# GWINNETT COUNTY FIRE & RESCUE AIR/LIGHT/REHAB VEHICLE SVI #1111 Production Specification

Contract Administrator; Jackie Sipes Sales Administrator: Dwayne Woodard



# **ROCK SOLID QUALITY**

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# LIABILITY INSURANCE

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

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

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

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

Excess Umbrella Liability coverage of \$4,000,000.00 each occurrence, Aggregate of \$4,000,000.00. Garage Keepers Liability coverage of \$4,000,000.00 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 shall post and maintain a website where the Gwinnett County Fire and Emergency Services will be able to view digital images of their apparatus as its being built. The digital images shall be posted once a week starting when the body begins production or when the cab/chassis arrives and shall continue until the final completion of unit.

#### VEHICLE STABILITY SUPPLIED WITH CAB/CHASSIS

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

# 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).

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# HIGHWAY PERFORMANCE

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

- 1) Accelerating from 0 to 35 mph (55 km/hr) within 25 seconds on a 0 percent grade
- 2) Attaining a speed of 50 mph (80 km/hr) on a 0 percent grade
- 3) Maintaining a speed of at least 20 mph (32 km/hr) on any grade up to and including 6 percent

The maximum top speed of fire apparatus with a GVWR over 26,000 lb (11,800 kg) shall not exceed either 68 mph (109 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

If the combined water tank and foam agent tank capacities on the fire apparatus exceed 1250 gal (4732 L), or the GVWR of the vehicle is over 50,000 lb (22,680 kg), the maximum top speed of the apparatus shall not exceed either 60 mph (95 km/ hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

# SERVICEABILITY

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

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

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

# FIRE APPARATUS DOCUMENTATION

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

- 1) The manufacturers record of apparatus construction details, including the following documents:
  - a) Owner's name and address
  - b) Apparatus manufacturer, model, and serial number
  - c) Chassis make, model, and serial number
  - d) GAWR of front and rear axles and GVWR
  - e) Front tire size and total rated capacity in pounds (kilograms)
  - f) Rear tire size and total rated capacity in pounds (kilograms)
  - g) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
  - h) Engine make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio
  - i) Type of fuel and fuel tank capacity
  - j) Electrical system voltage and alternator output in amps
  - k) Battery make, model, and capacity in cold cranking amps (CCA)
  - Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
  - m) Ratios of all driving axles
  - n) Maximum governed road speed

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- o) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), maximum discharge pressure capability rating, and serial number
- p) Pump transmission make, model, serial number, and gear ratio
- q) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
- r) Water tank certified capacity in gallons or liters
- s) Foam tank (if provided) certified capacity in gallons (liters)
- t) Aerial device type, rated vertical height in feet (meters), rated horizontal reach in feet (meters), and rated capacity in pounds (kilograms)
- u) Paint manufacturer and paint number(s)
- v) Company name and signature of responsible company representative
- w) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose)
- 2) Certification of compliance of the optical warning system (see 13.8.16)
- 3) Siren manufacturer's certification of the siren (see 13.9.1.1)
- 4) Written load analysis and results of the electrical system performance tests (see 13.14.1 and Section 13.15)
- 5) Certification of slip resistance of all stepping, standing, and walking surfaces (see 15.7.4.5)
- 6) If the apparatus has a fire pump, the pump manufacturer's certification of suction capability (see 16.2.4.1)
- 7) If the apparatus is equipped with a fire pump and special conditions are specified by the purchaser, the pump manufacturer's certification of suction capacity under the special conditions (see 16.2.4.2)
- 8) If the apparatus has a fire pump, a copy of the apparatus manufacturer's approval for stationary pumping applications (see 16.3.1)
- 9) If the apparatus has a fire pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed (see 16.3.2.2)
- 10) If the apparatus has a fire pump, the pump manufacturer's certification of the hydrostatic test (see 16.5.2.2)
- 11) If the apparatus has a fire pump with a maximum discharge pressure capability rating that exceeds the hydrostatic test pressure of 16.5.2.1, the pump manufacturer's certification of the hydrodynamic test
- 12) If the apparatus has a fire pump, the certification of inspection and test for the fire pump (see 16.13.1.1.5 or 16.13.1.2.4 as applicable)
- 13) If the apparatus is equipped with an auxiliary pump, the apparatus manufacturer's certification of the hydrostatic test (see Section 17.13)
- 14) When the apparatus is equipped with a water tank, the certification of water tank capacity (see Section 18.6)
- 15) If the apparatus has an aerial device, the certification of inspection and test for the aerial device (see Section 19.24)
- 16) If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1911
- 17) If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy (see 20.10.4.2) and the final installer's certification the foam proportioning system meets this standard (see 20.11.2)
- 18) If the system has a CAFS, the documentation of the manufacturer's pre delivery tests (see Section 21.9)
- 19) If the apparatus has a line voltage power source, the certification of the test for the power source (see 22.15.7.2)
- 20) If the apparatus is equipped with an air system, air tank certificates (see 24.5.1.2), the SCBA fill station certification (see 24.9.6), and the results of the testing of the air system installation (see 24.14.5 and 24.15.4)
- 21) Any other required manufacturer test data or reports

# **OPERATIONS AND SERVICE DOCUMENTATION**

The contractor shall deliver with the fire apparatus complete operation and service documentation covering the completed apparatus as delivered and accepted.

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

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

- 1) Manufacturer's name and address
- 2) Country of manufacture
- 3) Source for service and technical information
- 4) Parts replacement information
- 5) Descriptions, specifications, and ratings of the chassis, pump (if applicable), and aerial device (if applicable)
- 6) Wiring diagrams for low voltage and line voltage systems to include the following information:
  - 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 shall be provided on a USB Flash Drive. These manuals shall be divided into sections for ease of reference. There shall be two (2) USB flash drives provided with the completed vehicle.

# FIRE APPARATUS SAFETY GUIDE

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

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# 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:

- 1) A separate specification of the section of the applicable standard for which compliance is lacking
- 2) A description of the particular aspect of the apparatus that is not in compliance therewith or required equipment that is missing
- 3) A description of the further changes or modifications to the delivered apparatus that must be completed to achieve full compliance
- 4) Identification of the entity that will be responsible for making the necessary post delivery changes or modifications or for supplying and installing any missing required equipment to the apparatus to achieve full compliance with this standard

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

# CARRYING CAPACITY

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

The estimated in-service weight shall include the following:

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

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

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

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

The label shall show the height of the completed unequipped fire apparatus in feet and inches (meters), the length of the completed fire apparatus in feet and inches (meters), and the GVWR in tons (metric tons).

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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.

# <u>TESTING</u>

# 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  $0^{\circ}$ F and  $110^{\circ}$ F (–  $18^{\circ}$ C and  $43^{\circ}$ 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.

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# 2. ALTERNATOR PERFORMANCE TEST

# TEST AT IDLE

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

# TEST AT FULL LOAD

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

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

# 3. LOW VOLTAGE ALARM TEST

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

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

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

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

# LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

# DOCUMENTATION

The manufacturer shall deliver the following with the fire apparatus:

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

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# UL 120/240 VAC CERTIFICATION

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

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

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

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

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

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

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

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

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

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

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

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

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# DIELECTRIC VOLTAGE WITHSTAND TEST

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

The test shall be conducted as follows:

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

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

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

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

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

# WARRANTY

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

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

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

# **GENERAL LIMITED WARRANTY - TWO (2) YEARS**

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

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

# LOW VOLTAGE ELECTRICAL WARRANTY - FIVE (5) YEARS

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

# **STRUCTURAL WARRANTY - TEN (10) YEARS**

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

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# UNDERCOAT WARRANTY

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

# PAINT LIMITED WARRANTY - TEN (10) YEARS

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

# **GRAPHICS LIMITED WARRANTY**

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

# CONSTRUCTION PERIOD

The completed vehicle shall be delivered within three hundred sixty five (365) days after receipt of a purchase order or contract.

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

# OVERALL HEIGHT REQUIREMENT

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

# OVERALL LENGTH REQUIREMENT

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

# OVERALL WIDTH

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

# ANGLE OF APPROACH

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

# ANGLE OF DEPARTURE

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

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# PRE-CONSTRUCTION CONFERENCE

A pre-construction conference shall be required at the Contractor's factory for four (4) personnel from the Gwinnett County Fire and Emergency Services to finalize all construction details prior to manufacturing.

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

# PRE-PAINT CONFERENCE

A pre-paint conference shall be required at the Contractor's factory for four (4) personnel from the Gwinnett County Fire and Emergency Services to inspect the vehicle and construction details prior to the painting process.

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

#### FINAL INSPECTION CONFERENCE

A final inspection conference shall be required at the Contractor's factory for four (4) personnel from the Gwinnett County Fire and Emergency Services to inspect the vehicle and construction details prior to shipment of the completed vehicle. This inspection shall take place after any specified striping and lettering is installed.

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

# CAB AND CHASSIS SPECIFICATIONS

#### **KENWORTH 370 SERIES CONVENTIONAL**

Electric Door locks LH/RH: Ignition & doors keyed a like; Single electric horn: Single-piece windshield; Electric windshield wipers, 2-speed plus intermittent; Electric windshield washers: Steering wheel 18in. 4-spoke; Glovebox door with locking latch: Dash-mounted cruise control with switches: Tum signal switch with column-mounted dimmer: Standard dash panels include gray w/ burl wood accents: Slate Gray interior primary color; Dark Slate Gray seat color; Floormat; Inside sun visor, LH/RH; Door courtesy lights; Under-dash center console with 1 cup holder, 1 ashtray & 1 lighter.

#### T370 Class 7: medium-duty Conventional. Wheelbase 190" CA 122" GVWR; 38,000

**CARB** Idle Emissions Reduction Feature for PX-7 and PX-9 Exempt Application Emergency Vehicles Only. Medium-duty 4x2 automatic.

**EMT/rescue service.** Vehicles used responding to emergencies & rescue operations. Typically configured for rapid response & carry medical & other rescue equipment. Road usage: minimum 5% Class B and maximum 5% Class D.

# U.S. Domestic Registry, 50-State

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Engine & Equipment; PACCAR PX·9 350EV 2017 350@2000 320@2200 1000@1400 There Emergency Vehfcle includes turbo exhaust brake, no code is used. Diagnostic Plug for data link, Oil Cooler, Aluminum Flywheel Housing, Engine Idle Shutdown Timer Enabled Enable EIST Ambient Temp Overrule Eff EIST NA Expiration Miles Use only with MX and Cummins engines

Air compressor: Cummins 18.7 CFM For Cummins And PACCAR PX engines.

**Air Cleaner**: Dry-type firewall mounted w/filter restriction indicator. Air Inlet ember separator NFPA compliant for fire applications.

Fan Hub: Horton 2-Speed for ISL9, ISL-G, PX-8 or PX-9

**Cooling module:** 1000 square inches T1701r2701T3701T470. Includes metal surge tank on T170fT2701T370.

Bug screen: Front of grille on C500 ,T800, T880, and W900. Behind grille on T660, T680, and T300 (Medium Duty).

Exhaust: 2017 EPA RH Under Cab DPF/SCR For PX-9 w/ Single Vertical RH Side of Cab Tailplpe.

**Tailpipe:** 5 In. single 30 in. 45 degree curved. **Fuel Filter**: Fleetguard FS1003 Fuel/Water Separator for PX-9

Start Aid: None

Retarder Jacobs for PX-8/9 ISL w/3-way switch .

Alternator: Delco 40SI 320 amp Brushless with battery voltage sense.

Batteries: 2 Optima 31A Threaded post (900) 1800CCA.

**Starter:** PACCAR 12 volt electrical system. W/centralized power distribution incorporating plug-in style relays. Circuit protection for serviceability, 12-volt light system w/circuit protection circuits number & color coded.

Cab Power Cutoff SW on Cab Floor NFPA Compliant -Engine Shut off

Multi-function engine connector for body builder interface for Cummins.

Body Builder Connector 500mm Back of Cab

**Transmission:** Allison 3000EVS 6-speed w/PTO drive gear. 5th Gen controls. Includes heat exchanger & oil level sensor. Emergency Vehicle Series for vocational applications. Transynd transmission fluid Is standard on all Allison 1000, 2000, 3000 & 4000 series transmissions.

Rear transmission support springs for transmission PTO applications are required to ensure that engine flywheel housings are not overloaded when transmission PTO's are installed.

Driveline: 3 Dana standard-duty; 2 center bearlng. \*Standard duty is 1710 series.

Torque converter Included w/Allison Transmission.

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# Park Brake Auto Neutral

#### Front Axle & Equipment

Meritor MFS12E PLUS 12.SK rated at 12K 3.51n, drop standard track. Front brakes Included w/ front hub package.

**Air Brake:** 14,600 lb. package Includes Bendix 16-1/2 x5 brakes, cast drums, aluminum 10-boll hub pilot Preset hubs, hubcaps, oil seals & automatic slack adjusters. For use w/ 22-1/2in. wheels.

Front Springs: Taperleaf 12K w/ shock absorber for use on 201 o+ chassis w/ 22.5ln. wheels only.

Single power steering gear: 13.2K for air brakes.

#### **Rear Axle & Equipment**

Single Dana Spicer S26-190 rear axle; 26K capacity rated at 26K. Single rear axle. Single rear brakes Included w/rear hub package.

Rear Axle Ratio -5.38.

2**6K air brake package** includes 16-1/2x7 In. brakes, cast drums, iron 10-bolt hub pilot hubs, slack adjusters and oil seals for use w/ 22.5 in. wheels.

**Spring Brake**: 3030 long stroke single 3 In. travel replace standard 2-1/2 in. travel. Helps keep brakes in adjustment longer. Bendix 4S/4M anti-lock brake system.

**Rear suspension:** single Reyco 79KB multileaf 26K with helper spring. Medium duty. Unladen Height: 10.8 in. Laden Height 8.1 in. Not rear air disc brake compatible.

#### Tires & Wheels

Front Tires: Michelin XZE2 11R22.516PR. 41.4 In. Diameter, All Position. 19.2 in. SLR.

**Rear tires:** Michelin XDN212R22.516PR. 42.9in. Diameter. drive tire. 20 In. SLR. Code Is priced per pair of tires. Rear Tire Quantity: 4

**Front Wheel**: Alcoa 88367 22.5x8.25 aluminum with Lvl One [TM] finish, hub-pilot mount. 7,400 lb. maximum rating. Air disc brake compatible.

**Rear Wheel:** Alcoa 88367 22.5x8.25 aluminum with Level One [TM) finish, hub-pilot mount. 7400 lb. maximum rating. Air disc brake compatible, Code is priced per pair of wheels. Rear Wheel/Rim Quantity: 4

#### Frame & Equipment

**Frame Ralls:** 10-5/8 x 3-1/2 x 5/16 in. Steel to 308 in. Truck frame weight is 2.91 lb.-in. per pair of rails. Section modulus is 14.80 cu.in., RBM is 1,776,000 in-lbs per rail. 120,000 PSI yield. Heat treated. Frame rail availability may be restricted based upon application, axle/suspension capacity, fifth wheel setting, or component/dimensional specifications. The results of the engineering review may result in a change to the requested frame rail. If a change is required Kenworth Application Engineering will advise the dealer of the appropriate material specification for a substitute rail.

**Delete bumper:** Requires a bumper setting code. 40.9 In. Bumper setting. Requires a bumper code.

#### Front mudflaps.

Custom Frame layout: one chassis

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**In-cab steel battery box:** under rider seat or in stand alone box. Requires appropriate AGM battery code, which varies by model, and appropriate rider seat code be selected prior to entering the work screen. Includes 1 battery disconnect switch.

One-piece welded crossmember assembly with 12mm frame fasteners, center and rear frame. Standard crossmember. Square end-of-frame wlo crossmember; non-towing.

**Special frame drill:** dealer to provide drawing with dimensions and revision level. Acceptable hole diameters range from 10.2 mm to 40.4 mm. Preferred file formal Is .pdf. Not for use for rear suspension, fifth wheel or other published frame drilling code. Does not replace clear frame space requests or custom frame layout.

# Fuel Tanks & Equip

Fuel Tank: 56 US gallon 24.Sin. aluminum under replace.

Location: 56 gal fuel tank LH under cab

**Small round DEF tank.** 11 gallons of usable volume. The DEF tank win be localed on the side you specified. If you have specific configuration or body builder concerns, please utilize the **Custom Frame Layout option.** Standard capacity is calculated by fuel capacity of the vehicle and will accommodate two diesel fill-ups for every DEF fill-up. DEF tank location Is on the LH.

# Cab & Equipment

# Cab: Curved Glass Conventional.

Cab Includes aluminum & fiberglass fully hucked cab w/ all aluminum bulkhead doors & continuous stainless steel pianostyle door hinges. Single electric horn standard. Incandescent exterior lights Include diagnosable bulb detection and warning. Trailer cable on tractors includes Integrity detection. Standard features include multiplex wiring for interior lights, automated pre-trip inspection, short and open check diagnostics. Warning alarm will sound when lights are left on.

**Hood:** Sloped aerodynamic hood Includes grill & separate bumper.

**Cab heater:** W/integral defrosters & A/C 45t000 btu cab heater. No sleeper heater/AC. Includes 5 mode rotary control. T660 include filter media.

# Adjustable telescoping tilt steering column.

5 sets of keys. Replaces standard 2 sets of keys.

Information for customer-installed PTO Chelsea 277.10-bolt. Available only with Allison 3000/4000 series transmissions. Switch & Wiring for Customer-Installed PTO. Electric over hydraulic PTO. Includes switch guard. Wiring is routed to LH frame for connection to the customer Installed PTO.

# Custom Dash Layout

KW Driver Information Center: Includes fuel economy, RPM display, trip information, truck Information, diagnostics, gear display, alarm clock.

**Instrument package:** Includes speedometer, tachometer, fuel gauge, engine coolant temperature gauge, engine oil pressure, voltmeter. Class 8 also includes primary & secondary air reservoir gauges & an air application gauge. DEF level gauge and warning lamp are included with 2010+ engines. Engine hour meter and outside air temperature readouts are standard. Primary read out will be MPH.

**Cab Interior:** Pinnacle. Includes vinyl headliner & cab back panel, slate gray interior, dark slate gray seats, floormats, LH/RH inside sun visor & door courtesy lights.

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**Driver seat:** Kenworth Air cushion Plus HB Mordura Standard features incudes 7 in. fore and aft slide adjustment w/isolator, 6- 23 degree recline, air suspension with cover, dual armrests, and single chamber air lumbar support. Seat cushion is 20 inches wide w/ 2-position tilt and 2-posilion front cushion extension. Seat material has a horizontal stitch pattern and is 2-tone in color. Seat back is carpeted and includes a map pocket. Seat is manufactured by National. Indudes Inside visor and retractable 3-point matching seat belts.

**Rider seat:** Kenworth Plus battery box HB Mordura. Standard features includes fixed base and backrest, fixed seat base and backrest, and dual armrests. Seat cushion Is 19.5 inches. Seat material has a horizontal stitch pattern and is 2-tone in color. Seat back is carpeted. Seat is manufactured by National. Includes inside visor and retractable 3-point matching seat belts.

**NFPA Compliance Kit:** Includes seat occupancy sensors. Seat belt switches, VDR & seat sensor harness, reflective labels, and a second copy of operators manual. Vehicle data recorder (VDR) Pre-wire Alternative Fire Research VDR harness replacing Weldon harness. Requires code 8489910.

Seat color: Jet Black.

**Driver/Rider Seat Belts:** Red, Replace Standard. Extended Length. Not NFPA Compliant. **Kenworth Radio** with AM/FM/WB/USB and Bluetooth

Dome lamp over driver door.

Self cancelling turn signal: W/head light dimmer switch.

Cab access contoured grab handles, LH/RH. LH & RH NFPA Compliant Grab handles

Daylite Door: LH/RH Includes RH peeper window

Look-Down, Pass. Door, Stainless 8.Sx4.4 Mirror:

Dual Kenworth aerodynamic heated motorized 7 in. x 13 In. mirror w/ chrome shell. LH/RH convex mirrors 5 in. x 7 In. heated. Mirror brackets set for 8 1/2 ft load width, Switch located on door pad.

Electric-powered LH & RH door window llfts. Switch located on door.

Solid rear wall. Deletes rear cab window.

#### Exterior stainless steel sunvisor.

Lights & Instruments Headlamps: Halogen Projector Low Beam, Halogen Complex Reflector High Beam

Marker Lights: Five, rectangular, LED

Turn Signal Lights: Mounted on fender

Electric Backup Alarm: Meets SAE J994 & OSHA

Circuit Breakers: Replacing fuses.

#### Air Equipment

Air dryer: Bendix AD-SP heated. With 2010 engine installations the dryer is mounted under the hood.

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Air tanks: mounted Inside frame flanges where possible. This code requires the use of a custom frame layout code.

# **Extended Warranty**

Base Warranty - PACCAR PX-9 Engine 24 months / 250,000 miles I 402,336 km I 6250 hours.

Severe Service Medium-duty Warranty: 1-year/ 50,000 miles.

# Miscellaneous

Warning triangle reflector kit: Shipped loose. Kil consists of 3 triangles in plastic carrying case, Not floor mounted,

One 5 lb. dry chemical type fire extinguisher mounted outboard of rider seat. Class ABC.

Paint Paint color number(s). N97020 A - L1003 FIRE RED N97200 FRAME N0001 BLACK Day Cab Premium Paint 1 -Color Paint -Day Cab

# Base coat/clear coat.

The Kenworth Color Selector contains additional instructions, as well as information on Kenworth paint guidelines and surface finish applications. Kenworth is standard with Dupont Imron Elite paint.

# CAB TO AXLE DIMENSION

Cab to axle will be 122".

# CHASSIS MODIFICATIONS

# LUBRICATION AND TIRE DATA PLATE

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

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

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# 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 shall permanently affix a high-visibility label in a location visible to the driver while seated.

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

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.

# PERSONNEL CAPACITY

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

# 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, 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, 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, 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, shall be visible from each seat that is intended to be occupied while the vehicle is in motion.

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# **CLIMBING METHOD - FAMA23**

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

# **REAR STEP CROSSWALK WARNING - FAMA24**

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

# FINAL STAGE MANUFACTURER VEHICLE CERTIFICATION

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

# FRONT BUMPER

The manufacturer supplied front bumper shall be replaced with a custom chassis 2-rib style, chrome finished bumper.

The front bumper of the chassis shall be extended approximately 12" ahead of the cab.

The bumper shall be bolted to the frame extension members. After fabrication of the bumper extension with gravel guard supports the assembly shall be removed and the unit shall be primed and painted black. SHOP NOTE; Available bumper located in refurb.

# **BUMPER GRAVEL SHIELD**

The front bumper extension shall have a 3/16" aluminum tread plate gravel shield. The gravel shield shall cover the full width of the front bumper to the front of the cab and the full height of the bumper on each end.

# AIR HORNS

Two (2) Grover 24" Stuttertone chrome plated air horns shall be mounted, one (1) each side of the cab hood. An emergency air shut off valve shall be provided in cab.

# AIR HORN ACTIVATION

The air horn(s) shall be operated by a foot switch on the cab floor at the driver's position. Air horn switch located outboard of specified mechanical siren switch.

# AIR HORN SHUT-OFF

There shall be two (2) shut-off valve(s) located under cab hood to shut-off air supply to specified air horns. One (1) valve for each specified air horn.

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# **MOTOR DRIVEN SIREN**

There shall be a Federal model Q2B motor driven rotary siren with chrome plated grill and housing, recess in the extended front bumper. The siren shall be wired through the master warning light switch, and properly wired with heavy copper cable for minimum voltage drop.

The siren shall be located at the center of the front bumper.

There shall be a siren brake installed in the rocker switch control panel to activate the siren brake.

# SIREN ACTIVATION

There shall be two (2) foot switches provided to activate the siren; one (1) for the driver, and one (1) for the officer. The switches shall be mounted on the floor in a location to prevent accidental activation. Mechanical siren shall only activate with Master Warning switch activated.

#### GROUND LIGHTS

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

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

#### FRONT TOW EYES

There shall be two (2) heavy duty tow eyes securely mounted to the chassis frame below the front bumper.

#### AIR INTAKE SYSTEM

An air filter shall be provided in the engine's air intake system by the body builder. Air inlet restrictions shall not exceed the engine manufacturer's recommendations.

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

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

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

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# <u>EXHAUST</u>

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. SHOP NOTE; Exhaust filter system to be installed by dealer.

# RADIO/ANTENNA INSTALLATION

There shall be one (1) Gwinnett County Fire and Emergency Services supplied Motorola APEX6500 7/800 mHZ radio(s) with remote head mounted in specified cab consol. All required radio programming shall be responsibility of Gwinnett County Fire and Emergency Services. Radio(s) may not be fully tested if no radio program is provided with radio and will be responsibility of Gwinnett County Fire and Emergency Services after delivery.

Three (3) antenna(s) installed in the cab roof.

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

# Note: One (1) antenna shall be a 5 Antenna Array Puck; Route ALL cables down the officer's "B" post to center cab console.

# SCBA SEAT AIR PACK BRACKETS

No SCBA air pack bracket(s) shall be provided in specified commercial cab SCBA seats. Gwinnett County Fire and Emergency Services will provide and install necessary bracket(s) after delivery.

# SEAT BELT COLOR

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

# **SEAT BELT WEB LENGTH - COMMERCIAL CAB**

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

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

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# SEAT BELT MONITORING AND VEHICLE DATA RECORDER (VDR) SYSTEMS

# SEAT BELT MONITORING

Vista IV display shall be provided and installed to allow the driver to know if all persons seated in the vehicle are secured with seat belts before moving the vehicle. Built-in smart seating logic shall detect if the correct sit and buckle sequence is not followed for all seats. System shall also provide an output for an external alarm. A diagnostic port will be located under dash on driver side. System shall include the following features;

# VEHICLE DATA RECORDER (VDR)

The vehicle data recorder shall have the following features;

- Recorded Data Includes: Vehicle Speed, Acceleration, Deceleration, Engine Speed, Engine Throttle Position, ABS Event, Seat Occupied Status, Seat Belt Status, Master Optical Warning Switch, Park Brake, Service Brake, Time, Date and Engine Hours.
- Password Protected by the customer
- Six (6) seat position inputs for occupied and belts buckled. Additional six (6) seat expansion module available.
- Easily interfaces with multiplexing systems
- Data is extracted by a standard, mini USB cable

# **OCCUPANT RESTRAINT INDICATOR**

The occupant restraint indicator shall have the following features;

- Will be displayed on Vista IV panel.
- Supports commercial and custom cab seating layouts; up to 12 seats
- Built-in audible alarm
- Use in conjunction with Vehicle Data Recorder (VDR)

# **IGNITION KEY**

If the vehicle is specified to have an ignition key it will be attached to steering column or dash with vinyl covered steel cable.

# TIRE PRESSURE MONITOR SYSTEM

A tire pressure monitoring system shall be provided. PressurePro model TT6 (or equal) TPMS which includes;

- Six (6) tire mounted sensors.
- In cab dash mounted monitor display.
- Power cord and mounting hardware.

#### HELMET STORAGE

No helmet storage is required in the cab driving area.

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# **CAB CRASH TEST CERTIFICATION**

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

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

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

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

# CAB MIRRORS, DRIVER ADJUSTABLE

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

# **RE-PAINT CAB - TWO COLORS**

The cab exterior (door jambs not painted unless specified otherwise) shall be re-painted with PPG Delfleet Evolution paint.

Exterior Upper Color: BLACK

Exterior Upper Paint Number: 911028 match L0001EW

Exterior Lower Color: RED

Exterior Lower Paint Number: 948137 match 865041EW

# CHASSIS PAINT WARRANTY

The portion of the cab re-painted shall be provided with a ten (10) year, non-prorated paint warranty to the original owner. The warranty shall be provided by PPG Inc. A warranty sheet with all conditions and maintenance procedures shall be provided with the delivered vehicle.

# CAB STEP OVERLAY

One (1) of the cab/chassis supplied entry steps will be overlaid with 1/8" NFPA compliant aluminum treadplate non-skid stepping surface.

The maximum stepping height shall not exceed 18", with the exception of the ground to first step, which shall not exceed 24" when the vehicle is loaded to its estimated in-service weight. All steps shall have a minimum area of 35 sq in and shall be of such a shape that a 5" diameter disk does not overlap any side when placed on the step, and shall be arranged to provide a t least 8" of clearance between the leading edge of the step and any obstruction. All platforms shall have a minimum depth of 8" from the leading edge of the platform to any obstruction.

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# CAB STEP AND FUEL TANK COVER

The stock cab upper and lower entry steps shall be overlaid with 1/8" NFPA compliant aluminum treadplate.

The maximum stepping height shall not exceed 18", with the exception of the ground to first step, which shall not exceed 24" when the vehicle is loaded to its estimated in-service weight. All steps shall have a minimum area of 35 sq in and shall be of such a shape that a 5" diameter disk does not overlap any side when placed on the step, and shall be arranged to provide a t least 8" of clearance between the leading edge of the step and any obstruction. All platforms shall have a minimum depth of 8" from the leading edge of the platform to any obstruction.

# MUDFLAPS

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

# AIR BRAKE SYSTEM QUICK BUILD-UP

There shall be one (1) Milton male quick connector type air shoreline inlet to provide air to the chassis air tanks from an external source compressed air shoreline hookup in order to maintain full operating air pressure while the vehicle is not running. Air inlet shall be located near driver's door. The female end of the connector shall be supplied by the Gwinnett County Fire and Emergency Services.

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

# AUTOMATIC TIRE CHAINS

The completed unit shall be provided with Onspot brand (extreme duty) six (6) strand automatic ice chains on the rear axle of the chassis to provide instant traction while traveling on ice and snow at speeds below 35 MPH.

# TIRE CHAINS ACTIVATION

The tire chain system shall be activated by a dashboard switch so that the operator may engage the chains from the driver's seat. The switch shall be lighted to indicate when the chains are engaged. The switch shall be complete with a red switch guard to avoid accidental engagement of the automatic chains. The switch guard must be properly labeled with a sticker with operating instructions provided.

The tire chains shall be interlocked with the transmission and shall engage only if the vehicle is traveling 30 MPH or less. After traveling over 30 MPH, the vehicle must be reduced to a speed below 5 MPH for the tire chains to be engaged or reengaged.

# DRIVELINE GUARD

There shall be one (1) driveline guard provided per drive shaft. Driveline guards shall be a "U" bolt type driveline guard to provide protection in case of driveline or universal joint failure.

#### ROAD EMERGENCY SAFETY KIT

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

# **INTERIOR DOOR WARNING LIGHTS**

There shall be two (2) Amber Federal Signal Micro Pulse warning lights installed on cab door interior door pan, lower outside corner. One (1) on each to interior of cab door.

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# BODY DESIGN

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

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

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

The fabrication of the body shall be formed sheet metal. Formed components shall allow the Gwinnett County Fire and Emergency Services to have the body repaired locally in the case where any object has struck the body and caused damage. The use of proprietary extrusions will prevent the Gwinnett County Fire and Emergency Services from such repair and shall NOT be used.

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

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

#### EXTERIOR ALUMINUM BODY

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

The body compartment floors and exterior panels shall be constructed with not less than 3/16" (.187) aluminum 3003H-14 smooth plate. Interior compartment dividing walls shall be constructed with not less than 1/8" (.125) aluminum 3003H-14 smooth plate. Lighter gauge sheet metal will not be acceptable in these areas, No Exceptions.

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

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

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

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

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

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

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

# DRIP RAILS

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

# ROOF CONSTRUCTION

The roof structure shall be integral with the body sheet metal construction and shall be an all welded assembly. The body roof structure shall be overlaid with not less than 3/16" aluminum 3003H-14 alloy tread plate and welded to roof structure and body sheet metal. All seams in roof material shall be fully and continuously welded to prevent entry of moisture.

There 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 shall be used for roof support and in addition 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 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 shall be provided along the body sides and utilized as a wiring trough. The use of aluminum extrusions in this area shall not be acceptable.

# BODY SUBFRAME

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

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

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

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# **BODY MOUNTING**

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

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

# **12" REAR STEP BUMPER**

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

The corners of bumper shall have a 45 degree chamfer.

#### REAR TOW EYES

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

#### GROUND LIGHTS

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

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

#### WHEEL WELL EXTERIOR PANEL

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

#### STAINLESS STEEL BODY FENDERS

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

#### WHEEL WELL LINERS

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

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# SCBA CYLINDER COMPARTMENTS

There shall be four (4) SCBA cylinder storage compartments located, two (2) on each side of body in the rear wheel well area. Each compartment shall be capable of storing three (3) SCBA (30 min.) cylinders. Each tube shall allow the storage of an SCBA or Oxygen cylinder up to 5-3/4" in diameter x 24" deep. Each compartment shall have a vertical stainless steel hinged aluminum door with a positive catch latch and painted primary lower body color. The door shall activate the "Hazard Warning Light" in the cab when not in the closed position.

# CYLINDER RESTRAINT

In addition to standard rubber friction pad in each storage tube/module a loop strap shall be provided to secure manually secure neck of bottle after positioned in compartment.

# BODY PAINT SPECIFICATIONS

# **BODY PAINT PREPARATION**

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

The exterior (and interior, if painted) body shall undergo a thorough cleaning process starting with a biodegradable phosphoric acid solution to begin the etching process followed by a complete clear water rinse. The next step shall consist of a chemical conversion coating applied to seal the metal substrate and become part of the metal surface for greater film adhesion.

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

# PAINT PROCESS

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

- 1) Clean bare metal with a wax and grease remover using low lint rags.
- Inspect, straighten, and hammer high points, grind all seams, sharp edges, and welds. DA sand entire paintable surfaces using 24-180 grit dry paper. Plastic fill all low spots and DA sand fill areas using 36-180 grit dry paper. Apply pinhole filler and DA sand areas using 80-180 grit dry paper.
- 3) Re-clean bare metal using a wax and grease remover and low lint rags.
- 4) Within 24 hours, a PPG Delfleet® epoxy color primer with proper hardener for corrosion resistance using a pressure pot spray gun and applying 2-5 full wet coats or 1.5-8.0 dry mils max. achieving full hiding and allow to air dry 60 minutes @ 70°F or bake for 45 minutes @ 140°F degree.
- 5) Inspect, putty fill, and dry guild coat entire body surface and DA sand using 180-400 grit dry paper.
- 6) Re-clean bare metal using a wax and grease remover using low lint rags.
- 7) A PPG Delfleet® primer sealer with proper hardener and thinner shall be sprayed using a pressure pot spray gun and applying 1 full wet coat or 1.0-2.0 dry mils achieving full hiding and allow to flash off in spray booth for minimum of 60 minutes @ 70°F.
- 8) A PPG Delfleet® FBCH basecoat (color) with proper hardener and dry additive shall then be sprayed using a pressure pot set @ 45-60 PSI and achieving full hiding or 1.5-2.0 wet mils and allow to flash off in spray booth 45-60 minutes before applying clearcoat.

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- 9) A PPG Delfleet® clearcoat with proper hardener and thinner shall be sprayed using a pressure pot spray gun and applying 2-3 full wet coats or 5.0 wet mils for a uniform gloss and allow to flash off in spray booth 10 minutes and bake for 120-140 minutes @ 125°F (surface temp.).
- 10) After cooling, DA sand heavy orange peel or runs using 1000 grit dry sand paper and final DA sand using 1500-2000 grit dry sand paper. Wipe off all surfaces to remove dust and debris. Buff unit as needed using 3M rubbing compound and a white wool pad and inspect until all sand scratches are removed.
- 11) Polish as needed using 3M Perfect-It-Polish and a black foam pad, repeat as necessary and inspect until all sand scratches are removed.

# PAINT - ENVIRONMENTAL IMPACT

The contractor shall meet or exceed 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 shall be used to prevent damage to the finish painted surface. These components shall be fastened to body using either a plastic insert into body metal with stainless steel screws or zinc coated nut-surts into body surface using stainless steel bolts to prevent corrosion from dissimilar metals.

# ELECTROLYSIS CORROSION CONTROL

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

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

# PAINT FINISH - TWO COLOR

The body shall be painted with a two-tone color of PPG Delfleet® Evolution paint per approved customer spray-out.

Touch-up paint shall be provided with completed vehicle.

- Paint Color, Upper: BLACK Paint Number, Upper: L0001EW
- Paint Color, Lower: RED Paint Number, Lower: 865041EW

# **BODY UNDERCOATING**

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

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# UNDERCOAT WARRANTY

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

#### PAINT WARRANTY

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

#### COMPARTMENT INTERIOR FINISH

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

#### **REFLECTIVE STRIPE REQUIREMENTS**

Exterior cab and body NFPA required reflective striping shallshall be provided after apparratus delivered.

#### **REFLECTIVE STRIPE - CAB DOOR INTERIOR**

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

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

There shall be a reflective red stop sign with white lettering. The sign should measure at least 18" by 18".

# **CHEVRON REFLECTIVE STRIPE - REAR SIDES PANELS**

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

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

The stripe material shall be 3M Diamond Grade.

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

# **LETTERING**

No lettering shall be provided on the completed unit.

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# EXTERIOR COMPARTMENT DOORS

# **ROLL-UP DOOR CONSTRUCTION - ROBINSON (ROM)**

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

Each shutter slat, track, bottom rail, and drip rail shall be constructed from anodized 6063 T6 aluminum. Shutter slats 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 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 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 shall be one piece design with integral overlapping flange to provide a clean finished look without the need of caulk. Door track shall feature an extruded Santoprene rubber double lip low profile side seal with a silicone coextruded back to reduce friction during shutter operation.

Shutter bottom rail shall be a one piece double wall extrusion with integrated finger pull. Finger pull shall be curved upward with a linear striated surface to improve operator grip while operating the shutter door. Bottom rail shall have a smooth contoured interior surface to prevent loose equipment from jamming the shutter door. Bottom rail seal shall be made from Santoprene; it will be a double "V" seal to prevent water and debris from entering compartment. Bottom rail lift bar shall be a one piece "D" shaped aluminum extrusion with linear striations to improve operator grip during operation. Lift bar shall have a wall thickness of 0.125". Lift bar 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 shall have incorporated drain holes which will allow any moisture that collects inside the extrusion to drain out.

Shutter door shall have an enclosed counter balance system. Counter balance system shall be 4" in diameter and held in place by two (2) heavy duty 18 gauge zinc plated plates. Counter balance system 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 shall have the standard 3.0" tall bottom rail extrusion for easy one (1) hand opening and closing.

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

#### **BODY WIDTH DIMENSIONS**

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

Area Description	<u>Dimension</u>
Transverse above subframe	95.0"
Compartment depth below subframe	24.5"

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# **STREETSIDE COMPARTMENT - FRONT (S1)**

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

The compartment door opening shall be approximately 34.2" wide.

In addition to the specified roll-up door a SureStep heavy duty drop-down door step shall be provided at the base of the roll-up door opening to access equipment stored in the upper compartment area. The SureStep drop-down door step and the roll up door of compartment will operate independently of each other. The 16" deep stepping surface shall be NFPA compliant aluminum treadplate and shall withstand a static load of 800 pounds. When closed, the SureStep door shall have a matching job color paint finish.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door. Lock cylinder keyed for J236 key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

# COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 16" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
- In addition to the chassis supplied batteries, two (2) Delco group 31 battery(s) shall be furnished in lower tray. Batteries shall provide isolated power for specified radios, MDT and necessary components.
  - The above component(s) shall have a smooth un-painted finish.

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- There shall be one (1) OnScene Solutions 81 series aluminum tray base with 100% extension, and rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 55" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails. Each slide base shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
  - Vertical partition(s) shall be provided on slide-out tray base dividing the tray into left and right sides. Each vertical partition shall be horizontally adjustable; mounted on aluminum Shelf Trac on tray floor. The vertical partition(s) shall be 3/16" (.188) 3003H-14 alloy smooth aluminum sheet.
  - The above component(s) shall have a smooth un-painted finish.
- There shall be one (1) OnScene Solutions 84 series slide-out, drop-down style aluminum tray base with 90% extension, and rating of 250 lbs. Slide-out tray(s) base shall be approximately 46" deep and as wide as the compartment layout or door opening permits. It shall be located above the level of the chassis frame rails and shall be vertically adjustable in height. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will hold the tray in the closed position. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
  - The above component(s) shall have a smooth un-painted finish.
- There shall be one (1) Oxygen cylinder storage module for 9" OD (maximum) cylinder. The module shall have an
  exterior shell fabricated from 1/8" (.125) 3003H-14 aluminum alloy sheet. The module shall have a 2" slope, front to
  back to prevent cylinders from sliding out. In addition there shall be rubber matting provided in the base of each
  storage tube for bottle protection and to prevent slipping.
  - The oxygen cylinder module shall be capable of storing two (2) "M250" size oxygen cylinders 9" diameter x 52" long.
- The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.
- One (1) Hannay ECR1618-17-18 240 volt electric cable reel(s) capable of storing 200' of 10/4 electric cable. Reel(s) shall be designed to hold 110% of the capacity of cord length, with fully enclosed 60 amp, four (4) conductor collector rings. Reel(s) shall be mounted to channel structure that allows for side-to-side adjustment of reel position.
  - Power rewind control(s) shall be in a position where the operator can observe the rewinding operation and not be more than 72 in. (1830 mm) above the operator's standing position, and shall be marked with a label indicating its function and shall be guarded to prevent accidental operation.
  - A label shall be provided in a visible location adjacent to reel with following information: Current rating, Current type, Phase, Voltage, and Total cord length.
  - The electric cord reel shall be equipped with 200' of 10/4 SEOW yellow cord, a molded plastic ball clamp, and a single heavy duty L14-30 twist-lock female plug.
- The fairlead roller shall be mounted directly to the reel.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- The controls for the specified light tower(s) will be located above cylinders storage on forward (left) wall.

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- The controls for the specified awning(s).
- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R). Locate near the light tower controller.
  - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.
- There shall be one (1) 240 VAC outlet(s) located in compartment mounted on the forward wall.
  - The outlet receptacle(s) shall be 30 amp, twist-lock (NEMA L6-30R).
  - Actual location to be in lower part of compartment.
  - Outlet(s) shall be powered through the on-board generator system.
- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.
- The 12 volt electrical distribution panel shall be located in the front lower compartment.

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# STREETSIDE COMPARTMENT - AHEAD OF REAR WHEELS (S2)

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

The compartment door opening shall be approximately 34.2" wide.

In addition to the specified roll-up door a SureStep heavy duty drop-down door step shall be provided at the base of the roll-up door opening to access equipment stored in the upper compartment area. The SureStep drop-down door step and the roll up door of compartment will operate independently of each other. The 16" deep stepping surface shall be NFPA compliant aluminum treadplate and shall withstand a static load of 800 pounds. When closed, the SureStep door shall have a matching job color paint finish.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door. Lock cylinder keyed for J236 key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

# COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component
  installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary
  items, without need for drilling into body.
- There shall be two (2) OnScene Solutions 84 series slide-out, drop-down style aluminum tray base with 90% extension, and rating of 250 lbs. Slide-out tray(s) base shall be approximately 46" deep and as wide as the compartment layout or door opening permits. It shall be located above the level of the chassis frame rails and shall be vertically adjustable in height. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will hold the tray in the closed position. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
  - The above component(s) shall have a smooth un-painted finish.
  - There shall be two (2) OnScene Solutions cargo straps provided to secure the stored equipment.

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- A mobile cart shall be provided capable of holding nine (9) Gwinnett County Fire and Emergency Services SCBA breathing air cylinders. Cart shall will be stored in lower section of compartment with strap of securing during travel.
- The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
  - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.
- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.
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## STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S3)

The interior useable compartment width shall be approximately 64.5" wide.

The compartment door opening shall be approximately 57.2" wide.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door. Lock cylinder keyed for J236 key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## COMPARTMENT LAYOUT

- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- A Bauer model K-22.42-30-E3 air compressor with a recharging rate of 35.9 SCFM @ 6,000 PSI shall be provided, . Compressor skid shall include 30 HP, 3-phase soft start electric motor, P10 Securus purification system, electronic CO monitor and calibration kit, and fill station inter-connecting harness. Compressor module shall be approximately 58" L x 56" W x 54" H and weigh 1,950 pounds.
  - No boost system shall be provided with compressor skid.
  - An Appleton inlet and base shall be provided in compartment near compressor. The compressor shall have a 2/00 AWG SO cord with a matching Appleton plug for operating compressor from the on-board generator system. Another matching Appleton plug shall be provided with completed vehicle for operating the compressor from an in-house electrical system. All required building wiring shall be responsibility of Gwinnett County Fire and Emergency Services.

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• Air storage shall consist of six (6) ASME 491 SCF @ 6,000 PSI, (does not require hydrostatic testing) shall be provided on completed vehicle complete with gauges and valves. Each cylinder shall measure 9.6" diameter x 55" long, and weigh 400 lbs.

The manufacturer's test date (month and year) on each air tank shall be current within 12 months of the apparatus delivery date.

Air tanks shall be marked with a label that reads;

"High Pressure 6,000 PSI Breathing Air" or "High Pressure 41,368 kPa Breathing Air."

- There will be a welded reinforcement above the body frame to carry specified DOT or ASME cylinders. The
  mounting of the cylinders will be with adjustable track and powder coated steel band straps to securely hold all
  cylinders in place.
- The Bauer compressor shall be free from defects in material and workmanship for a period of two (2) years. The foregoing warranty period shall be extended to five (5) years from the date of shipment from Bauer for Customers that are Municipal Fire Departments with respect to the compressor block (breathing air application), provided that such extended warranty period shall only apply to product parts with proof of proper maintenance being completed in accordance with published Bauer factory recommendations. To be eligible for this limited warranty to cover Customer's product, Customer must return a properly completed start-up/warranty registration form to Bauer within ninety (90) days from the date of start-up.
- Training and instruction shall be provided by compressor manufacturer at Gwinnett County Fire and Emergency Services location on proper use of complete air compressor system.
- The NFPA required air quality test shall be completed by manufacturer prior to delivery. Complete results of test shall be provided to Gwinnett County Fire and Emergency Services upon delivery.

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## **STREETSIDE COMPARTMENT - REAR (S4)**

The interior useable compartment width shall be approximately 64.5" wide.

The compartment door opening shall be approximately 57.2" wide.

In addition to the specified roll-up door a SureStep heavy duty drop-down door step shall be provided at the base of the roll-up door opening to access equipment stored in the upper compartment area. The SureStep drop-down door step and the roll up door of compartment will operate independently of each other. The 16" deep stepping surface shall be NFPA compliant aluminum treadplate and shall withstand a static load of 800 pounds. When closed, the SureStep door shall have a matching job color paint finish.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door. Lock cylinder keyed for J236 key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) adjustable shelf/shelves approximately 24" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edge.
  - The above component(s) shall have a smooth un-painted finish.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
  - The above component(s) shall have a smooth un-painted finish.

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- There shall be one (1) SCBA cylinder storage module for 8" OD (maximum) SCBA bottles. The maximum length of the SCBA cylinder shall be 24.75". The module shall have an exterior shell fabricated from 1/8" (.125) 3003H-14 aluminum alloy sheet. The module shall have a 2" slope, front to back to prevent cylinders from sliding out. The SCBA cylinder storage tubing shall be fabricated from PVC pipe to prevent damage or abrasion to cylinders. 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 shall be capable of storing twenty eight (28) SCBA cylinders up to 7.5" diameter.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (nonextended floor).
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
  - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.
- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

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## **CURBSIDE COMPARTMENT - FRONT (C1)**

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

The compartment door opening shall be approximately 34.2" wide.

In addition to the specified roll-up door a SureStep heavy duty drop-down door step shall be provided at the base of the roll-up door opening to access equipment stored in the upper compartment area. The SureStep drop-down door step and the roll up door of compartment will operate independently of each other. The 16" deep stepping surface shall be NFPA compliant aluminum treadplate and shall withstand a static load of 800 pounds. When closed, the SureStep door shall have a matching job color paint finish.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door. Lock cylinder keyed for J236 key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

### COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be two (2) adjustable shelf/shelves approximately 40" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
  - The above component(s) shall have a smooth un-painted finish.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
  - The above component(s) shall have a smooth un-painted finish.

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- There shall be one (1) OnScene Solutions 81 series aluminum tray base with rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 40" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails. Slide base shall extend depth specified, less 4".Each slide base shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
  - The above component(s) shall have a smooth un-painted finish.
- The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
  - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.
- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.

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## CURBSIDE COMPARTMENT - AHEAD OF REAR WHEEL (C2)

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

The compartment door opening shall be approximately 34.2" wide.

In addition to the specified roll-up door a SureStep heavy duty drop-down door step shall be provided at the base of the roll-up door opening to access equipment stored in the upper compartment area. The SureStep drop-down door step and the roll up door of compartment will operate independently of each other. The 16" deep stepping surface shall be NFPA compliant aluminum treadplate and shall withstand a static load of 800 pounds. When closed, the SureStep door shall have a matching job color paint finish.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door. Lock cylinder keyed for J236 key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
  - The above component(s) shall have a smooth un-painted finish.

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- There shall be one (1) OnScene Solutions 81 series aluminum tray base with rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 46" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails. Slide base shall extend depth specified, less 4". Each slide base shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
  - The above component(s) shall have a smooth un-painted finish.
- There shall be one (1) OnScene Solutions 84 series slide-out, drop-down style aluminum tray base with 90% extension, and rating of 250 lbs. Slide-out tray(s) base shall be approximately 46" deep and as wide as the compartment layout or door opening permits. It shall be located above the level of the chassis frame rails and shall be vertically adjustable in height. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will hold the tray in the closed position. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
  - The above component(s) shall have a smooth un-painted finish.
- The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
  - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.
- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

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## CURBSIDE COMPARTMENT - ABOVE REAR WHEEL (C3)

The interior useable compartment width shall be approximately 64.5" wide.

The compartment door opening shall be approximately 57.2" wide.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door. Lock cylinder keyed for J236 key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## COMPARTMENT LAYOUT

- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- There shall be two (2) 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
  - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.

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## **CURBSIDE COMPARTMENT - REAR (C4)**

The interior useable compartment width shall be approximately 64.5" wide.

The compartment door opening shall be approximately 57.2" wide.

In addition to the specified roll-up door a SureStep heavy duty drop-down door step shall be provided at the base of the roll-up door opening to access equipment stored in the upper compartment area. The SureStep drop-down door step and the roll up door of compartment will operate independently of each other. The 16" deep stepping surface shall be NFPA compliant aluminum treadplate and shall withstand a static load of 800 pounds. When closed, the SureStep door shall have a matching job color paint finish.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door. Lock cylinder keyed for J236 key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

## COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) SCBA cylinder storage module for 8" OD (maximum) SCBA bottles. The maximum length of
  the SCBA cylinder shall be 24.75". The module shall have an exterior shell fabricated from 1/8" (.125) 3003H-14
  aluminum alloy sheet. The module shall have a 2" slope, front to back to prevent cylinders from sliding out. The SCBA
  cylinder storage tubing shall be fabricated from PVC pipe to prevent damage or abrasion to cylinders. 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 shall be capable of storing twenty one (21) SCBA cylinders up to 7.5" diameter.
- A bolted removable panel shall be provided on compartment back wall behind specified fill station. Panel shall provide access to back of fill station thru compartment RC1.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (nonextended floor).

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- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- A specified multiplex system interface display(s) shall be provided in compartment adjacent to breathing air fill panel.
- Mounted speaker location at fill station.
- The controls for the specified awning(s).
- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
  - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.
- One (1) Bauer model CFS5.5 3M, NFPA 1901 compliant containment type three (3) cylinder filling station with Side Mounted compressor & filling controls rated for cylinder pressures up to 5,500 PSI shall be provided with proper reinforcement for weight of fill station and venting thru floor opening. Fill station will be approximately 52.75" wide x 30.25" high x 21" deep, and weigh approximately 905 lbs.

SHOP NOTE; Side mounted fill & compressor controls.

- Filling operation shall be controlled with panel mounted on front of fill station. Electronic auto cascade manifold shall be located on air compressor skid.
- An air storage refill port shall be provided on the fill station.
- One (1) high pressure air hose reel gauge(s), adjustable regulator(s), and fill control(s) shall be provided on front panel with outlet port located on the rear of the fill station.
- The fill station fill whip(s) shall terminate in a high pressure CGA-347 threaded connectors for 4,500 5,500 PSI air pack cylinders.
- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

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## **REAR COMPARTMENT - CENTER (RC1)**

The rear center compartment shall be closed to both side rear compartments.

The rear center compartment shall begin just above the bumper height and be as high as the side compartments, unless specified otherwise. The body sub-frame shall extend at least 20" into the compartment to allow for the spring loaded body mounts.

The interior useable compartment width shall be approximately 56.5" wide.

The compartment door opening shall be approximately 49.2" wide.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door. Lock cylinder keyed for J236 key.
- One (1) 1" wide nylon strap shall be provided to assist in closing the compartment door. The strap shall be fastened to the lower left inside door sill with a nickel plated Footman loop secured to back of door. The strap shall extend from door to a nickel plated Footman loop secured to wall or vertical slot of Shelf-Trac on left side of the door opening.
- One (1) aluminum drip pan/door guard shall be provided below door roll area. Drip pan/door guard shall have thumb nuts making it easily removable without tools with a maintenance-free, un-painted finish. A plastic drain line shall be provided on each end of the drip pan to lower door threshold.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

### COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) OnScene Solutions 81 series aluminum tray base with rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 56" deep (depending on stored thickness of folding ramp) and as wide as the compartment layout or door opening permits located above the body subframe and shall be vertically adjustable in height. Slide base shall extend depth specified, less 4". (Full depth of compartment) Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
  - The above component(s) shall have a smooth un-painted finish.
- Floor of compartment behind (forward of) specified folding ramp shall provide storage area for specified Roll N Rack Power Roller. There shall be two (2) OnScene Solutions cargo straps provided to secure the stored equipment.

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• There shall be a Link Manufacturing model LB-20 bi-fold ramp installed in the rear compartment door opening. Ramp capacity shall be 750 pounds, 30-36" wide x 117" long with a deployed angle approximately 13 degrees. Final configuration for ramp shall depend on recommended engineering design based on rear compartment and body configuration.

The ramp shall have the following features:

- Flat surface mount
- Stores vertically inside the vehicle
- Reduces dangerous lifting
- Increases efficiency
- Reduces equipment damage
- High strength aluminum extrusion
- Takes seconds to position for use
- One (1) Hannay ECR1618-17-18 240 volt electric cable reel(s) capable of storing 200' of 10/4 electric cable. Reel(s) shall be designed to hold 110% of the capacity of cord length, with fully enclosed 60 amp, four (4) conductor collector rings. Reel(s) shall be mounted to channel structure that allows for side-to-side adjustment of reel position.
  - Power rewind control(s) shall be in a position where the operator can observe the rewinding operation and not be more than 72 in. (1830 mm) above the operator's standing position, and shall be marked with a label indicating its function and shall be guarded to prevent accidental operation.
  - A label shall be provided in a visible location adjacent to reel with following information: Current rating, Current type, Phase, Voltage, and Total cord length.
  - The electric cord reel shall be equipped with 200' of 10/4 SEOW yellow cord, a molded plastic ball clamp, and a single heavy duty L14-30 twist-lock female plug.
- The fairlead roller shall be mounted directly to the reel.
- One (1) Hannay EFH1516-17-18 high pressure air hose reel(s) shall be provided in this compartment. Reel shall be designed to hold 110% of the capacity needed.
  - Power rewind control(s) shall be in a position where the operator can observe the rewinding operation and not be more than 72 in. (1830 mm) above the operator's standing position, and shall be marked with a label indicating its function and shall be guarded to prevent accidental operation.
  - A label shall be provided in a visible location adjacent to reel with following information: (1) Utility air or breathing air, (2) Operating pressure, (3) Total hose length, (4) Hose size (ID).
  - The hose reel shall be equipped with 300' of 3/16" Parker 6,000 PSI, high pressure air hose. A molded plastic ball clamp shall be provided on the hose to stop it at the 4-way roller. The hose shall be Gray in color with a red color coded end.
  - The fitting on the end of the high pressure air hose reel shall be a CGA-347 high pressure fitting.
  - The air supply shall be from the specified mobile breathing air system.
  - A reel shut-off valve, 0 125 psi adjustable low pressure regulator, and 0 300 psi gauge shall be provided on an aluminum control panel with flow diagram graphic overlay near the air reel location, not exceeding 72" from ground.

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- The fairlead roller shall be mounted directly to the reel.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- There shall be one (1) DSPower BC-Series BC-1224-10 24 volt charger installed in compartment adjacent to specified 120volt outlet. Charger is for specified Power Roller battery pack.
- There shall be one (1) 120 VAC outlet(s) located in compartment on the forward wall.
  - The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
  - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.

## 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 black.
- The plastic edge trim shall be black.

### LOWER SIDE BODY PROTECTION - RUB RAIL

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

The rub rail shall be fabricated from 6063 extruded aluminum, measuring approximately 2-3/4" high x 1-3/8" thick with tapered aluminum end caps. The rub rail shall be bolted to the body using stainless steel bolts and 1-1/2" diameter x 5/8" thick rubber mount isolators to prevent damage to the body.

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

There shall be four (4) MircoPulse MPS600-RR LED surface mount lights provided and installed in rubrail, one each side centered forward of rear wheelwell and one each side adjacent to rear lower marker light.

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

3M<sup>™</sup> ScotchLite striping shall be provided in the rub rail. The striping shall be black in color.

### FRONT GRAVEL GUARDS

Gravel guards shall be provided on front lower body corners. Guards shall be 12" high, extend from behind cab or step and wrap around to the front compartment door opening fabricated from 20 gauge brushed stainless steel.

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## ROOF ACCESS LADDER

The top of the body shall be accessible from the ground by a folding style ladder. The ladder design shall have a main pivoting ladder section with a fixed bolt-on upper hand rail section that extends just above top surface. The lower step section of ladder shall fold-out creating an angled ladder that brings the first step closer to ground for easier step height access and a comfortable climbing angle. The ladder shall fold-up and store in vertical position for better angle of departure.

Each cast aluminum step shall be 4-1/2" deep x 16" wide. Hand railing shall be 2-1/8" oval shaped aluminum tubing with a ribbed gripping surface.

The ladder shall be wired to the door ajar warning light in cab to warn the driver that the ladder is in the down position. Ladder shall be mounted to body with stainless steel bolts.

Ladder shall be located on rear streetside of the body.

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

## **ROLL-OUT AWNING STREETSIDE**

A Girard G-2000, 120 VAC powered, automatic retractable lateral arm awning shall be provided and mounted on the body. The cassette housing is made of corrosion-resistant, white powder-coated extruded aluminum with components made of stainless steel.

Streetside control shall be located in S1 adjacent to the command light control.

The awning shall activate the door ajar warning system in the cab when not in the stowed position.

The unit shall measure 17' long x 5-1/4" deep, 7-3/4" high with a 9' - 9" outward projection, (length refers to box length; actual fabric length will be shorter).

The G-2000 shall deploy and retract using a 120V AC motor with manual override (to retract awning in the event of a power failure). The controls shall be located in compartments S1 for a streetside awning, and C1 for a curbside awning.

The awning shall have a system to detect canopy motion. The awning shall automatically retract when the canopy reaches a certain level of movement. The G-2000 has a Limited Lifetime Warranty. Wind and rain damage are not covered.

• The awning fabric color shall be red.

The specified awning above shall be recess mounted into upper body side. An aluminum box enclosure shall be fabricated and recessed into upper body side for awning mounting and painted same color as upper body. The recessed awning shall add approximately 1.5" to body width.

### AWNING HOUSING COLOR

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

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## ROLL-OUT AWNING CURBSIDE

A Girard G-2000, 120 VAC powered, automatic retractable lateral arm awning shall be provided and mounted on the body. The cassette housing is made of corrosion-resistant, white powder-coated extruded aluminum with components made of stainless steel.

Curbside control shall be located in C4 adjacent to the Bauer Fill station and ES-Key 4 display.

The awning shall activate the door ajar warning system in the cab when not in the stowed position.

The unit shall measure 17' long x 5-1/4" deep, 7-3/4" high with a 9' - 9" outward projection, (length refers to box length; actual fabric length will be shorter).

The G-2000 shall deploy and retract using a 120V AC motor with manual override (to retract awning in the event of a power failure). The controls shall be located in compartments S1 for a streetside awning, and C1 for a curbside awning.

The awning shall have a system to detect canopy motion. The awning shall automatically retract when the canopy reaches a certain level of movement. The G-2000 has a Limited Lifetime Warranty. Wind and rain damage are not covered.

• The awning fabric color shall be red.

The specified awning above shall be recess mounted into upper body side. An aluminum box enclosure shall be fabricated and recessed into upper body side for awning mounting and painted same color as upper body. The recessed awning shall add approximately 1.5" to body width.

#### AWNING HOUSING COLOR

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

### ROOF ACCESS HATCH COVER

One (1) roof access hatch cover shall be provided in the roof structure to allow for installation or removal of large equipment into the compartment area. The roof around the hatch opening shall be reinforced as necessary to prevent deflection in the roof area. The hatch cover shall overlap a 2" vertical lip on the body roof to prevent entry of moisture. It shall be sealed with automotive type rubber molding to provide a weather resistant seal.

The hatch cover shall have a lift-up type door hinged on the front side. The door shall be fabricated from 3/16" aluminum treadplate with a pair of pneumatic type cylinders mounted to hold the door in the open position. The door shall be mounted using a full length 14 gauge stainless steel hinge, with 1/4" stainless steel pin. A polyester barrier film gasket shall be placed between the stainless steel hinge and any dissimilar metals as necessary to prevent corrosion.

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## LOW VOLTAGE ELECTRICAL SYSTEM- 12 VDC

## <u>General</u>

Any low voltage electrical systems or warning devices installed on the fire apparatus shall be appropriate for the mounting location and intended electrical load.

Where wire passes through sheet metal, grommets shall be used to protect wire and wire looms. Electrical connections shall be with double crimp water-tight heat shrink connectors.

All 12 VDC wiring running from front to back of vehicle body shall be run in full length electrical wiring raceway down each side of body.

### Wiring

All electrical circuit feeder wiring supplied and installed by the fire apparatus manufacturer shall meet the requirements of NFPA Chapter 13.

The circuit feeder wire shall be stranded copper or copper alloy conductors of a gauge rated to carry 125% of the maximum current for which the circuit is protected. Voltage drops in all wiring from the power source to the using device shall not exceed 10%. The use of star washers for circuit ground connections shall not be permitted.

All circuits shall otherwise be wired in conformance with SAE J1292, Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring.

## Wiring and Wire Harness Construction

All insulated wire and cable shall conform to SAE J1127, *Low Voltage Battery Cable,* or SAE J1128, *Low Voltage Primary Cable,* type SXL, GXL, or TXL.

All conductors shall be constructed in accordance with SAE J1127 or SAE J1128, except where good engineering practice dictates special strand construction. Conductor materials and stranding, other than copper, shall be permitted if all applicable requirements for physical, electrical, and environmental conditions are met as dictated by the end application. Physical and dimensional values of conductor insulation shall be in conformance with the requirements of SAE J1127 or SAE J1128, except where good engineering practice dictates special conductor insulation. The overall covering of conductors shall be moisture-resistant loom or braid that has a minimum continuous rating of 194°F (90°C) except where good engineering practice dictates special consideration for loom installations exposed to higher temperature rating of 194°F (90°C), except where good engineering practice dictates special consideration for cable installations exposed to higher temperatures.

All wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection. The wiring connections and terminations shall be installed in accordance with the device manufacturer's instructions. All ungrounded electrical terminals shall have protective covers or be in enclosures. Wire nut, insulation displacement, and insulation piercing connections shall not be used.

Wiring shall be restrained to prevent damage caused by chafing or ice buildup and protected against heat, liquid contaminants, or other environmental factors.

Wiring shall be uniquely identified at least every 2 ft (0.6 m) by color coding or permanent marking with a circuit function code. The identification shall reference a wiring diagram.

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Circuits shall be provided with properly rated low voltage over-current protective devices. Such devices shall be readily accessible and protected against heat in excess of the over-current device's design range, mechanical damage, and water spray. Circuit protection shall be accomplished by utilizing fuses, circuit breakers, fusible links, or solid state equivalent devices.

If a mechanical-type device is used, it shall conform to one of the following SAE standards:

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

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

### Power Supply

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

#### Minimum Continuous Electrical Load

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

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

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

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

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

If electrical system voltage is monitored, the alarm shall sound if the system voltage at the battery or at the master load disconnect switch drops below 11.8 V for 12 V nominal systems, 23.6 V for 24 V nominal systems, or 35.4 V for 42 V nominal systems for more than 120 seconds.

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A voltmeter shall be mounted on the driver's instrument panel to allow direct observation of the system voltage.

## Electromagnetic Interference

Electromagnetic interference suppression shall be provided, as required, to satisfy the radiation limits specified in SAE J551/1, *Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 18 GHz)*.

### Wiring Diagram

A complete electrical wiring schematic of actual system shall be provided with finished apparatus. Similar or generic type electrical schematics shall NOT BE ACCEPTABLE.

#### Low Voltage Electrical System Performance Test

A low voltage electrical system test certification shall be provided with delivered apparatus.

## 12 VOLT MULTIPLEX CONTROL CENTER

The apparatus shall be equipped with a Class 1 ES-Key multiplexed 12 volt electrical system that will provide complete diagnostic capability. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The system shall use shielded twisted-pair wire for transmission of system function signals. The shielded wire shall provide protection against EMI and RFI noise interruptions.

The multiplex system shall be responsible for providing power management functions as well as load shedding. The warning light system shall be controlled by the multiplex system. The system shall be capable of displaying text and/or graphic messages on a display module. The system shall be based on solid-state technology and shall include self-contained diagnostic indicators.

The 12-volt body electrical system should be a fully engineered distributed Class 1 Es-Key<sup>™</sup> Multiplex system. The system should be designed as a completely integrated electrical package consisting of a central power distribution and switching panel, water tight Class 1 electrical connectors, power studs and ground studs. Complete and accurate (as constructed) wiring schematics and documentation should also be included. All corresponding software including but not limited to the diagnostic and programming software should be included. The system should be installed to the exact recommendations of Class I, Inc.

The electrical system shall utilize Class1 Inc. **Es-Key™** technology, **UltraView™** displays and **1Touch™** switch modules, where applicable.

The apparatus shall be equipped with a Class 1 Es-Key<sup>™</sup> Management System for controlling electrical system devices. This management system shall be capable of performing load management functions, system switching, monitoring and reporting, and be fully programmable for a standardized electrical system utilizing the Es-Key Professional software program.

The system shall consist of a main control module (Universal System Manager or Supernode II) and the appropriate combination of Power Distribution Module(s) (PDM), Switch Input Module(s) (SIM), and other I/O modules as required for the application.

Wiring harness must be specifically designed for the Es-Key system. Generic or universal harnesses designed for multiple systems are not permitted (no exceptions). All connections must be sealed and water tight.

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All nodes should be mounted in an accessible location as determined by the design of the apparatus and as agreed upon by Gwinnett County. **This system should be engineered as a distributed multiplex system and as such each node should be mounted as close to the components being controlled as possible and will require several mounting locations.** All mounting locations should be located in a location adequately protected from the environment. Proposed mounting locations should be discussed in the proposal.

System enhancements may include the UltraView™ 700 display, the UltraView 450 display and 1Touch switch modules for increased graphic user interface.

### Supernode II

The apparatus shall be equipped with a minimum of two (2) Supernode II<sup>™</sup> high density input output nodes, one for cab/chassis and additional body function units as necessary.

The Supernode II<sup>™</sup> shall have (24) polarity selectable inputs, (24) outputs, an integrated Universal System Manager (USM), Vehicle Data Recorder (VDR), Seat Belt Warning System (SBW), Climate Control Module (CCM), data logger, programmable special utilities, and select J1939 engine and drive train message reception with Es-Key<sup>™</sup> I/O association. It must be sealed to IP-67 and have integrated power connections.

The Supernode II<sup>™</sup> shall have (18) positive and (6) negative outputs. Each positive output shall be capable of 13 amps continuous duty. The negative outputs shall be capable of 2 amps continuous duty.

Supernode II<sup>™</sup> outputs shall contain features such as digital circuit breaker, flash capability, PWM capability and open load detection. Its special utility functions shall include timers (delay on/off and one shot), counters, bi-stable switches, and select J1939 broadcast messages. The Supernode II<sup>™</sup> shall have an integrated USB port to allow for direct connection to the Es-Key system without additional interface devices.

### Load Manager

The Supernode II<sup>™</sup> shall have an integrated Load Manager. The Load Manager sequencer shall assure that loads applied and removed gradually, thus eliminating the possibility of inducing failures in the vehicle's equipment. The load manager shall be a precision, solid state controller which sequentially switches "ON" multiple circuits at 1/2 second intervals. Individual switches shall enable the user (Driver) to select output "ON or "OFF" status, at any time. The sequencer shall be initiated by the "Emergency Master" switch. The sequencer priority shall be set at the apparatus prebuild conference.

The Load Manager shall monitor the vehicles battery voltage. Loads may be shed at any voltage at one tenth of volt increments. A low voltage warning may be set at any set point (usually 11.5 volts). The load manager can shed any output that is controlled by the system (there is no limit to the number of loads that may be managed by the network). The load shed priority shall be set by the circuit significance, followed closely by circuit draw. The Load Manager shall shed loads until the voltage level begins to rise.

### Voltage Monitor

A voltage monitor shall be built into the Es-Key electrical system. It shall activate a warning when the alternator output voltage falls below any desired voltage (usually 11.5 volts).

### UltraView™ 700 Display

The apparatus shall be equipped with one (1) UltraView<sup>™</sup> 700 display UV700 (or equal) located in cab driver positions. The UV700 is a 7 inch, full color LCD display, with (14) buttons and touch screen capability with (2) J1939 CAN Bus connections and (3).

NTSC/PAL video inputs. It shall be bonded for direct sunlight viewing, sealed to IP67 and mounted in either the flush, pedestal or rear-mount position.

The UV700's switches shall be configured to allow for the control of emergency master and non-emergency master functions and are completely configurable via the Es-Key<sup>™</sup> Professional software. Switches shall be set to act as

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momentary, maintained or three-way switches without any physical hardware change. All switches and or indicators may be configured as touch screen inputs into the Es-Key<sup>™</sup> system. The (14) buttons are blue LED backlit.

### UltraView<sup>™</sup> 450 Display

The apparatus shall be equipped with one (1) UltraView<sup>™</sup> 450 display UV450 (or equal). It is a custom programmed, 4.3 inch, full color LCD display with an (8) button, touch screen capable display. It shall be bonded for direct sunlight viewing. The UV450 is sealed to IP67 and allows for flush, pedestal or rear mounting options. The UV450 has (2) J1939 CAN Bus connections and (2) NTSC/PAL video inputs.

The UV450 switches are configured to allow for the control of emergency master and non-emergency master functions and are completely configurable via the Es-Key<sup>™</sup> professional software. Switches may be set to act as momentary, maintained or 3 way switches without any physical hardware change. All switches and or indicators may be configured as touch screen inputs into the Es-Key<sup>™</sup> system. The (8) buttons are LED backlit.

UV-450 display shall mounted in compartment C4 on or adjacent to breathing air fill panel.

#### **1Touch Switch Modules**

The apparatus shall be equipped with the appropriate quantity of 1Touch switch modules for enhanced device activation. The 1Touch switch modules shall be available in any combination of 4-button, 8-button, 12-button or 16-button configurations to accommodate specific apparatus requirements. Individual switches shall be backlit with multiple colored and textured switch caps and printable labels. Switch panels shall be sealed to IP67 and have dual LED indicators.

Each switch position's back light may be individually controlled allowing for the specific switch position to be used as an indicator. Each switch pair can be configured to momentary, maintained, toggle or a dimmer.

All lit panels should be included in network dimming functions and controlled with the chassis dim switch.

#### **Component Installation**

All Es-Key components shall be mounted as recommended in the component datasheets provided by Class1.

### CAB CONSOLE

A center cab console shall be provided between the Driver's and Officer's seats. Console shall be as large as possible and fabricated of 1/8" smooth aluminum. A textured powder coat paint finish shall be provided for durability and finished appearance.

The rear portion of the console shall be provided with open top storage for notebooks or maps. Two (2) adjustable dividers shall be provided in the storage area. The forward portion of console shall be slanted for easy viewing of the specified multiplex display screen, and any siren or radio equipment and within easy access to both Driver and Officer. Two (2) cup holders shall be provided in console.

The final design of console shall be reviewed with Gwinnett County Fire and Emergency Services prior to fabrication.

The following options shall be provided in specified console. Final layout to be determined by Gwinnett County Fire and Emergency Services at pre-construction meeting.

- There shall be one (1) communications radio and/or siren 3" recess mount(s) with black powdercoat paint finish in specified console.
- There shall be one (1) communications radio and/or siren 3" filler plate(s) with black powdercoat paint finish provided for future radio/siren location in specified console.
- There shall be three (3) Blue Sea 12 VDC USB port(s) provided in specified console.

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## **BATTERY SYSTEM**

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

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

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

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

An onboard battery conditioner or charger or a polarized inlet 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 shall be provided:

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

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

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

A green "battery disconnect on" indicator light that is visible from the driver's position shall be provided.

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

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

### **BATTERY SWITCH**

One (1) battery "On/Off" switch shall be provided and located in cab within easy reach of Driver. A green "BATTERY ON" pilot light shall be visible from the driver's position.

#### BATTERY SOLENOID

Battery switch shall consist of a minimum 200 ampere, constant duty solenoid to feed from positive side of battery.

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## BATTERY CONDITIONER

One (1) Kussmaul model Auto Charge LPC 40 single battery conditioner, with 120 VAC input and 40 amp, 12 volt output shall be provided. This system shall monitor the condition of batteries and provide an electrical current at variable rates to overcome battery failure. A display shall be provided with charge indicator, remote mounted. SHOP NOTE

Battery conditioner to be mounted compartment S1 below extended floor at frame level.

## SHORE POWER INLET

One (1) Model # 63-11-2106-RD Kussmaul 120 VAC, 20 amp Super Auto-Eject shore power inlet(s) shall be provided to include bar graph integrated within the cover. The shore power connection shall automatically disengage from vehicle when chassis ignition is engaged. The protective ground from the shoreline inlet shall be bonded to the vehicle frame.

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

## ENGINE COMPARTMENT LIGHT

There shall be one (1) OnScene Severe Service LED light(s) mounted in the engine compartment with integral switch with a light output of at least 20 candlepower (250 lumens). The engine compartment light(s) shall operate only when the master battery switch is turned "On".

### CHASSIS HEADLIGHT WIG/WAG

A chassis headlight wig/wag flashing unit shall be provided. The headlight flasher shall shut down when the parking brake is engage for "Blocking Mode".

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

### **CAB HAZARD WARNING LIGHT**

A Truck-Lite red LED flashing light shall be provided and located in the driving compartment and be illuminated automatically whenever the vehicles parking brake is not fully engaged and any of the following conditions exist:

- Any passenger or equipment compartment door is not closed.
- Any ladder or equipment rack is not in the stowed position.
- Stabilizer system is not in its stowed position.
- Powered light tower is not stowed.
- Any other device permanently attached to the apparatus is open, extended, or deployed in a manner that is likely to cause damage to the apparatus if the apparatus is moved.

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

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

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

An audible alarm shall be provided for the door ajar light.

## BACK-UP ALARM

An electronic Federal Signal Reactor #210504 back-up alarm shall be supplied and installed. The back-up alarm shall actuate automatically when the transmission gear selector is placed in reverse.

## CAMERA SYSTEM

The apparatus should be equipped with the Brigade Backeye 360 system. System includes four (4) Select cameras, VBV-770M 7" cab mounted display, BN-360-200 ECU and all cables and adapters as required (unit is not a wireless system). camera system provides a birds eye 360 degree view surrounding vehicle along with automatic reverse, left & right lane change assistance.

A MDR-408GW-1000 (or equal), 8 Channel Mobile Digital Recorder with 1TB Hard Drive, 64GB SD CARD, 4G/WiFi capable, and internal G-force sensor. Recorder includes WiFi, GPS, 4G antennas. System shall be installed to the system manufacturer's specifications and be fully functional at final inspection. Proposer should include any other necessary components including but not limited to antennas, cables and adapters as to have a complete functional and integrated system.

Note; quote in truck folder.

## 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) Federal red LED QL64Z-BTT stop/tail lights
- Two (2) Federal white LED QL64Z-BACKUP back-up lights
- Two (2) Federal amber LED QL64Z-ARROW turn signal lights

Two (2) 3-light polished bezels shall be provided, one (1) each side vertically mounted on the rear of the apparatus body for the above tail lights.

## **MIDSHIP MARKER/TURN SIGNAL**

Two (2) Whelen model T0A00MAR 2" round amber LED midship body clearance marker/turn signal lights shall be provided and installed, one (1) light on each side of the body, in forward wheel well of rear axle. Midship marker/turn lights shall be wired to the headlight circuit of the chassis.

### MARKER LIGHTS

The body shall be equipped with all necessary side and rear clearance lights and reflectors in accordance with Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS). Clearance lights shall be Truck-Lite model 18 series, 3 diode LED, reflectorized type to reduce the need for maintenance and lower the amp draw. Clearance lights on body shall be connected to the clearance light circuit of the chassis.

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## **CAB STEP LIGHTS / GROUND LIGHTS**

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

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

### 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

One (1) Federal PA300-012MSC, 200 watt electronic siren with standard microphone shall be provided and installed in cab within easy reach of Driver. Siren power shall be wired through the master warning light switch.

#### SIREN SPEAKER

Two (2) Federal BP200-EF, 200 watt siren speakers shall be provided, recess mounted in the front bumper with chrome "F" grill.

The siren speakers shall be located outboard of front bumper.

#### FRONT SCENE LIGHTS

There shall be two (2) Federal QL97LEDSCENE, 9" x 7" surface mounted LED scene lights provided on the upper front portion of the body. Each light will have a clear lens and chrome bezel.

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

#### SIDE SCENE LIGHTS

There shall be four (4) Federal QL97LEDSCENE, 9" x 7" surface mounted LED scene lights provided on the upper body. Light quantity shall be divided equally per side. Each light will have a clear lens and chrome bezel.

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

#### **REAR SCENE LIGHTS**

There shall be two (2) Federal QL97LEDSCENE, 9" x 7" surface mounted LED scene lights provided on the upper rear body. Each light will have a clear lens and chrome bezel.

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

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

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## TRAFFIC DIRECTIONAL LIGHT

One (1) Federal SignalMaster VPX model 320882, 42" eight (8) LED light, traffic directional warning device with 30' control cable shall be located on upper rear body. The heavy duty control head with slide switch shall be located in the cab within easy reach of the Driver.

The traffic directional light shall be surface mounted on upper rear body.

## INTERCOM SYSTEM

A David Clark 3800 wired intercom system shall be provided and installed to improve the safety of firefighters and rescue professionals through enhanced communication and hearing protection. System shall have the following major components as minimum;

One (1) 3800 Master Intercom Station Two (2) U3815 Radio Interface Headset Station One (1) U3805 Radio Junction Module for Motorola APX6500 7/800 MHZ Two (2) H3442 Headset, Behind Head, 6' Cord, Flex Boom Mic One (1) U9922-G38 Gateway 3800, with Antenna One (1) H9940 Headset, Behind Head One (1) U9910 Belt Station-VOX Three (3) C38-xx Jumper Cords (length TBD) One (1) C3821-RD1 Radio Cord Three (3) C3821-05 U3805 Cords 20ft. One (1) C3820 Power Cord One (1) A99-14CGR 4-Bank Charger Two (2) 40668G-90 Lithium Polymer Cell One (1) C99-14 DC1

The David Clark Vehicle Intercom System shall be a three (3) position radio interface system with wired push to talk capabilities at the Driver and Officer and one (1) wireless headset for operation at air fill station position.

The body builder should provide and install hooks inside the cab for hanging the head sets when not in use. The exact mounting location will be determined prior to construction. Note; quote in truck folder.

### **INTERCOM SYSTEM INSTALLATION**

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

## Front of Cab

- Driver's Mounted above the right shoulder position on ceiling.
- Officer's Mounted above the left shoulder position on ceiling.

### <u>Body</u>

Compartment C4 - Air Fill Station (Belt Station)

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## 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 call for the right-of-way shall be energized. When 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**

One (1) VSLR53S-GWCO 7-pod light bar mounted on the center forward portion of the cab. Light Bar configured and programmed for Gwinnett County and should be ordered with the Gwinnett County Part number.

All clear lights shall shut down when the parking brake is set to comply with "Blocking" mode requirements as outlined in NFPA 1901.

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

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## ZONE B & D - SIDE WARNING LIGHTS

There shall be four (4) Federal Signal QuadraFlare model QL97-RR, 9" x 7" LED red lights provided, two (2) on each side of the apparatus in the upper corners. Each light shall have a red lens and chrome flange.

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

## ZONE C - REAR WARNING LIGHTS

There shall be two (2) Federal Signal QuadraFlare model QL97-RR, 9" x 7" LED red lights provided, one (1) on each side of the apparatus in the upper corners. Each light shall have a red lens and chrome flange.

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

## LOWER LEVEL OPTICAL WARNING DEVICES

To define the clearance lines of the apparatus, the optical center of the lower-level optical warning devices in the front of the vehicle shall be mounted on or forward of the front axle centerline and as close to the front corner points of the apparatus as is practical.

The optical center of the lower-level optical warning devices at the rear of the vehicle shall be mounted on or behind the rear axle centerline and as close to the rear corners of the apparatus as is practical. The optical center of any lower-level device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground for large apparatus, and 18 in. and 48 in. (460 mm and 1600 mm) above level ground.

A midship optical warning device shall be mounted right and the left sides of the apparatus if the distance between the front and rear lower-level optical devices exceeds 25 ft (7.6 m) at the optical center. Additional midship optical warning devices shall be required, where necessary, to maintain a horizontal distance between the centers of adjacent lower-level optical warning devices of 25 ft (7.6 m) or less. The optical center of any midship mounted optical warning device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground.

### **ZONE A - FRONT WARNING LIGHTS**

There shall be four (4) Federal Signal QuadraFlare model QL64-RR, 6" x 4" red LED lights provided, one (1) on each side. Each light shall have a red lens and chrome flange.

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

There shall be two (2) Federal Signal Micro Pulse model MPS1200U-RW red/white LED lights provided on front bumper face outer corners, one (1) on each side. Each light shall have a clear lens and chrome flange. Lights shall deactivate with parking brake activation.

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

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

There shall be two (2) Federal Signal QuadraFlare model QL64XFR, 6" x 4" red LED lights provided, one (1) on each side. Each light shall have a red lens and chrome flange.

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

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

There shall be two (2) Federal Signal QuadraFlare model QL64-RR, 6" x 4" red LED lights provided, one (1) on each side. Each light shall have a red lens and chrome flange.

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

## ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

There shall be two (2) Federal Signal QuadraFlare model QL97-RR, 9" x 7" LED red lights provided, one (1) on each side. Each light shall have a red lens and chrome flange.

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

## LINE VOLTAGE ELECTRICAL SYSTEM

## LIMA PTO GENERATOR

The vehicle shall be equipped with a Lima MAC 360 series, single bearing generator system with a capacity of 40,000 watts at 120/240 VAC, 3-phase. Current frequency shall be stable at 60 hertz.

The transmission's PTO port and PTO, or the split shaft PTO, and all associated drive shaft components shall be rated to support the continuous duty torque requirements of the generator's continuous duty rating as stated on the power source nameplate.

Where the generator is driven by the chassis engine and transmission through a split shaft PTO, the driving compartment speedometer shall register when the generator drive system is engaged.

Where the generator is driven by the chassis engine and transmission through a split shaft PTO and a chassis transmission retarder is furnished, it shall be automatically disengaged for generator operations.

The direct drive generator shall be mounted so that it does not change the ramp break-over angle, angle of departure, or angle of approach as defined by other components, and it shall not extend into the ground clearance area.

The direct drive generator shall be mounted away from exhaust and muffler areas or provided with a heat shield to reduce operating temperatures in the generator area.

### **GENERATOR BONDING**

A minimum of four (4) 16" x 2 gauge copper ground straps shall be bolted to body sub-frame and chassis sub-frame for proper bonding of high voltage system. The conductor shall have a minimum amperage rating, as defined in 310.15, "Ampacities for Conductors Rated 0–2000 Volts," of *NFPA 70*, of 115 percent of the rated amperage on the power source specification label.

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## **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 Marathon's written instruction; Marathon warrants that the MAC series PTO continuous duty generators shall be free from defects in material and workmanship for a period of one (1) year, from the date of delivery to the first purchaser.

### GENERATOR CONTROL

The generator shall be engaged at the switch 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.

### POWER-TAKE-OFF GENERATOR DRIVE

There shall be a "Hot Shift" power-take-off (PTO) installed on the transmission PTO opening of the chassis. The "Hot Shift" PTO is provided to allow the engagement of the PTO at higher engine RPM speeds. The PTO output shall be connected to the generator through hollow tube type driveline with heavy duty universals.

The engagement of the PTO shall be in the chassis cab with a rocker switch and red pilot light to note engagement of the PTO or via the V-Mux screen if so equipped.

The power supply to the PTO engagement control shall be wired to the parking brake and a neutral position transmission switch to prevent engagement unless the vehicle is stopped and transmission has been placed in neutral.

The installation of the engine, transmission, driven accessories (power takeoffs (PTO), etc.) shall meet the engine and transmission manufacturers' installation recommendations for the service intended.

Model part number shall be Chelsea 280 series.

Double check the model number and ratio with engineering before ordering the PTO on the chassis.

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## ENGINE SPEED CONTROL

An engine speed auxiliary control device (high idle switch or throttle) shall be installed to maintain a stable cycle output from generator when the apparatus is parked.

An interlock shall prevent the operation of the engine speed auxiliary control device unless the parking brake is engaged and the transmission is in neutral or park, or the parking brake is engaged and the engine is disengaged from the drive wheels.

The engine shall be prevented from regulating its own engine speed during times when engine rpm control is critical for consistent apparatus functions such as generator, water pump, or aerial operation.

## LOADCENTER

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

## **GENERATOR MONITORING PANEL**

An Accuvim CL digital meter package shall be provided to properly monitor the generator performance and load demand during operation. The electrical parameters can be viewed on a backlit LCD screen. The 15 screens are accessible via four buttons on the front panel allowing the user to scroll between various screens. The following shall be displayed full-time;

- Generator frequency in hertz
- Line voltage, phase to neutral or phase to phase, in volts
- Line current in amperes
- Generator voltage in volts

In addition, an elapsed generator hours gauge shall be provided near the digital meter.

### SHORE POWER INLET - BATTERY CHARGER

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

## **OUTLETS AND CIRCUITS**

The generator and or shore power shall supply the 120/240 volt electrical equipment and outlets outlined below. Proper circuit protection shall be installed as noted:

- One (1) 120 volt exterior outlet. located rear body panel streetside.
  - The outlet receptacle(s) shall be 20 amp, twist-lock (NEMA L5-20R).

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## 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.

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## 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.

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### Instrumentation

If the power source is rated at less than 3 kW, a "Power On" indicator shall be provided. If the power source is rated at 3 kW or more but less than 8 kW, a voltmeter shall be provided.

If the power source is rated at 8 kW or more, the following instrumentation shall be provided at an operator's panel:

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

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

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

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

#### **Operation**

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

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

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

If there is permanent wiring on the apparatus that is designed to be connected to the power source, a power source specification label that is permanently attached to the apparatus at the operator's control station shall provide the operator with the information required.

The power source, at any load, shall not produce a noise level that exceeds 90 dBA in any driving compartment, crew compartment, or onboard command area with windows and doors closed or at any operator's station on the apparatus.

#### Power Supply Assembly

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device shall not exceed 12 ft (4 m) in length.

All power supply assembly conductors, including neutral and grounding conductors, shall have an equivalent amperage rating and shall be sized to carry not less than 115 percent of the amperage of the nameplate current rating of the power source.

If the power supply assembly connects to the vibrating part of a generator (not a connection on the base), the conductors shall be flexible cord or other fine-stranded conductors enclosed in metallic or nonmetallic liquid tight flexible conduit rated for wet locations and temperatures not less than 194°F (90°C).

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## **Over-current Protection**

Manually re-settable over current devices shall be installed to protect the line voltage electrical system components.

#### Power Source Protection

A main over current protection device shall be provided that is either incorporated in the power source or connected to the power source by a power supply assembly.

The size of the main over current protection device shall not exceed 100 percent of the rated amperage stated on the power source specification label or the rating of the next larger available size over current protection device, where so recommended by the power source manufacturer.

If the main over current protection device is subject to road spray, the unit shall be housed in a Type 4-rated enclosure.

#### Branch Circuit Over-current Protection

Over current protection devices shall be provided for each individual circuit and shall be sized at not less than 15 amps in accordance with 240.4, "Protection of Conductors," of *NFPA 70*.

Any panel board shall have a main breaker where the panel has six or more individual branch circuits or the power source is rated 8 kW or larger.

Each over current protection device shall be marked with a label to identify the function of the circuit it protects.

Dedicated circuits shall be provided for any large appliance or device (air conditioning units, large motors, etc.) that requires 60 percent or more of the rated capacity of the circuit to which it is connected, and that circuit shall serve no other purpose.

### Panelboards

All fixed power sources shall be hardwired to a permanently mounted panel board unless one of the following conditions exists:

- 1) All line voltage power connections are made through receptacles on the power source and the receptacles are protected by integrated over current devices.
- 2) Only one circuit is hardwired to the power source, which is protected by an integrated over current device.

The panel shall be visible and located so that there is unimpeded access to the panel board controls. All panel boards shall be designed for use in their intended location. The panel(s) shall be protected from mechanical damage, tool mounting, and equipment storage.

Where the power source is 120/240 V and 120 V loads are connected, the apparatus manufacturer or line voltage system installer shall consider load balancing to the extent that it is possible.

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## Wiring Methods

Fixed wiring systems shall be limited to the following:

- 1) Metallic or nonmetallic liquid tight flexible conduit rated at temperatures not less than 194°F (90°C) with stranded copper wire rated for wet locations and temperatures not less than 194°F (90°C)
- 2) Type SOW, SOOW, SEOW, or SEOOW flexible cord rated at 600 V and at temperatures not less than 194°F (90°C)

Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring and shall be arranged as follows:

- 1) Separated by a minimum distance of 12 in. (300 mm) from exhaust piping or shielded from such piping
- 2) Separated from fuel lines by a minimum distance of 6 in. (150 mm)

A means shall be provided to allow "flexing" between the driving and crew compartment, the body, and other areas or equipment whose movement would stress the wiring.

Electrical cord or conduit shall be supported within 6 in. (150 mm) of any junction box and at a minimum of every 24 in. (600 mm) of run.

Supports shall be made of nonmetallic materials or of corrosion-resistant or corrosion-protected metal. All supports shall be of a design that does not cut or abrade the conduit or cord and shall be mechanically fastened to the apparatus.

Only fittings and components listed for the type of cord or conduit being installed shall be used.

Splices shall be made only in a listed junction box.

### Additional Requirements for Flexible Cord Installations

Where flexible cord is used in any location where it could be damaged, it shall be protected by installation in conduit, enclosures, or guards.

Where flexible cord penetrates a metal surface, rubber or plastic grommets or bushings shall be installed.

#### Wiring Identification

Each line voltage circuit originating from the main panel board shall be identified.

The wire or circuit identification either shall reference a wiring diagram or wire list or shall indicate the final termination point of the circuit.

Where pre-wiring for future power sources or devices exists, the un-terminated ends shall be marked with a label showing their wire size and intended function.
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#### 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.

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### Wiring Schematics

An "As-Built" Wiring diagrams for line voltage systems shall be provided to include the following information;

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

## 120/240 VAC SCENE LIGHTING

## REAR TRIPOD SCENE LIGHTS

One (1) Federal Signal Commander model COMX-120-530SW tripod telescopic light shall be provided. The light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall extend 28" and rotate 360 degrees. An internal brake shall slow the extension pole during lowering. The outer pole shall be a grooved aluminum extrusion. The folding legs shall be anodized aluminum tubing with plastic end caps. The fully extended tripod system shall exceed a height of 8' and be less than 5' when collapsed. Wiring shall extend from the pole bottom with a 4' retractile cord.

A weatherproof on-off toggle switch shall be mounted in a switch box below the lamphead. A wire guard shall be furnished to protect the lamphead glass.

A tripod truck mount bracket set shall be provided for each light. Each set shall include a lower base plate, an upper lock with a quick release spring loaded locking pin, and a shim set.

## LIGHT TOWER

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

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

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

#### Light Tower Construction and Design

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

The electrically controlled unit shall not require usage of the vehicle's air supply for operation, thereby eliminating the chance for air leaks in the vehicle braking system. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the specified all electric light tower.

The light tower shall be tested to in wind conditions of 90 mph (150 kph) minimum. Light towers that have not been tested to these conditions are not acceptable.

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

#### Light Tower Electrical System

The light tower shall be a two-stage articulating device with a lighting bank on top of the second stage capable of continuous 360 degree rotation. The light shall be elevated by electric linear actuators, one (1) actuator shall elevate the light bank and one (1) actuator shall adjust the light bank angle from 0 to 110 degrees. Power for the light bank shall be supplied through power collecting rings thus allowing continuous 360 degree rotation in either direction.

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

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

### Light Tower Floodlights

The Command Light model CL602A-FS shall be equipped with the following bank of floodlights:

Floodlight manufacturer:	Fire Research Corp.
Number of lamp heads:	Six (6) Spectra SPA100-K20 LED
Voltage:	120 volts
Watts of each lamp head:	220 watt
Total watts of light tower:	1,320 watts
Total lumens of light tower:	120,000 lumens
Configuration:	The light heads shall be mounted with three (3) on each side of
	the light tower, giving two (2) vertical lines of three (3) when the lights are in the upright position.

#### Light Tower Strobe Indicator

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

The lens color for the strobe light shall be green.

#### Light Tower Paint

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

#### Light Tower Controls

The light tower(s) shall be operated with a hand-held 15-foot umbilical line remote control. The storage station for the remote control unit shall be equipped with a button to activate the "Auto-Park" automatic nesting feature. The remote control shall be located per the itemized compartment list and include;

Three (3) switches; one (1) for each pair of lights.

One (1) switch for light bank rotation.

One (1) switch for elevating lower stage.

One (1) switch for elevating upper stage.

- One (1) switch for optional light bank rotation.
- One (1) switch for the optional strobe.
- One (1) indicator light to indicate when light bank is out of the roof nesting position.

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One (1) indicator light to indicate when light bank is rotated to proper nesting position.

### Light Tower Mounting

The specified light tower(s) shall be mounted on the roof of the body.

## LIGHT TOWER TREE LIMB GUARD

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

### EQUIPMENT PAYLOAD WEIGHT ALLOWANCE

In compliance with NFPA 1901 standards, the special service vehicle shall be designed for an equipment loading allowance of 4,000 lbs. of Gwinnett County Fire and Emergency Services provided equipment based on a 30,001 - 40,000 pound gross vehicle weight rating.

## **EQUIPMENT**

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

- One (1) container of assorted stainless steel nuts, bolts, screws and washers used in the construction of the apparatus shall be provided with the completed apparatus.
- There shall be two (2) Zico SAC-44-E NFPA approved folding aluminum wheel chocks provided for 44" diameter tires that together will hold the vehicle when loaded to its GVWR or GCWR, on a hard surface with a 20 % grade, with the transmission in neutral, and the parking brake released.
  - The wheel chock(s) shall be mounted behind rear wheels, below body on streetside.
- Two (2) Streamlight Survivor, C4 LED flashlight(s) shall be provided with 140 lumens, and 3.5/14 hour run time. Each flashlight shall be orange in color and have a 12 volt DC charger and vehicle mount kit. Each flashlight shall have an LED spotlight style bulbs and reflectors. The flashlight(s) shall be wired to battery direct unless otherwise specified by Gwinnett County Fire and Emergency Services.
  - The flashlight(s) shall be mounted on the completed unit in the lower area of compartment S1.

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- One (1) Roll N Rack Power Roller shall be provided with delivered apparatus. Power Roller shall have the following specification;
  - -Portable-90# base (Battery pack & drain attachment removable)
  - -Drains & Rolls 4-5,000' of LDH on full charge (depending on weather conditions, terrain, water in the line and battery charge level)
  - -24-volt rechargeable battery pack
  - -Kussmaul battery meter
  - -Self-propelled, quiet operation
  - -Traverses grass, gravel or dirt
  - -Safely load ALL HOSE,1-1/2" to 5" (LDH) with proper coupling jaw attachments
  - -Comes with one set of Coupling jaws, battery pack & charger
  - -Integrated, removable hose drainer lifts up and out of the way for safe hose roll removal
  - -High-torque motor/gearbox is maintenance-free
  - -Brush whisks all gravel and grass off the bottom of the hose
  - -13" Rear tires, 10" swivel tire heavy-duty aluminum w/stainless steel hardware
  - -Draw 3" & smaller diameter hose to the unit

# REMAINING NFPA MINOR EQUIPMENT BY PURCHASER

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