27.09			TE 1000 Bits					
27.10	Hilti	406765	Chisel bit, point,short	14 3/16"	1.10	Hilti	406765	6

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27.11	Hilti	406767	Chisel bit, point, long	27 9/16"	3.31	Hilti	406767	6
27.12	Hilti	406770	Chisel bit,flat,sh ort	1 1/4"x 14 3/16"	1.10	Hilti	406770	6
27.13	Hilti	406772	Chisel bit,flat,lon g	1 1/4" x 27 9/16"	3.31	Hilti	406772	6
28.00			Nail Kit					
28.01		25lb	3 1/4" Common	16 x 16 x 9	49.82			1
28.02		25lb	3 1/2" Duplex	16 x 16 x 9	49.82			1
28.03		25lb	2 1/4" Common	16 x 16 x 9	49.82			1
28.04	Bostitch	C12P131D	3 1/4" Coil Nails	15.5 x 10.5 x 3.5 each	48.50			2
28.05	Bostitch	C8P131D	2 1/2" Coil Nails	13.5 x 8 x 8 each	48.50			2
28.06	Bostitch	S12D131- FH	3 1/4" Cordless Nails	6 x 10.25 x 4.4	20.28			2
28.07	Bostitch	S8D131- FH	2 1/2" Cordless Nails	5.6 x 9.6 x 3.1	15.08			2
28.08	Bostitch	9B12061R	Fuel Cells	5.6 x 4.6 x 10.4 per 2pak	0.35			5
28.09	Bostitch	N89C-1	Full round head air- nailer	14 x 12.5 x 8	8.09			1

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28.10	Bostitch		Hose and regulator for gun with air bottle adapter	18" round 3" thick	11.02			1
28.11	Bostitch	GF28WW	Cordless air nailer with fuel cells	20 x 20 x 7	9.79			1
28.12	Dewalt	DWD520K	Drill with wood and metal bits 1/8 to 1 and 1/2" hammer drill bits	14 x 16 x 4	9.26			1
28.13	Bostitch	PN100K	Palm Nailer	5.5 x 4.25 x 3.25	2.91			1
29.00			Electrical Equipment					
29.01	Honda	EG6500	6 - 6.5 KW Portable Generator	27 x 21 x 23	179.00	Honda	EG6500	1
29.02			Electrical cords 10 gauge	50'	14.33			4
29.03			Electrical cords- 12 gauge	50'	14.33			8

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29.04	Deleted at PCM							
30.00			Adapter Box	32"L x 16"W x 12"H				
30.01			Twist to Wye adapter					2
30.02			Straight to Twist adapter					2
30.03			Twist to Straight adapter					2
30.04			Electrical splitters and adapters					4
31.00			General Equipment					
31.01			Depot tarps	12 x 12				6
31.02	Impact	IMP1010 WHT	EZ Up Tents 10x10	62 x 12 x 12	53.99			2
31.03			Decon 5 gallon pail and Kit	15 x 10				1
31.04	Crawford	38" SH38A-16	Aluminum saw horses	36 x 25 x 2.5	17.20			4

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31.05	Little Giant	Type 1AA Model 22	Little Giant folding ladder w leg levelers x2	67 x 27.5 x 8	54.01			1
31.06	Firehall Issue		water key (house)	60	21.38			1
31.07	Firehall Issue		water key (street)	60	21.38			1
31.08			Case ear plugs, hearing protection					1
31.09			Ear muffs, hearing protection					6
31.10			Box heavy duty disposable shop rags and mounting bracket					1
31.11			1 set 20ft jumper cables					1
31.12			Spare SCBA Bottles					15

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31.13			Box of Tyvex coveralls in rubbermaid	21.5x 13 x15	11.02			1
31.14			Battery Kit - 24 AAA, 24AA, 24 C and 24 D with plastic box with lid					1
32.00			Tool Box					
32.01			Heavy duty multi drawer tool box for hand tools			Inc. w/ truck		1
32.02	Proto		Standard combination wrench 1/4 to 1 1/2 inch -12 point		9.92	Proto		1
32.03	Proto		Metric combination wrench 7mm to 36mm - 12 point		9.92	Proto		1

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32.04	Proto		1/2" drive deep sockets 12 point 1/4 to 1 1/2 inch		7.94	Proto		1
32.05	Proto		1/2" drive deep sockets 12 point 9mm to 36mm		7.94	Proto		1
32.06	Ingersoll	IR-21350timax	Impact Gun	9.5 x 9.5 x 4.5	11.68	Ingersoll	IR-2135 TIMAX	1
32.07			Air Regulator and hose	50ft	7.72			1
32.09	Proto	PRT-74114	Deep impact sockets 3/8 inch to 1 1/2 inch		7.94	Proto	J74114	1
32.10	Proto		1/2" drive impact sockets standard 9mm to 36mm		3.97	Proto	J74216	1
32.12	Proto		4 inch extension. 1/2" drive - impact.		0.30	Proto, 3"	J7182P	1

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32.13	Proto		7 inch extension. 1/2" drive - impact.	0.50	Proto, 5"	J7181P	1
32.14	Proto		10 inch extension. 1/2" drive - impact.	0.99	Proto	J7183-00	1
32.15	Proto		1/2 inch drive flex bar 24 inch length	1.50	Proto, 18"	J5468	1
32.16	Proto		1/2 inch drive ratchet 15 inch length	1.10	Proto	J5467	1
32.17	Proto		1/2 inch drive impact univesral joint	0.30	Proto	J74470P	1
32.19	Ingersoll		Impact ratchet 1/2 inch drive (air operated) (See 32.06)	2.65	Ingersoll	IR-2135 TIMAX	2
32.20	Proto		1 5/16 inch jaw opening (adjustable wrench)	1.00	Proto	J710S	1

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32.21	Proto		2 1/16 inch opening (adjustable wrench)	5.60	Proto	J718S	1
32.22	Proto		Flat blade (Screwdriver) Set	0.50	Proto	J1206SRF	1
32.23	Proto		Phillips (Screwdriver) Set	0.50	Proto	J1206SP	1
32.24	Proto		Robertson (Screwdriver) Set	0.50	Proto		1
32.25	Proto		Torx Head Screwdriver Set	0.50	Proto	J1209ST	1
32.26	Proto		Mult bit screwdriver	0.66	Proto	J9320	2
32.30	Proto		Linesman plier	1.00	Channello ck	369	1
32.31	Proto		Slip joint plier set	1.00	Channello ck	TR5	1
32.32	Proto		Side cutter	1.00	Channello ck	348	1
32.33	Proto		Needle nose plier set	1.00	Proto	J2806SMP	1
32.34	Channello ck	911-CB	Cable cutter	1.00	Channello ck	911-CB	1
32.35	Vise Grip		10 inch length curved jaw	1.20	Vise Grip		1

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32.36	Vise Grip		10 inch length straight jaw	1.20	Vise Grip		1
32.37	Proto		Aviation style tin snips	0.90	Proto	J303L/J303R	1
32.38	Vise Grip		Chain clamp locking pliers	1.20	Vise Grip		1
32.39	Stanley		Wonder bar pry bar 12"	1.10	Stanley	55-515	1
32.40	Nicholson	21870	Four in one hand file	1.00	Nicholson	21870	2
32.41	Quik Grip		Hand clamps 24 inch length	3.00	Quik Grip	524QCN	2
32.42	Quik Grip		Hand clamps 18 inch length	5.80	Quik Grip	518QCN	1
32.43	Quik Grip		Hand clamps 36 inch length	18.96	Quik Grip	536QCN	1
32.44	Proto		Hacksaw with 8 extra blades (bi- metal)	2.43	Proto		1
32.45	Proto		Dead blow hammer 3 pound	2.87	Proto	J1431DB	1

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32.46	Proto		Ball peen hammer 24 oz		1.50	Proto	J1324PGD	1
33.00			Extinguishers					
33.01			20lb CO2 extinguisher			Darley	H793/AF871	2
33.02			20lb ABC extinguisher			Darley	AF555/AF871	2
33.03			5Lb ABC extinguisher			Darley	AF553/AF870	2
34.00			Dewatering					
34.01	Honda	WH20XK2C1	Gas Water Portable Pump	22 x 16 x 17	68.03	Honda	WH20X	1
34.02	Honda	a2115200x20-02	Suction hose for Honda Portable pump	240"x2"		Honda	1240-2000-20H	2
34.03	Honda	a2410200x100-01	Discharge hose for Honda portable pump			Honda	1145-2000-50H	2
34.04	Bur Cam	8515140	electric sump pump high volume	11.8 x 10.2 x 13.5	26.68	Honda	WSP53	1

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34.05	Apache	98128652	100 feet discharge hose for sump pump	1.5"	9.92	Apache	98128652	1
35.00			Exterior of Apparatus					
35.01			Removable portable winch min. 900lbs rating			Inc. w/truck		1
35.02			Multiple receiver anchors for ropes located at each anchor spot			Inc. w/truck		1
36.00			Internal of Apparatus					

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36.01			1 Gin pole set, high point for winch and rope work (attaches to anchor points on the L.S. of the body)		Inc. w/truck		1
36.02			20 foot jumper cables (See 31.11)				1
37.00			Auto extrication kit (includes)	23"L x 19"W x 8"D			
37.01	Genesis	How-97000	Pyroshield Rescue Blanket		Darley	BA125	1
37.02			Glass master with window punch (Inc. with 37.01)	5.7			1

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37.03			Cable cutter (See 32.34)			1
37.04			Art glass removal tool (Inc. with 37.01)			1
37.05			Wonder bar (See 32.39)			1
37.06			Pro Hack Saw and Blades (See 32.44)			1
37.07			V- Knife belt/ Wire cutter (Inc. with 37.01)			1
37.08			6 Piece hand tool set (Inc. with 37.01)			1
TOTAL						

REMAINING NFPA MINOR EQUIPMENT BY PURCHASER

All other minor equipment not specified above, but required by NFPA 1901 for special service vehicles, section 10.5.1 shall be supplied and mounted by Vancouver Fire & Rescue Services before the unit is placed in emergency service.