SAVANNAH FIRE DEPT

Preliminary Specifications

SVI #1021

Table of Contents

LIABILITY INSURANCE

The manufacturer {will/shall} furnish with the bid a certificate of insurance for;

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

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

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

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

All insurance policies must be;

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

INTERNET IN-PROCESS SITE

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

VEHICLE STABILITY SUPPLIED WITH CAB/CHASSIS

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

WEIGHT DISTRIBUTION

When the fire apparatus is loaded to its estimated in-service weight, the front-to-rear weight distribution shall be within the limits set by the chassis manufacturer.

The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer under full load and all other loading conditions.

LOAD DISTRIBUTION

The apparatus manufacturer shall calculate the load distribution for the apparatus, and that load distribution plan shall be delivered with the fire apparatus.

The manufacturer shall engineer the fire apparatus to comply with the gross axle weight ratings (GAWR), the overall gross vehicle weight rating (GVWR), and the chassis manufacturer's load balance guidelines.

The fire apparatus, when loaded to its estimated in service weight, shall have a side-to-side tire load variation of no more than 7 percent of the total tire load for that axle.

Each tire shall be equipped with a visual indicator or monitoring system that indicates tire pressure.

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 (O°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 {will/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:

   b) Owner's name and address
   c) Apparatus manufacturer, model, and serial number
   d) Chassis make, model, and serial number
   e) GAWR of front and rear axles and GVWR
   f) Front tire size and total rated capacity in pounds (kilograms)
   g) Rear tire size and total rated capacity in pounds (kilograms)
   h) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
   i) 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
   j) Type of fuel and fuel tank capacity
   k) Electrical system voltage and alternator output in amps
   l) Battery make, model, and capacity in cold cranking amps (CCA)
   m) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
   n) Ratios of all driving axles
   o) Maximum governed road speed
   p) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), maximum discharge pressure capability rating, and serial number
   q) Pump transmission make, model, serial number, and gear ratio
   r) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
   s) Water tank certified capacity in gallons or liters
   t) Foam tank (if provided) certified capacity in gallons (liters)
   u) Aerial device type, rated vertical height in feet (meters), rated horizontal reach in feet (meters), and rated capacity in pounds (kilograms)
   v) Paint manufacturer and paint number(s)
   w) Company name and signature of responsible company representative
   x) 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
20) One copy of the latest edition of FAMA's *Fire Apparatus Safety Guide*

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 {will/shall} be provided on a USB Flash Drive. These manuals {will/shall} be divided into sections for ease of reference. There {will/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 {will/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.

STATEMENTOF 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:

21) A separate specification of the section of the applicable standard for which compliance is lacking
1) A description of the particular aspect of the apparatus that is not in compliance therewith or required equipment that is missing
2) A description of the further changes or modifications to the delivered apparatus that must be completed to achieve full compliance
3) 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 Body Manufacturer shall establish the estimated in service weight during the design of the vehicle

The estimated in-service weight shall include the following:

4) The chassis, body and tank(s)
1. Full fuel, lubricant, and other chassis or component fluid tanks or reservoirs
2. Full water and other agent tanks
3. *250 lb (114 kg) in each seating position
4. Fixed equipment such as pumps, aerial devices, generators, reels and air systems as installed
5. Ground ladders, suction hose, designed hose load in their hose beds and on their reels
6. An allowance for miscellaneous equipment that is the greatest of the following:
   7. The values shown in Table 12.1.2
   h) A purchaser-provided list of equipment to be carried with weights
   i) 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.

			Equipment Allowance	
Apparatus Type	**Equip. Storage Area**	**Apparatus Size**	**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

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

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

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

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

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

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

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

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

The vehicles low voltage electrical system shall be 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:

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

UL 120/240 VAC CERTIFICATION

The 120/240 volt electrical system {will/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:

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

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

4) Altitude
1) Barometric pressure
2) Relative humidity

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

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

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

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

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

DOCUMENTATION

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

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

DIELECTRIC VOLTAGE WITHSTAND TEST

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

The test shall be conducted as follows:

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

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

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

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

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

WARRANTY

A full statement {will/shall} be provided of the warranties for the vehicle(s) being bid. Warranties should

clearly describe the terms under which the vehicle manufacturer accepts responsibility for the cost to repair defects caused by faulty design, quality of work or material and for the applicable period of time after delivery.

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

The Body Manufacturer {will/shall} warrant all materials and accessories used on the vehicle(s), whether fabricated by manufacturer or purchased from an outside source and will deal directly with the {Company} on all warranty work.

GENERAL LIMITED WARRANTY - TWO (2) YEARS

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

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

LOW VOLTAGE ELECTRICAL WARRANTY - FIVE (5) YEARS

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

STRUCTURAL WARRANTY - TEN (10) YEARS

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

UNDERCOAT WARRANTY

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

PAINT LIMITED WARRANTY - TEN (10) YEARS

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

GRAPHICS LIMITED WARRANTY

The 3M graphics installation {will/shall} be warranted for a period of two (2) years. The 3M materials installed on completed vehicle {will/shall} be warranted for seven (7) years. The 3M Diamond grade film (if specified) {will/shall} be warranted for ten (10) years.

CONSTRUCTION PERIOD

The completed vehicle {will/shall} be delivered within {qty} days after receipt of a purchase order or contract.

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

OVERALL HEIGHT

The overall height (OAH) of the vehicle {will/shall} be approximately 130“ (10' - 10") from the ground. This measurement {will/shall} be taken on flat ground with the tires properly inflated, in the unloaded condition, at that highest point of the vehicle.

OVERALL LENGTH

The overall length (OAL) of the vehicle {will/shall} be approximately 456“ (38' - 0").

OVERALL WIDTH

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

ANGLE OF APPROACH

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

PRE-CONSTRUCTION CONFERENCE

A pre-construction conference {will/shall} be required at the Contractor's factory for {qty} personnel from the {Company} to finalize all construction details prior to manufacturing.

The Contractor {will/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 {will/shall} be by non-stop commercial air travel.

FINAL INSPECTION CONFERENCE

A final inspection conference {will/shall} be required at the Contractor's factory for {qty} personnel from the {Company} to inspect the vehicle and construction details prior to shipment of the completed vehicle. This inspection {will/shall} take place after any specified striping and lettering is installed.

The Contractor {will/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 {will/shall} be by non-stop commercial air travel.

DELIVERY AND DEMONSTRATION

The Contractor {will/shall} be responsible for the delivery of the completed unit to the {Company}'s location. On initial delivery of the apparatus, the Contractor {will/shall} supply a qualified representative to demonstrate the apparatus and provide initial instruction to representatives of the {Company} regarding the operation, care and maintenance of the apparatus and equipment supplied at {Company} location.

The Delivery Engineer {will/shall} set delivery and instruction schedule with the person appointed by {Company}.

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

CHASSIS MODIFICATIONS

LUBRICATION AND TIRE DATA PLATE

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

5) Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid . . (if applicable)
- Pump priming system fluid, if applicable . . (if applicable)
- Drive axle(s) lubrication fluid
- Air conditioning refrigerant . . (if applicable)
- Air conditioning lubrication oil . . (if applicable)
- Power steering fluid
- Cab tilt mechanism fluid . . (if applicable)
- Transfer case fluid . . (if applicable)
- Equipment rack fluid (if applicable)
- CAFS air compressor system lubricant . . (if applicable)
- Generator system lubricant . . (if applicable)
- Front tire cold pressure
- Rear tire cold pressure
- Maximum tire speed ratings

VEHICLE DATA PLATE

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

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

- Sales Order Number

OVERALL HEIGHT, LENGTH DATA PLATE (US)

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

The label {will/shall} show the height of the completed fire apparatus in feet and inches, the length of the completed fire apparatus in feet and inches, and the GVWR in pounds.

Wording on the label {will/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.

PERSONNEL CAPACITY

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

SEAT BELT WARNING - FAMA06/07

A safety sign FAMA06 shall be visible from each seat that is not equipped with occupant restraint and therefore not intended to be occupied while the vehicle is in motion.

A safety sign FAMA07, which warns of the importance of seat belt use, {will/shall} be visible from each seat that is intended to be occupied while the vehicle is in motion.

EQUIPMENT MOUNTING FAMA10

A safety sign FAMA10, which warns of the need to secure items in the cab, {will/shall} be visible inside the cab.

FIRE SERVICE TIRES - FAMA12

A safety sign FAMA12, which warns of the special requirements for fire service–rated tires, {will/shall} be visible to the driver entering the cab of any apparatus so equipped.

HELMET WARNING - FAMA15

A safety sign FAMA15, which warns not to wear helmets while the vehicle is in motion, {will/shall} be visible from each seat that is intended to be occupied while the vehicle is in motion.

CLIMBING METHOD - FAMA23

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

REAR STEP CROSSWALK WARNING - FAMA24

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

FINAL STAGE MANUFACTURER VEHICLE CERTIFICATION

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

FRONT BUMPER

The front bumper {will/shall} be as provided by the cab/chassis manufacturer. No other alteration or modifications are required to extension length.

EXHAUST

The exhaust system shall be as provided by cab/chassis manufacturer. The tailpipe may require some modifications for proper ground clearances and fit with body.

The exhaust piping and discharge outlet shall be located or shielded so as not to expose any portion of the vehicle or equipment to excessive heating.

Exhaust pipe discharge shall be directed away from any operator's position or entry doors on body.

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

HELMET STORAGE, DRIVING AREA

{Quantity} OnScene Solutions Talon model helmet storage bracket(s) shall be provided and installed in the cab driving area. The helmet mounting will comply with the 9G NFPA requirements. If cab is specified with air bags, the helmet bracket(s) will be mounted clear of the deployment area.

- {Quantity} helmet bracket(s) {will/shall} be mounted overhead on the driver and officer sides of the raised roof slope of the cab.

HELMET STORAGE, CREW AREA

{Quantity} OnScene Solutions Talon model helmet storage bracket(s) shall be provided and installed in the rear crew area. The helmet mounting will comply with the 9G NFPA requirements. If cab is specified with air bags, the helmet bracket(s) will be mounted clear of the deployment area.

- {Quantity} helmet bracket(s) {will/shall} be mounted on the side of full height cabinets and underside of the overhead cabinet between. Mounting {will/shall} not interfere with air bag systems, if specified.

ROAD EMERGENCY SAFETY KIT

One (1) set of three (3) dual faced triangular warning flares with fold away base complete with storage case per DOT requirements shall be provided with the completed apparatus.

One (1) 2.5 lb. ABC type vehicle fire extinguisher with bracket per DOT requirements shall be provided and mounted inside cab area.

FUEL FILL

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

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 {will/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 {will/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 {will/shall} be strictly adhered to. {No Exceptions}

The fabrication of the body {will/shall} be formed sheet metal. Formed components {will/shall} allow the {Company} 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 {Company} from such repair and {will/shall} NOT be used. {No Exceptions}

Following construction of the subframe, which supports the apparatus body, the sheet metal portion of the body {will/shall} be built directly on the subframe. The joining of the subframe and body {will/shall} be of a welded integral construction. {No Exceptions}

The sheet metal fabrication of the body {will/shall} be performed using inert gas continuous feed welders only. The entire body {will/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 {will/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. {No Exceptions}

EXTERIOR ALUMINUM BODY

The fabrication of the body {will/shall} be constructed from aluminum 3003H-14 alloy smooth plate. This {will/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 {will/shall} be constructed with not less than 3/16" (.187) aluminum 3003H-14 smooth plate. Interior compartment dividing walls {will/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 {will/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 {will/shall} be formed "C" channel design. An electrical wiring conduit raceway running the full length of exterior compartments {will/shall} be provided. This raceway {will/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 {will/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 {will/shall} be single one-piece sections. Compartment floors {will/shall} be preformed, then positioned in body and welded into final position.

Compartment floors {will/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 {will/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 {will/shall} be welded and caulked to prevent moisture from entering the compartments. All other interior seams and corners {will/shall} be sealed with silicone based caulk prior to painting.

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

DRIP RAILS

The body {will/shall} have drip rails over the side full height compartments. The drip rails {will/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 WITH COMPARTMENTS

The roof structure {will/shall} be integral with the body sheet metal construction and {will/shall} be an all welded assembly. All seams in roof material {will/shall} be fully and continuously welded to prevent entry of moisture.

There {will/shall} be a total of four (4) 2" x 2" x 1/4" 6061-T6 alloy aluminum "C" channels running the length of body, two (2) on each outboard side. These "C" channels {will/shall} be used for roof support and in addition {will/shall} be used for mounting of any specified reels. This open "C" channel design along with special reel mounting clips allows for a universal location of any specified reels within each compartment.

In between the two (2) center "C" channels running the length of body {will/shall} be 2" x 2" x 1/4" 6061-T6 alloy aluminum tubing running in between and welded in place on approximate 16" centers to support roof and/or walkway structure if specified.

A 2" formed radius {will/shall} be provided along the body sides and utilized as a wiring trough. The use of aluminum extrusions in this area {will/shall} not be acceptable, {No Exceptions}.

BODY SUBFRAME

The chassis frame rails {will/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 {will/shall} be constructed from 6061T6 aluminum alloy tubing. Subframe {will/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 {will/shall} be cross members of 2" x 6" x 1/4" aluminum. These cross members {will/shall} extend the full width of the body to support the compartments. Cross members {will/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 {will/shall} be located on 16" centers, or as necessary to support walkway or heavy equipment.

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

BODY MOUNTING

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

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

12" REAR STEP BUMPER

The full width rear bumper {will/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 {will/shall} extend from the rear vertical body panel 12" and provide a rear step with a minimum of 1/2" space at body for water drainage.

REAR TOW EYES

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

TRAILER HITCH

A Class III weight carrying capacity rear hitch receiver {will/shall} be provided below the rear bumper. The receiver {will/shall} be attached to the apparatus body subframe.

The hitch {will/shall} be complete with a 2" square receiver. Without the use of a "weight distribution" ball hitch the Class III receiver {will/shall} have a capacity of 6,000 lbs. gross trailer weight and a maximum tongue weight of 600 lbs.

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

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

TRAILER ELECTRICAL RECEPTACLE

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

TRAILER AUXILIARY ELECTRICAL RECEPTACLE

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

RECEIVER WITH TRAILER BALL

No hitch receiver with trailer ball will be provided with completed unit.

GROUND LIGHTS

There {will/shall} be two (2) OnScene 9" Night Axe 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 {will/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 {will/shall} be constructed from 3/16" smooth aluminum panels.

STAINLESS STEEL BODY FENDERS

The body wheel well openings {will/shall} be provided with round radius, polished stainless steel fenderettes. The fenderettes {will/shall} be bolted and easily replaceable if damaged. The fenderettes {will/shall} be installed using a rubber gasket to reduce buildup of moisture and/or debris.

WHEEL WELL LINERS

The wheel wells {will/shall} be provided with an easily removable polymer, circular inner fender liner. The inner liner {will/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 {will/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 {will/shall} be capable of storing three (3) SCBA cylinders (30 min cylinders). Each compartment {will/shall} have a vertically hinged door with a positive catch latch installed and painted primary lower body color. Each compartment {will/shall} allow the storage of an SCBA cylinder up to 5-3/4" in diameter and 24" deep. The door shall activate the "Hazard Warning Light" in the cab when not in the closed position. Provide a "rope lasso" for each ctlinder location to hold bottles in place.

BODY PAINT SPECIFICATIONS

BODY PAINT PREPARATION

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

The exterior (and interior, if painted) body {will/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 {will/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, {will/shall} be chrome plated. Iron fittings {will/shall} be copper under plated prior to chrome plating.

PAINT PROCESS

The paint process {will/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 {will/shall} go through the following paint process;

- Clean bare metal with a wax and grease remover using low lint rags.

1) 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.
2) Re-clean bare metal using a wax and grease remover and low lint rags.
3) 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.
4) Inspect, putty fill, and dry guild coat entire body surface and DA sand using 180-400 grit dry paper.
5) Re-clean bare metal using a wax and grease remover using low lint rags.
6) 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.
7) A PPG Delfleet® FBCH basecoat (color) with proper hardener and dry additive {will/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.
8) A PPG Delfleet® clearcoat with proper hardener and thinner {will/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.).
9) 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.
10) Polish as needed using 3M Perfect-It-Polish and a black foam pad, repeat as necessary and inspect until all sand scratches are removed.

PAINT - ENVIRONMENTAL IMPACT

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

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 {will/shall} be used to prevent damage to the finish painted surface. These components {will/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 prevent corrosion from dissimilar metals.

ELECTROLYSIS CORROSION CONTROL

The vehicle {will/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 - SINGLE COLOR

The body {will/shall} be painted with a single color of PPG Delfleet® Evolution per {Company} approved paint spray out provided.

A small touch-up bottle of paint {will/shall} be provided with completed vehicle.

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

BODY UNDERCOATING

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

UNDERCOAT WARRANTY

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

PAINT WARRANTY

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

COMPARTMENT INTERIOR FINISH

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

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

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

ROOF COMPARTMENT INTERIOR FINISH

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

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

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

REFLECTIVE STRIPE REQUIREMENTS

Material

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

All retroreflective materials used that are colors not listed in ASTM D 4956, Section 6.1.1, {will/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 {will/shall} conform to the standards required of an integral colored film as specified in ASTM D 4956, Section 6.1.1.

Minimum Requirements

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

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

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

GRAPHICS PROOF

A color graphics proof of the reflective striping layout {will/shall} be provided for approval by {Company} prior to installation. The graphics proof {will/shall} be submitted to {Company} 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 {will/shall} be provided showing all details.

Reflective Stripe: Cab, Oracal

REFLECTIVE STRIPE - CAB SIDE

The reflective stripe material {will/shall} be 6" wide, Oracal 5800 series.

12) This reflective stripe {will/shall} be white #015 in color.

There shall be a 1" Oracal 5800 series reflective stripe located 1" above and a second 1" Oracal 5800 series reflective stripe located 1" below the main stripe.

- This reflective stripe {will/shall} be gold #018 in color.

REFLECTIVE STRIPE - CAB FRONT

The reflective stripe material {will/shall} be 6" wide, Oracal series.

- This reflective stripe {will/shall} be white #015 in color.

There shall be a 1" Oracal 5800 series reflective stripe located 1" above and a second 1" Oracal 5800 series reflective stripe located 1" below the main stripe.

- This reflective stripe {will/shall} be gold #018 in color.

CHEVRON STRIPE - CAB BUMPER

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

The approximate 10" wide Chevron retroreflective stripe {will/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 {will/shall} be 6" width. Chevron panels {will/shall} have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use. Chevron panels {will/shall} have a minimum 10 year warranty for material failure, and colorfastness.

- The stripe material {will/shall} be Oracal 5800 series #L2 Flourescent Lime and #012 Red.

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

This reflective chevron stripe {will/shall} alternate red and fluorescent yellow-green in color.

REFLECTIVE STRIPE - CAB DOOR INTERIOR

Any door of the apparatus designed to allow persons to enter or exit the apparatus {will/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 {will/shall} have 4" Chevron style diamond grade reflective striping. The stripe material {will/shall} be Oracal 5800 series #L2 Flourescent Lime and #012 Red.

REFLECTIVE STRIPE - BODY SIDES

The reflective stripe material {will/shall} be 6" wide, Oracal 5800 series.

- This reflective stripe {will/shall} be white #015 in color.

There shall be a 1" Oracal 5800 series reflective stripe located 1" above and a second 1" Oracal 5800 series reflective stripe located 1" below the main stripe.

- This reflective stripe {will/shall} be gold #018 in color.

The stripe {will/shall} remain in a straight line from the front of the front of cab to the rear 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 {will/shall} be 6" width.

The rear side panels of the body on each side of a rear stairway or compartment {will/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 {will/shall} have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use. Chevron panel {will/shall} have a minimum 10 year warranty for material failure, and colorfastness.

The stripe material {will/shall} be Oracal 5800 series #L2 Flourescent Lime and #012 Red.

This reflective chevron stripe {will/shall} alternate red and fluorescent yellow-green in color.

LETTERING

GRAPHICS PROOF

A color graphics proof of the lettering layout {will/shall} be provided for approval by {Company} prior to installation. The graphics proof {will/shall} be submitted to {Company} 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 {will/shall} be provided showing all details.

The following lettering {will/shall} be provided and installed on the completed unit as follows;

SIDE CAB DOOR LETTERING

There shall be {qty} 4" high reflective letters furnished and installed on the vehicle as follows;

"SAVANNAH" - On top of main stripe, front cab doors. "FIRE" - On top of main stripe, rear cab doors.

"RESCUE" - Below rear cab door windows.

- This reflective lettering {will/shall} be gold in color.

There shall be {qty} 2" high reflective letters furnished and installed on the vehicle.

" . . . committed to those we serve" - Cab sides in script font.

- This reflective lettering {will/shall} be black in color.

There shall be {qty} 11" high reflective letters furnished and installed on the vehicle.

"1" - In sign holder on rear cab doors.

- This reflective lettering {will/shall} be gold in color.

UPPER BODY SIDE LETTERING

There shall be {qty} 11" high reflective letters furnished and installed on the vehicle.

"SAVANNAH FIRE"

- This reflective lettering {will/shall} be gold in color.

REAR BODY LETTERING

There shall be {qty} 11" high reflective letters furnished and installed on the vehicle.

"1" In sign holder on rear strretside of body.

- This reflective lettering {will/shall} be gold in color.

There shall be {qty} 4" high reflective letters furnished and installed on the vehicle.

"KEEP BACK 500 FEET"

- This reflective lettering {will/shall} be white in color.

FRONT OF CAB LETTERING

There shall be {qty} 3" high reflective letters furnished and installed on the vehicle.

"CITY OF SAVANNAH" - Above windshield

- This reflective lettering {will/shall} be gold in color.

There shall be {qty} 8" high reflective letters furnished and installed on the vehicle.

"1" In sign holder front of cab on curbside.

- This reflective lettering {will/shall} be gold in color.

There shall be {qty} 11" high reflective letters furnished and installed on the vehicle.

"SAVANNAH" - Front of raised roof cab.

- This reflective lettering {will/shall} be gold in color.

CUSTOM DECAL LOGO - 18"

{Quantity} Savannah Fire Department 18" Oracal type retroreflective emblem/logos {will/shall} be provided and located on front cab doors. The emblems shall match existing vehicles in fleet.

{Quantity} copy of the above custom logo {will/shall} be provided and located on the completed vehicle as directed by {Company}.

TRUCK NUMBER PLATES

{Quantity} truck numbering plates {will/shall} be installed on the vehicle, located {User Function 4}.

EXTERIOR COMPARTMENT DOORS

ROLL-UP DOOR CONSTRUCTION - ROBINSON (ROM)

The vehicle {will/shall} be equipped with R•O•M Series IV roll-up exterior compartment doors. The R•O•M roll-up doors {will/shall} be complete with the following features;

Each shutter slat, track, bottom rail, and drip rail {will/shall} be constructed from anodized 6063 T6 aluminum. Shutter slats {will/shall} feature a double wall extrusion 0.315" thick with a concave interior surface to minimize loose equipment jamming the shutter door closed. Shutter slats {will/shall} feature an interlocking end shoe to prevent side to side binding of the shutter door during operation. Slats must have interlocking joints with an inverted locking flange. Slat inner seal {will/shall} be a one piece PVC extrusion; seal design will be such to prevent metal to metal contact while minimizing dirt and water from entering the compartment.

Shutter door track {will/shall} be one piece design with integral overlapping flange to provide a clean finished look without the need of caulk. Door track {will/shall} feature an extruded Santoprene rubber double lip low profile side seal with a silicone co-extruded back to reduce friction during shutter operation.

Shutter bottom rail {will/shall} be a one piece double wall extrusion with integrated finger pull. Finger pull {will/shall} be curved upward with a linear striated surface to improve operator grip while operating the shutter door. Bottom rail {will/shall} have a smooth contoured interior surface to prevent loose equipment from jamming the shutter door. Bottom rail seal {will/shall} be made from Santoprene; it will be a double "V" seal to prevent water and debris from entering compartment. Bottom rail lift bar {will/shall} be a one piece "D" shaped aluminum extrusion with linear striations to improve operator grip during operation. Lift bar {will/shall} have a wall thickness of 0.125". Lift bar {will/shall} be supported by no less than two pivot blocks; pivot blocks shall be constructed from Type 66 Glass filled reinforced nylon for superior strength. Bottom rail end blocks {will/shall} have incorporated drain holes which will allow any moisture that collects inside the extrusion to drain out.

Shutter door {will/shall} have an enclosed counter balance system. Counter balance system {will/shall} be 4" in diameter and held in place by two (2) heavy duty 18 gauge zinc plated plates. Counter balance system {will/shall} have two (2) over-molded rubber guide wheels to provide a smooth transition from vertical track to counter balance system; no foam material of any kind shall be permitted or used in this area.

ROM DOOR BOTTOM RAIL

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

The specified retroreflective stripe material {will/shall} be applied on the roll-up compartment doors. The stripe {will/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. {No Exceptions}

BODY HEIGHT MEASUREMENTS

The vertical body dimensions {will/shall} be as follows:

AHEAD OF REAR AXLE

	Description	Dimension
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	68.0"

ABOVE REAR AXLE

	Description	Dimension
G	Vertical Door Opening - Above Rear Wheel	
	-with roll-up door	34.0"
	-with hinged door	37.0"

BEHIND REAR AXLE

	Description	Dimension
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	65.0"

GENERAL

	Description	Dimension
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)

The forward transverse compartment {will/shall} be 90.0" long x 27.0" wide x 33.5" deep. There {will/shall} be four (4) compartments parallel to the sides of the body, two (2) on each side. Each of these compartments {will/shall} be 85.0" long x 28.0" wide x 33.5" deep. The side compartments {will/shall} be open under each door sill to allow for long equipment. Each compartment {will/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. {No Exceptions}

Each compartment {will/shall} have a lift-up type compartment door hinged on the outboard side. Each door {will/shall} be fabricated from 3/16" aluminum tread plate. Each door {will/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 {will/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 {will/shall} be placed between stainless steel hinge and the body mounting surface as necessary to prevent corrosion caused by dissimilar metals.

Each compartment door {will/shall} overlap a 2" vertical lip on the body roof to prevent entry of moisture and sealed with automotive type rubber molding to provide a weather resistant seal.

Each roof compartment door shall have a chrome 7" handle bolted to center of each door.

Each compartment {will/shall} have a 13/16" drain hole located in floor of compartment with a 1" flexible drain tube that terminates below body.

Each compartment {will/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.

- {Quantity} Grainger model 1NNF7 or equal, 240 VAC, 3.1 HP electric powered air compressor with 20 gallon storage tank {will/shall} be located in forward streetside compartment. Compressor {will/shall} be rated at 15.0 free air CFM @ 90 PSI, 10.20 free air CFM @ 135 PSI max. pressure. {Quantity} 240 VAC twist lock receptacle shall be provided in compartment with switch provided on wall within easy reach of operator for turning the compressor ON/OFF located in Compt. C4.

Results of the NFPA required utility air system test shall be provided with delivered vehicle.

The hinged door(s) {will/shall} have an automotive tailgate style lift-up locking handle. A gasket {will/shall} be placed between the handle and the compartment exterior wall. Door latches {will/shall} be a single point, double-catch latch, mounted on the interior wall of the compartment panel.

TRANSVERSE ROOF COMPARTMENT - SHELF TRAC

The front transverse roof compartment {will/shall} be provided with four (4) rows; two (2) rows each side of horizontally mounted aluminum Shelf-Trac welded to the walls for vertical partition installation and adjustability.

ROOF COMPARTMENT - VERTICAL PARTITION

There {will/shall} be {qty} vertical partition(s) provided in the roof compartment(s). The partition(s) {will/shall} be used to retain or hold equipment in place during travel. Each partition {will/shall} be fabricated from 3/16" smooth aluminum and bolted to specified Shelf-Trac for ease of adjustment.

SIDE ROOF COMPARTMENT - SHELF TRAC

There {will/shall} be four rows; two (2) rows each side of horizontally mounted aluminum Shelf-Trac welded to the walls of the side upper body compartments for vertical partition installation and adjustability.

ROOF COMPARTMENT - VERTICAL PARTITION

There {will/shall} be {qty} vertical partition(s) provided in the roof compartment(s). The partition(s) {will/shall} be used to retain or hold equipment in place during travel. Each partition {will/shall} be fabricated from 3/16" smooth aluminum and bolted to specified Shelf-Trac for ease of adjustment.

UPPER BODY WALKWAY

A 34" wide, upper body walkway {will/shall} be provided at the center of body and recessed into the roof structure. The walkway {will/shall} be fabricated from NFPA compliant 3/16" aluminum tread plate with continuously welded cross seams to prevent moisture penetration into apparatus body, No Exceptions. The walkway shall be supported with 2" x 2" tubing on 14" - 22" centers.

13/16" drains {will/shall} be installed at front of walkway connected to 1" flexible drain tubes that will terminate below the body.

WALKWAY/STEP LIGHTS

There {will/shall} be four (4) OnScene Solutions Rough-Service 9" LED lights provided to illuminate the walkway or step area. The lights {will/shall} be activated when the parking brake is set.

Each light {will/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 {will/shall} be switchable but activated automatically when the vehicle park brake is set.

ROOF ACCESS LADDER

The ladder {will/shall} be weld constructed of vertical aluminum extrusion tubing and aluminum grip surface ladder rungs with slip resistant tread grip pattern. It shall be set off from body 8 inches and mounted to body with chrome plated end stanchions bolted to the body with stainless steel bolts. The ladder shall NOT extend above the body roof.

The location {will/shall} be on the rear curbside of the apparatus body.

WALKWAY/STEP LIGHTS

There {will/shall} be two (2) OnScene Solutions Rough-Service 9" LED lights provided to illuminate the walkway or step area. The lights {will/shall} be activated when the parking brake is set.

Each light {will/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 {will/shall} be switchable but activated automatically when the vehicle park brake is set.

BODY WIDTH DIMENSIONS

The body {will/shall} be 100.0" wide, not including drip rail or non-permanent fixtures. Interior compartment depth dimensions {will/shall} be approximately:

Area Description	Dimension
Transverse Area above Subframe	95.0"
Compartment Depth below Subframe	24.5"

STREETSIDE COMPARTMENT - FRONT (S1)

The interior useable compartment width shall be approximately 64.0" wide.

The compartment door opening shall be approximately 57.0" wide.

This compartment {will/shall} have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components {will/shall} be painted to match the single tone exterior color.

- The door {will/shall} be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.

- A keyed cylinder lock {will/shall} be provided on bottom rail of the roll-up door.

- One (1) 1" wide nylon strap {will/shall} be provided to assist in closing the compartment door. The strap {will/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.

- {Quantity} aluminum drip pan/door finish guard {will/shall} be provided with the roll-up door.

- A compartment threshold protection plate {will/shall} be installed on the bottom edge of the compartment door opening. The threshold protection {will/shall} be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There {will/shall} be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion {will/shall} have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.

- There {will/shall} be three (3) 14" wide bolt-in shelves approximately 46" deep located ahead of vertical divider, and one (1) 44" wide above slideout tray. Shelves {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical flange along the front and rear edges in front of compartment, and 2" vertical flange for shelf above rescue tools.

- There {will/shall} be {qty} OnScene Solutions 81 series aluminum tray base with 100% extension, and rating of 1,000 lbs. Slide-out tray(s) base {will/shall} be approximately 46" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails. Each slide base {will/shall} have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray {will/shall} be fabricated from 3/16" 3003 aluminum sheet and {will/shall} have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".

- There {will/shall} be {qty} bolt-in vertical compartment partition(s) provided dividing the compartment into left and right sides. The vertical partition(s) {will/shall} be 3/16" (.188) 3003H-14 alloy smooth aluminum sheet.

- There {will/shall} be a transverse plywood storage module for full 4' x 8' sheets of plywood without altering the size. The module shall be fabricated from 3/16" (.188) 3003H-14 aluminum alloy sheet and {will/shall} have hinged retainer doors at each end to hold plywood in place. Storage module {will/shall} hold the following sheets of plywood;

The module will have the capacity to store 6 sheets of plywood.

  - {Quantity} {Company} supplied sheets of 4' x 8' x ¾" sheets of plywood.

- The floor of the compartment above the frame rails {will/shall} be extended to the interior edge of the door. The floor {will/shall} have a 2" vertical lip and a 1" return to increase strength.

- Two (2) OnScene 63" Night Axe LED compartment lights, vertically mounted.

- The specified portable winch {will/shall} be mounted in compartment using a heavy duty "U" shaped channel. Winch receiver tube and mounting pin shall be utilized to hold in place during travel.

- The controls for the specified light tower(s).

- There shall be {qty} 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) {will/shall} be 20 amp, twist-lock (NEMA L5-20R).
  - Outlet(s) shall be powered through the on-board generator system.

- {Quantity} OnScene 9" Night Axe LED ground light(s) {will/shall} be provided below the body.

- The 12 volt electrical distribution panel {will/shall} be located in the front lower compartment.

STREETSIDE COMPARTMENT - AHEAD OF REAR WHEELS (S2)

The interior useable compartment width shall be approximately 64.0" wide.

The compartment door opening shall be approximately 57.0" wide.

This compartment {will/shall} have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components {will/shall} be painted to match the single tone exterior color.

- The door {will/shall} be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.

- A keyed cylinder lock {will/shall} be provided on bottom rail of the roll-up door.

- One (1) 1" wide nylon strap {will/shall} be provided to assist in closing the compartment door. The strap {will/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.

- {Quantity} aluminum drip pan/door finish guard {will/shall} be provided with the roll-up door.

- A compartment threshold protection plate {will/shall} be installed on the bottom edge of the compartment door opening. The threshold protection {will/shall} be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There {will/shall} be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion {will/shall} have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.

- There {will/shall} be {qty} adjustable shelf/shelves approximately 24" deep on aft side of vertical partition. Each shelf {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edge.

- There {will/shall} be {qty} OnScene Solutions 83 series aluminum tray base with 70% extension, and rating of 1,000 lbs. Slide-out tray(s) base {will/shall} be approximately 94" deep and as wide as the compartment layout or door opening permits, capable of extending out either side of the body located above the level of the chassis frame rails. Each slide base {will/shall} have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed, 40% extended and 70% extended positions. Each tray top {will/shall} be fabricated from 3/16" 3003 aluminum sheet {will/shall} have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".

- There {will/shall} be {qty} transverse module fabricated from 3/16" (.188) 3003H-14 aluminum alloy smooth sheet. The module will be designed for the following long tools and equipment:

  - A Little Giant folding ladder shall be stored in the transverse module and be accessible from the curbside. There shall be approximately 39" of space on the streetside for misc storage.

  - {Quantity} {Company} supplied stokes basket(s). Manufacturer, model number and dimensions of the stokes basket(s) {will/shall} be provided during the pre-construction meeting.

Dimensions of the Stokes Basket: ___" l x ___" w x ___" h

  - {Quantity} {Company} supplied backboard(s) stored inside stokes basket. Manufacturer, model number and dimensions of the backboard(s) {will/shall} be provided during the pre-construction meeting.

Dimensions of the back boards: ___" l x ___" w x ___" h

- The above module will have a solid aluminum door with a double return brake at the top for strength. The door shall have stainless steel plates with round stainless dowels welded onto them to create the latches and hinges for the door.

- There {will/shall} be {qty} OnScene Solutions cargo straps provided to secure the customer installed PPV fan.

- There {will/shall} be {qty} 14" x 14" x 11" H removable plastic tool box(s) with hand holes for carrying. Each tool box shall be fabricated from ½" (.50) textured finish polypropylene sheet. There shall be a 1/2" lip installed across the bottom of the compartment to retain the boxes from sliding towards the door opening.

- The floor of the compartment above the frame rails {will/shall} be extended to the interior edge of the door on forward half only. The floor {will/shall} have a 2" vertical lip and a 1" return to increase strength.

- Two (2) OnScene 63" Night Axe LED compartment lights, vertically mounted.

- {Quantity} OnScene 9" Night Axe LED ground light(s) {will/shall} be provided below the body.

- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents {will/shall} be provided in the lower compartment.

STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S3)

The interior useable compartment width shall be approximately 59.0" wide x 25" deep.

The compartment door opening shall be approximately 52.0" wide.

This compartment {will/shall} have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components {will/shall} be painted to match the single tone exterior color.
- The door {will/shall} be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock {will/shall} be provided on bottom rail of the roll-up door.
- One (1) 1" wide nylon strap {will/shall} be provided to assist in closing the compartment door. The strap {will/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.
- {Quantity} aluminum drip pan/door finish guard {will/shall} be provided with the roll-up door.
- A compartment threshold protection plate {will/shall} be installed on the bottom edge of the compartment door opening. The threshold protection {will/shall} be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There {will/shall} be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion {will/shall} have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There {will/shall} be {qty} 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top {will/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 {will/shall} extend 100% of the slide length. The tray assembly {will/shall} utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
- There {will/shall} be {qty} OnScene Solutions 84 series aluminum tray base with 90% extension, and rating of 150 lbs. Slide-out tray(s) base {will/shall} be approximately 30" deep and as wide as the compartment layout or door opening permits. It {will/shall} be located above the level of the chassis frame rails and {will/shall} be vertically adjustable in height. Each slide {will/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 {will/shall} be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".

- There {will/shall} be {qty} bolt-in back wall installed in this compartment to eliminate the transverse feature.

- Two (2) OnScene 27" Night Axe LED compartment lights, vertically mounted.

STREETSIDE COMPARTMENT - REAR (S4)

The interior useable compartment space shall be approximately 70.0" wide x 25" deep.

The compartment door opening shall be approximately 63.0" wide.

This compartment {will/shall} have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components {will/shall} be painted to match the single tone exterior color.

- The door {will/shall} be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.

- A keyed cylinder lock {will/shall} be provided on bottom rail of the roll-up door.

- One (1) 1" wide nylon strap {will/shall} be provided to assist in closing the compartment door. The strap {will/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.

- {Quantity} aluminum drip pan/door finish guard {will/shall} be provided with the roll-up door.

- A compartment threshold protection plate {will/shall} be installed on the bottom edge of the compartment door opening. The threshold protection {will/shall} be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There {will/shall} be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion {will/shall} have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.

- There {will/shall} be {qty} adjustable shelf/shelves approximately 24" deep, two (2) each side of vertical partition. Each shelf {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edge.

- There {will/shall} be {qty} 400 lbs. slide-out tray(s) approximately 24" deep on forward side of vertical partition. The tray top {will/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 {will/shall} extend 100% of the slide length. The tray assembly {will/shall} utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.

- There {will/shall} be {qty} bolt-in vertical compartment partition(s) provided dividing the compartment into left and right sides. The vertical partition(s) {will/shall} be 3/16" (.188) 3003H-14 alloy smooth aluminum sheet.

- A clay absorbent (or similar weight material) storage hopper {will/shall} be provided in this compartment for approximately 150 pounds of material. The storage hopper {will/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 {will/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 {will/shall} cover the area directly above the frame rails ONLY (non-extended floor).

- {Quantity} 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) {will/shall} be mounted to channel structure that allows for side-to-side adjustment of reel position.

    - Power rewind control(s) {will/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 {will/shall} be marked with a label indicating its function.

    - A label {will/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 {will/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.

– {Quantity} Akron model EJB series, cast aluminum electrical power distribution box with yellow powder coat painted finish {will/shall} be provided. The power distribution box shall meet all requirements described in NFPA 1901. The power distribution box {will/shall} include the following outlets mounted on a backlit face plate;

    – A 12" pigtail that terminates in an L5-30 configuration to match the cable on the cord reel. The outlet configuration {will/shall} include:

    - {Quantity} 120 VAC, 5-15 duplex straight-blade receptacle.

    – {Quantity} 120 VAC, 5-15 duplex straight-blade receptacle.

    – {Quantity} 120 VAC, L5-20 single twist lock receptacle.

    – {Quantity} 120 VAC, L5-20 single twist lock receptacle.

– {Quantity} Akron formed aluminum treadplate vertical mounting bracket {will/shall} be provided for specified power distribution box.

– The fairlead roller {will/shall} be mounted directly to the reel.

- Two (2) OnScene 63" Night Axe LED compartment lights, vertically mounted.

- {Quantity} OnScene 9" Night Axe LED ground light(s) {will/shall} be provided below the body.

- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents {will/shall} be provided in the lower compartment.

CURBSIDE COMPARTMENT - FRONT (C1)

The interior useable compartment width shall be approximately 64.0" wide.

The compartment door opening shall be approximately 57.0" wide.

This compartment {will/shall} have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components {will/shall} be painted to match the single tone exterior color.
- The door {will/shall} be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock {will/shall} be provided on bottom rail of the roll-up door.
- One (1) 1" wide nylon strap {will/shall} be provided to assist in closing the compartment door. The strap {will/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.
- {Quantity} aluminum drip pan/door finish guard {will/shall} be provided with the roll-up door.
- A compartment threshold protection plate {will/shall} be installed on the bottom edge of the compartment door opening. The threshold protection {will/shall} be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There {will/shall} be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion {will/shall} have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There {will/shall} be {qty} 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top {will/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 {will/shall} extend 100% of the slide length. The tray assembly {will/shall} utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
- There {will/shall} be {qty} OnScene Solutions 85 series aluminum slide-out vertical tool board(s) with 100% extension, and rating of 1,000 lbs. approximately 46" deep. Each tool board shall be mounted on an OnScene Solutions slide frame constructed of anodized aluminum extrusion(s). Each slide shall have a cable operated, spring loaded latch complimented by a red "T" handle (Pull to Release). The slide shall lock in the closed and full extension positions.
    - The tool board material shall be PAC Trac double face 7040 extrusion with the tracks in a horizontal orientation.
    - Each tool board will be bolted to compartment floor.
- There {will/shall} be a transverse storage module which extends from the opposite side of the body (specified in opposite side compartment).

- One (1) Craftsman 6-drawer tool box (26" wide x 16" high x 12" deep) on lower slide-out tray.
- The floor of the compartment above the frame rails {will/shall} be extended to the interior edge of the door. The floor {will/shall} have a 2" vertical lip and a 1" return to increase strength.
- Two (2) OnScene 63" Night Axe LED compartment lights, vertically mounted.
- The cab tilt control pendant.
- {Quantity} 120/240 VAC load center.
- The generator gauge panel.
- There shall be {qty} 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) {will/shall} be 20 amp, twist-lock (NEMA L5-20R).
  - Outlet(s) shall be powered through the on-board generator system.
- {Quantity} OnScene 9" Night Axe LED ground light(s) {will/shall} be provided below the body.

CURBSIDE COMPARTMENT - AHEAD OF REAR WHEEL (C2)

The interior useable compartment width shall be approximately 64.0" wide.

The compartment door opening shall be approximately 57.0" wide.

This compartment {will/shall} have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components {will/shall} be painted to match the single tone exterior color.
- The door {will/shall} be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock {will/shall} be provided on bottom rail of the roll-up door.
- One (1) 1" wide nylon strap {will/shall} be provided to assist in closing the compartment door. The strap {will/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.
- {Quantity} aluminum drip pan/door finish guard {will/shall} be provided with the roll-up door.
- A compartment threshold protection plate {will/shall} be installed on the bottom edge of the compartment door opening. The threshold protection {will/shall} be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There {will/shall} be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion {will/shall} have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.

- There {will/shall} be {qty} 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top {will/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 {will/shall} extend 100% of the slide length. The tray assembly {will/shall} utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.

- There {will/shall} be {qty} OnScene Solutions 81 series aluminum tray base with 100% extension, and rating of 1,000 lbs. Slide-out tray(s) base {will/shall} be approximately 60" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails. Each slide base {will/shall} have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray {will/shall} be fabricated from 3/16" 3003 aluminum sheet and {will/shall} have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".

    - Vertical partition(s) {will/shall} be provided on slide-out tray base dividing the tray into left and right sides. Each vertical partition {will/shall} be horizontally adjustable; mounted on aluminum Shelf Trac on tray floor. The vertical partition(s) {will/shall} be 3/16" (.188) 3003H-14 alloy smooth aluminum sheet. Sheet {will/shall} be perforated with 1/4" (.25) holes on 1" centers.

- There {will/shall} be {qty} OnScene Solutions 83 series aluminum tray base with 70% extension, and rating of 1,000 lbs. Slide-out tray(s) base {will/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 {will/shall} be {qty} OnScene Solutions 84 series aluminum tray base with 90% extension, and rating of 150 lbs. Slide-out tray(s) base {will/shall} be approximately 46" deep and as wide as the compartment layout or door opening permits. It {will/shall} be located above the level of the chassis frame rails and {will/shall} be vertically adjustable in height. Each slide {will/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 {will/shall} be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".

– There {will/shall} be {qty} bolt-in vertical compartment partition(s) provided dividing the compartment into left and right sides. The vertical partition(s) {will/shall} be 3/16" (.188) 3003H-14 alloy smooth aluminum sheet.

- There {will/shall} be a transverse storage module which extends from the opposite side of the body (specified in opposite side compartment).

- The floor of the compartment above the frame rails {will/shall} be extended to the interior edge of the door. The floor {will/shall} have a 2" vertical lip and a 1" return to increase strength.

- Two (2) OnScene 63" Night Axe LED compartment lights, vertically mounted.

- {Quantity} OnScene 9" Night Axe LED ground light(s) {will/shall} be provided below the body.

- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents {will/shall} be provided in the lower compartment.

CURBSIDE COMPARTMENT - ABOVE REAR WHEEL (C3)

The interior useable compartment width shall be approximately 59.0" wide.

The compartment door opening shall be approximately 52.0" wide.

This compartment {will/shall} have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components {will/shall} be painted to match the single tone exterior color.
- The door {will/shall} be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock {will/shall} be provided on bottom rail of the roll-up door.
- One (1) 1" wide nylon strap {will/shall} be provided to assist in closing the compartment door. The strap {will/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.
- {Quantity} aluminum drip pan/door finish guard {will/shall} be provided with the roll-up door.
- A compartment threshold protection plate {will/shall} be installed on the bottom edge of the compartment door opening. The threshold protection {will/shall} be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There {will/shall} be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion {will/shall} have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There {will/shall} be {qty} OnScene Solutions 84 series aluminum tray base with 90% extension, and rating of 150 lbs. Slide-out tray(s) base {will/shall} be approximately 46" deep and as wide as the compartment layout or door opening permits. It {will/shall} be located above the level of the chassis frame rails and {will/shall} be vertically adjustable in height. Each slide {will/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 {will/shall} be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
- There {will/shall} be {qty} air bag storage module(s). The module shall be fabricated from 1/8" (.125) 3003H-14 aluminum alloy sheet. Circular notches shall be provided along the front edge to ease the access to the air bags. Each bay shall be sized to hold the air bag and a matching piece of 1/2" plywood (plywood not provided). Air bags as follows;
    - Two (2) 38" x 38" x 1"
    - One (1) 29-1/2" x 29-1/2" x 1"
    - Two (2) 25-1/4" x 25-1/4" x 1"

- Two (2) 22-1/2" x 16-1/4" x 1"

- There {will/shall} be {qty} OnScene Solutions Velcro cargo straps provided to secure the stored equipment.

- Slide-in type storage for four (4) specified fire extinguishers below spare SCBA cylinder storage.

- Two (2) OnScene 27" Night Axe LED compartment lights, vertically mounted.

CURBSIDE COMPARTMENT - REAR (C4)

The interior useable compartment space shall be approximately 70.0" wide x 25" deep.

The compartment door opening shall be approximately 63.0" wide.

This compartment {will/shall} have a R•O•M series IV roll-up door.

- The roll-up door slats and the door track components {will/shall} be painted to match the single tone exterior color.

- The door {will/shall} be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.

- A keyed cylinder lock {will/shall} be provided on bottom rail of the roll-up door.

- One (1) 1" wide nylon strap {will/shall} be provided to assist in closing the compartment door. The strap {will/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.

- {Quantity} aluminum drip pan/door finish guard {will/shall} be provided with the roll-up door.

- A compartment threshold protection plate {will/shall} be installed on the bottom edge of the compartment door opening. The threshold protection {will/shall} be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There {will/shall} be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion {will/shall} have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.

- There {will/shall} be {qty} adjustable shelf/shelves approximately 24" deep, one (1) full width for mounting specified Hurst reels, and two (2) on aft side of vertical partition above frame height. Each shelf {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edge.

- There {will/shall} be {qty} OnScene Solutions 86 series aluminum tray base with 100% extension, and rating of 600 lbs. The tray base {will/shall} be 30" wide maximum x 24" deep. Each slide base {will/shall} have a cable operated, spring loaded latch complimented by a red "T" handle (Pull to Release) which {will/shall} lock the tray in the closed and full extension positions. Each tray top {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 3 ½" vertical lip and welded corners

to form a box type tray surface and as wide as the compartment layout or door opening permits located below the level of the chassis frame rails.

- There {will/shall} be {qty} OnScene Solutions 86 series aluminum tray base with 100% extension, and rating of 600 lbs. The tray base {will/shall} be 30" wide maximum x 24" deep. Each tray {will/shall} be vertically adjustable. Each slide base {will/shall} have a cable operated, spring loaded latch complimented by a red "T" handle (Pull to Release) which {will/shall} lock the tray in the closed and full extension positions. Each tray top {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 3 ½" vertical lip and welded corners to form a box type tray surface and as wide as the compartment layout or door opening permits located below the level of the chassis frame rails.

- There {will/shall} be {qty} bolt-in vertical compartment partition(s) provided dividing the compartment into left and right sides. The vertical partition(s) {will/shall} be 3/16" (.188) 3003H-14 alloy smooth aluminum sheet.

- Two (2) poly "L" angles {will/shall} be provided on floor on aft side of vertical partition.

- The floor of the compartment above the frame rails {will/shall} cover the area directly above the frame rails ONLY (non-extended floor).

- {Quantity} 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) {will/shall} be mounted to channel structure that allows for side-to-side adjustment of reel position.

    - Power rewind control(s) {will/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 {will/shall} be marked with a label indicating its function.

    - A label {will/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 {will/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.

- {Quantity} Akron model EJB series, cast aluminum electrical power distribution box with yellow powder coat painted finish {will/shall} be provided. The power distribution box shall meet all requirements described in NFPA 1901. The power distribution box {will/shall} include the following outlets mounted on a backlit face plate;

    - A 12" pigtail that terminates in an L5-30 configuration to match the cable on the cord reel. The outlet configuration {will/shall} include:

    - {Quantity} 120 VAC, 5-15 duplex straight-blade receptacle.

    - {Quantity} 120 VAC, 5-15 duplex straight-blade receptacle.

    - {Quantity} 120 VAC, L5-20 single twist lock receptacle.

    - {Quantity} 120 VAC, L5-20 single twist lock receptacle.

- {Quantity} Akron formed aluminum treadplate vertical mounting bracket {will/shall} be provided for specified power distribution box.

- The reel {will/shall} be supplied with OnScene Solutions fairlead extension with a 6" - 10" extension (depending on compartment depth). The fairlead extension {will/shall} allow hoses or cords to be extended out and away from compartment door edges, slide trays, or shelving that may result in wear damage.

- {Quantity} Hannay EF2016-17-18 hydraulic hose reel(s) with painted finish capable of storing 100' of dual line hydraulic hose. The rewind button for each reel {will/shall} be located adjacent to the reel it controls.

- The hydraulic reel {will/shall} be equipped with 100' of Hurst low pressure 5,000 PSI hydraulic hose with Streamline couplings and a molded plastic ball clamp. The hose {will/shall} be gray and yellow with black guards. A set of color inserts will be shipped with each hose set to designate hose color set.

- The hydraulic reel {will/shall} connect to the hydraulic pump with {qty} 6' Hurst hydraulic hose(s) with Streamline couplings.

- The fairlead roller {will/shall} be mounted directly to the reel.

- {Quantity} Hannay EF2016-17-18 hydraulic hose reel(s) with painted finish capable of storing 100' of dual line hydraulic hose. The rewind button for each reel {will/shall} be located adjacent to the reel it controls.

- The hydraulic reel {will/shall} be equipped with 100' of Hurst low pressure 5,000 PSI hydraulic hose with Streamline couplings and a molded plastic ball clamp. The hose {will/shall} be gray and yellow with black guards. A set of color inserts will be shipped with each hose set to designate hose color set.

- The hydraulic reel {will/shall} connect to the hydraulic pump with {qty} 6' Hurst hydraulic hose(s) with Streamline couplings.

- The fairlead roller {will/shall} be mounted directly to the reel.

- {Quantity} Hannay EF1514-17-18 low pressure air hose reel(s) {will/shall} be provided in this compartment. Reel {will/shall} be designed to hold 110% of the capacity needed.

    - Power rewind control(s) {will/shall} be in a position where the operator can observe the rewinding operation and {will/shall} be marked with a label indicating its function and {will/shall} be guarded to prevent accidental operation.

    - A label {will/shall} be provided in a visible location adjacent to reel with following information: (1) Utility air or breathing air, (2) Operating pressure, (3) Total hose length, (4) Hose size (ID).

    - The hose reel {will/shall} equipped with 200' of 3/8" Parker Series 7092 GST II low pressure air hose rated for 300 PSI maximum pressure. A molded plastic ball clamp {will/shall} be provided on the hose to stop it at the 4-way roller. The hose {will/shall} be Red in color.

    - The air supply shall be from the utility air compressor.

  - A reel shut-off valve, pressure regulator, and 0-150 psi gauge {will/shall} be provided on an aluminum control panel near the air reel, not exceeding 72" from ground.

- The fairlead roller {will/shall} be mounted directly to the reel.

- Two (2) OnScene 63" Night Axe LED compartment lights, vertically mounted.

- There shall be {qty} 240 VAC outlet(s) located in compartment mounted on the forward wall.

  - The outlet receptacle(s) {will/shall} be 30 amp, twist-lock (NEMA L6-30R).

  - Outlet(s) shall be powered through the on-board generator system.

- {Quantity} {Company} supplied electric hydraulic power unit(s). {Quantity} 240 VAC twist lock receptacle with switch {will/shall} be provided on wall within easy reach of operator for turning the power unit ON/OFF.

- {Quantity} {Company} supplied gas powered hydraulic power unit(s).

- Mounts will be supplied and installed for {qty} {Company} supplied hydraulic ram(s).

- Mounts will be supplied and installed for {qty} {Company} supplied hydraulic cutter(s).

- Mounts will be supplied and installed for {qty} {Company} supplied hydraulic spreader(s).

- {Quantity} OnScene 9" Night Axe LED ground light(s) {will/shall} be provided below the body.

- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents {will/shall} be provided in the lower compartment.

REAR COMPARTMENT - CENTER (RC1)

The rear center compartment shall start at the bottom of the body, between the frame rails, and shall be as high as the body permits. The frame shall extend to the back of the body, stopping just inside the door opening.

A compartment {will/shall} be provided between chassis frame rails just above bumper as deep as possible (minimum 24") for storage of {Company} fuel cans. Compartment {will/shall} vented to outside and sealed against the compartment doors to prevent gas fumes from entering upper compartment area.

The interior useable compartment width shall be approximately 45.0" wide.

The compartment door opening shall be approximately 40.0" wide.

- This compartment {will/shall} have flush fitting vertically hinged compartment door. The door exterior {will/shall} be painted job color.

- The hinged door(s) {will/shall} have a stainless steel 6" offset bent D-ring locking handle. A gasket {will/shall} be placed between handle and door. Door latches {will/shall} be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

The hinged door(s) {will/shall} be free swinging and have a socket and plunger to hold door in the open position.

- A compartment threshold protection plate {will/shall} be installed on the bottom edge of the compartment door opening. The threshold protection {will/shall} be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There {will/shall} be {qty} OnScene Solutions 81 series aluminum tray base with 100% extension, and rating of 1,000 lbs. Slide-out tray(s) base {will/shall} be approximately 60" deep located above the level of the chassis frame rails on curbside of compartment. Each slide base {will/shall} have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray {will/shall} be fabricated from 3/16" 3003 aluminum sheet and {will/shall} have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".

- There {will/shall} be {qty} module fabricated from 3/16" (.188) 3003H-14 aluminum alloy smooth sheet. The module will be designed for the following long tools and equipment:

- There {will/shall} be a storage module for on left side of compartment for strong back plywood sheet storage. The module shall be fabricated from 3/16" (.188) 3003H-14 aluminum alloy sheet and shall have hinged retainer in center. Module shall hold the following sheets of plywood;

    - Two (2) {Company} supplied strong backs (4' x 8' x ¾" sheets of plywood with 2" x 10" x 12' in center of each sheet).
    - Three (3) {Company} supplied 4" x 4" x 10' lumber.
    - Three (3) {Company} supplied 2" x 6" x 10' lumber.

    - {Quantity} pike pole(s) (see detailed list) {will/shall} be provided and stored above ladders in rear compartment. The (3) pike poles shall be a 6' an 8' and a 10' length.

    – {Quantity} ladder(s) (see detailed list) {will/shall} be provided and stored in rear compartment. A heavy duty roller assembly {will/shall} be provided on floor level to prevent damage during removal/replacement of ladders. All extension type ladders to be stored on fiberglas angles for protection. Labels to be provided to identify ladder type and length.

There shall be a storage module in this compartment located in the upper right hand side to store the pair of portable tripod storage lights.

– There {will/shall} be {qty} cylinder storage module for (customer) SCUBA bottles. The maximum length of the cylinder {will/shall} be 32" x 9" in diameter. The module shall have an exterior shell fabricated from 1/8" (.125) 3003H-14 aluminum alloy sheet. In addition there shall be rubber matting provided in the base of each storage tube for bottle protection and to prevent slipping.

    – The SCBA cylinder module {will/shall} be capable of storing four (4) SCUBA cylinders up to 9" diameter and two (2) SCUBA cylinders up to 6" in diameter.

- Two (2) OnScene 63" Night Axe LED compartment lights, vertically mounted.

PLASTIC FLOOR AND SHELF TILE

All compartment floors, shelves, and trays shall be covered with Dri-Dek plastic interlocking grating.

- The plastic floor tile shall be red.

- The plastic edge trim shall be red.

ROPE ANCHOR OR PORTABLE WINCH RECEIVERS

The completed unit {will/shall} have an integrated receiver or anchor system for use with removable rope anchor point and/or a portable electric winch, when specified.

Receivers or anchors installed at any location on the apparatus for use as removable winch anchors {will/shall} be designed and affixed to provide at least a 2.0 to 1 straight line pull no-yield safety factor over the load rating of the removable winch.

Receivers or anchors installed at any location on the apparatus for use with rope operations {will/shall} be designed and affixed to the apparatus to provide at least a 9,000 lbf (40,000 N) no-yield condition with a straight line pull.

A safety sign FAMA28 shall be located on or near each receiver or anchor stating the maximum straight line pull rating.

Side receiver(s) (if specified) {will/shall} have the following load rating:

	STRAIGHT PULL	SAFETY FACTOR
Rope Tie Off:	600 Lbs.	15:1
Winch:	5,000 Lbs.	2:1

Front and/or rear receiver(s) (if specified) {will/shall} have the following load rating:

	STRAIGHT PULL	SAFETY FACTOR
Rope Tie Off:	600 Lbs.	15:1
Winch:	Winch Load Rating (9,000 Lbs. Max)	2:1

The following items {will/shall} be provided to accomplish rope rescue and/or portable winch operation;

- {Quantity} rope anchor point receiver(s) {will/shall} be provided and located on outboard edges of body roof area. The receiver(s) {will/shall} be manufactured using 2" x 2" x 1/4" wall steel trailer style receiver tube and 1/2" steel plate and bolted to body structure. The receiver assembly {will/shall} be powder coat painted black. Each receiver location {will/shall} have a stainless steel scuff plate to protect paint on upper body. Reinforcements to body {will/shall} be added as necessary to increase the structural integrity and to provide a working weight rating of 600 lbs., with a 9,000 lbs. maximum load based upon using a 15:1 safety factor to match typical 1/2" rescue rope ratings.

- {Quantity} removable rope anchor(s) {will/shall} be provided with completed vehicle. Each rope anchor {will/shall} be fabricated from 3/4" steel, 2" high x 11.5" long with a 3" OD/2" ID eyelet. Eyelet end {will/shall} have radiused edge to prevent damage to rope or carabineer. Each rope anchor {will/shall} have a black powder coat paint finish. A steel 5/8" x 3" hitch pin {will/shall} lock the rope anchor into the receiver tube.

- {Quantity} removable rope anchor(s) {will/shall} be provided with completed vehicle. Each rope anchor {will/shall} be fabricated from 3/4" steel, 2" high x 11.5" long with a 3" OD/2" ID eyelet. Eyelet end {will/shall} have radiused edge to prevent damage to rope or carabineer. Each rope anchor {will/shall} have a powder coat paint finish and a steel 5/8" hitch pin to lock it in place. An aluminum mounting bracket {will/shall} be provided to store rope anchor(s) inside a body compartment as close to receiver location as possible.

- One (1) portable winch {will/shall} be supplied by {Company}. The contractor {will/shall} make necessary provisions to accept supplied portable winch.

- There {will/shall} be {qty} 2" x 2" x 1/4" wall steel receiver tube(s) with powder coat paint finish located on the streetside of the body in the forward wheel well panel area for use with removable rope anchor and/or a portable electric winch (when specified).

    - The receiver(s) {will/shall} have {qty} rubber cover(s) provided.

- There {will/shall} be {qty} 2" x 2" x 1/4" wall steel receiver tube(s) with powder coat paint finish located on the curbside of the body in the forward wheel well panel area for use with removable rope anchor and/or a portable electric winch (when specified).

    - The receiver(s) {will/shall} have {qty} rubber cover(s) provided.

- The specified rear trailer hitch {will/shall} be compatible with the removable rope anchor point and/or a portable electric winch (when specified).

    – There {will/shall} be {qty} 12 VDC plug(s) with quick connect provided to power a Ramsey portable winch. All 12 VDC cables to be sized according to Ramsey and installation for intended use.

    - The receiver(s) {will/shall} have {qty} rubber cover(s) provided.

LOWER SIDE BODY PROTECTION - RUB RAIL

OnScene Solutions rub rails {will/shall} be provided below the compartment door openings on both the streetside and curbside.

The rub rail {will/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 {will/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 {will/shall} incorporate LED clearance marker lighting recessed into the rail fascia to avoid damage to the light in case of impact. The rub rail {will/shall} have an accessory mounting track integrated into the backside of the rail to allow mounting of accessories such as ground lighting.

UPPER SIDE BODY PROTECTION - RUB RAIL

Rub rails {will/shall} be provided on upper body sides on both the streetside and curbside.

The rub rails {will/shall} be fabricated from ABS plastic, measuring approximately 2-3/4" high x 1-3/8" thick. The rub rail {will/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 ABS plastic material {will/shall} be black in color.

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 {will/shall} be used to protect wire and wire looms. Electrical connections {will/shall} be with double crimp water-tight heat shrink connectors.

All 12 VDC wiring running from front to back of vehicle body {will/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:

- SAE J156, *Fusible Links*
- SAE J553, *Circuit Breakers*
- SAE J554, *Electric Fuses (Cartridge Type)*
- SAE J1888, *High Current Time Lag Electric Fuses*
1) SAE J2077, *Miniature Blade Type Electrical Fuses*

Switches, relays, terminals, and connectors shall have a direct current (dc) rating of 125% of maximum current for which the circuit is protected.

Power Supply

A 12 V or greater electrical alternator shall be provided. The alternator shall have a minimum output at idle to meet the minimum continuous electrical load of the vehicle, at 200°F (93°C) ambient temperature within the engine compartment, and shall be provided with full automatic regulation.

Minimum Continuous Electrical Load

The minimum continuous electrical load shall consist of the total amperage required to simultaneously operate the following in a stationary mode during emergency operations:

2) The propulsion engine and transmission
3) All legally required clearance and marker lights, headlights, and other electrical devices except windshield wipers and four-way hazard flashers
4) The radio(s) at a duty cycle of 10 percent transmit and 90 % receive (for calculation and testing purposes, a default value of 5 A continuous)
5) The lighting necessary to produce 2 fc (20 lx) of illumination on all walking surfaces on the apparatus and on the ground at all egress points onto and off the apparatus, 5 fc (50 lx) of illumination on all control and instrument panels, and 50 percent of the total compartment lighting loads
1) The minimum optical warning system, where the apparatus is blocking the right-of way
2) The continuous electrical current required to simultaneously operate any fire pumps, aerial devices, and hydraulic pumps
3) Other warning devices and electrical loads defined by the purchaser as critical to the mission of the apparatus

If the apparatus is equipped to tow a trailer, an additional 45 A shall be added to the minimum continuous electrical load to provide electrical power for the federally required clearance and marker lighting and the optical warning devices mounted on the trailer.

The condition of the low voltage electrical system shall be monitored by a warning system that provides both an audible and a visual signal to persons on, in, or near the apparatus of an impending electrical system failure caused by the excessive discharge of the battery set.

The charge status of the battery shall be determined either by direct measurement of the battery charge or indirectly by monitoring the electrical system voltage.

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 {will/shall} be provided with finished apparatus. Similar or generic type electrical schematics {will/shall} NOT BE ACCEPTABLE.

Low Voltage Electrical System Performance Test

A low voltage electrical system test certification {will/shall} be provided with delivered apparatus.

12 VOLT DIAGNOSTIC RELAY CONTROL CENTER

The 12 volt power distribution {will/shall} be conveniently located with easy access for service. All relays and circuit breakers {will/shall} be plug-in type allowing for removal for repairs without necessitating soldering or tools. The sockets mounts for both the relays and circuit breakers {will/shall} be of a design that permits the use of standard automotive type components.

The 12 volt distribution panel {will/shall} utilize printed circuit boards mounted in high strength enclosure. Each printed circuit board {will/shall} be provided with twelve (12) heavy duty independent switching relays. Each relay {will/shall} have the ability to be configured either normally open or normally closed and be protected by a 20 amp automatic reset breaker. Each circuit will be provided with a LED for visual diagnostic.

Power distribution panel {will/shall} be located in apparatus body within a protected enclosure with removable or hinged cover.

ROCKER SWITCH PANEL

The 12 volt control switch panel shall be supplied and installed by the cab/chassis manufacturer.

ELECTRICAL SYSTEM MANAGER

The chassis shall contain an electrical system manager for:

4) Monitoring chassis battery voltage
5) Shedding pre-determined electrical circuits
6) Sequencing pre-determined electrical circuits

7) Automatically controlling chassis engine fast-idle
- Monitor master switch and parking brake applications
- Automatically control warning light modes ("Calling-For" and "Blocking Right of Way")
- Provide low voltage alarm
- Programmable control circuits
- Remote system status indicator panel

System manager shall perform all electrical functions required by current NFPA 1901 Standards.

The electrical system manager shall be supplied and installed by the cab/chassis manufacturer.

BATTERY SYSTEM

The battery connectors {will/shall} be heavy duty type with cables terminating in heat shrink loom. Heavy duty battery cables {will/shall} provide maximum power to the electrical system. Where required, the cables {will/shall} be shielded from exhaust tubing and the muffler. Large rubber grommets {will/shall} be provided where cables enter the battery compartment.

Batteries {will/shall} be of the high-cycle type. With the engine off, the battery system {will/shall} be able to provide the minimum continuous electrical load for 10 minutes without discharging more than 50 percent of the reserve capacity and then to restart the engine. The battery system cold cranking amps (CCA) rating {will/shall} meet or exceed the minimum CCA recommendations of the engine manufacturer. The batteries {will/shall} be mounted to prevent movement during fire apparatus operation and shall be protected against accumulations of road spray, snow, and road debris. The batteries {will/shall} be readily accessible for examination, testing, and maintenance.

A means {will/shall} be provided for jump-starting the engine if the batteries are not accessible without lifting the cab of a tilt-cab apparatus.

Where an enclosed battery compartment is provided, it {will/shall} be ventilated to the exterior to prevent the buildup of heat and explosive fumes. The batteries {will/shall} be protected against vibration and temperatures that exceed the battery manufacturer’s recommendation.

An onboard battery conditioner or charger or a polarized inlet {will/shall} be provided for charging all batteries. Where an onboard conditioner or charger is supplied, the associated line voltage electrical power system shall be installed in accordance with Chapter 22.

One of the following master disconnect switches {will/shall} be provided:

- A master body disconnect switch that disconnects all electrical loads not provided by the chassis manufacturer
- A master load disconnect switch that disconnects all electrical loads on the apparatus except the starter

Electronic control systems and similar devices {will/shall} be permitted to be otherwise connected if so specified by their manufacturer.

The alternator {will/shall} be wired directly to the batteries through the ammeter shunt(s), if one is provided, and not through the master load disconnect switch.

A green “battery disconnect on” indicator light that is visible from the driver’s position {will/shall} be provided.

Rechargeable hand lights, radios, and other similar devices {will/shall} be permitted to be connected to the electrical system ahead of the master disconnect switch.

A sequential switching device {will/shall} be permitted to energize the optical warning devices and other high current devices required in minimum continuous electrical load, provided the switching device shall first energize the electrical devices required in minimum continuous electrical load within 5 seconds.

BATTERY SWITCH

One (1) "battery disconnect on" switch in cab located within easy reach of Driver with indicator light that is visible from the driver's position {will/shall} be provided. The switch and indicator light {will/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.

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.

1) Stabilizer system is not in its stowed position.
2) Powered light tower is not stowed.

- Any other device permanently attached to the apparatus is open, extended, or deployed in a manner that is likely to cause damage to the apparatus if the apparatus is moved.

Compartments and equipment meeting all of the following conditions shall be permitted to be exempt from being wired to the hazard light:

- The volume is less than or equal to 4 ft3 (0.1 m3).
- The compartment has an opening less than or equal to 144 in.2 (92,900 mm2).
- The open door does not extend sideways beyond the mirrors or up above the top of the fire apparatus.
- All equipment in the compartment is restrained so that nothing can fall out if the door is open while the apparatus is moving.
- Manually raised pole lights with an extension of less than 5 ft (1.5 m).

The hazard light shall be labeled "DO NOT MOVE APPARATUS WHEN LIGHT IS ON".

BACK-UP ALARM

An electronic back-up alarm shall be supplied and installed by the cab/chassis manufacturer. The back-up alarm shall actuate automatically when the transmission gear selector is placed in reverse.

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 amber LED 600 Series 60A00TAR turn signal lights
- Two (2) Whelen red LED 600 Series 60BTT stop/tail lights
- Two (2) Whelen LED 600 Series 60C00WCR maximum intensity back-up lights with clear lens

Each of the lights above shall be mounted in a 6EFLANGE, chrome finish bezel.

MIDSHIP MARKER/TURN SIGNAL

Two (2) Whelen model T0A00MAR 2" round amber LED midship body clearance marker/turn signal lights {will/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 {will/shall} be wired to the headlight circuit of the chassis.

MARKER LIGHTS

The body shall be equipped with all necessary clearance lights and reflectors in accordance with Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS) regulations. All body clearance lights shall be Truck-Lite Model 18 LED to reduce the need for maintenance and lower the amp draw. Clearance lights shall be wired to the headlight circuit of the chassis.

REAR BUMPER MARKER LIGHTS

Two (2) Britax style dual face flexible mounted rear bumper markers shall be located, one (1) each side lower rear corner of body visible from driver mirrors.

CAB STEP LIGHTS / GROUND LIGHTS

The step lights and/or ground lights {will/shall} be supplied and installed by the cab/chassis manufacturer. Light(s) {will/shall} be capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the vehicle in areas designed for personnel to climb onto or descend from the vehicle to the ground level.

Lighting designed to provide illumination on areas under the driver and crew riding area exits {will/shall} be switchable but activated automatically when the exit doors are opened.

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.

ELECTRONIC SIREN

The siren control head {will/shall} be supplied and installed by the cab/chassis manufacturer. Siren power {will/shall} be wired through the master warning light switch.

SIREN SPEAKER

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

FRONT CAB MOUNTED SCENE LIGHT(S)

Floodlight(s) {will/shall} be provided on the front of the cab by the cab/chassis manufacturer. Scene lights shall be provided with a lens or a means for preventing damage from water spray and shall be listed for wet location usage.

Each light {will/shall} be wired directly to the 12 VDC electrical system with stranded copper wire. The floodlights {will/shall} be protected with circuit breakers rated at the proper amperage and wire size.

One (1) switch {will/shall} be provided for front scene lights.

The lights {will/shall} be switched at the 12 volt control panel in the cab.

REAR SCENE LIGHTS

Two (2) Whelen M9LZC series (9" x 7") surface mounted Super-LED scene lights {will/shall} be provided on the upper rear body to light the work area. Each light will have a 8-32 degree gradient lens and chrome flange.

The above scene lights {will/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 {will/shall} be switched at the 12 volt control panel in the cab.

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

The light bar {will/shall} be supplied and installed by the cab/chassis manufacturer.

The lightbar {will/shall} be separately switched at the 12 volt control panel in the cab.

ZONES B AND D - SIDE WARNING LIGHTS

UPPER REAR CORNER WARNING LIGHTS

There {will/shall} be two (2) Whelen M9 series Red Linear Super-LED lights (M9R) provided, one (1) each side. Each light {will/shall} have a red lens and chrome flange.

The lights {will/shall} be switched at the 12 volt control panel in the cab.

UPPER FORWARD CORNER WARNING LIGHTS

There {will/shall} be two (2) Whelen M9 series Red Linear Super-LED lights (M9R) provided, one (1) each side. Each light {will/shall} have a red lens and chrome flange.

The lights {will/shall} be switched at the 12 volt control panel in the cab.

ZONE C - REAR WARNING LIGHTS

There {will/shall} be two (2) Whelen M9 series Red Linear Super-LED lights (M9R) provided, one (1) each side. Each light {will/shall} have a red lens and chrome flange.

The lights {will/shall} be switched at the 12 volt control panel 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

The warning lights {will/shall} be supplied and installed by the cab/chassis manufacturer. They {will/shall} be Whelen lights to complete an NFPA compliant lower level warning light system.

The lights {will/shall} be switched at the 12 volt control panel in the cab.

ZONES B AND D - CAB INTERSECTOR LIGHT (CAB FRONT CORNERS)

The warning lights {will/shall} be supplied and installed by the cab/chassis manufacturer. They {will/shall} be Whelen lights to complete an NFPA compliant lower level warning light system.

The lights {will/shall} be switched at the 12 volt control panel in the cab.

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

There {will/shall} be two (2) Whelen M6 series red linear Super-LED lights (M6R) provided, one (1) each side. Each light {will/shall} have a red lens and chrome flange.

The lights {will/shall} be switched at the 12 volt control panel in the cab.

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

There {will/shall} be two (2) Whelen M6 series red linear Super-LED lights (M6R) provided, one (1) each side. Each light {will/shall} have a red lens and chrome flange.

The lights {will/shall} be switched at the 12 volt control panel in the cab.

ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

There {will/shall} be two (2) Whelen M6 series red linear Super-LED lights (M6R) provided, one (1) each side. Each light {will/shall} have a red lens and chrome flange.

The lights {will/shall} be switched at the 12 volt control panel 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 25,000 watts at 120/240 VAC, 208/104 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 {will/shall} be bolted to body sub-frame and chassis sub-frame for proper bonding of high voltage system. The conductor shall have a minimum amperage rating, as defined in 310.15, "Ampacities for Conductors Rated 0–2000 Volts," of *NFPA 70*, of 115 percent of the rated amperage on the power source specification label.

GENERATOR ENGAGEMENT

A "Generator Engaged" indicator shall be provided in the driving compartment to indicate that the generator shift has been successfully completed.

An "OK to Operate Generator" indicator shall be provided in the driving compartment to indicate that the generator is engaged (if not always engaged), the transmission is in the proper gear (if required, automatic transmissions only), and the parking brake is engaged (if applicable).

An interlock system shall be provided to prevent advancement of the engine speed in the driving compartment or at any operator's panel unless the parking brake is engaged, and the transmission is in neutral or the output of the transmission is correctly connected to a pump or generator instead of the drive wheels.

WARRANTY PERIOD

Provided such goods are operated and maintained in accordance with Onan's written instructions, Onan warrants that the Protec YDCR series PTO generators shall be free from defects in material and workmanship for a period of five (5) years or one thousand (1,000) hours, whichever comes first, from the date of delivery to the first purchaser.

GENERATOR SPLASH GUARD

A powder coat painted splash cover shall be installed to reduce the amount of road spray on the frame mounted PTO generator. A V-ring seal shall also be installed in the cover to provide additional protection against contaminates reaching the generator front seals.

The generator {will/shall} be engaged at the 12 volt control panel in the cab.

GENERATOR MOUNTING

The generator shall be mounted between the chassis frame rails. The generator mounting brackets shall be fabricated using heavy duty steel tubing, or structural channel. The generator mounting shall be bolted and removable so that the generator can be lowered from under apparatus for service, if necessary. The generator case shall not extend below the bottom edge of the apparatus body.

MANUALS AND SCHEMATICS

Two (2) complete manuals on parts list, maintenance, wiring schematics, hydraulic schematics, circuit boards, voltage regulator board and other components {will/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 by the cab chassis manufacturer. 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 through the Weldon Vista screen, if specified.

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.

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 {will/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, {No Exceptions} to loadcenter type and CSA listing.

GENERATOR MONITORING PANEL

To properly monitor the generator performance and load demand during operation, the generator installation {will/shall} be equipped with a full instrument monitor panel.

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

The program {will/shall} support the accumulation of elapsed generator hours. Generator hours {will/shall} be displayed.

SHORE POWER INLET - BATTERY CHARGER

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

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:

- Voltmeter
- Current meters for each ungrounded leg
- Frequency (Hz) meter
- Power source hour meter

The instrumentation shall be permanently mounted at an operator’s panel. The instruments shall be located in a plane facing the operator. Gauges, switches, or other instruments on this panel shall each have a label to indicate their function.

The instruments and other line voltage equipment and controls shall be protected from mechanical damage and not obstructed by tool mounting or equipment storage.

An instruction plate(s) that provides the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the apparatus at any point where such operations can take place.

Operation

Provisions shall be made for placing the generator drive system in operation using controls and switches that are identified and within convenient reach of the operator.

Where the generator is driven by the chassis engine and engine compression brakes or engine exhaust brakes are furnished, they shall be automatically disengaged for generator operations.

Any control device used in the generator system power train between the engine and the generator shall be equipped with a means to prevent unintentional movement of the control device from its set position in the power generation mode.

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:

- All line voltage power connections are made through receptacles on the power source and the receptacles are protected by integrated over current devices.

1) 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:

2) 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)
3) 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:

4) Separated by a minimum distance of 12 in. (300 mm) from exhaust piping or shielded from such piping
1) 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;

2) Pictorial representations of circuit logic for all electrical components and wiring
1) Circuit identification
2) Connector pin identification
3) Zone location of electrical components
1) Safety interlocks
2) Alternator–battery power distribution circuits
(a) Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems

120/240 VAC SCENE LIGHTING

SIDE UPPER RECESSED SCENE LIGHTS

{Quantity} Whelen Pioneer+ model PFP2AC LED dual floodlight(s) {will/shall} be provided and installed. Light quantity {will/shall} be divided equally per side. Lights {will/shall} be 120 VAC, 1.25 amp, 150 watt, with 15,000 useable lumens. The PFP2AC is covered by a five year factory warranty.

Each light {will/shall} be mounted in PBA203 mounting bracket, semi recessed into the apparatus body with chrome trim ring housing. The light mounts {will/shall} provide either a straight out, 0 degree or a 15 degree downward angle.

(b) The above lights {will/shall} be controlled by {qty} switch(es) in the lower portion of compartment S1.

REAR TRIPOD SCENE LIGHTS

{Quantity} Whelen 3200 series folding tripod light(s) model 8728304 {will/shall} be provided. The 50” AC folding tripod pole assembly {will/shall} incorporate 50” internal aluminum alloy pole with an outer diameter of 1.125” with an inner diameter of 0.875” and 30” folding legs. The internal coil cord cable shall be UL listed and have a liquid tight strain relief that eliminates internal wire twisting. The internal coil cord cable stall be installed with a NEMA 5-20 plug.

The tripod {will/shall} have ability to be mounted by an upper body quick disconnect mounting bracket and a lower folded tripod mounting cradle. All mounting hardware shall be stainless steel.

Voltage: +120v AC
Height of Tripod Folded = 56.40”
Height of Tripod Folded Out = 104.51” Max. Length
Diameter of Tripod Legs When Folded Out = 51.12”

Each tripod assembly {will/shall} have a Whelen Pioneer Plus model PFP2AP provided. The 150 watt 120 VAC Pioneer light head shall incorporate Super-LED dual flood light installed in a die-cast white powder coated aluminum housing. The PFP2AC configuration shall consist of 72 white Super-LEDs with a clear optic collimator/reflector assembly and a clear non-optic polycarbonate lens. The Pioneer flood light {will/shall} have 15,000 usable lumens.

The tripod and light is covered by a five year factory warranty.

Voltage: +120v AC
Size: H=4.125”, W=14.00”, D=2.50”
Amp Draw: Spot Light = 1.20 Amps
Lens Color: Clear

A weatherproof on-off toggle switch {will/shall} be mounted in a switch box below the lamphead.

LIGHT TOWER

{Quantity} Command Light, CL Series light tower(s) {will/shall} be provided and installed on the completed unit. A flashing warning light {will/shall} be provided in cab, indicating when a light tower is not in nested position as required by NFPA 1901.

The Command Light {will/shall} be covered by a five (5) year limited warranty from defects in materials and workmanship. An operation, maintenance, and parts manual {will/shall} be provided with the completed unit.

The light tower {will/shall} extend 131" above the mounting surface and {will/shall} extend to full upright position in less than 15 seconds. The overall size of nested light tower {will/shall} be approximately 42" wide x 74" long x 12" high and weigh approximately 300 pounds.

Light Tower Construction and Design

The Command Light assembly {will/shall} be of aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance.

The electrically controlled unit {will/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 {will/shall} be tested to in wind conditions of 90 mph (150 kph) minimum. Light towers that have not been tested to these conditions are not acceptable.

The light tower {will/shall} be capable of overhanging the side or back of the vehicle to provide maximum illumination to the vicinity adjacent to the vehicle for the safety of emergency personnel in high traffic conditions. Light towers that are only capable of rotation at the top of a pole are not acceptable to the specified light tower.

Light Tower Electrical System

The light tower {will/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 {will/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 {will/shall} be supplied through power collecting rings thus allowing continuous 360 degree rotation in either direction.

The tower base {will/shall} have a light that illuminates the envelope of motion during any movement of the light tower mast as required by NFPA 1901.

Light Tower Floodlights

The Command Light model CL602A-W2 {will/shall} be equipped with the following bank of floodlights:

Floodlight manufacturer:	Whelen Engineering
Number of lamp heads:	Six (6) Pioneer Plus PFP2AC LED
Voltage:	120 volts
Watts of each lamp head:	150 watt
Total watts of light tower:	900 watts
Total lumens of light tower:	90,000 lumens
Configuration:	The light heads {will/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 {will/shall} have a strobe indicator located on the top of the upper section.

The lens color for the strobe light {will/shall} be green.

Light Tower Backlight Option

A backlight option {will/shall} be provided on the light tower. The lower pair of light heads {will/shall} be capable of being rotated about a horizontal axis 180 degree, providing light down on the vehicle or to the opposite side of the vehicle while allowing the fixed lights to remain pointed at the scene.

The hand-held remote control {will/shall} have an additional switch supplied for the backlight rotation option.

Light Tower Paint

The light tower {will/shall} be electro-statically powder coated with a hammer tone gray color.

Light Tower Controls

The light tower(s) {will/shall} be operated with a hand-held 15-foot umbilical line remote control. The storage station for the remote control unit {will/shall} be equipped with a button to activate the "Auto-Park" automatic nesting feature. The remote control {will/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 specified light tower(s) {will/shall} be recessed into the roof of body to allow light tower(s) to be stowed below roof level. The floor and side walls of recessed area shall be fabricated as a separate module from 3/16" aluminum treadplate with an overlapping 3" flange around perimeter roof line. The recessed area shall be completely water tight. All electrical connections made to light tower shall be located on sidewalls for a water tight connection.

The recessed area shall have two (2) water drain holes (in opposite corners) with flexible 2" diameter hose routed to the area below the body.

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 {Company} 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;

(c) 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.

(d) There {will/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.

(e) The wheel chock(s) {will/shall} be mounted behind rear wheels, below body on streetside.

(f) {Quantity} Alco-Lite model PEL-24, 24' 2-section extension ladder(s) shall be provided with the completed unit.

(g) The ladder(s) {will/shall} be located in specified ladder compartment.

- {Quantity} Alco-Lite PRL-16, 16' aluminum roof ladder(s) shall be provided with the completed unit.
  - The ladder(s) {will/shall} be located in specified ladder compartment.
- {Quantity} Alco-Lite FL-10, 10' aluminum folding ladder(s) shall be provided with the completed unit.
  - The ladder(s) {will/shall} be located in specified ladder compartment.
- {Quantity} Little Giant model 1AA-17, 15' "A" frame type aluminum combination ladder(s) {will/shall} be provided with the completed unit. Folded size is 55" x 25" x 9", and weigh 45 pounds.
  - The ladder(s) {will/shall} be located in specified ladder compartment.
- {Quantity} Super Vac 724EVS, 24" electric variable speed ventilation fan(s) shall be provided with the completed unit.
  - The above specified ventilation fan(s) shall be shipped loose with the 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 {will/shall} be supplied and mounted by {Company} before the unit is placed in emergency service.