

Topeka Fire Department
Topeka, KS
Haz-Mat SVI #1253
Production Specification



APPARATUS BRAND

The apparatus provided shall be a Spartan Emergency Response brand of Spartan Motors USA, Inc.

INTENT OF SPECIFICATIONS

Spartan Motors USA, Inc. ("Spartan") of Charlotte, MI and the authorized Dealership representing Spartan submit the following detailed proposal for your consideration.

The following items have been specifically addressed regardless of whether they are included in the published specifications.

This detailed proposal supersedes the published specifications and will be the specifications in which the apparatus will be designed and manufactured to, if awarded the contract.

Any mutually agreed changes made during a pre-construction meeting or build process, will become part of the contract and the build specification. Based on these processes any costs and or credits will be applied to the final invoice.

We maintain a complete on-site parts department with same-day shipping provided for all necessary service parts.

Spartan is a U.S. based provider of fire apparatus. Spartan designs and manufactures fire and rescue apparatus which utilize the approach of complete product integration including the apparatus body and pump house structures. Engineering, assembly and testing all take place at Spartan facilities.

Each apparatus is quality control inspected with full documentation at each step of the manufacturing process.

The unit will be manufactured at a Spartan manufacturing facility.

STANDARD FEATURES PROVIDED

The unit will be designed and assembled so that all recommended daily maintenance checks can be performed easily by the operator without the need for hand tools.

Apparatus components that interfere with removal or repair of other major components will be attached with fasteners and installed with normal hand tools. These components will not be welded or otherwise permanently secured into place.

A manufacturer's certification of GVWR and GAWR on a nameplate will be affixed to the completed vehicle.

A Fire Apparatus Safety Guide published by Fire Apparatus Manufacturer's Association shall be provided with the apparatus upon delivery. This manual includes essential safety information for fire fighters, fire chiefs, apparatus mechanics, and fire department safety officers. The guide is applicable to municipal, wildland, and airport firefighting apparatus manufactured on either custom or commercial chassis.

A permanent plate mounted in the driver's area of the cab unless otherwise specified will be supplied. It will specify the quantity and type of the following fluids used in the vehicle: engine oil, engine coolant, chassis transmission fluid, generator fluid (if used), and drive axle lubrication fluid.

A permanent plate in the driver's compartment will be installed, specifying the seating capacity of the included cab.

Signs that state "OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION" will be provided.

They will be visible from each seated position.

An accident prevention sign will be located at the rear step area of the apparatus. The sign will warn personnel that standing on the step while vehicle is in motion; is prohibited.

The height of the fully loaded vehicle's center of gravity will not exceed the chassis manufacturer's maximum limit.

The front to rear weight distribution of the fully loaded vehicle will be within the limits set by the chassis manufacturer. The front axle loads will be less than the maximum axle loads specified by the chassis manufacturer, under full load and all other loading conditions.

The difference in weight on the end of each axle, from side to side, when the vehicle is fully loaded and equipped will not exceed 7 percent.

All manufacturers' operations and maintenance documents supplied with components and equipment installed on, or supplied with the completed vehicle will be provided with the completed unit.

The unit will be protected by permanent Anti-Freeze for operation between -30 degrees F to +235 degrees F.

All fluid levels and applicable pressures will be brought to proper levels and noted prior to final delivery.

The GAWR and GVWR of the chassis will be adequate to carry the fully equipped apparatus including water and other tanks filled, the specified hose load, unequipped personnel weight, ground ladders, and a miscellaneous equipment allowance per (NFPA) 1901, Standard for Automotive Fire Apparatus, criteria as well as additional equipment and personnel specified by the purchaser. Personnel are calculated at 250 lbs. per person.

The apparatus will be designed and constructed to follow the requirements of the following recognized standards unless otherwise specified by the customer:

(NFPA) 1901 Standard for Automotive Fire Apparatus
Federal Motor Vehicle Safety Standards (FMVSS)
Department of Transportation (DOT)
Interstate Commerce Commission (ICC)
Society of Automotive Engineers (SAE)
Underwriters Laboratories, LLC (UL, LLC)

The apparatus when fully loaded will be capable of the following performance on dry, level paved roads in good condition. Item (d) not included requiring an incline.

A continuous minimum ten (10) mile road test shall be conducted with the apparatus fully loaded.

The apparatus shall be inspected for any loss of power, overheating, noise from the transmission or drive lines, any vibrations and noise.

(a) From a standing start the vehicle will attain a true speed of 35 mph within 25 seconds.

(b) From a steady pace of 15 mph, the vehicle will accelerate to a true speed of 35 mph within 15 seconds. This will be accomplished without moving gear selector.

(c) The vehicle will attain a minimum top speed of 50 mph.

(d) The apparatus will be able to maintain a speed of at least 20 mph on any grade up to and including 6 percent.

DELIVERY

To insure proper break-in of all components while still under warranty, the apparatus **shall be delivered under its own power**. The unit will remain insured by the apparatus manufacturer until the department accepts the unit.

SERVICE

Due to the importance of keeping this vital piece of firefighting apparatus in service with a minimum of downtime, the manufacturer shall maintain a network of service centers with factory-trained personnel.

WARRANTY

Warranties applicable to the chassis and body (excluding vendor supplied components {engine, transmission, axles, etc.} which carry their own specific warranties) will be addressed by a single point warranty service provider approved by the manufacturer to perform service as necessary.

BID/PROPOSAL DRAWING

For purposes of evaluation, Spartan shall provide a drawing illustrating, but not limited to, the overall dimensions, wheelbase, and overall length of the proposed apparatus.

The drawings shall be large "D" size (minimum 24.00 inches x 36.00 inches).

Other specified equipment shall be required to be included with the bidder's proposal package.

PRE-CONSTRUCTION DRAWINGS

After the award of the bid, Spartan shall provide detailed colored engineering drawings including, but not limited to, the overall dimensions, wheelbase, and overall length of the proposed apparatus for use at the pre-construction conference.

The drawings shall include, but shall not be limited to the right, left, top, front and rear views of the apparatus.

SINGLE SOURCE MANUFACTURER

Spartan is defined as a single source apparatus manufacturer.

Spartan designs and manufactures our products utilizing an approach that includes complete product integration, including the apparatus Chassis, Chassis Cab, Pump Module and Body Module being constructed, assembled, and tested on company facilities.

Warranties qualified to the Chassis, Pump Module and Body Module design construction (excluding vendor component warranties such as engine, axles, transmission, and pumps, etc.) will be from Spartan.

SURCHARGE

Notwithstanding anything to the contrary in this Agreement, if the costs to Seller of acquiring any of the raw materials (including without limitation actual raw materials and/or conversion costs) used in the production and supply of the product(s) and/or goods (including, without limitation, the costs of acquiring raw materials, costs associated with tariffs, labor costs, shipping costs, or any other costs) materially increase from the cost levels as of the date of this Agreement, the parties agree that (1) Buyer shall have the obligation to pay and reimburse to Seller such increased costs, or (2) Seller

shall have the right in its discretion to terminate this Agreement, without further liability, upon ten (10) days' notice to buyer. For purposes hereof, a "material increase" is defined to mean 5% of the quoted product and/or goods.

FINITE ELEMENT ANALYSIS AND TESTING

Finite Element Analysis has been utilized in evaluating and engineering the critical areas of the Spartan apparatus body and pump module.

Prototype bodies were subjected to rigorous testing over varied terrains simulating different environmental conditions.

The purpose of such complex engineering methods of analysis is to ensure the longevity of the design by analyzing stress levels throughout the body and pump module incorporating the structural supports wherever necessary.

There has been a minimum of three (3) different load cases (per DOT, FHWA, and TTMA recommended practice) applied and analyzed to properly display the different areas and levels of stresses that will be present under the various operating conditions of the apparatus. This is in addition to the static stress analysis. The analysis has included the weight of the structure plus an estimate of all the components that exist on a fully loaded apparatus (i.e. tank, water, hose load, equipment in compartments, etc.).

Analysis has also been conducted on the mounting system for the apparatus body and pump module.

SUPPLIED INFORMATION & EXTRAS

There shall be two (2) copies of apparatus manuals with all manufactured apparatus.

The manuals shall include, but not be limited to: all component warranties, users' manuals and information for supplied products, apparatus engineering information including drawings and build prints, and whatever other pertinent information Spartan can supply to its customer regarding the said apparatus.

Included in the delivery of the unit, Spartan will also include spare hardware and extra fasteners, paint for touch-up, information regarding washing and care procedures, as well as other recommendations for care and upkeep of the general apparatus.

Spartan will also supply a manufacturer's record of apparatus construction details, including the following information:

- Owner name and address
- Spartan model and serial number
- Chassis make, model, and serial number
- GAWR of front and rear axles
- Front tire size and total rated capacity in pounds
- Rear tire size and total rated capacity in pounds
- Chassis weight distribution in pounds with water (if applicable) and Spartan mounted equipment (front and rear)
- Engine make, model, serial number, rated horsepower, and no load governed speed
- Type of fuel and fuel tank capacity
- Electrical system voltage and alternator output in amps
- Battery make and model, capacity in CCA
- Paint numbers
- Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle (with the water tank full (if applicable) but without personnel, equipment, and hose)

- Written load analysis and results of the electrical system performance tests
- Transmission make, model, and type
- The engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum no load governed speed

WARNING AND INFORMATION LABELS

All warning and informational labels (non-vendor specific) shall be provided in compliance with (NFPA) 1901, Standard for Automotive Fire Apparatus, and installed in the appropriate locations to alert the operator of potential hazards and operating instructions.

ONLINE CUSTOMER INTERACTION

Spartan shall provide the capability for online access through the Spartan website.

The fire department shall be able to view digital photos of their apparatus in the specified phases of construction.

The following phases will be captured and displayed:

1. Chassis when available at manufacturing facility
2. Body – Prior to Paint
3. Body – Painted
4. Assembly – 80% Complete

LIABILITY INSURANCE COVERAGE

Spartan certificate of liability insurance coverage is included in this proposal, in the required amount of \$10 million.

GENERAL WARRANTY

A warranty shall be offered for each new fire apparatus manufactured by Spartan for a period of two (2) years from the date of delivery, except for a commercial chassis (if specified) and certain other components as noted in the next paragraph.

The warranty on the chassis, engine, transmission, tires, storage batteries, generators, electrical lamps and other devices subject to deterioration is limited to the warranty of the chassis manufacturer thereof and adjustments for the same are to be made directly with the chassis manufacturer.

This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on our part.

We neither assume nor authorize any person to assume for us any liability in connection with the sales of our apparatus unless made in writing by Spartan.

Please see the official warranty document in the appendix (attached) for specific details.

STRUCTURAL BODY WARRANTY

A structural Aluminum body warranty shall be provided by Spartan for products of its manufacture to be free from defects in material and workmanship under normal use and service for a period of ten (10) years.

Please see the official warranty document in the appendix (attached) for specific details.

PAINT WARRANTY

A Prorated Paint Warranty shall be provided by Spartan for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of ten (10) years.

Please see the official warranty document in the appendix (attached) for specific details.

MULTI-PLEXED ELECTRICAL WARRANTY

A four (4) year limited (V-MUX) multiplex system warranty, of Weldon Technologies, Inc.; shall be provided by Spartan for parts and labor, while under normal use and service; against mechanical, electrical and physical defects from the date of installation.

The warranty shall exclude; sensors, shunt interface modules, serial or USB kits, transceivers, cameras, GPS, and electrical display screens, which shall be limited to a period of one a (1) year repair parts and labor from the date of installation.

FACTORY PRECONSTRUCTION CONFERENCE

The factory authorized Distributor shall be required, prior to manufacturing, to have a pre construction conference at the manufacturing facility with a factory representative present and individuals from the Topeka to finalize all construction details.

The factories authorized distributor shall, at his expense, provide transportation, lodging, and meals. Any distance greater than 200 miles shall be by commercial air travel.

FINAL INSPECTION CONFERENCE

The factory authorized Distributor shall be required, during manufacturing, to have a final completion inspection conference at the site of the manufacturing facility with One (1) individuals from the Topeka to inspect the apparatus after construction.

The factories authorized distributor shall, at his expense, provide transportation, lodging, and meals. Any distance greater than 200 miles shall be by commercial air travel.

LIABILITY INSURANCE COVERAGE

In order to protect the department and its personnel, the bidder shall show proof that it has no less than \$10 million in liability insurance in force. A certificate of coverage shall be included in the bid package. Failure to carry liability insurance of at least this amount or failure to include proof of coverage shall be cause to reject the bidder's proposal.

OVERALL HEIGHT REQUIREMENT

There is no overall height (OAH) restriction for this vehicle.

OVERALL LENGTH REQUIREMENT

There is no overall length (OAL) restriction for this vehicle.

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.

INTERNET IN-PROCESS SITE

The manufacturer shall post and maintain a website where the Topeka 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.

RESPONSIBILITY OF PURCHASER

It shall be the responsibility of the purchaser to specify the details of the apparatus in addition to the requirements in NFPA 1901 needed by the manufacturer to build the apparatus, including:

- 1) Requirements not uniquely specified in NFPA 1901, such as the type of apparatus desired.
- 2) Any features of the apparatus desired in addition to, or in excess of, the requirements in NFPA 1901.

After acceptance of the fire apparatus, the purchaser shall be responsible for ongoing training of personnel to develop and maintain proficiency regarding the proper and safe use of the apparatus and the associated equipment.

RESPONSIBILITY OF CONTRACTOR

The Contractor shall provide a detailed description of the apparatus, a list of equipment to be furnished, and other construction and performance details to which the apparatus shall conform. The detailed description of the apparatus shall include, but shall not be limited to,

1. Estimated In-Service Weight,
2. Wheelbase, Turning Clearance Radius,
3. Principal dimensions, Angle of Approach, Angle of Departure,
4. Transmission, Axle Ratios.

The Contractor's detailed description shall include a statement specifically describing each aspect of the delivered apparatus that will not be fully compliant with the requirements of this standard.

The purpose of these Contractor specifications shall be to define what the contractor intends to furnish and deliver to the purchaser.

Responsibility for the apparatus and equipment shall remain with the contractor until they are accepted by the purchaser.

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.

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 6 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).

HIGHWAY PERFORMANCE

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) Accelerating from 0 to 35 mph (55 km/hr) within 25 seconds on a 0 percent grade
- 2) Attaining a speed of 50 mph (80 km/hr) on a 0 percent grade
- 3) Maintaining 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 (109 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 (95 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.

FIRE APPARATUS DOCUMENTATION

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

- 1) The manufacturers record of apparatus construction details, including the following documents:
 - a) Owner's name and address
 - b) Apparatus manufacturer, model, and serial number
 - c) Chassis make, model, and serial number
 - d) GAWR of front and rear axles and GVWR
 - e) Front tire size and total rated capacity in pounds (kilograms)

- f) Rear tire size and total rated capacity in pounds (kilograms)
 - g) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
 - h) 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
 - i) Type of fuel and fuel tank capacity
 - j) Electrical system voltage and alternator output in amps
 - k) Battery make, model, and capacity in cold cranking amps (CCA)
 - l) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
 - m) Ratios of all driving axles
 - n) Maximum governed road speed
 - o) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), maximum discharge pressure capability rating, and serial number
 - p) Pump transmission make, model, serial number, and gear ratio
 - q) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
 - r) Water tank certified capacity in gallons or liters
 - s) Foam tank (if provided) certified capacity in gallons (liters)
 - t) Aerial device type, rated vertical height in feet (meters), rated horizontal reach in feet (meters), and rated capacity in pounds (kilograms)
 - u) Paint manufacturer and paint number(s)
 - v) Company name and signature of responsible company representative
 - w) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose)
- 2) Certification of compliance of the optical warning system (*see 13.8.16*)
 - 3) Siren manufacturer's certification of the siren (*see 13.9.1.1*)
 - 4) Written load analysis and results of the electrical system performance tests (*see 13.14.1 and Section 13.15*)
 - 5) Certification of slip resistance of all stepping, standing, and walking surfaces (*see 15.7.4.5*)
 - 6) If the apparatus has a fire pump, the pump manufacturer's certification of suction capability (*see 16.2.4.1*)
 - 7) 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 (*see 16.2.4.2*)
 - 8) If the apparatus has a fire pump, a copy of the apparatus manufacturer's approval for stationary pumping applications (*see 16.3.1*)
 - 9) If the apparatus has a fire pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed (*see 16.3.2.2*)
 - 10) If the apparatus has a fire pump, the pump manufacturer's certification of the hydrostatic test (*see 16.5.2.2*)
 - 11) If the apparatus has a fire pump with a maximum discharge pressure capability rating that exceeds the hydrostatic test pressure of 16.5.2.1, the pump manufacturer's certification of the hydrodynamic test
 - 12) If the apparatus has a fire pump, the certification of inspection and test for the fire pump (*see 16.13.1.1.5 or 16.13.1.2.4 as applicable*)
 - 13) If the apparatus is equipped with an auxiliary pump, the apparatus manufacturer's certification of the hydrostatic test (*see Section 17.13*)
 - 14) When the apparatus is equipped with a water tank, the certification of water tank capacity (*see Section 18.6*)
 - 15) If the apparatus has an aerial device, the certification of inspection and test for the aerial device (*see Section 19.24*)
 - 16) If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1911
 - 17) If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy (*see 20.10.4.2*) and the final installer's certification the foam proportioning system meets this standard (*see 20.11.2*)
 - 18) If the system has a CAFS, the documentation of the manufacturer's pre delivery tests (*see Section 21.9*)
 - 19) If the apparatus has a line voltage power source, the certification of the test for the power source (*see 22.15.7.2*)

- 20) If the apparatus is equipped with an air system, air tank certificates (see 24.5.1.2), the SCBA fill station certification (see 24.9.6), and the results of the testing of the air system installation (see 24.14.5 and 24.15.4)
- 21) Any other required manufacturer test data or reports

OPERATIONS AND SERVICE DOCUMENTATION

The contractor shall deliver with the fire apparatus 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.

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:
 - a) Pictorial representations of circuit logic for all electrical components and wiring
 - b) Circuit identification
 - c) Connector pin identification
 - d) Zone location of electrical components
 - e) Safety interlocks
 - f) Alternator–battery power distribution circuits
 - g) 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.

FIRE APPARATUS SAFETY GUIDE

A Fire Apparatus Safety Guide published by Fire Apparatus manufacturer's Association shall be provided with delivered vehicle. This manual includes essential safety information for fire fighters, fire chiefs, apparatus mechanics, and fire department safety officers. The guide is applicable to municipal, wildland, and airport fire fighting apparatus manufactured on either custom or commercial chassis.

STATEMENT OF EXCEPTIONS

The final-stage manufacturer 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 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.

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 manufacturer shall establish the estimated in service weight during the design of the vehicle.

The estimated in-service weight shall include the following:

1. The chassis, body and tank(s)
2. Full fuel, lubricant, and other chassis or component fluid tanks or reservoirs
3. Full water and other agent tanks
4. *250 lb (114 kg) in each seating position
5. Fixed equipment such as pumps, aerial devices, generators, reels and air systems as installed
6. Ground ladders, suction hose, designed hose load in their hose beds and on their reels
7. An allowance for miscellaneous equipment that is the greatest of the following:
 - a) The values shown for items 1 - 7
 - b) A purchaser-provided list of equipment to be carried with weights
 - c) A purchaser-specified miscellaneous equipment allowance

The manufacturer shall engineer and design the fire apparatus such that the completed apparatus, 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 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.

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 unequipped fire apparatus in feet and inches (meters), the length of the completed fire apparatus in feet and inches (meters), and the GVWR in tons (metric tons).

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.

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.	10,000 lb to 15,000 lb (4,500 kg to 7,000 kg) GVWR	2,000	910
		15,001 lb to 20,000 lb (7,001 kg to 9,000 kg) GVWR	2,500	1,135
		20,001 lb to 30,000 lb (9,001 kg to 14,000 kg) GVWR	3,000	1,350
		30,001 lb to 40,000 lb (14,001 kg to 18,000 kg) GVWR	4,000	1,800
		40,001 lb to 50,000 lb (18,001 kg to 23,000 kg) GVWR	6,000	2,700
		50,001 lb to 60,000 lb (23,001 kg to 27,000 kg) GVWR	8,000	3,600
		60,001 lb and up (27,001 kg) GVWR	10,000	4,500

TESTING

ROAD TEST

Each apparatus shall be tested by the manufacturer before delivery to verify that it meets the following criteria;

Tests shall be conducted at a location and in a manner that does not violate local, state or provincial, or federal traffic laws. Tests shall be conducted on a dry, level, paved surface that is free of loose material, oil, or grease. Tests shall be conducted with the water and foam tanks full (water or product).

The apparatus shall accelerate from 0 to 35 mph (55 km/hr) within 25 seconds. The apparatus shall attain a speed of 50 mph (80 km/ hr).

The auxiliary braking system, if so equipped, shall function as intended by the auxiliary braking system manufacturer.

The air service brakes shall bring the apparatus to a complete stop from a speed of 20 mph (32.2 km/hr) in a distance not exceeding 35 ft (10.7 m).

The hydraulic service brakes shall bring the apparatus to a complete stop from a speed of 30 mph (48.2 km/hr) in a distance not exceeding 88 ft (26.8 m).

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

The vehicles low voltage electrical system shall be tested and certified by the manufacturer. 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.

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

DOCUMENTATION

The manufacturer shall deliver the following with the fire apparatus:

- 1) Documentation of the electrical system performance tests
- 2) A written electrical load analysis, including the following:
 - a) The nameplate rating of the alternator
 - b) The alternator rating
 - c) Each of the component loads specified that make up the minimum continuous electrical load
 - d) Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load
 - e) 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:

- 1) The power source output voltage, frequency and amperes
- 2) The prime mover's oil pressure, water temperature and transmission temperature, if applicable
- 3) The power source hydraulic fluid temperature, if applicable
- 4) 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:

- 1) Altitude
- 2) Barometric pressure
- 3) 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.

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 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:

- 1) Isolate the power source from the panel board and disconnect any solid state low voltage components
- 2) Connect one lead of the dielectric tester to all the hot and neutral buses tied together
- 3) Connect the other lead to the fire apparatus frame or body
- 4) Close any switches and circuit breakers in the circuit(s)
- 5) 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.

CONSTRUCTION PERIOD

The completed vehicle shall be delivered within five hundred ninety (590) days after pre-construction meeting and receipt and approval of any signed change orders from Topeka.

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 written notice to Topeka as to delays and to what extent these delays have in completing vehicle within the stated construction time period.

Dealer Commission

PRE-CONSTRUCTION CONFERENCE

A pre-construction conference shall be required at the Contractor's factory for five (5) personnel from the Topeka 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.

FINAL INSPECTION CONFERENCE

A final inspection conference shall be required at the Contractor's factory for five (5) personnel from the Topeka 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 Topeka'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 Topeka regarding the operation, care and maintenance of the apparatus and equipment supplied at Topeka location.

The Delivery Engineer shall set delivery and instruction schedule with the person appointed by Topeka.

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

CAB TO AXLE DIMENSION

Cab to axle will be 176".

FRONT BUMPER

The front bumper shall be provided by the cab/chassis manufacturer.

BUMPER GRAVELSHIELD

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

AIR HORNS

Two (2) Grover 18" Aquatone chrome plated air horns shall be recess mounted in the front bumper, one (1) on each side outboard of the frame rails. An emergency air shut off valve shall be provided in the cab.

Air horns shall be configured to oscillate when activated.

AIR HORN ACTIVATION

Air horn(s) activation if specified shall be supplied by the cab/chassis manufacturer.

FRONT TOW PROVISIONS

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

SIREN SPEAKER

The siren speaker(s) 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 by the customer cab/chassis manufacturer.

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

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:

1. 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.
2. 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 SYSTEM (VERTICAL)

The existing exhaust tailpipe shall be modified to a vertical exhaust pipe. The tailpipe shall extend above the body height a minimum of 12". Where the pipe extends through the vertical chimney of body the exhaust piping shall be wrapped with high temperature Fiberglass material to reduce body components exposed to high temperatures.

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.

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.

RADIO WIRING

All purchaser provided or vendor supplied radios, if specified shall be powered from the battery master switch, unless specified otherwise.

COMMUNICATION RADIO/ANTENNA INSTALLATION

There shall be three (3) mobile communication radio(s) with antenna installed in the cab. The location of radio shall be determined by the Topeka at the pre-construction meeting. All required radio programming shall be responsibility of Topeka. Radio(s) may not be fully tested if no radio program is provided with radio and will be responsibility of Topeka after delivery.

Radio shall be installed per Manufacturer's requirements and wired for proper 12 volt power and ground.

**Three (3) radio installs, installed under or in front of cab desk with four (4) remote head.
One (1) head will be in the chassis supplied cutout in dash, and the other three(3) on the desk.
UHF, VHF, 800mhz.**

All wired battery hot with master switch trigger.

Note: all customer supplied radios will be Motorola APX8500 w/ remote heads.

- Radio shall be Motorola model _____.

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. Each 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.

Antenna #1 mounted on specified antenna rail.

Due to multiple configurations of antenna whips, the Body Manufacturer shall provide the antenna base, and Topeka shall provide the whip.

The end of antenna cable shall be routed to specified command desk. Cable shall be labeled

Antenna #2 mounted and installed on specified antenna rail.

Due to multiple configurations of antenna whips, the Body Manufacturer shall provide the antenna base, and Topeka shall provide the whip.

The end of antenna cable shall be routed to specified command desk. Cable shall be labeled

Antenna #3 mounted and installed on specified antenna rail.

Due to multiple configurations of antenna whips, the Body Manufacturer shall provide the antenna base, and Topeka shall provide the whip.

The end of antenna cable shall be routed to specified command desk. Cable shall be labeled

Antenna #4 mounted and installed on specified antenna rail.

Due to multiple configurations of antenna whips, the Body Manufacturer shall provide the antenna base, and Topeka shall provide the whip.

The end of antenna cable shall be routed to specified command desk. Cable shall be labeled

Antenna #5 mounted and installed on specified antenna rail.

Due to multiple configurations of antenna whips, the Body Manufacturer shall provide the antenna base, and Topeka shall provide the whip.

The end of antenna cable shall be routed to specified command desk. Cable shall be labeled

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

Cab roof mounted antenna rail shall be located on forward upper roof section.

SEAT BELT COLOR

Section 14.1.3.3 of the NFPA 1901 Standards, 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, 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.

TIRE PRESSURE VISUAL INDICATORS

Tire pressure visual indicators if specified shall be supplied by the cab and chassis manufacturer.

HELMET STORAGE, DRIVING AREA

No helmet storage is required in the cab driving area. A safety sign FAMA15, which warns not to wear helmets while the vehicle is in motion, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

HELMET STORAGE, CREW AREA

No helmet storage is required in the cab crew area. A safety sign FAMA15, which warns not to wear helmets while the vehicle is in motion, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

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.

The certification shall state that the cab does meet or exceed the requirements below:

- 1) European Occupant Protection Standard ECE Regulation No. 29.
- 2) SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.

CAB PAINT

The finish paint and color as provided from the cab/chassis manufacturer shall be provided. Cab shall not be repainted.

(Note: Most departments do NOT find that the fleet paint finish from a commercial cab/chassis manufacturer is acceptable. The Body Builder will NOT be responsible for paint quality and finish issues.)

REFLECTIVE STRIPE - CAB DOOR INTERIOR

Any door of the apparatus designed to allow persons to enter or exit the apparatus shall have at least 96 in.2 (62,000 mm2) of retroreflective material affixed to the inside of the door.

The inside of each cab and crew doors shall have 4" Chevron style diamond grade reflective striping. The colors shall be red and fluorescent yellow-green.

CAB INTERIOR COMPONENT PAINT COLOR, OEM SUPPLIED

Powder coat shall be hammertone silver/grey. Cardinal T064-GR05

HUB AND NUT COVERS

If specified chassis supplied front and rear wheels hub caps and wheel nut covers shall be installed prior to delivery of completed unit.

MUDFLAPS

There shall be 1/4" rubber mudflaps with logo provided and installed behind rear axle tires to prevent throwing road debris and lower road spray.

AIR BRAKE SYSTEM QUICK BUILD-UP

The air brake quick build-up system shall be supplied from the cab/chassis manufacturer.

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 DRAIN CABLES

The cab/chassis air brake system tank drains cables shall be extended to panel(s) located on forward streetside lower body or as per tank locations. Each air tank drain cable shall be extended/routed to the panel(s) through eyelets so as to prevent cables hanging or being exposed below the body.

Each pull ring/handle shall be properly labeled to identify each tank and include a black colored label bezel.

Labeled as follows: Wet, primary, secondary, and axuillary.

ROAD EMERGENCY SAFETY KIT

The DOT required reflective triangles, warning flares, and fire extinguisher shall be provided by cab and chassis supplier.

AUTOMATIC VEHICLE LEVELING SYSTEM

A Quadra Manufacturing, Inc. "Big Foot" model QEIIAM-26 shall be provided and installed on the completed vehicle designed for large heavy duty vehicles. The system shall have the following features;

- Simple, one touch operation for fully automatic leveling of the vehicle or trailer.
- Individual power units at each corner, which means nearly 4x the pump life compared to ordinary central pump systems due to each pump only running 25% of the time, less cycles = less wear & tear.
- All-Up safety feature signals if one or more of the cylinders are not fully retracted before you drive off.
- Manual adjustment feature that allows you to operate each cylinder individually.
- Four powder coated cylinders made at our facility capable of lifting 17,000 pounds each with 18" of stroke.
- Four weatherproof hydraulic power units, each with an American made marine pump & motor wrapped in a steel housing, allows the unit to be mounted outside in the elements so it does not take up storage space.
- 100 square inch "Bigfoot" pads for secure ground contact during operation.
- Emergency Retract operation.

The system shall be provided with Lifetime Cylinders, 2 Years Parts, 1 Year Labor limited warranty from Quadra Manufacturing, Inc.

FIRECOM INTERCOM SYSTEM

The following Firecom intercom system shall be provided and installed to improve the safety of firefighters and rescue professionals through enhanced communication and hearing protection. System shall have the following major components as minimum;

- Intercom Station, 5100D
- Wireless base station for up to five headsets.
- Radio interface for single radio.

INTERCOM SYSTEM INSTALLATION

The above listed intercom system headset jacks shall be installed in the cab locations as follows;

- Driver's – Intercom & radio PTT provided at driver position.
 - Position provided with dual ear, under helmet wireless headset with Bluetooth capability model DW501BT
 - Headset hook provided overhead right shoulder.
- Officer's – Intercom & radio PTT provided at officer position.
 - Position provided with dual ear, under helmet wireless headset with Bluetooth capability model DW501BT
 - Headset hook provided overhead left shoulder.
- Crew Forward Facing – (2) Intercom(s) & radio PTT provided at forward facing crew position(s).
one (1) of the crew will be located at body work station (IC2)
 - Position provided with dual ear, under helmet wireless headset with Bluetooth capability model DW501BT

FRONT CAB INTERIOR COMPONENTS

- Engine cover between driver & officer shall be provided with a smooth aluminum equipment mounting plate mounted with spacers to allow bolting and cabling space between cover and plate.

MAP BOX

A map box shall be provided on engine cover of the cab between driver and officer. The map box shall be securely fastened to the cab interior per NFPA 1901 standards. It shall be fabricated of 1/8" smooth aluminum approximately .

The final design **will have four (4) slots for 3" 3-ring binders with an open are between two (2) pairs (see greeley Engine Box), in front of map box will be two (2) cup holders sepeareted by open tray.**

Map box shall be provided with open top.

- There shall be one (1) OnScene Solutions Velcro cargo straps provided to secure the stored equipment.

MOBILE DATA TERMINAL SLIDE-OUT TRAY

There shall be a slide-out tray provided and installed on officer side dash area for a Topeka supplied mobile data terminal. The tray shall be fabricated from aluminum with a pair of 12" ball-bearing slides and an under-mounted gas strut to hold the tray in the full extended or full retracted positions.

CREW CAB INTERIOR COMPONENTS

Two (2) cup holder(s) shall be provided .

REAR CAB COMPONENT LAYOUT

The following components shall be provided in the rear area of cab, final layout to be determined at pre-construction meeting.

Located on floor rear facing center position shall be:

REAR CAB DESK - "L" SHAPED

The rear portion of cab shall be provided with an "L" shaped desk extending from the curbside to streetside and extending on the streetside.

The full width section shall be approximately 26" deep and located 30" from the floor. The streetside extension shall be approximately 18" deep and located 30" from the floor.

The desk top surface shall be fabricated of 3/16" smooth finish aluminum. There shall be 2-1/2" diameter holes with plastic edge grommets provided at each rear corner for wiring of future equipment located on the desk top.

DESKTOP COMPONENT CONSOLE

There shall be a one (1) console(s) at top rear of the desk for optional component mounting. The console(s) shall be fabricated from 1/8" aluminum approximately 6" high x 9" deep with a 6" sloping component mounting face.

The sloped component mounting surface shall be a one-piece cover to allow access to optional components, and wiring and held closed with fastener in each corner.

- There shall be three (3) communications radio and/or siren 3" recess mount(s) with black powdercoat paint finish in specified console.
- There shall be three (3) 120 VAC, 20 amp, duplex straight-blade receptacle (NEMA 5-20R) outlet(s) provided in specified console.
 - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.
- There shall be three (3) Blue Sea 12 VDC USB dual port(s) provided in specified console.

CAB, CAB DESK, CABINET - VDC COMPONENTS

- Three (3) 12 VDC cigarette style power port(s) shall be provided in cabinet with dust cover.
- Power port shall be wired battery direct.
- Power port shall be located in the top left interior corner.

FILING CABINET, 2-DRAWER

One (1) Hon 2-drawer Efficiency Pedestal cabinet(s) with "K" type pull handles shall be provided. Cabinet(s) shall have a keyed lock and shall be painted charcoal. Each filing cabinet shall be approximately 15" wide x 27" high x 20" deep. Both drawers of the cabinet shall be capable of storing 8-1/2" x 11" file folders.

INTERIOR ROLL-AROUND CHAIRS

There shall be two (2) Hon model HPN1 roll-around, folding seat bottom nesting style office chair(s) provided. Chair(s) shall have a dark gray upholstered finish with no arms. The chair(s) shall have provisions to be fully secured under the desk when not in use and the vehicle is in motion.

Note: These chairs are not NFPA compliant, and can not be occupied while vehicle is in motion.

INTERIOR ROLL-AROUND CHAIR TRAVEL PROVISIONS

There shall be travel provisions for two (2) specified roll-around office chairs. The provisions shall include a bungee strap for each chair and a means to secure the strap to the underside of the desktop.

There shall be two (2) eyelets under desk for securing the roll around chairs.

CREW CAB INTERIOR COMPONENTS

CAB INTERIOR CABINET - OVERHEAD

There shall be one (1) overhead cabinet(s) provided on interior. Cabinet(s) shall be constructed of 1/8" smooth finish aluminum. Each cabinet shall be approximately 26" wide x 14" high x 14" deep, length to best fit the designated area. If cab is specified with air bags, the interior cabinet(s) will be mounted clear of the deployment area.

- The above cabinet(s) shall have lift-up type door(s) **fabricated from aluminum sheet and powder coated to match the cabinet.**

Cabinet door shall have a winged cam latch mechanism to hold door in closed position. Cabinet door latch required per NFPA 1901 in areas occupied while vehicle is in motion.

- The compartment light(s) shall be controlled by a switch actuated by the compartment door.
- There shall be one (1) OnScene Solutions 10" Access PRO LED light(s) mounted inside the cabinet.

CREW CAB INTERIOR COMPONENTS

There shall be one (1) full height cabinet located in rear cab area. The cabinet shall be fabricated from 1/8" smooth aluminum, and shall have two (2) vertically hinged double doors. The cabinet shall have one permanent horizontal divider to create an upper and lower storage area.

The cabinet and doors shall be finished with a dark gray hammer tone powder coat paint for a hard and durable finish. The cabinet shall be approximately 23" wide x cab interior height (less 3") x 21" deep. If cab is specified with air bags, the interior cabinet(s) will be mounted clear of the deployment area.

- The above cabinet(s) shall have a single vertical hinged aluminum door(s) with a Southco push-release style latch and painted with a hammer tone powder coat paint finish to match cabinet color choice.
- Chassis specified seating position.

CAB INTERIOR CABINET - OVERHEAD

There shall be one (1) overhead cabinet(s) provided on interior. Cabinet(s) shall be constructed of 1/8" smooth finish aluminum. Each cabinet shall be approximately 26" wide x 14" high x 14" deep, length to best fit the designated area. If cab is specified with air bags, the interior cabinet(s) will be mounted clear of the deployment area.

- The above cabinet(s) shall have lift-up type door(s) **fabricated from aluminum sheet and powder coated to match the cabinet.**

Cabinet door shall have a winged cam latch mechanism to hold door in closed position. Cabinet door latch required per NFPA 1901 in areas occupied while vehicle is in motion.

- The compartment light(s) shall be controlled by a switch actuated by the compartment door.
- There shall be one (1) OnScene Solutions 10" Access PRO LED light(s) mounted inside the cabinet.

CAB MISCELLANEOUS EQUIPMENT

The following items shall be provided in cab as follows;

ROOF MOUNTED AIR CONDITIONER

One (1) Dometic Penguin II low profile, 120 VAC, 60 cycle, single phase air conditioner(s) shall be provided and installed on the cab roof. The unit shall be a roof top contemporary contoured integral evaporator/condenser type with built-in heating elements.

Each unit shall be rated at minimum of 13,500 BTU cooling capacity with a heating element rated at 5,600 BTU. A three-speed fan shall supply a maximum/minimum of 320/250 cfm air flow capacity. Air conditioner(s) shall be controlled by a wall mounted Comfort Control II LCD thermostat.

The roof mounted air conditioner shall be approximately 9.5" high x 29" wide x 40" long and weigh approximately 99 lbs.

SHORE POWER INLET

The 30A auto ejecting Inlet shall be cab/chassis supplied. Body builder to add use and load labeling.

- Auto eject inlet cover color shall be red.

STREETSIDE 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.

DEF FLUID FILL

The DEF fluid fill shall be as supplied by commercial cab/chassis manufacturer.

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 Topeka 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 Topeka from such repair and shall NOT be used. All fabricated body components to be cut by a laser or water-jet for superior cut edge quality.

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, No Exceptions.

The front and rear corners of body shall be formed as part of the front or rear body panels. This provides a stronger body corner and finished appearance. The use of extruded corners, or caps will not be acceptable, No Exceptions.

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.

Individual compartment modules, with dead air space voids between compartments, will 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 resist 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, and sheet metal screws shall be used in mounting exterior trim, hardware and equipment.

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

DRIP RAILS

The body shall have drip rails over the side full height compartments. The drip rails shall be formed into the upper body panels providing a ridged lower panel and a flat upper body panel surface. The use of mechanically fastened, taped or glued on drip rails will not be acceptable, No Exceptions.

ROOF CONSTRUCTION

The roof shall be integral with the body and shall be all welded construction. The roof of the body shall not be less than 3/16" aluminum 3003H-14 alloy NFPA nonskid compliant tread plate, fully and continuously welded. The roof shall be reinforced with 2" x 2" x 1/4" aluminum tubing running the full width of the body. A 2" rounded radius shall be provided along the body sides.

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.

BODY MOUNTING

The body subframe shall be fastened to the chassis frame with 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 resist 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.

10" 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 10" and provide a rear step with a minimum of 1/2" space at body for water drainage.

REAR TOW EYES

There shall be two (2) heavy duty rear mounted tow eyes securely attached to the body subframe, below body. The tow eyes shall be fabricated from 3/4" thick steel plate with a 3" diameter opening. Tow eyes shall have a black powder coat finish.

GROUND LIGHTS

There shall be two (2) OnScene 8" Access white 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 FENDERETTES

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 a rubber gasket 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 three (3) SCBA cylinder storage compartments located, two (2) on the curbside, and one (1) on the streetside of rear wheel well area. Each compartment shall be capable of storing three (3) SCBA (30 min.) cylinders. Each compartment shall have a vertically hinged aluminum door with 14ga stainless steel hinge, a positive catch latch and painted primary lower body color. Each compartment shall allow the storage of an SCBA cylinder up to 5-3/4" in diameter x 24" 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. 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;

- 1) Clean bare metal with a wax and grease remover using low lint rags.
- 2) 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.
- 3) Re-clean bare metal using a wax and grease remover and low lint rags.
- 4) 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.
- 5) Inspect, putty fill, and dry guild coat entire body surface and DA sand using 180-400 grit dry paper.
- 6) Re-clean bare metal using a wax and grease remover using low lint rags.
- 7) 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.
- 8) 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.
- 9) 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.).
- 10) 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.
- 11) 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 their current State regulations concerning paint operations pollution control and 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.

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 nut-surts into body surface using stainless steel bolts to resist 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.

PAINT FINISH - TWO COLOR

The body shall be painted with a two-tone single color of PPG Delfleet® Evolution per Topeka approved paint spray out provided. The two-tone paint break line will be at upper body drip rail location unless an alternate location is approved at the pre-construction meeting.

COMPARTMENT INTERIOR FINISH

The interior of all exterior body compartments shall be a "Maintenance Free" smooth unpainted finish. All body seams shall be finished with a caulk sealant for both appearance and moisture protection.

REFLECTIVE STRIPE REQUIREMENTS

Material

All retroreflective materials shall conform to the requirements of ASTM D4956, *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 D4956, Section 6.1.1, shall have a minimum coefficient of retro-reflection 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 D4956, 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 vehicle, not including mirrors or other protrusions.

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.

A graphic design shall be permitted to replace all or part of the required striping material if the design or combination thereof covers at least the same perimeter length(s).

GRAPHICS PROOF (Refer to Signed approval)

A color graphics proof of the reflective striping layout shall be provided for approval by Topeka prior to installation. The graphics proof shall be submitted to Topeka 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. **Note:** The graphics color proof may not reflect the correct paint break lines on the chassis and body please refer to the paint section of your specifications for correct paint break lines.

REFLECTIVE STRIPE - CAB SIDE

The reflective stripe material shall be 6" wide, 3M Scotchlite 680 series graphic film.

- This reflective stripe shall be black in color.

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

- This reflective stripe shall be black in color.

REFLECTIVE STRIPE - CAB FRONT

The reflective stripe material shall be 6" wide, 3M Scotchlite 680 series graphic film.

- This reflective stripe shall be black in color.

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

- This reflective stripe shall be black 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 stripe shall be red/black in color.

REFLECTIVE STRIPE - BODY SIDES

The reflective stripe material shall be 6" wide, 3M Scotchlite 680 series graphic film.

- This reflective stripe shall be black in color.

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

- This reflective stripe shall be white 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.

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 side compartment drip rail 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.

A black 1/4" pin stripe shall be installed to emphasize the break between colors.

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 Topeka prior to installation. The graphics proof shall be submitted to Topeka 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

There shall be fourteen (14) 5" high 22K gold letters provided and installed on the vehicle. Lettering shall have a clear 3M UV protective laminate applied before installation.

Provide details.

UPPER BODY SIDE LETTERING

There shall be thirty (30) 9" high 22K gold letters provided and installed on the vehicle. Lettering shall have a clear 3M UV protective laminate applied before installation.

Provide details.

REAR BODY LETTERING

There shall be seven (7) 8" high SuperGold letters furnished and installed on the vehicle. Lettering shall have a clear 3M UV Protective Over Laminate applied before installation.

FRONT OF CAB LETTERING

There shall be seven (7) 10" high 22K gold letters provided and installed on the vehicle. Lettering shall have a clear 3M UV protective laminate applied before installation.

Provide details.

CUSTOM DECAL LOGO - 12" -18"

Two (2) custom designed 12" - 18" 3M Scotchlite type retroreflective logo shall be provided and located on the completed vehicle. The exact design and/or artwork shall be provided by the Topeka prior to construction.

Two (2) copy of the above custom logo shall be provided and located on the completed vehicle as directed by Topeka.

EXTERIOR COMPARTMENT DOORS

ROLL-UP DOOR CONSTRUCTION - AMDOR

The apparatus shall be equipped with Amdor brand exterior roll-up compartment doors. Amdor roll-up doors shall be complete with the following features;

- 1" aluminum double wall slats with continuous ball & socket hinge joint and recessed dual durometer slat seal
- Double wall reinforced bottom panel with stainless steel lift bar latching system
- Bottom panel flange with cut-outs for ease of access with gloved hands
- Reusable slat shoes with positive snap-in securement
- Smooth interior door curtain to prevent equipment hang-ups
- One-piece aluminum door track / side frame, top gutter with non-marring seal
- Non-marring recessed side seals with UV stabilizers to prevent warping
- Dual leg bottom seal, with all wear component material to be Type 6 Nylon
- The door shall be warranted for a period of 36 months from the date of delivery. AMDOR Inc. liability covers the replacement or repair of any component that fails due to defects in material and / or workmanship during the coverage period.

Each shutter door shall decrease the compartment door frame opening approximately 2.00" in width and approximately 5.50" in height for the bottom section of door assembly.

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	88.7"
B	Bottom of Subframe to Bottom of Body	22.5"
C	Total Body Height	111.2"
D	Compartment Height Above Frame	48.0"
E	Compartment Height Below Frame	25.0"
F	Vertical Door Opening:	
	-with roll-up door	65.0"
	-with hinged door	68.5"

ABOVE REAR AXLE

	<u>Description</u>	<u>Dimension</u>
G	Vertical Door Opening - Above Rear Wheel	
	-with roll-up door	34.0"
	-with hinged door	37.5"

BEHIND REAR AXLE

	<u>Description</u>	<u>Dimension</u>
H	Bottom of Subframe to Bottom of Body	20.0"
I	Compartment Height Above Frame	48.0"

J	Compartment Height Below Frame	22.5"
K	Vertical Door Opening:	
	-with roll-up door	62.0"
	-with hinged door	65.5"

GENERAL

	<u>Description</u>	<u>Dimension</u>
L	Top of Body to Bottom of Drip Rail	38.5"

(Dimensions are approximate and subject to change during construction or design process.)

FIVE (5) UPPER BODY COMPARTMENTS (OPEN)

approx. 55"

The forward transverse compartment shall be 90.0" long x 24.0" wide x 33.5" deep. There shall be four (4) compartments parallel to the sides of the body, two (2) on each side. Each of these compartments shall be approximately 67"-long x 28.0" wide x 33.5" 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.

Add a set of brackets for storing a CMC Series Stokes (#726103)

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 resist corrosion caused by dissimilar metals.

Each compartment door shall overlap a 2" vertical lip on the body roof to resist 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.

UPPER BODY COMPARTMENT EQUIPMENT

The specified upper body compartments shall be provided with the following equipment;

OVERPACK DRUM STORAGE

OnScene retaining straps and angled lip on walkway floor, if required shall be provided to hold a Topeka supplied 95gal Eagle w/screw lid #1690 or equal overpack drum in forward walkway area. Dimensions: Height 41 1/4" Diameter 31" Top 26 1/16" Bottom Weight 50 lbs.

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 resist 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 three (3) OnScene Solutions Rough-Service 9" LED lights provided to illuminate the walkway or step area.

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.

WALKWAY/STEP LIGHTS

There shall be two (2) OnScene Solutions Rough-Service 9" LED lights provided to illuminate the walkway or step area.

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 lift-up brushed stainless steel door. Each compartment shall be manufactured to resist road debris, dirt and moisture from entering. 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 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.
- Two (2) OnScene Access PRO white LED light(s) mounted in cabinet(s).

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. The compartment shall be manufactured to resist road debris, dirt and moisture from entering. 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 specified 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 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.
- One (1) OnScene Access PRO white LED light(s) mounted in cabinet(s).

FOLD-DOWN STEP

There shall be one (1) 30" wide fold-down step located at the bottom of the roof access stairway to reduce the distance from the ground to the first step. The step surface shall be NFPA compliant aluminum treadplate. The step 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 rear body. Handrails shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions.

A safety sign FAMA23, which warns of the proper climbing method, shall be visible to personnel entering the cab and at each designated climbing location on the body.

A safety sign FAMA24, which warns personnel not to ride on the vehicle, shall be located at the rear step areas and at any cross walkways.

BODY WIDTH DIMENSIONS

The walk thru body shall be 100.0" wide, and 102.0" wide at drip rails. Interior compartment depth dimensions shall be approximately:

<u>Area Description</u>	<u>Dimension</u>
Transverse above subframe:	95.0" (If specified.)
Compartment depth above subframe:	31.0" (To walkway wall, if specified.)
Compartment depth below subframe:	24.5"
Walkway width:	34" (If specified.)

STREETSIDE COMPARTMENT - FRONT (S1)

The interior useable compartment space shall be approximately 70.5" wide.

- This compartment shall have a flush fitting horizontally hinged, drop-down style compartment door. The door exterior shall be painted job color.
- The compartment door opening shall be approximately 64.5" wide.
- The interior door panel shall have a smooth un-painted aluminum panel.
- 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 latches shall be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.
- The hinged door(s) shall have a pair of tailgate style mechanisms to stop the door at 90 degrees. Each door shall be capable of being closed without unlatching.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior to activate compartment lighting and door ajar signal in cab when door is opened.

COMPARTMENT LAYOUT

- One (1) OnScene Access PRO white LED mounted at the top of the compartment toward the door opening.
- One (1) OnScene 10" Access Pro white LED ground light(s) shall be provided below the body. Light(s) shall be switchable but activated automatically when the park brake is set.
- The 12 volt electrical distribution panel shall be located in the front lower compartment.

STREETSIDE COMPARTMENT - AHEAD OF REAR WHEELS (S2)

The interior useable compartment space shall be approximately 70.5" wide.

- This compartment shall have a flush fitting horizontally hinged, drop-down style compartment door. The door exterior shall be painted job color.
- The compartment door opening shall be approximately 64.5" wide.
- The interior door panel shall have a smooth un-painted aluminum panel.
- The hinged door(s) shall have a stainless steel 6" offset bent D-ring non-locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.
- The hinged door(s) shall have a pair of tailgate style mechanisms to stop the door at 90 degrees. Each door shall be capable of being closed without unlatching.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior to activate compartment lighting and door ajar signal in cab when door is opened.

COMPARTMENT LAYOUT

- 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 and shall be guarded to prevent accidental operation.
 - 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 EJBX series, cast aluminum electrical power distribution box with gray 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 duplex straight-blade receptacle
 - One (1) 120 VAC, 5-20 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 Brass model EJB-VMT aluminum treadplate vertical mounting bracket for specified power distribution box shall be provided and mounted in compartment per Topeka.
- The fairlead roller shall be mounted directly to the reel.
- One (1) OnScene Access PRO white LED mounted at the top of the compartment toward the door opening.
- One (1) OnScene 10" Access Pro white LED ground light(s) shall be provided below the body. Light(s) shall be switchable but activated automatically when the park brake is set.
- **One (1) Large** black plastic louvered vent shall be provided in the lower compartment.

STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S3)

The interior useable compartment width shall be approximately 59.5" wide.

- This compartment shall have an Amdor roll-up door.
- The compartment door opening shall be approximately 53.0" wide.
- The roll-up door slats and the door track components shall be painted to match the single tone exterior color. The painted roll-up doors shall be equipped with Extended Slat Shoe (ESS) feature which eliminates abrasion on the door finish.
- The Amdor door shall be equipped with an integral switch in the lower door handle retainer block to activate compartment lighting and door ajar signal in cab when door is opened.
- A keyed 1250 cylinder lock shall be provided on bottom rail of the roll-up door.
- The roll-up doors shall be manually operated with a key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- Compartment threshold protection shall be provided on the bottom edge of the compartment door sill. The threshold protection shall be an extruded aluminum shape with an un-painted anodized finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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 slide-out, drop-down style aluminum tray base with 90% extension, and rating of 250 lbs. Slide-out tray(s) base shall be approximately 47" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails. 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 shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
 - The above component(s) shall have a smooth un-painted finish.
- 3M™ Diamond Grade™ 2" wide conspicuity striping shall be provided on the front and side faces of the tray.
- This reflective stripe shall be red/white in color.

- There shall be one (1) OnScene Solutions 84 series slide-out, drop-down style aluminum tray base with 90% extension, and rating of 250 lbs. Slide-out tray(s) base shall be approximately 47" 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 shall have welded corners to form a box type tray surface with an internal depth of approximately 3 1/2".
 - The above component(s) shall have a smooth un-painted finish.
 - 3M™ Diamond Grade™ 2" wide conspicuity striping shall be provided on the front and side faces of the tray.
- This reflective stripe shall be red/white in color.
- Two (2) OnScene Access PRO white LED, full height compartment lights, vertically mounted.

STREETSIDE COMPARTMENT - BEHIND REAR WHEELS (S4)

The interior useable compartment width shall be approximately 41.5" wide.

- This compartment shall have an Amdor roll-up door.
- The compartment door opening shall be approximately 35.0" wide.
- The roll-up door slats and the door track components shall be painted to match the single tone exterior color. The painted roll-up doors shall be equipped with Extended Slat Shoe (ESS) feature which eliminates abrasion on the door finish.
- The Amdor door shall be equipped with an integral switch in the lower door handle retainer block to activate compartment lighting and door ajar signal in cab when door is opened.
- A keyed 1250 cylinder lock shall be provided on bottom rail of the roll-up door.
- The roll-up doors shall be manually operated with a key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- Compartment threshold protection shall be provided on the bottom edge of the compartment door sill. The threshold protection shall be an extruded aluminum shape with an un-painted anodized finish.

COMPARTMENT LAYOUT

The following components shall be located above frame level:

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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 full width (street/curb) 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 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, 40% extended and 70% extended 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".
 - The above component(s) shall have a smooth un-painted finish.
 - Any equipment mounting on transverse tray shall be provided by Topeka after delivery.

- 3M™ Diamond Grade™ 2" wide conspicuity striping shall be provided on the front and side faces of the tray.
- This reflective stripe shall be red/white in color.
- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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.
 - The above component(s) shall have a smooth un-painted finish.
- 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 Access PRO white LED, full height compartment lights, vertically mounted.
- One (1) OnScene 10" Access Pro white LED ground light(s) shall be provided below the body. Light(s) shall be switchable but activated automatically when the park brake is set.

STREETSIDE COMPARTMENT - REAR (S5)

The interior useable compartment width shall be approximately 41.5" wide.

- This compartment shall have an Amdor roll-up door.
- The compartment door opening shall be approximately 35.0" wide.
- The roll-up door slats and the door track components shall be painted to match the single tone exterior color. The painted roll-up doors shall be equipped with Extended Slat Shoe (ESS) feature which eliminates abrasion on the door finish.
- The Amdor door shall be equipped with an integral switch in the lower door handle retainer block to activate compartment lighting and door ajar signal in cab when door is opened.
- A keyed 1250 cylinder lock shall be provided on bottom rail of the roll-up door.
- The roll-up doors shall be manually operated with a key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- Compartment threshold protection shall be provided on the bottom edge of the compartment door sill. The threshold protection shall be an extruded aluminum shape with an un-painted anodized finish.

COMPARTMENT LAYOUT

LOW PRESSURE AIR OUTLET

There shall be one (1) Milton female quick connector type air outlet connection(s) to supply low pressure air for general maintenance. The outlet shall terminate in a 1/4" NPT threaded port with a Milton female type adapter. Air outlet shall be located near driver's door. The male end of the connector shall be supplied by the Topeka.

Air Outlet shall be tied to the chassis air aux system with priority valves.

The following components shall be located above frame level:

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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 30" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
 - Any equipment mounting on adjustable shelf shall be provided by Topeka after delivery.

- The above component(s) shall have a smooth un-painted finish.
- 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the shelf(s).
- This reflective stripe shall be red/white in color.
- One (1) Lista drawer cabinet, model HS-0900-0603FA-NB-RG-IDL shall be provided in compartment. The Lista cabinet(s) shall be 40-1/4" wide x 39-3/8" high x 22-1/2" deep. Cabinet shall have six (6) individual locking drawers as follows as follows; one (1) 2", one (1) 3", one (1) 4", one (1) 5", one (1) 7", and one (1) 9". The cabinet shall be Light Gray in color.

Dividers shall be supplied for the drawers.

- 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 Access PRO white LED, full height compartment lights, vertically mounted.
- The controls for the specified awning(s).
This will be for the Streetside Awning
- The controls for the specified awning(s).
- There shall be one (1) 120 VAC outlet(s) located in compartment.
 - 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.
 - The outlet shall be located on forward wall, **just above the Lista cabinet.**
- One (1) OnScene 10" Access Pro white LED ground light(s) shall be provided below the body. Light(s) shall be switchable but activated automatically when the park brake is set.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

SIDE ENTRY DOOR

Access shall be provided to the interior through a single side entry door with a clear door opening width of approximately 28.5".

There shall be one (1) amber tracer light at the top of the door.

Construction of the side entry door shall be with 1/8" aluminum exterior smooth plate and painted exterior body color choice. The interior door pan shall be constructed from 1/8" aluminum treadplate.

The door shall be hung on full height 14 gauge stainless steel hinge, with a 1/4" stainless steel pin. The hinge shall be bolted to the door and body with stainless steel machine screws at offset 5" centers. A polyester barrier film gasket shall be placed between the stainless steel hinge and door.

Full width padded foam cushion head bumper shall be provided above door opening. The head bumper shall be covered with matching interior vinyl and bolted to interior of door way.

The door latch mechanism shall include a stainless steel paddle type handle on interior. A polyester barrier film gasket shall be placed between the stainless steel handles and the aluminum door panels. The door latch shall be a double catch two-point safety slam latch recessed inside the double panel door with strike plate mounted top and bottom of door frame complying with FMVSS requirements.

- The hinged door(s) shall have a stainless steel **Paddle Latch** non-locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

WINDOW(S)

There shall be one (1) 18" wide x 22" high, double-paned insulated, non-sliding window(s) installed in the entrance door. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish.

- The controls for the specified awning(s).
Awning controls will be located inside the entry door on wall for the Curbside Awning.
- One (1) OnScene 8" Access white LED ground light(s) shall be provided below the body. Light(s) shall be switchable but activated automatically when the park brake is set.

ENTRY HANDRAILS

There shall be two (2) handrails provided at entry door; one (1) Hansen International 24" x 1-1/8" vertical handrail on exterior of body on door handle side, and one (1) Hansen International 30" x 1-1/8" on inside of door. The interior handrail shall be angled for optimum use when entering or exiting the interior body area. Handrails shall be NFPA compliant formed from anodized aluminum **BLACK Finish** with knurled anti-slip finish.

Each handrail shall be back-lit with a Safetylite, 12 VDC **GREEN** LED light tube. Lights shall be activated with headlight and park brake set circuits.

A safety sign FAMA23, which warns of the proper climbing method, shall be visible to personnel entering the cab and at each designated climbing location on the body.

A safety sign FAMA24, which warns personnel not to ride on the vehicle, shall be located at the rear step areas and at any cross walkways.

The specified **interior** handrails shall be powdercoat painted yellow.

ELECTRIC STEP

There shall be one (1) Kwikkee 39 Series 12 VDC, electric step(s) that automatically extends when you open entry door(s) and retracts when you close entry door(s). The power step will automatically stop if it strikes an obstacle. The Kwikkee electric step components uses weatherproof wiring and connectors to prevent shorts and corrosion in the system.

There shall be a override switch to the electric step to allow locking it in the out position when on scene. The switch shall be a momentary rocker that when the park break is set and sitch is actuated the step shall extend and remain so until the switch is actuated or the master battery switch is cycled or park break is released. (This prevents the step from opening and closing everytime the door opens and closes, but allows for auto retract when the park brake is released.)

The distance from the ground to the first step shall be no more than 24" per in accordance with NFPA 1901 guideline. The top surface of each step shall be covered with an NFPA 1901 nonskid compliant aluminum tread plate.

REFLECTIVE STRIPE - CAB DOOR INTERIOR

Any door of the apparatus designed to allow persons to enter or exit the apparatus shall have at least 96 in. sq. (62,000 mm²) of retroreflective material affixed to the inside of the door.

The stripe material shall be 3M Diamond Grade series graphic film.

Chevron Kicker

- This reflective stripe color shall be **Red/Black**.

CURBSIDE COMPARTMENT - AHEAD OF REAR WHEEL (C2)

Compartment deminsions are approx. 44" door opening by 12" deep.

- This compartment shall have an Amdor roll-up door.
- The compartment door opening shall be approximately 50.0" wide.
- The roll-up door slats and the door track components shall be painted to match the single tone exterior color. The painted roll-up doors shall be equipped with Extended Slat Shoe (ESS) feature which eliminates abrasion on the door finish.
- The Amdor door shall be equipped with an integral switch in the lower door handle retainer block to activate compartment lighting and door ajar signal in cab when door is opened.
- A keyed 1250 cylinder lock shall be provided on bottom rail of the roll-up door.
- The roll-up doors shall be manually operated with a key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- Compartment threshold protection shall be provided on the bottom edge of the compartment door sill. The threshold protection shall be an extruded aluminum shape with an un-painted anodized finish.

COMPARTMENT LAYOUT

The following components shall be located above frame level:

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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 three (3) adjustable shelf/shelves approximately 12" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
 - Any equipment mounting on adjustable shelf shall be provided by Topeka after delivery.
 - The above component(s) shall have a smooth un-painted finish.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the shelf(s).
- This reflective stripe shall be red/white in color.

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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.
 - The above component(s) shall have a smooth un-painted finish.
 - 3M™ Diamond Grade™ 2" wide conspicuity striping shall be provided on the front and side faces of the tray.
- This reflective stripe shall be red/white in color.
- 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 Access PRO white LED, full height compartment lights, vertically mounted.

CURBSIDE COMPARTMENT - AHEAD OF REAR WHEELS

Compartment Dimensions to be approx. 44" Door opening and 12" deep.

- This compartment shall have an Amdor roll-up door.
- The compartment door opening shall be approximately 50.0" wide.
- The roll-up door slats and the door track components shall be painted to match the single tone exterior color. The painted roll-up doors shall be equipped with Extended Slat Shoe (ESS) feature which eliminates abrasion on the door finish.
- The Amdor door shall be equipped with an integral switch in the lower door handle retainer block to activate compartment lighting and door ajar signal in cab when door is opened.
- A keyed 1250 cylinder lock shall be provided on bottom rail of the roll-up door.
- The roll-up doors shall be manually operated with a key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- Compartment threshold protection shall be provided on the bottom edge of the compartment door sill. The threshold protection shall be an extruded aluminum shape with an un-painted anodized finish.

COMPARTMENT LAYOUT

- Two (2) OnScene Access PRO white LED, full height compartment lights, vertically mounted.

The following components shall be located above frame level:

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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 three (3) adjustable shelf/shelves approximately 12" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
 - Any equipment mounting on adjustable shelf shall be provided by Topeka after delivery.
 - The above component(s) shall have a smooth un-painted finish.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the shelf(s).
- This reflective stripe shall be red/white in color.

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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.
 - The above component(s) shall have a smooth un-painted finish.
 - 3M™ Diamond Grade™ 2" wide conspicuity striping shall be provided on the front and side faces of the tray.
- This reflective stripe shall be red/white in color.
- Two (2) OnScene 10" Access Pro white LED ground light(s) shall be provided below the body. Light(s) shall be switchable but activated automatically when the park brake is set.
- 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 59.5" wide.

- This compartment shall have an Amdor roll-up door.
- The compartment door opening shall be approximately 53.0" wide.
- The roll-up door slats and the door track components shall be painted to match the single tone exterior color. The painted roll-up doors shall be equipped with Extended Slat Shoe (ESS) feature which eliminates abrasion on the door finish.
- The Amdor door shall be equipped with an integral switch in the lower door handle retainer block to activate compartment lighting and door ajar signal in cab when door is opened.
- A keyed 1250 cylinder lock shall be provided on bottom rail of the roll-up door.
- The roll-up doors shall be manually operated with a key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- Compartment threshold protection shall be provided on the bottom edge of the compartment door sill. The threshold protection shall be an extruded aluminum shape with an un-painted anodized finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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 slide-out, drop-down style aluminum tray base with 90% extension, and rating of 250 lbs. Slide-out tray(s) base shall be approximately 47" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails. 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 shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
 - The above component(s) shall have a smooth un-painted finish.
- 3M™ Diamond Grade™ 2" wide conspicuity striping shall be provided on the front and side faces of the tray.
- This reflective stripe shall be red/white in color.

- There shall be one (1) OnScene Solutions 84 series slide-out, drop-down style aluminum tray base with 90% extension, and rating of 250 lbs. Slide-out tray(s) base shall be approximately 47" 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 shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
 - The above component(s) shall have a smooth un-painted finish.
- Two (2) OnScene Access PRO white LED, full height compartment lights, vertically mounted.

CURBSIDE COMPARTMENT - BEHIND REAR WHEEL (C4)

The interior useable compartment width shall be approximately 41.5" wide.

- This compartment shall have an Amdor roll-up door.
- The compartment door opening shall be approximately 35.0" wide.
- The roll-up door slats and the door track components shall be painted to match the single tone exterior color. The painted roll-up doors shall be equipped with Extended Slat Shoe (ESS) feature which eliminates abrasion on the door finish.
- The Amdor door shall be equipped with an integral switch in the lower door handle retainer block to activate compartment lighting and door ajar signal in cab when door is opened.
- A keyed 1250 cylinder lock shall be provided on bottom rail of the roll-up door.
- The roll-up doors shall be manually operated with a key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- Compartment threshold protection shall be provided on the bottom edge of the compartment door sill. The threshold protection shall be an extruded aluminum shape with an un-painted anodized finish.

COMPARTMENT LAYOUT

The following components shall be located above frame level:

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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 and shall be vertically adjustable in height. (Specified in opposite side compartment.)
- 3M™ Diamond Grade™ 2" wide conspicuity striping shall be provided on the front face of the tray.
- This reflective stripe shall be red/white in color.
- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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; capable of extending out either side of the body located above the level of the chassis frame rails. (Specified in opposite side compartment.)
- There shall be one (1) SCBA cylinder storage module for 7-5/8" OD (maximum) SCBA bottles. The maximum length of the SCBA cylinder shall be 24.75". The module shall have an exterior shell fabricated from 1/8" (.125) 3003H-14 aluminum alloy sheet. The module shall have a 2" slope, front to back to prevent cylinders from sliding out. The SCBA cylinder storage tubing shall be fabricated from PVC pipe to resist damage or abrasion to cylinders. In addition there shall be rubber pad provided in the base of each storage tube for bottle protection and to resist slipping.
 - The SCBA cylinder module shall be capable of storing eight (8) SCBA cylinders up to 7-5/8" diameter.
- There shall be six (6) Zico 1000 series KD-UH walkaway type SCBA air pack bracket(s) with high cycle coated spring clips and short foot plate.
- 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 Access PRO white LED, full height compartment lights, vertically mounted.
- One (1) OnScene 10" Access Pro white LED ground light(s) shall be provided below the body. Light(s) shall be switchable but activated automatically when the park brake is set.

CURBSIDE COMPARTMENT - REAR (C5)

The interior useable compartment width shall be approximately 41.5" wide.

- This compartment shall have an Amdor roll-up door.
- The compartment door opening shall be approximately 35.0" wide.
- The roll-up door slats and the door track components shall be painted to match the single tone exterior color. The painted roll-up doors shall be equipped with Extended Slat Shoe (ESS) feature which eliminates abrasion on the door finish.
- The Amdor door shall be equipped with an integral switch in the lower door handle retainer block to activate compartment lighting and door ajar signal in cab when door is opened.
- A keyed 1250 cylinder lock shall be provided on bottom rail of the roll-up door.
- The roll-up doors shall be manually operated with a key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- Compartment threshold protection shall be provided on the bottom edge of the compartment door sill. The threshold protection shall be an extruded aluminum shape with an un-painted anodized finish.

COMPARTMENT LAYOUT

LOW PRESSURE AIR OUTLET

There shall be one (1) Milton female quick connector type air outlet connection(s) to supply low pressure air for general maintenance. The outlet shall terminate in a 1/4" NPT threaded port with a Milton female type adapter. Air outlet shall be located near driver's door. The male end of the connector shall be supplied by the Topeka.

Air Outlet shall be tied to the chassis air aux system with priority valves.

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls 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 three (3) adjustable shelf/shelves approximately 30" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
 - The above component(s) shall have a smooth un-painted finish.
 - 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front face of the shelf(s).

- This reflective stripe shall be red/white in color.
- A clay absorbent (or similar weight material) storage hopper shall be provided in this compartment for approximately 150 pounds of material. The storage hopper shall be filled from an upper body compartment and funneled to a manual 3" PVC 1/4-turn ball valve with flexible hose provided on bottom of hopper storage. The bottom of absorbent hopper and valve shall be spaced off floor to allow for a 5 gallon pail to be stored under valve.
- 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 Access PRO white LED, full height compartment lights, vertically mounted.
- One (1) OnScene 10" Access Pro white LED ground light(s) shall be provided below the body. Light(s) shall be switchable but activated automatically when the park brake is set.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

ROOF ACCESS STAIRWAY

The rear of the body shall be provided with a recessed center stairway in lieu of a compartment.

BODY OPTIONS AND UPGRADES

NO Plastic Grating (LR, WA)

LOWER 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 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™ striping shall be provided in the rub rail. The striping shall be **BLACK** 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.

ROLL-OUT AWNING STREETSIDE

A Carefree Mirage, **12** Volt powered, Lateral Arm Acrylic Patio Awning with Direct Response Electronics shall be installed on the 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 **12V** motor shall be completely sealed and UL approved. The awning pitch shall be adjusted to up to 30"

The awning shall be **10'** long 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.

A red flashing or rotating light located in the driving compartment shall be illuminated automatically whenever the vehicles parking brake is not fully engaged, indicating that the awning is not in stowed position, as required by NFPA 1901.

- The Firesist HUV awning fabric color shall be black (#82008).

The specified awning above shall be surface mounted to upper body side. The awning shall add approximately 5.75" to body width.

AWNING HOUSING COLOR

The awnings standard white housing color shall be re-painted to match upper body color.

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 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 110V motor shall be completely sealed and UL approved. The awning pitch shall be adjusted to up to 30"

The awning shall be 20' 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.

A red flashing or rotating light located in the driving compartment shall be illuminated automatically whenever the vehicles parking brake is not fully engaged, indicating that the awning is not in stowed position, as required by NFPA 1901.

- The Firesist HUV awning fabric color shall be black (#82008).

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. The recessed awning shall add approximately 1.5" to body width.

AWNING HOUSING COLOR

The awnings standard white housing color shall be re-painted to match upper body color.

WALK-IN INTERIOR FINISH DETAILS

DESK, CABINET, CONSOLE FINISH

All specified interior desks, cabinets, overhead cabinets, or consoles shall be fabricated from formed 1/8" 3003 H14 alloy smooth aluminum.

The use of wood materials or laminated surfaces in the construction of desks, cabinets, overhead cabinets, or consoles will not be allowed. There will be **No Exceptions** allowed on specified ruggedized finish.

INTERIOR COMPONENT FINISH

After fabrication is completed all specified desk(s) or cabinet(s) shall be painted with a hammer tone powder coat paint finish for a hard durable surface.

Powder coat shall be hammertone **pearl**/grey.

CAB/BODY WALK-THROUGH CONNECTION

The front center of the rescue body shall be interconnected with the rear crew area of custom cab through a weather resistant walk-through opening. The opening shall be designed to allow the custom cab to tilt forward without disconnecting an attached type seal between the cab and body. The opening shall be approximately 24" wide x 70" high (sized to match the cutout in the rear wall of the cab).

The front of the body shall be cut out to match the cab opening. Additional reinforcements with metal angle or tubing shall be provided to back of cab or front of body, if necessary so that the walk-through opening weakens neither the cab nor body integrity.

The connection shall be weather resistant, yet provide the cab and body to move independent of each other. A flexible 3" rubber weather strip shall be attached to a stainless steel sheet metal frame around the perimeter of the opening in the back wall of the cab. A drip rail shall be provided on front of body above the opening to channel water to both sides of opening. Stainless steel scuff panels shall be provided on back of cab were the rubber seal on body comes in contact with cab.

A formed metal frame shall be bolted to the front of the body. The body-mounted frame shall be provided where the rubber seal comes into contact with the body. The framework shall be painted to match the body color.

The base of the opening shall be covered with a 3/16" aluminum tread plate full width panel, which will overlap from the cab to body so that the rubber seal can not be damaged.

Full width padded foam cushion head bumpers shall be provided on both sides of opening. Head bumpers shall be covered with matching interior vinyl and bolted to each side of walk-through.

CUT OUT IN REAR CAB WALL

The rear wall of the custom cab shall be cut out 24" wide for walk-thru application. The height of the cutout shall be determined by the cab structure in the rear wall and the roof. The opening shall be completed by the custom cab/chassis manufacturer to assure proper cab structural integrity and completed final interior finish.

SLIDING POCKET DOOR

There shall be one (1) sliding pocket door(s) provided on interior of walk-in body area. Pocket door shall be fabricated from 1/8" smooth aluminum and be approximately 1-1/2" thick and hang on adjustable pocket door hardware. The door shall be painted to match the interior wall color. A stainless steel handle shall be provided on each side of door. The door shall be equipped with a pneumatic cylinder which will "over-center" to hold the door in open and closed positions.

INTERIOR SPECIFICATIONS

INTERIOR INSULATION

Following the sheet metal fabrication the roof area, upper exterior walls and the entry door of the apparatus body shall be insulated with Dow Thermax, or equal 1-1/2" glass-fiber reinforced polyisocyanurate foam core laminated between 1.0 mil smooth, reflective aluminum foil facers on both sides, with an R9.8 value. The reinforcement, along with chemical modifications, contributes to fire resistance and dimensional stability. This insulation shall be the type that will not absorb moisture, move once in place or deteriorate. Mat type fiberglass or spray in foam insulation is not acceptable.

INTERIOR FINISH

The interior of the apparatus body shall have a fully maintenance free and durable finish. The interior finish shall be installed on the ceiling, front wall, and interior side walls from top of exterior compartments to ceiling height.

The interior panels shall be installed with sheet metal screws with gray plastic plugs covering the screws. The seams between FRP panels, interior corners, and exterior corners shall be trimmed with gray plastic molding.

The interior finish shall be pearl gray pebble grain FRP.

INTERIOR WALKWAY FLOOR

There shall be Lonseal, Loncoin-II Flecks installed on the floor substrate. Loncoin II Flecks is a heterogeneous resilient sheet vinyl with a decorative raised coin texture, breathtaking color, and intriguing style. The fleck coloration provides camouflage for simpler maintenance while the raised coin embossing provides enhanced traction. Excellent for interior, retail, commercial, or institutional use where design parameters call for a high performance, sophisticated flooring solution.

Loncoin II Flecks is composed of polyvinyl chloride (PVC) resin, plasticizers, fillers, and pigments. The co-calendared wear layer is formulated to provide maximum resistance to foot traffic and most commercial and healthcare chemicals.

The middle layer provides dimensional stability, sound-absorbing properties, and resiliency under foot. The backing layer provides strength and stability of the flooring and enhances the bonding strength of the adhesive.

The material shall be gray in color (Loncoin-II Flecks - Moonstone).

Lonseal, Inc. warrants that Lonseal flooring products shall be free from manufacturing defects for a period of one (1) year from the date of purchase and that, when properly installed and maintained, shall not wear through as a result of normal foot traffic for a period of 7 years from the date of installation.

INTERIOR SUB-FLOOR

Above the body sub frame walk in areas shall be an isolation sheet to prevent outside elements from permeating the acoustic and thermal barrier. The isolation sheet shall be fabricated from the same type of material as is used in the subframe, and flanged on sides with a 1" high vertical break.

3/4" thick plywood shall be placed between the isolation sheet and finished floor for its structural, acoustic and thermal values.

AIR CONDITIONER - HEATER

One (1) Dometic Penguin II low profile, 120 VAC, 60 cycle, single phase air conditioner(s) shall be provided and installed on roof of vehicle. The unit shall be a roof top contemporary contoured integral evaporator/condenser type with built-in heating elements.

Each unit shall be rated at minimum of 13,500 BTU cooling capacity with a heating element rated at 5,600 BTU. A three-speed fan shall supply a maximum/minimum of 320/250 cfm air flow capacity. Air conditioner(s) shall be controlled by a wall mounted Comfort Control II LCD thermostat.

The roof mounted air conditioner shall be approximately 9.5" high x 29" wide x 40" long and weigh approximately 99 lbs.

- The above rooftop Air Conditioning units shall be powered by both the generator and shore power

- The thermostat(s) for the above rooftop Air Conditioning units shall be located above the interior light switch panel.

HEATER

The completed unit shall be provided with one (1) Red Dot 49,000 BTU hot water type heater(s). The heater(s) shall be connected to the chassis engine cooling system and have three-speed, 12 volt blower. The cooling system lines shall be insulated and be provided with 1/4 turn shut-off valves to isolate system, if required.

EXHAUST FAN

One (1) Fantastic model 6000RBTA, 12 VDC, 3-speed ventilation fan(s) shall be provided for air circulation. Each fan shall be wired to a wall switch located near fan location.

Technical Information:

- Durable, proven longevity
- Quiet, 12 – volt ceiling fan with 3-speeds
- Polycarbonate dome/Lifetime guarantee
- Removable screen for easy cleaning
- Reversible fan blade motor (in or out)
- Low AMP draw insures full-time use

Performance:	SCFM	AMPS	Decibels
High	920	3.00	40
Medium	653	2.29	39
Low	478	1.86	39

Specifications:

- Rooftop weight: 11lbs.
 - Dimensions: 16 1/2 x 16 1/2 x 4 1/2 (Fits Most Standard 14"x14" Openings)
 - CSA / UL Certified
- Specified roof vent shall be provided with a Maxxair model 00-933069 black vent cover.

STREETSIDE INTERIOR AREA (IS1/IS2)

SLIDE-OUT ROOM EXTENSION

A slide-out room extension with floor offset approximately 3" from main walk-in floor shall be provided on the streetside. The slide-out room shall extend approximately 32". The slide-out extension shall be up to up to 120" in width depending on body configuration. The interior height shall be approximately 9" less than the interior height of the main walk-in floor. The slide-out room shall have a water resistant seal in both the fully extended and the retracted positions. The flooring specified on main walk-in floor shall be provided on floor of slide-out room.

The slide-out section shall utilize two (2) PowerGear smooth operating, quiet gear and rack system. Systems using hydraulic components will NOT BE ACCEPTABLE. There shall be only two (2) serviceable items - the 12 VDC motor and the electric control switch. The system shall use a heavy duty, positive, 100% synchronized gear and rack system to prevent binding during the extend or retract cycle. The rack system shall be rated for up to 1,500 pounds. A manual override shall be provided in the event of a system failure. The touch pad control for slide-out system shall be mounted on wall near main entry door.

The slide-out section shall be framed with 2" x 2" x 1/4" 6061-T6 alloy aluminum. The frame structure shall be covered with no less than 1/8" thick 3003-H14 smooth aluminum.

A full width padded foam cushion head bumper shall be provided along ceiling of slide-out. Head bumper shall be covered with matching interior vinyl.

There shall be two (2) flashing LED warning lights with red lenses, one (1) at each end of the slide-out section. The lights shall activate and be visible when the unit is extended.

All electrical wiring installed in the slide-out wall shall run through a boxed type conduit at the lower corner of the system. All wiring shall be enclosed in a flexible, moisture resistant, reinforced conduit, with proper seal tight connectors and hardware. Access shall be provided for inspection of all wiring and the slide-out mechanisms.

The slide-out room extension must be able to withstand years of rugged service and wear. For this reason, this design, metal thickness and attachments must be strictly adhered to. RV type slide-outs using light weight metal or fiberglass shall not be acceptable.

SLIDE-OUT AWNING

A Carefree SlideOut Kover III shall be provided and work automatically with slide-out for increased protection of the slide-out from the elements. Helps keep leaves, debris and rain off the roof and out of the vehicle and keeps the roof cooler by blocking the sun from the roof.

The SlideOut Kover III comes with a built-in wind deflector to prevent the billowing of the slide out fabric. The full-enclosure aluminum case protects the slide out fabric from dirt and debris while traveling.

- The Firesist HUV awning fabric color shall be black (#82008).

SLIDE-OUT KOVER

The SlideOut Kovers standard white housing color shall be re-painted to match upper body color.

WINDOWS

There shall be two (2) 32" wide x 16" high, double-paned insulated, non-sliding window(s) installed on the completed apparatus. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish.

WINDOW(S)

There shall be two (2) 18" wide x 22" high, double-paned insulated, high non-sliding window(s) installed, one (1) on each side of the slide-out. Each window shall have tinted automotive type safety glass mounted in an extruded aluminum frame. The frame shall have a black anodized finish.

INTERIOR CABINET - OVERHEAD

- There shall be three (3) approximately 42" wide x 14" high x 14" deep overhead cabinet(s) provided on interior. Cabinet(s) shall be constructed of 1/8" smooth finish aluminum, and painted with a hammer tone powder coat paint finish for a hard durable surface.
- Three (3) OnScene Access white LED light(s) mounted in cabinet(s).
- The above cabinet(s) shall have lift-up type door(s). (powdercoated NO Dry erase)
- The compartment light(s) shall be controlled by a switch actuated by the compartment door.
 - Each cabinet door shall have one (1) winged cam latch mechanism to hold door in closed position. Cabinet door latch required per NFPA 1901 in occupied areas while vehicle is in motion.

INTERIOR UNDER CABINET LED LIGHTS

Three (3) OnScene Solution model #70152, 10" x 6" x 7/8", 10-30 VDC, surface mount white LED light(s) with clear lens shall be provided under cabinet (white light only NO dual red/white.). Each light shall be individually switched with a high/low intensity setting. In addition light(s) will be capable of a five (5) second delay after switching off.

Wire under cabinet lights to Interior Light Switch.

INTERIOR BENCH SEAT

The interior body walkway shall be provided with a squad bench seat for four (4) personnel along the side wall. The seat cushion shall be approximately 3" thick with a 3/4" plywood platform for stability. The seat backrest shall be approximately 12" high x 2" thick and constructed the same as the seat cushion.

The cushion and seat back shall be covered with vinyl heavy duty material.

Seat material color shall be black.

INTERIOR BENCH SEAT STORAGE

The bench seat base shall be fabricated of aluminum tread plate to form a under seat storage compartment.

A hinged seat cushion shall be provided for access to seat storage.

Will have gas struts.

The above specified seat(s) shall not be provided with automotive seat belts and therefore will not be considered a riding position.

CURBSIDE INTERIOR AREA (IC1)

Locate the switch panel for the interior lights, Flood Mater, PTO, Door Lock/Unlock, Step override and the 120/240V Panel, Gauge panel, as well as the A/C Tstat, Bigfoot controls and slide-out controls.

CURBSIDE INTERIOR AREA (IC2)

Match Campbell County #1173

INTERIOR CABINET - COUNTER HEIGHT

- There shall be two (2) interior counter height cabinet(s) provided on interior. Cabinet(s) shall be constructed of 1/8" smooth finish aluminum approximately (insert actual dimensions).
- Cabinet(s) shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.
- One (1) OnScene Access white LED, full height compartment light, vertically mounted.
 - The above cabinet(s) shall have a 4" x 4" toe kick area at the base to allow for the top surface to be used as a working surface.
 - The above cabinet(s) shall have double vertically hinged aluminum door(s) with a Southco push-release style latches and painted with a hammer tone powder coat paint finish to match cabinet color choice.
- The compartment light(s) shall be controlled by a switch actuated by the compartment door.
 - Each cabinet shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.
 - There shall be one (1) vertically adjustable shelf in each of the above cabinets. It shall have a 1.25" lip to contain items while minimizing space used.

INTERIOR CABINET - FULL HEIGHT

- There shall be one (1) full height cabinet(s) provided on interior. Cabinet(s) shall be constructed of 1/8" smooth finish aluminum. Each cabinet shall be approximately (insert actual dimensions) x full height x 24" deep.

Circulation fans shall be supplied to ventilate the compartment interior.

- Cabinet(s) shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.
- One (1) OnScene Access white LED, full height compartment light, vertically mounted.

- Cargo netting of 1" - 2" nylon webbing shall be provided over cabinet opening with automotive seatbelt style latches.
- The compartment light(s) shall be controlled by a latching, black rocker switch with amber indicator light. The switch shall be labeled as "COMPARTMENT LIGHTS" with a black and chrome label bezel.
- Cabinet(s) shall be provided with vertically mounted shallow aluminum Shelf-Trac for specified component installation.
- There shall be four (4) vertically adjustable shelf in each of the above cabinets. It shall have a 1.25" lip to contain items while minimizing space used.

CAB, CAB DESK, CABINET - VDC COMPONENTS

- There shall be one (1) Blue Sea Systems ST series blade type fuse block(s) with screw type terminals for both positive and negative buss with cover provided for distribution of up to twelve (12) 30 amp, 12 VDC circuits.
- The fuse block shall be protected by a 60 amp maxi fuse located at the source.
- Fuse block shall be wired battery direct.
- Fuse block shall be located in the top left interior corner.
- 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).
- There shall be one (1) approximate 4' long 120 VAC outlet strip(s) with straight blade household type outlets provided.
 - Outlet(s) shall be powered through the on-board generator system.
 - The outlet shall be located on rearward wall, upper left area.
 - Outlet(s) shall be powered through the on-board generator system.
 - The outlet shall be located on rear wall, upper left area.

INTERIOR CABINET - OVERHEAD

- There shall be three (3) approximately 26" wide x 14" high x 14" deep overhead cabinet(s) provided on interior. Cabinet(s) shall be constructed of 1/8" smooth finish aluminum, and painted with a hammer tone powder coat paint finish for a hard durable surface.
- Three (3) OnScene Access white LED light(s) mounted in cabinet(s).
 - The above cabinet(s) shall have lift-up type door(s)
- The compartment light(s) shall be controlled by a switch actuated by the compartment door.

INTERIOR UNDER CABINET LED LIGHTS

Three (3) OnScene Solution model #70152, 10" x 6" x 7/8", 10-30 VDC, surface mount dual red and white LED light(s) with clear lens shall be provided under cabinet. Each light shall be individually switched with a high/low intensity setting. In addition light(s) will be capable of a five (5) second delay after switching off.

Wire under cabinet lights to interior switch.

CAB, CAB DESK, CABINET - VDC COMPONENTS

- Two (2) 12 VDC cigarette style power port(s) shall be provided in cabinet with dust cover.
- Power port shall be wired battery direct.
- Power port shall be located in the top left interior corner.
- Two (2) 12 VDC USB dual charger port(s) shall be provided in cabinet with dust cover.
- Power port shall be wired battery direct.
- Power port shall be located in the top left interior corner.

120 VAC INTERIOR OUTLETS

- There shall be one (1) 120 VAC, 20 amp custom fabricated outlet strip provided with approximately two (2) duplex outlets per foot in height. Strip shall be approximately long.
 - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.
 - The outlet shall be located on rearward wall, upper left area.

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.

Circuits shall be provided with properly rated low voltage over-current protective devices. Such devices shall be readily accessible and protected against heat in excess of the over-current 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:

- 1) SAE J156, *Fusible Links*
- 2) SAE J553, *Circuit Breakers*
- 3) SAE J554, *Electric Fuses (Cartridge Type)*
- 4) SAE J1888, *High Current Time Lag Electric Fuses*
- 5) 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:

- 1) The propulsion engine and transmission
- 2) All legally required clearance and marker lights, headlights, and other electrical devices except windshield wipers and four-way hazard flashers
- 3) 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)
- 4) 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
- 5) The minimum optical warning system, where the apparatus is blocking the right-of way
- 6) The continuous electrical current required to simultaneously operate any fire pumps, aerial devices, and hydraulic pumps
- 7) 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.

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.

MULTIPLEX SYSTEM INTERFACE DISPLAY

The Weldon V-MUX Vista IV multiplex system interface display(s) shall be provided by the cab/chassis manufacturer. The full-color Vista interface display allows the user to control warning and scene lighting, HVAC controls (when specified), and view on-board diagnostics including service information. This display has a wide operating temperature range, automatic screen switching in response to current conditions, and a sleep mode option to eliminate night glare. The following features shall be included;

- 800 x 480 resolution
- Four video ports
- Flash updates with USB memory stick

- Display inside and outside temperature (when specified)
- Automatic climate control (when specified)
- 100% Configurable (OEM Level)
- Field re-programmable
- Peer to peer network
- On-board diagnostics / service information
- Colors change to indicate button status
- Video Ready for: Backup camera, Thermal camera, DVD, GPS...

BATTERY SYSTEM

Any body builder supplied battery connections 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.

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.

BATTERY SWITCH

One (1) battery disconnect switch shall be provided in cab located within easy reach of driver with green indicator light that is visible from the driver's position. The switch and indicator light shall be supplied and installed by the cab/chassis manufacturer.

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.

SHORE POWER INLET

The shore power inlet for battery conditioner shall be supplied and installed by the cab chassis manufacturer.

- The shore power plug shall be located near the Driver door area.

ENGINE COMPARTMENT LIGHT

Engine compartment light(s) shall be supplied and installed by the cab chassis manufacturer.

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:

- Any passenger or equipment compartment door is not closed.
- Any ladder or equipment rack is not in the stowed position.
- Stabilizer system is not in its stowed position.
- 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 FLASHING".

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.

REAR VIEW CAMERA

The cab chassis provided rear view box camera shall be installed on the rear of the body.

INTERIOR LED LIGHTS

Three (3) OnScene Solution model #70154, 10" x 10" x 7/8", 10-30 VDC, surface white LED light(s) with clear lens shall be provided **to the ceiling of the walkin interior** throughout the vehicle. In addition light(s) will be capable of a five (5) second delay after switching off.

The light(s) shall be switched with high/low intensity setting at the entry door(s). An Innovative Controls black back-lit switch panel shall be provided to control specified lighting or other control switching.

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 M6 Series M6T amber LED turn lights **with clear lens**
- Two (2) Whelen M6 Series M6BTT red LED stop/tail lights **with clear lens**
- Two (2) Whelen M6 Series M6BUW clear LED back-up lights with clear lens

Each light shall have a chrome flange.

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 side and rear clearance lights and reflectors in accordance with Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS). Clearance lights on body shall be connected to the clearance light 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.

LICENSE PLATE LIGHT

One (1) Arrow #437 chrome plated LED license plate light shall be installed on the rear of the body. License plate light shall be wired to the headlight circuit of chassis. A fastener system shall be provided for license plate installation.

FRONT CAB MOUNTED SCENE LIGHT(S)

Floodlight(s) shall be provided on the front of the cab by the cab/chassis manufacturer.

The lights shall be controlled at the multiplex display(s) in the cab.

SIDE LED SCENE LIGHTS

Four (4) Whelen Pioneer Plus model PCH2B with dual panel Super LED flood/spot light(s) on the upper side body, evenly distributed each side of body with black powder coat paint finish. Lights shall be 12 VDC, 13 amp, 150 watt, with 17,750 useable lumens each.

The above scene lights shall light to a level of at least 3 fc (30 lx), measured at 25 equally spaced points on a 2.5 ft (750 mm) grid with in a 10 ft x 10 ft (3 m x 3m) square to the rear of vehicle.

The lights shall be controlled at the multiplex display(s) in the cab.

Each light shall be mounted in PBH203 mounting bracket, semi recessed into the apparatus body with chrome trim ring housing. The light mounts will provide a straight out, 0 degree angle.

The rear scene lights shall also be activated when the apparatus is in reverse.

REAR LED SCENE LIGHTS

Two (2) Whelen Pioneer Plus model PCH2B with dual panel Super LED flood/spot light(s) on the upper rear body with black powder coat paint finish. Lights shall be 12 VDC, 13 amp, 150 watt, with 17,750 useable lumens each.

The above scene lights shall light to a level of at least 3 fc (30 lx), measured at 25 equally spaced points on a 2.5 ft (750 mm) grid within a 10 ft x 10 ft (3 m x 3m) square to the rear of vehicle.

The lights shall be controlled at the multiplex display(s) in the cab.

Each light shall be mounted in PBH203 mounting bracket, semi recessed into the apparatus body with chrome trim ring housing. The light mounts will provide a straight out, 0 degree angle.

The rear scene lights shall also be activated when the apparatus is in reverse.

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 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.

Steadily burning, non flashing optical sources shall be permitted to be used.

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

See Chassis Modification section for cab mounted warning lights.

ZONES B AND D - SIDE WARNING LIGHTS

UPPER REAR CORNER WARNING LIGHTS

There shall be two (2) Whelen M9 linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities.

Each Light shall have:

- Clear Lens

Each light shall have a black flange.

- Blue Light Streetside / Red Light Curbside
 - Flash Pattern shall be (factory default) Action Scan.

The lights shall be controlled at the multiplex display(s) in the cab.

UPPER FORWARD CORNER WARNING LIGHTS

There shall be two (2) Whelen M9 linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities.

Each Light shall have:

- Clear Lens

Each light shall have a black flange.

- Blue Light Streetside / Red Light Curbside
 - Flash Pattern shall be (factory default) Action Scan.

The lights shall be controlled at the multiplex display(s) in the cab.

ZONE C - REAR WARNING LIGHTS

There shall be two (2) Whelen M9 linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities.

Each Light shall have:

- Clear Lens

Each light shall have a black flange.

– Blue Light Streetside / Red Light Curbside

- Flash Pattern shall be (factory default) Action Scan.

The lights shall be controlled at the multiplex display(s) 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 1600 mm) above level ground.

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, LOWER

See Chassis Modification section for cab mounted warning lights.

ZONES B AND D - BODY LIGHT (BODY WHEELWELL AREA)

There shall be two (2) Whelen M6 linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities.

Each Light shall have:

- Clear Lens

Clear warning lights shall be deactivated when vehicle is in Blocking Mode (Parking Brake Set and/or Transmission in Park).

Each light shall have a chrome flange.

- Red Outboard/White Inboard as facing each zone.
 - Flash Pattern shall be (factory default) Action Scan.
- The Lo Power option will **NOT** be provided for the above lighting group.

The lights shall be controlled at the multiplex display(s) in the cab.

ZONES B AND D - BODY INTERSECTOR LIGHT (BODY REAR CORNERS)

There shall be two (2) Whelen M6 linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities.

Each Light shall have:
- Clear Lens

Each light shall have a chrome flange.

- Red Outboard/Blue Inboard as facing each zone.
 - Flash Pattern shall be (factory default) Action Scan.

The lights shall be controlled at the multiplex display(s) in the cab.

ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

There shall be two (2) Whelen M6 linear super-LED Light(s) with full-fill optic provided, one (1) each side. The light head shall include an integral flasher with programmable flash patterns and Hi/Lo intensities.

Each Light shall have:
- Clear Lens

Each light shall have a chrome flange.

- Red Light Streetside / Blue Light Curbside
- Flash Pattern shall be SIGNALALERT 75, On/Off, Phase 1
- The above group of **upper and lower Zone C warning** lights shall be sync'd and be on opposing phases, creating an "X" pattern. **Red on Phase 1 and Blue on Phase 2.**
- The Lo Power option will **NOT** be provided for the above lighting group.

The lights shall be controlled at the multiplex display(s) 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 30,000 watts at 120/240 VAC, 250/125 amps, single 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 break-over 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.

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

There shall be a label provided stating " MUST ALWAYS ENGAGE PTO WHILE TRUCK IS RUNNING AND PARKED".

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.

GENERATOR CONTROL

The generator shall be engaged at the multiplex display(s) in the cab.

GENERATOR CONTROL

The generator shall be engaged at the switch panel **in Curbside Entry door in body walk-in.**

GENERATOR MOUNTING - ONAN PROTEC

The generator shall be mounted below the chassis frame rails. The generator mounting brackets shall be fabricated using steel plate and/or tubing and powder coat primed and painted black. The generator mounting shall be bolted to the side of the chassis frame rail 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.

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 280 series.

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 an Eaton BR Series specifically designed for protection and distribution of AC line voltage such as lighting and small motor branch circuits. The loadcenter enclosure is made of 16 gauge galvanized sheet steel with a galvanized coating provided for corrosion protection. All trims used on BR loadcenters are chromate sealed and finished with an electro-disposition epoxy paint (ANSI-61) which exceeds requirements for outdoor and indoor applications. A combination surface/flush cover with integral door is supplied with indoor loadcenters rated from 100 through 400 amperes. All plug-in loadcenters are CSA listed to file LL98266. CSA Certified to C22.2 No.29, to loadcenter type and CSA listing.

GENERATOR MONITORING PANEL

An Accuenergy Acuvim II multifunction power and energy meter shall be provided to properly monitor the generator performance and load demand during operation. The Accuenergy Acuvim CL includes a digital RS485 communication port running Modbus protocol. The electrical parameters can be viewed on a backlit LCD screen. Unit shall be capable of displaying the following;

- Generator frequency in hertz
- Line 1 current in amperes
- Line 2 current in amperes
- Generator voltage in volts
- Meter running time

SHORE POWER INLET - BATTERY CHARGER

The above mentioned shore power inlet, and battery conditioner shall be specified in the 12 volt section.

120/240 VAC 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:

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

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 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.

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.

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:

- 1) Voltmeter
- 2) Current meters for each ungrounded leg
- 3) Frequency (Hz) meter
- 4) 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.

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 amperage rating and shall be sized to carry not less than 115 percent of the amperage 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).

Over-current Protection

Manually re-settable 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 amperage 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 Over-current 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.

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:

- 1) 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)
- 2) 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.

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.

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;

- (a) Pictorial representations of circuit logic for all electrical components and wiring
- (b) Circuit identification
- (c) Connector pin identification
- (d) Zone location of electrical components
- (e) Safety interlocks
- (f) Alternator–battery power distribution circuits
- (g) Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems

LIGHT TOWER

One (1) Command Light Knight 2, KL Series light tower(s) shall be provided and installed on the completed unit.

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.

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. Other type floodlights 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. Any tower that is only capable of rotations at the top of a pole is not an acceptable alternative to the specified 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 per NFPA 1901.

A red flashing or rotating light located in the driving compartment shall be illuminated automatically whenever the vehicles parking brake is not fully engaged, indicating that the light tower is not in stowed position, as required by NFPA 1901.

Light Tower Floodlights

The Command Light model KL415A-CH shall be equipped with the following bank of floodlights:

Floodlight manufacturer:	FireTech
Number of lamp heads:	Six (6) Helios
Voltage:	120 volts
Watts of each lamp head:	60 watt
Total watts of light tower:	360 watts
Total lumens of light tower:	84,000 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 Strobe Indicator

The floodlight tower shall have a strobe indicator located on the top of the upper section.

The lens color for the strobe light shall be green.

Light Tower Paint

The light tower shall be electro-statically 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.

Where the light tower is to be mounted above a finished walk-in area; the roof backing plates and structure shall have threaded holes to allow removal of light tower without removal of the interior paneling.

Where the light tower is mounted in close proximity to other roof mounted items (i.e. antennas, air conditioners, and weather stations) the light tower shall be orientated in order to help prevent a operator driven collision.

TREE LIMB GUARD

A three-sided tree limb guard shall be provided fabricated from 1/8" smooth aluminum and painted to match the upper paint color to provide protection to the specified roof mounted equipment from small tree branches.

INFORMATION TECHNOLOGY (IT) SYSTEMS

All information technology systems specified below shall be supplied, installed, and supported by the contractor including, but not limited to the design, inter-connecting wiring, and integration of all specified systems. Under no circumstances will the installation of these systems be subcontracted

The following information technology systems shall be provided and installed on completed unit as follows;

NETWORK SYSTEM

DATA ROUTER - CELLULAR

A cellular router shall not be required on completed unit.

TELEPHONE SYSTEM

No telephone system shall be required on completed unit.

VIDEO SYSTEM

EXTERIOR VIDEO SYSTEM

No exterior body mounted video monitoring system shall be required on completed unit.

INTERIOR VIDEO SYSTEM

No interior wall or ceiling mounted video monitoring system shall be required on completed unit.

BROADCAST TV ANTENNA

One (1) Winegard Sensar III, RV-3095 broadcast TV antenna w/ amplified multi-switch shall be provided on roof of completed unit.

The 75 ohm Sensar RV-3095 antenna has built-in amplifier and unique circuitry that gives you clear VHF/UHF reception whenever you park. Raise, lower and rotate the Sensar III antenna from inside the vehicle.

The travel height of the antenna shall only be 4" above the roof. The antenna can be elevated to 40" above the roof line, and is bi-directional, it must be pointed toward the TV station you want to watch. It must be used while the vehicle is parked. The Sensar antenna is made of tough UV protected Centrex polymer and other materials that are corrosion resistant.

TV SATELLITE ANTENNA

No Satellite TV system shall be required with completed unit.

SMART BOARD INTERACTIVE DISPLAY

One (1) SMART Board 6055 (or equal) interactive flat panel using a LED 65" LCD flat screen monitor shall be provided and wall mounted on completed vehicle.

The SMART Board® 6065 Pro interactive display with iQ is the hub of your meeting room. PC-free embedded computing provides one-touch access to collaborative tools, including a whiteboard, wireless screen sharing and a web browser. There's no need for wires, cables or manual software and firmware updates. The 65" 4K ultra-high-definition LED display provides optimal image clarity and wide viewing angles. With the Pen ID™ feature, you can assign different appearances to the two pens and write or draw over any application in digital ink. Object Awareness™ allows you to perform mouse functions with your finger, write in digital ink with the pen, and erase with your palm or eraser—all without switching tools or modes. You can use a variety of gestures in applications, and two users can write or draw at the same time.

The unit shall be approximately 59 3/8" wide × 38 1/2" high × 3 3/4" deep, and weigh 134 lbs.

In order to make the SMART Board operational it must be connected to at least one (1) on-board computer to be determined by Topeka. This computer shall be accessed by a provided wireless keyboard, and wireless mouse.

The SMART Board system shall be connected to optional matrix switcher if specified, and installed to view signals from all on-board audio/video equipment, and the computer network system.

MONITOR MOUNT

Specified monitor(s) shall be mounted to wall using a heavy duty mount with adjustable tilt for ideal viewing. Wall mount bracket shall support TVs with VESA mounts.

LCD VIDEO DISPLAYS

Two (2) Samsung 24" flat panel, 4 Series (or equal) LED commercial grade, display(s) shall be provided and installed on completed unit.

Inputs/Outputs:

- (2) HDMI
- (1) USB
- (1) Component
- (1) Composite In (AV)
- (1) RF In (Terrestrial/Cable Input)
- (1) RS232C

Display(s) shall be complete and fully operational, including all miscellaneous coax or CAT 6 cable, HDMI to CAT6 extenders (if required), 120 volt AC wiring, and cable connections.

One (1) will be located on the center forward (of cab) edge of desk.
One (1) located above the forward facing outer seat.

MONITOR MOUNT

Specified monitor(s) shall be mounted to desk or wall using a Ram RAM-D-101U246 (or equal) double ball mount black aluminum flat surface mount with a 3.68" diameter base, standard length arm, and 4.75" square VESA 75/100mm compatible plate.

LCD VIDEO DISPLAY

One (1) Samsung 55" flat panel, 5 Series (or equal) LED commercial grade, display(s) shall be provided and installed on completed unit.

Inputs/Outputs:

- (2) HDMI
- (1) USB
- (1) Component
- (1) Composite In (AV)
- (1) RF In (Terrestrial/Cable Input)
- (1) RS232C
- (1) Digital Audio Out (Optical)

Display(s) shall be complete and fully operational, including all miscellaneous coax or CAT 6 cable, HDMI to CAT6 extenders (if required), 120 volt AC wiring, and cable connections.

Will be located in the rear wall of interior walkin area.

MONITOR MOUNT

Specified monitor(s) shall be mounted to wall using a heavy duty mount with adjustable tilt for ideal viewing. Wall mount bracket shall support TVs with VESA mounts.

VIDEO/AUDIO RECORDER

No video/audio recording system shall be required on completed unit.

RADIO AND COMMUNICATION SYSTEM

RADIO SYSTEM

No radio system shall be required on completed unit.

WEATHER SYSTEM

An Columbia Magellan MX500™ vehicle-mounted weather station shall be provided and installed on completed unit. This compact, all-in-one sensor module is very durable and has no moving parts. A single cable attaches through an external connector mounted on the vehicle. Inside, an Interface Module provides power to the sensor transmitter and communication ports for both computer and/or weather display console. A permanent “snap-on” mounting adapter allows you to quickly remove and reinstall the sensor head.

Sensor Specifications:

Wind Speed: Ultrasonic
Range: 0-134mph

Relative Humidity: Capacitance
Range: 0 - 100%

Wind Direction: Ultrasonic
Azimuth: 0-359°
Electronic Compass/GPS

Barometric Pressure: Capacitance
Range: 8.85 to 32.48 InHg

Temperature: Capacitance

Precipitation: Optical

Range: -40 to 158°F

Range: 0 to >12 in/hr

Standard System Includes:

Sensor Module housed in a Self-Aspirating Radiation Shield with:

- Temperature Sensor
 - Relative Humidity Sensor
 - Digital Barometer
 - Ultrasonic Wind Direction/Speed Sensor
 - Optical Rain Sensor
- Orion Interface Module with Dual Communication Ports
 - Comprehensive User Manual
 - RS-232 Computer Cable, 7 feet

WEATHER SYSTEM MOUNTING

The weather system shall be mounted on a Fire Research model 530 series side mount push up telescopic pole. The pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall rotate 360 degrees. The outer pole shall be a grooved aluminum extrusion and qualify as an NFPA compliant handrail. The pole mounting brackets shall have a 2 3/4" offset. Pole shall be supplied with hazard switch option and wired to door ajar circuit to warn when pole is in the up position. The weather system quick release wiring connector shall be located near pole location. Overall length with Weatherpack mounted unit is approx. 90".

WEATHER SYSTEM SOFTWARE

The standard Weather Data Manager Software shall be provided.

WEATHER SYSTEM DISPLAY

A connection shall be provided for Topeka computer.

Locate the weather station monitor and connection for the laptop at the cab smartboard.

CAMERA MAST SYSTEM

No camera and mast system shall be required on completed unit.

MISCELLANEOUS TECH SYSTEMS

PHONE AND NETWORK CABLING STANDARDS

If a telephone or fax machine is specified it will be connected to the central phone system from the RJ-11 wall jacks and wired through to the data rack or technical cabinet using yellow Category 6, 4 pair twisted copper cabling with yellow boot ends.

If a computer network is specified it will be connected to the network switch location, if specified from the RJ-45 wall jacks wired through to the data rack or technical cabinet using blue Category 6, 4 pair twisted copper cabling with blue boot ends. The pin pair assignments will be based on the T568B standard configuration. The termination ends in shall be RJ-45 male ends and connected to the network switch.

Only Category 6, 4 pair twisted copper cable shall be used for all computer cabling for improved transmission performance and superior immunity from external noise. All wiring shall be installed to Institute of Electrical and Electronics Engineers (IEEE) 802 standards.

All Category 6 cable must be properly installed and terminated to meet specifications. Incorrect installation practices include kinking or bending the cable too tightly will not be allowed. The cable bend radius should be no less than 4 times the outer diameter of the cable. Incorrect termination practices include untwisting the wire pairs or stripping the outer jacket back too far will not be allowed. When used for 10/100/1000 BASE-T, the maximum allowed length of a Category 6 cable is 100 meters (330 ft). All cabling shall be properly labeled at both termination ends for proper identification in future.

The running of Category 6 cabling in the same loom with any VAC wiring will not be allowed.

WIRING CHANNELS

Minimum 4" x 4" wiring channels shall be provided directly below the desk tops along the outside walls for computer, radio, and communications wiring. The top of desk tops shall have minimum 3" diameter openings that drop directly into wiring channel. The wiring channels shall have openings for future wiring installation and access. The wiring channels shall run as direct as possible to the data rack or technical cabinet location with several cross overs provided in roof structure for running wiring across body.

CAMERA MAST SYSTEM

No camera and mast system shall be required on completed unit.

EQUIPMENT PAYLOAD WEIGHT ALLOWANCE

In compliance with NFPA 1901 standards, the special service vehicle shall be designed for an equipment loading allowance of 6,000 lbs. of Topeka provided equipment based on a 40,001 - 50,000 pound gross vehicle weight rating.

EQUIPMENT

The following equipment shall be furnished with the completed special service vehicle;

- 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.
- There shall be two (2) Zico SAC-44-E NFPA approved folding aluminum wheel chocks provided for 44" diameter tires that together will hold the vehicle when loaded to its GVWR or GCWR, on a hard surface with a 20 % grade, with the transmission in neutral, and the parking brake released.
 - The wheel chock(s) shall be mounted behind rear wheels, below body on streetside.
- Two (2) Little Giant Overhaul Firefighter model 1AA, 17' "A" frame type aluminum combination ladder(s) shall be **Dealer Supplied for SVI to mount.**
 - **The ladder(s) shall be located in specified upper body compartment with two (2) PAC brackets.**
- Dealer supplied NFPA required ventilation fans(s) shall be provided on completed unit before placing vehicle in service.
 - The above specified ventilation fan(s) shall be installed on completed unit using mounting brackets and/or straps, location to be **in C5, and dealer supplied batteries and chargers in S5.**

Two (2) Pelican 9480 LED Remote Area Lights shall be provided with the vehicle.

- Two (2) flashlight(s) shall be mounted on the completed unit in the lower area of compartment S1.

Five (5) Streamlight Survivor rechargeable LED flashlights shall be provided with 140 lumens, and 3.5/14 hour run time. Each flashlight shall be **yellow** in color and have a Streamlight 120VAC five (5) unit charger. Each flashlight shall have an LED spotlight style bulbs and reflectors.

- One (1)The flashlight(s) shall be mounted in the cab in the following locations;

Side body door above the head bumper

- One (1) Pack-A-Cone (5-pack) fluorescent orange traffic cones shall be provided with completed unit. Traffic cones shall be 28" height with a 13" x 13" base and a stored height of 2". Each cone shall have a 6" retroreflective white band no more than 4" from the top of the cone, and an additional 4" retroreflective white band 2" below the 6" band.
 - The above specified traffic cones(s) shall be shipped loose with completed unit.

REMAINING NFPA MINOR EQUIPMENT BY PURCHASER

All other minor equipment not specified above, but required by NFPA 1901 for special service vehicles, section 10.9.3 shall be supplied and mounted by Topeka before the unit is placed in emergency service.

