

# Texico Fire Department

## SVI # 793

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#### **LIABILITY INSURANCE**

Bidder shall furnish with the bid a certificate of insurance for;

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

General Liability each occurrence of \$1,000,000.00, General Aggregate of \$2,000,000.00 including Products Completed / Operations Aggregate.

Personal Injury of \$1,000,000.00, Fire damage of \$50,000.00 and Medical expense of \$10,000.00. 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 \$2,000,000.00 each occurrence, Aggregate of \$2,000,000.00.

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 Bidder shall post and maintain a website where the Texico Fire Department will be able to view digital images of their apparatus as its being manufactured. 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 the apparatus.

#### **ENGINEERING DRAWINGS**

The evaluation of bids shall also be based on design, engineering reliability, and completeness of drawings. No bidder's proposal shall be considered unless complete engineering drawings to these specifications are submitted with the request for proposal package. Failure to submit factory prepared blueprints with bid will result in automatic rejection. Bid drawings will allow the Texico Fire Department the ability to fully evaluate required product.

The engineering drawings shall be produced on computer aided design (CAD) equipment to assure critical tolerance and detail only available with CAD equipment. The drawings shall be on "D" size paper, 36" x 24" in size, and views must be 1/2" = 1' - 0" scale. This will allow the Texico Fire Department the ability to compare drawings of all manufacturers on an "equal" basis. The drawings shall be completed only by the body manufacturer, and must be exactly to Texico Fire Department specifications. Submission of "similar to" drawings or "statements referring to later submission of drawings after award of contract" will be automatically rejected.

Since the request for proposal package will require extensive evaluation by Texico Fire Department, all Bidders must submit exactly the same engineering drawings at the same scale, on the same size paper. For easy comparison of drawings, they must be on a 36" x 24" sheet as follows:

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- All bid drawings will be stamped BID DRAWING.
- All items shown on the drawing will be pre-designed with regards to layout and functionality prior to the completion of the BID DRAWING.
- Two (2) 36" x 24" color drawings will be supplied with the bid proposal. Black and white or blue line drawings will not be accepted.
- There shall be five (5) views of the truck with the doors closed (Top, Left, Right, Front, Rear), four (4) views of the truck with the doors open (Top, Left, Right, Rear) and four (4) views of any walk-in area (Top, Left, Right, Rear)
- All compartment door openings and usable space shall be clearly shown in inches.
- The trucks overall length, height, width, wheelbase and cab-to-axle dimensions shall be clearly shown.
- The angles of approach and departure shall be shown in the maximum loaded condition to the nearest degree.
- All lighting packages will be clearly shown on the drawing and verified accurate per the most current NFPA standards (when applicable).
- The exterior view shall show all scene lights, marker lights, speakers, horns, exhaust, tow points, exterior outlets, windows, winch receivers, tow hitches, exterior ladders and any other item important to the function of the vehicle.
- The open view shall show all trays, shelves, air system components, hydraulic components, tool boards, storage modules and any other items important to the function of the vehicle
- The interior view for all walk-in areas shall show all seating positions, desks, cabinets, windows, tech equipment, radio locations and any other item important to the function of the vehicle
- Any changes to the BID drawing will require a revision which will be clearly annotated in the upper right hand side of the drawing showing the revision number, reason for the revision, date and who made the changes

#### Text Block Items;

- Purchaser's name.
- Body size and material type.
- Chassis manufacturer and model number.
- Unit description.
- Wheelbase (WB) , Cab-to-axle (CA) distance.
- Overall length (OAL), Overall width, (OAW), Overall height (OAH).
- Scale, date, drawn by, drawing number and sheet number.

#### **VEHICLE STABILITY SUPPLIED WITH CAB/CHASSIS**

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

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#### **ROADABILITY**

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

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

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

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

#### **SERVICEABILITY**

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

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

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



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#### **CONSTRUCTION DOCUMENTATION**

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

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

- 1) Owner's name and address
- 2) Apparatus manufacturer, model, and serial number
- 3) Chassis make, model, and serial number
  - a) GAWR of front and rear axles and GVWR
  - b) Front tire size and total rated capacity in pounds (kilograms)
  - c) Rear tire size and total rated capacity in pounds (kilograms)
  - d) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
  - e) Engine make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio
  - f) Type of fuel and fuel tank capacity
  - g) Electrical system voltage and alternator output in amps
  - h) Battery make, model, and capacity in cold cranking amps (CCA)
  - i) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
- 4) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
- 5) Pump transmission make, model, serial number, and gear ratio
- 6) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
- 7) Water and Foam tank certified capacity in gallons or liters
- 8) Paint manufacturer and paint number(s)
- 9) Company name and signature of responsible company representative
- 10) If the apparatus is a mobile foam fire apparatus, the certification of foam tank capacity
- 11) Certification of compliance of the optical warning system
- 12) Siren manufacturer's certification of the siren
- 13) Written load analysis and results of the electrical system performance tests
- 14) Certification of slip resistance of all stepping, standing, and walking surfaces
- 15) If the apparatus has a fire pump, the pump manufacturer's certification of suction capability
- 16) If the apparatus is equipped with a fire pump and special conditions are specified by the purchaser, the pump manufacturer's certification of suction capacity under the special conditions
- 17) If the apparatus has a fire pump, a copy of the apparatus manufacturer's approval for stationary pumping applications
- 18) If the apparatus has a fire pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed
- 19) If the apparatus has a fire pump, the pump manufacturer's certification of the hydrostatic test
- 20) If the apparatus has a fire pump, the certification of inspection and test for the fire pump
- 21) If the apparatus is equipped with an auxiliary pump, the apparatus manufacturer's certification of the hydrostatic test
- 22) When the apparatus is equipped with a water tank, the certification of water tank capacity
- 23) If the apparatus has an aerial device, the certification of inspection and test for the aerial device
- 24) If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1911, Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service

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Automotive Fire Apparatus

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- 25) If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy and the final installer's certification the foam proportioning system meets this standard
- 26) If the system has a CAFS, the documentation of the manufacturer's pre delivery tests
- 27) If the apparatus has a line voltage power source, the certification of the test for the power source
- 28) If the apparatus is equipped with an air system, air tank certificates, the SCBA fill station certification, and the results of the testing of the air system installation
- 29) Any other required manufacturer test data or reports.

#### **OPERATIONS AND SERVICE DOCUMENTATION**

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

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

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

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

#### **NFPA REQUIRED DOCUMENTATION FORMAT - CD-ROM**

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

#### **STATEMENT OF EXCEPTIONS**

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

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

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

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

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

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#### **CARRYING CAPACITY**

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

The estimated in-service weight shall include the following:

- 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 values for type of vehicle per NFPA 1901, a Purchaser provided list of equipment to be carried with weights, or a Purchaser specified miscellaneous equipment allowance.

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

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

<b>Apparatus Type</b>	<b>Equip. Storage Area</b>	<b>Apparatus Size</b>	<b>Equipment Allowance</b>	
			<b>lb.</b>	<b>kg.</b>
Special Service Fire Apparatus	Minimum of 120 cu ft (3.4 cu mt) of enclosed compartmentation.	10,000 lb to 15,000 lb (4,500 kg to 7,000 kg) GVWR	2,000	910
		15,001 lb to 20,000 lb (7,001 kg to 9,000 kg) GVWR	2,500	1,135
		20,001 lb to 30,000 lb (9,001 kg to 14,000 kg) GVWR	3,000	1,350
		30,001 lb to 40,000 lb (14,001 kg to 18,000 kg) GVWR	4,000	1,800
		40,001 lb to 50,000 lb (18,001 kg to 23,000 kg) GVWR	6,000	2,700
		50,001 lb to 60,000 lb (23,001 kg to 27,000 kg) GVWR	8,000	3,600
		60,001 lb and up	10,000	4,500

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		(27,001 kg) GVWR		
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#### **TESTING**

##### **ROAD TEST**

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

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

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

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

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

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

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

##### **LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST**

The vehicles low voltage electrical system shall be tested and certified by the manufacturer. The certified test results shall be delivered with the completed vehicle. Tests shall be performed when the air temperature is between 0°F and 110°F (−18°C and 43°C).

##### **TEST SEQUENCE**

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

# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

#### **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 10 minutes.

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

#### **2. ALTERNATOR PERFORMANCE TEST**

##### **TEST AT IDLE**

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

##### **TEST AT FULL LOAD**

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of 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.

# **Texico Fire Department**

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### **Build Specification**

#### **LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST**

##### **DOCUMENTATION**

The manufacturer shall deliver the following with the fire apparatus:

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

##### **UL 120/240 VAC CERTIFICATION**

The 120/240 volt electrical system shall be tested and certified by Underwriters Laboratories, 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 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



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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 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.

# **Texico Fire Department**

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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 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 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 Texico Fire Department on all warranty work.

# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

#### **GENERAL LIMITED WARRANTY - ONE (1) YEAR**

The vehicle shall be free of defects in material and workmanship for a period of one (1) year or 12,000 miles, 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, 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 whichever occurs first, starting thirty (30) days after the original invoice date.

#### **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 whichever occurs first, starting thirty (30) days after the original invoice date.

#### **CONSTRUCTION PERIOD**

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

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

#### **OVERALL HEIGHT**

The overall height (OAH) of the vehicle shall be approximately 117" (9' -09") from the ground. This measurement shall be taken on flat ground with the tires properly inflated, in the unloaded condition, at that highest point of the vehicle.

#### **SHOP NOTES**

Can not exceed 10'6" In Height (including vertical exhaust tip)

# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

#### **OVERALL LENGTH**

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

#### **PRE-CONSTRUCTION CONFERENCE**

A pre-construction conference shall be required, at the contractor's factory for one (1) personnel from the Texico Fire Department to finalize all construction details prior to manufacturing.

The contractor shall at his/her expense, provide transportation, lodging, rental car and meal expenses during the pre-construction conference.

#### **PRE-PAINT CONFERENCE**

A pre-paint conference shall be required, at the contractor's factory for one (1) personnel from the Texico Fire Department to inspect the vehicle and construction details prior to the painting process.

The contractor shall at his/her expense, provide transportation, lodging, rental car and meal expenses during the pre-paint conference.

#### **FINAL INSPECTION CONFERENCE**

A final inspection conference shall be required, at the contractor's factory for one (1) personnel from the Texico Fire Department 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.

Dealer Supplied Equipment

#### **SHOP NOTES**

Equipment is described in equipment portion of spec

# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

#### **DELIVERY AND DEMONSTRATION**

The contractor shall be responsible for all costs associated with the delivery of the completed unit to the Texico Fire Departments location. On initial delivery of the apparatus, the contractor shall supply a qualified representative to demonstrate the apparatus and provide initial instruction to representatives of the Texico Fire Department regarding the operation, care, and maintenance of the apparatus and equipment supplied at Texico Fire Department location.

The dealer shall set delivery and instruction schedule with the person appointed by Texico Fire Department.

The dealer shall pay all expenses for two (2) personnel from the Texico Fire Department to drive their completed apparatus from the manufacturer's plant to Texico, NM

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

#### **CHASSIS SPECIFICATIONS**

- Freightliner M2 106 Conventional Chassis
- 2011 Model
- 2-Door
- 14,000 # Front Axle
- 26,000 # Rear Single Axle
- 40,000 # GVWR
- 120" Cab to Axle
- 186" Wheelbase
- Rescue & Emergency Service

#### **ENGINE**

- Cummins ISC-330 330 HP @ 2200 RPM
- 1,000 LB/FT @ 1400 RPM
- 2010 EPA/CARB Emission Certification
- NFPA Complaint Ember Screen and Fire Retardant Donaldson Air Cleaner
- DR 12V 275 AMP 40-SI Quadramount Pad Alternator with Remote Voltage Sense
- Two (2) Alliance Model 1231, Group 31, 12 Volt Maintenance Free 2200 CCA Thread Stud Batteries with Positive Jumpstart Post
- Battery Box Frame Mounted
- Wire Ground Return for Battery Cables with Additional Frame Ground Return
- Positive Load Disconnect with Cab Mounted Control Switch Mounted Outboard Driver Seat
- Cummins 18.7 CFM Compressor with Internal Safety Valve
- Fire & Emergency Service Vehicles Engine Warning
- Cummins Exhaust Brake Integral with Variable Geometry Turbo
- RH MTD Horizontal Aftertreatment System W/Vertical Exhaust Pipe
- 6 Gallon Diesel Exhaust Fluid Tank

# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

- Horton Drivemaster On/Off Fan Drive
- Automatic Fan Control without Dash Switch, Non Engine Mounted
- 1100 Square Inch Aluminum Radiator
- Antifreeze to -34 F, Ethylene Glycol Pre-Charged SCA Heavy Duty Coolant Hoses
- Electric Grid Air Intake Warmer
- Delco 12V 38MT HD Starter with Integrated Magnetic Switch

#### **TRANSMISSION**

- Allison 3000 EVS 5 SPD Automatic Transmission with PTO Provision
- Magnetic Plugs, Engine Drain, Transmission Drain, Axle(s) Fill and Drain
- Push Button Electronic Shift Control, Dash Mounted
- Transmission Prognostics Enabled
- Water to Oil Transmission Cooler
- Transmission Oil Check and Fill with Electronic Oil Level Check
- Synthetic Transmission Fluid (TES-295 Compliant)

#### **FRONT AXLE AND EQUIPMENT**

- AF-14.7-3 14,700#FF 71.5KI/3.74 Drop Single Front Axle
- Meritor 16.5 x 5 Q+ Cast Spider Cam Front Brakes, Double Anchor, Fabricated Shoes
- Fire & Emergency Severe Service, Non Asbestos Front Linings
- Meritor Automatic Slack Adjusters
- TRW TAS-85 Power Steering

#### **FRONT SUSPENSION**

- 14,600# Taperleaf Front Suspension
- Maintenance Free Rubber Bushings Front Suspension
- Front Shock Absorbers

#### **REAR AXLE AND EQUIPMENT**

- 26,000 LB. Fire/Emergency Single Rear Axle
- Iron Rear Axle Carrier with Standard Axle Housing
- SPL140HD Dana Spicer Main Driveline with Half Round Yokes
- Meritor 16.5 x 7 P Cam Rear Brakes, Double Anchor, Cast Shoes
- Fire & Emergency Severe Service Non-Asbestos Rear Brake Lining
- Gunite Automatic Rear Slack Adjusters

#### **REAR SUSPENSION**

- 26,000# Flat Leaf Spring Rear Suspension with Helper and Radius Rod
- Spring Suspension 1.00" Axle Spacer
- Custom Axle Clamping Group
- Fore/Aft Control Rods

#### **BRAKE SYSTEM**

# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

- Air Brake Package
- WABCO 4S/4M ABS with Traction Control
- Enhanced Stability Control
- BW AD-9 Brake Line Air Dryer with Heater
- Custom Steel Air Brake Reservoirs
- Standard Air System Pressure Protection System
- BW DV-2 Auto Drain without Heater Wet Tank

#### **ELECTRICAL CONNECTIONS**

- Upgraded Chassis Multiplexing Unit
- Upgraded Bulkhead Multiplexing Unit

#### **WHEELBASE & FRAME**

- 186 Inch Wheelbase / 120" Cab to Axle
- 11/32 x 3-1/2 x 10-15/16 Inch Steel Frame 120 KSI

#### **CHASSIS EQUIPMENT**

- Three Piece 14 Inch Chromed Steel Bumper with Collapsible Ends
- Front Tow Hooks Frame Mounted
- Grade 8 Threaded Hex Headed Frame Fasteners

#### **FUEL TANKS**

- 50 Gallon Rectangular Polished Aluminum Fuel Tank
- Alliance Fuel Filter/Water Separator
- Equipflo Inboard Fuel System
- High Temperature Reinforced Nylon Fuel Line

#### **TIRES**

- Continental HSR 12R22.5 16 Ply Radial Front Tires
- Continental HSR 12R22.5 16 Ply Radial Rear Tires

#### **HUBS**

- Conmet Pre-Set Bearing Iron Front Hubs
- Conmet Pre-Set Bearing Iron Rear Hubs

#### **WHEELS**

- 22.5 x 8.25 10-Hub Pilot Polished Aluminum Disc Front Wheels
- 22.5 x 8.25 10-Hub Pilot Polished Aluminum Disc Rear Outer Wheels

#### **CAB EXTERIOR**

- 106 Inch BBC Flat Roof Aluminum Conventional Cab
- Air Cab Mounts

# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

- NFPA Compliant Exterior Grab Handles
- Hood Mounted Chromed Plastic Grille
- Chromed Hood Mounted Air Intake Grille
- Single Electric Horn
- Door Locks And Ignition Switch Keyed the Same
- Integral Headlight/Marker Assembly with Chrome Bezel
- LED Aerodynamic Marker Lights
- Daylight Running Lights
- Dual 102" West Coast Bright Finish Heated Mirrors with LH and RH Remote
- LH and RH 8" Bright Finish Convex Mirrors Mounted Under Primary Mirrors
- 63 x 14 Inch Tinted Rear Window
- Tinted Door Glass LH and RH Powered, with Tinted Non-Operating Wing Windows
- Tinted Windshield
- 2 Gallon Windshield Washer Reservoir without Fluid Level Indicator, Frame Mounted

#### **CAB INTERIOR**

- Opal Gray Vinyl Interior
- Molded Plastic Door Panels with Aluminum Kickplate Lower Doors
- Gray Vinyl Mats with Insulation
- Forward Roof Mounted Console with Upper Storage Compartments without Netting
- In Dash Storage Bin
- (2) Cup Holders LH and RH Dash
- Heater, Defroster, and Air Conditioner
- Main HVAC Controls with Recirculation Switch
- Silencer Package for Cab
- Solid-State Circuit Protection and Fuses
- 12V Negative Ground Electrical System
- Dome Light with 3-way Switch Activated by LH and RH Doors
- One (1) 12 Volt Power Supply in Dash
- High Back Air Suspension Driver Seat NFPA Compliant
- High Back Air Suspension Passenger Seat NFPA Compliant
- LH and RH Integral Door Panel Armrests
- Gray Vinyl Driver Seat Cover with Gray Cordura Cloth Bolster and Headrest
- Gray Vinyl Front Passenger Seat Cove with Gray Cordura Bolster and Headrest
- NFPA Compliant High Visibility Seat Belts
- Adjustable Tilt and Telescoping Steering Column
- 4-Spoke 18 Inch Steering Wheel
- Driver and Passenger Interior Sun Visors

#### **INSTRUMENTS AND CONTROLS**

- Black Gauge Bezels
- Low Air Pressure Light and Buzzer
- 2 Inch Primary and Secondary Air Pressure Gauges
- Engine Compartment Mounted Air Restriction Indicator with Graduations with Warning Light in Dash
- Ignition Switch with Non-Removable Key



# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

- Odometer/Trip/Hour/Diagnostic/Voltage Display: 1 x 7 Character, 26 Warning Lamps, Data Linked, ICU3
- 2 Inch Electric Fuel Gauge
- Electrical Engine Coolant Temperature Gauge
- 2 Inch Transmission Oil Temperature Gauge
- Engine and Trip Hour Meters Integral within Drive Display
- Electric Engine Oil Pressure Gauge
- AM/FM/WB/CD/MP3 Premium Dash Mounted Radio
- Electronic MPH Speedometer with Secondary KPH Scale
- Electronic 3000 RPM Tachometer
- Digital Voltage Display Integral with Driver Display
- Single Electric Windshield Wiper Motor with Headlight Switch
- One (1) Valve Parking Brake System with Dimmer, Washer/Wiper and Hazard in Handle
- Integral Electronic Turn Signal Flasher with Hazard Lamps Overriding Stop Lamps

#### **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

# **Texico Fire Department**

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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.

#### **ACCIDENT PREVENTION**

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

#### **PERSONNEL CAPACITY**

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

#### **ACCIDENT PREVENTION**

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

# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

#### **WEARING HELMET WARNING**

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

#### **FRONT BUMPER EXTENSION**

The front bumper of the chassis shall be extended approximately 16" ahead of the cab using Junior I-beams.

The bumper mounting plate shall be welded to the Junior I-beam for mounting of the chassis bumper. After fabrication of the bumper extension, the panels shall be removed and the unit shall be primed and painted black.

#### **SHOP NOTES**

Add small bumper compartment on the curbside front bumper to hold approx 30' of 3/8 chain

#### **BUMPER GRAVEL SHIELD**

The front bumper extension shall have a 3/16" NFPA compliant 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 recess mounted in the front bumper, one (1) on each side inboard of the frame rails. An emergency air shut off valve shall be provided in the cab.

#### **AIR HORN ACTIVATION**

The air horn(s) shall be operated by lanyard at the cab ceiling between the driver and officer positions.

#### **MOTOR DRIVEN SIREN**

There shall be a motor driven, streamlined, rotary siren with chrome plated grill and housing pedestal, mounted on the extended front bumper. The siren shall be properly wired with heavy copper cable for minimum voltage drop. Make: Federal, Model: Q2BP.

Locate Siren - Streetside Front Bumper

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

# **Texico Fire Department**

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#### **SIREN ACTIVATION**

There shall be two (2) foot switches to activate the siren, one (1) for the officer and one (1) for the driver. The switches shall be mounted on the floor in a location to prevent accidental activation.

#### **SHOP NOTES**

Tie the foot switches for the Q siren to interlock with Emaster, so that the siren will only activate when E Master is on.

#### **FRONT MOUNTED WINCH**

The front bumper extension shall be provided with a heavy duty winch installation. The winch shall be a Ramsey RE-12000RX, 12 volt electric, 12,000 lb. capacity winch.

The winch shall be equipped with 125' of 3/8" galvanized cable.

A 25' remote control shall be provided with the assembly that permits the Operator to stand at a safe operating distance from the cable and winch.

The cable shall end with a clamp type loop and a drop forged heavy duty hook. The cable shall feed through a full captive type 4-way roller and guide assembly.

#### **FRONT TOW EYES**

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

#### **EXHAUST**

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

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

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

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

#### **SHOP NOTES**

This will be a vertical exhaust

# **Texico Fire Department**

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### **Build Specification**

#### **RADIO/ANTENNA INSTALLATION**

There shall be one (1) Texico Fire Department supplied radio(s) with antenna installed in the cab within easy reach of driver. The location of radio shall be determined by the Texico Fire Department at the pre-construction meeting.

Radio shall be installed per manufacturers requirements and wired for proper 12 volt power and ground.

#### **SHOP NOTES**

The location of radio will be determined at the Pre Paint inspection.

#### **SEAT BELT COLOR**

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

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

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

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

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

##### **SEAT BELT MONITORING**

A Weldon 6204 series system with Occupant Restraint Indicator (ORI) 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. Weldon diagnostic port will be located under dash on driver side. System shall include the following features;

# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

#### **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 traditional wiring, or optional V-MUX™ or other multiplexing systems
- Data is extracted by a standard, mini USB cable
- Use in conjunction with the Occupant Restraint Indicator or optional V-MUX™ multiplex system

#### **OCCUPANT RESTRAINT INDICATOR**

The occupant restraint indicator shall have the following features;

- Supports commercial and custom cab seating layouts; up to 12 seats
- Built-in audible alarm
- Use in conjunction with Vehicle Data Recorder (VDR)

#### **SIX (6) - TIRE PRESSURE VISUAL INDICATORS**

Each tire shall be equipped with an Accu-Pressure Safety Cap (or equal) visual indicator that indicates proper tire pressure.

#### **HELMET STORAGE**

No helmet storage is required in the in the cab driving or crew area.

#### **CAB TESTING CERTIFICATION**

As per NFPA 14.3.2, cabs on apparatus with a GVWR greater than 26,000 lb. (11,800 kg) shall meet the requirements of one of the following sets of standards:

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

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.

# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

# **Texico Fire Department**

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### **Build Specification**

#### **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: White

Exterior Upper Paint Number: FBCH-8717

Exterior Lower Color: Metallic Green

Exterior Lower Paint Number: FBCH-45799

#### **PAINT DOOR JAMBS JOB COLOR**

Two (2) chassis door jambs will be painted to match the exterior color of the chassis.

#### **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 COVER**

There shall be one (1) cab step cover(s) fabricated of 1/8" aluminum treadplate and using aluminum diamondback material as the stepping surface.

#### **CAB STEP AND FUEL TANK COVER**

The chassis fuel tank shall be overlaid with 1/8" aluminum treadplate. The fuel tank shall be labeled "DIESEL FUEL" with a permanent type label. There shall be cab access steps using aluminum diamondback material as the stepping surface.



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#### **HUB AND NUT COVERS**

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

#### **CHASSIS TRIM**

The chassis trim shall consist of 1/8" aluminum treadplate mounted on the lower inside portion of the cab doors and on the lower door jamb entrance area.

#### **BATTERY JUMPER STUDS**

Battery jumper studs shall be provided in the driver's step area. The studs allow the vehicle to be jump started in an emergency due to battery failure.

#### **MUDFLAPS**

There shall be rubber mudflaps furnished and installed behind each set of tires.

#### **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 Texico Fire Department.

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.

#### **LOW PRESSURE AIR OUTLET**

There shall be one (1) air outlet connection to supply low pressure air for general maintenance. The outlet shall terminate in a 1/4" NPT threaded port. Air outlet shall be located near driver's door. The connector shall be supplied by the Texico Fire Department.

#### **ROAD EMERGENCY SAFETY KIT**

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

One (1) 2.5 lb. ABC type vehicle fire extinguisher with bracket shall be provided and mounted in the cab or the front streetside compartment.

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#### **12 VOLT OUTLETS**

There shall be one (1) 12V outlet(s) provided in the front face of the component console.

#### **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 Texico Fire Department to have the body repaired locally in the case where any object has struck the body and caused damage. The use of proprietary extrusions will prevent the Texico Fire Department 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.

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#### **EXTERIOR ALUMINUM BODY**

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

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

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

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

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

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

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

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

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

#### **ROOF CONSTRUCTION**

The roof shall be integral with the body and shall be all welded construction. The roof shall be reinforced with 2" x 2" tubing running the full width of the body. All seams in the roof area shall be welded prior to paint to prevent entry of moisture.

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#### **BODY SUBFRAME**

To assure proper body alignment and clearance, the body subframe shall be constructed directly on the chassis.

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 4" x 1/4" aluminum tubes minimum, the same width as the chassis frame rails. Welded to this tubing shall be cross members of 2" x 4" x 1/4" aluminum. Smaller dimension, lighter gauge tubing or angle material subframe shall not be accepted.

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 as necessary to support walkways or heavy equipment.

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

#### **BODY MOUNTING**

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

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

#### **12" REAR STEP BUMPER**

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

#### **REAR TOW EYES**

There shall be two (2) heavy duty rear mounted tow eyes securely attached to the body subframe, below

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the apparatus body. The tow eyes shall be fabricated from 3/4" thick steel plate and shall have a black powder coat finish.

#### **GROUND LIGHTS**

Two (2) OnScene Solutions 9" LED Nightstik ground lights shall be mounted below the bumper.

#### **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.

#### **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 cylinders (30 min cylinders). Each compartment shall have a vertically hinged door with a positive catch latch installed and painted primary lower body color. Each compartment shall allow the storage of an SCBA cylinder up to 5-3/4" in diameter. The door shall activate the "Hazard Warning Light" in the cab when not in the closed position.

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#### **ALUMINUM BODY PAINT SPECIFICATIONS**

##### **BODY PAINT PREPARATION**

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

The exterior 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. If the compartment interior is to be painted the interior shall be acid etched as described above then primed with an epoxy primer and all seams caulked.

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 an eight-stage paint process;

- 1) Clean bare metal using a solvent base wax & grease remover.
- 2) Finish all exterior body seams as necessary, followed by a thorough sanding of all bare metal to be painted.
- 3) Re-clean bare metal using a solvent base wax & grease remover.
- 4) Bare Metal Epoxy Primer Coat - PPG Delfleet® Evolution corrosion resistance epoxy primer to be applied at 1.0-2.0 mills DFT over clean abraded bare metal.
- 5) Primer Filler Coat - PPG Delfleet® Evolution urethane build primer to achieve total thickness of 3.0-6.0 mils DFT after sanding.
- 6) Base coat (Color) - PPG Delfleet® Evolution High Solids Polyurethane Base coat. Apply 1.0-3.0 mils DFT of base coat color to achieve full hiding.
- 7) Clear coat PPG Delfleet® Evolution polyurethane premium quality clear coat with improved mar resistant finish. The clear coat shall be applied to achieve a total dry film thickness of 2.0-3.0 mils.
- 8) Curing process of the painted body shall go through a force dry/bake cycle process. The painted components shall be baked 180 degrees for 2 hours to achieve a complete coating cure on the finished product.

##### **MACHINE POLISHED**

After the force dry/bake cycle and ample cool down time, the coated surface shall be sanded using 1,000,

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1,500, and or 3,000 grit sandpaper to remove surface defects. In the final step, the surface shall be buffed then polished to an extra high gloss smooth finish. Total dry film thickness of paint will average between 8.0-12.0 mils.

#### **PAINT - ENVIRONMENTAL IMPACT**

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

#### **PAINT FINISH - SINGLE COLOR**

The body shall be painted with a single color of PPG Delfleet® Evolution paint as described above.

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

Touch-up paint shall be provided with completed vehicle.

- Paint Color: Metallic Green
- Paint Number: FBCH-45799

#### **BODY UNDERCOATING**

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

#### **UNDERCOAT WARRANTY**

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

#### **PAINT WARRANTY**

The vehicle shall be provided with a ten (10) year non-prorated warranty to the original owner. Warranty is provided by PPG Inc. A warranty sheet with all conditions and maintenance procedures shall be

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provided with the delivered vehicle.



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#### **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**

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

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

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

#### **REFLECTIVE STRIPE - CAB SIDE**

A retroreflective stripe(s) shall be affixed to at least 50 percent of the cab and body length on each side.

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

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

- The stripe material shall be 3M Scotchcal 680.
- This reflective stripe shall be white in color.

There shall be a 1" Scotchcal reflective stripe located approx. 1" above the main stripe.

There shall be a 1" Scotchcal reflective stripe located approx. 1" below the main stripe.

- This reflective stripe shall be white in color.

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#### **REFLECTIVE STRIPE - CAB FRONT**

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

A retroreflective stripe(s) shall be affixed to at least 25 percent of the width of the front of the apparatus.

- The stripe material shall be 3M Scotchcal 680.
- This reflective stripe shall be white in color.

#### **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 stripe material shall be 3M Scotchlite 680.

- This reflective stripe shall be white in color.

#### **REFLECTIVE STRIPE - BODY SIDES**

A 4" minimum reflective stripe shall be affixed to the sides of the body.

- The stripe material shall be 3M Scotchcal 680.
- This reflective stripe shall be white in color.

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

There shall be a 1" Scotchcal reflective stripe located approx. 1" above the main stripe.

- This reflective stripe shall be white in color.

There shall be a 1" Scotchcal reflective stripe located approx. 1" below the main stripe.

- This reflective stripe shall be white in color.

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#### **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 only of the body shall have a Chevron style reflective stripe layout, and cover as much of the rear side panels as possible. Chevron panels shall have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use. Chevron panels shall have a minimum 10 year warranty for material failure, and colorfastness.

- The stripe material shall be 3M Diamond Grade.

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

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

#### **LETTERING**

The following lettering shall be furnished and installed on the completed unit:

#### **SIDE CAB DOOR LETTERING**

There shall be sixty (60) 3" high SuperGold letters furnished and installed on the vehicle. Lettering shall have a clear 3M UV Protective Over Laminate applied before installation.

Final design and layout shall be determined prior to construction.

#### **UPPER BODY SIDE LETTERING**

There shall be twenty two (22) 8" high SuperGold letters furnished and installed on the vehicle. Lettering shall have a clear 3M UV Protective Over Laminate applied before installation.

Final design and layout shall be determined prior to construction.

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#### **SUPPLIED DECALS**

The bidder shall install four (4) Texico Fire Department supplied decal(s) on the vehicle, located on the.

#### **CHASSIS GOLD LEAF SGTRIPING**

There shall be 23kt gold leaf adhesive backed striping, outlined in black, installed on the left and right sides of the chassis cab front fender. The stripe shall follow the contour down the front fender.

#### **CHASSIS PAINT BREAK STRIPING**

There shall be 23kt gold leaf adhesive backed striping, outlined in black, installed at the two tone paint break on the chassis cab.

#### **BODY GOLD LEAF STRIPING**

There shall be 23kt gold leaf adhesive backed striping, outlined in black, installed on the left and right sides of the main body module.

#### **WHITE ACCENT STRIPE**

There shall be a white accent stripe run adjacent to all gold leaf striping.

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#### **EXTERIOR COMPARTMENT DOORS**

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

The apparatus shall be equipped with Robinson ROM Series III roll-up exterior compartment doors. Robinson roll-up doors shall be complete with the following features;

- Doors shall be front roll with drum positioned at upper front portion of compartment to afford maximum clearances and head room for mounting equipment to ceiling of compartment
- There shall be a non-abrasive side brush seals
- Magnetic door ajar system must be integrated in lift bar handle and the retainer block to signal open door. No mechanical switches or switches interior to the compartment shall be used
- Every slat must have interlocking end shoes to prevent slat from moving side-to-side and binding the door
- Between each slat must be a co-extruded PVC inner seal to prevent metal-to-metal contact and to repel moisture. This inner seal is not visible to detract from appearance of door
- Slat are to have interlocking joints with a folding locking flange to provide security and prevent penetration by sharp objects
- Slat to be double-wall extrusion 1.366" high by .315" thick. Exterior surface to be flat and interior surface to be concave to prevent loose equipment from interfering with door operation
- Latch system to be a full width one piece lift bar operable by one (1) hand
- A 2" wide finger pull integrated into the bottom rail extrusion for easy one (1) hand opening and closing
- Clip system that connects the curtain slats to the operator drum which allows for easy tension adjustment without tools
- Each roll-up door shall have a 4" diameter counterbalance operator drum to assist in lifting the door.
- Track shall be one-piece aluminum that has an attaching flange and finishing flange incorporated into its design
- Drip rail will have specially designed seal that prevents the seal from scratching the door
- Bottom rail extrusion must have smooth back to prevent loose equipment from jamming the door
- Bottom rail to have "V" shaped double seal to prevent water and debris from entering the compartment
- Standard replacement parts to be shipped from the United States and available in as little as 48 hours

Each shutter door shall decrease the compartment door frame opening approximately 2.00" in width and approximately 4.50" in height for the bottom section of door assembly.

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

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#### BODY HEIGHT MEASUREMENTS

The vertical body dimensions shall be as follows:

##### AHEAD OF REAR AXLE

	<u>Description</u>	<u>Dimension</u>
A	Bottom of Subframe to Top of Body	74.0"
B	Bottom of Subframe to Bottom of Body	25.0"
C	Vertical Door Opening	
	-with roll-up door	67.5"
	-with hinged door	71.5"

##### ABOVE REAR AXLE

	<u>Description</u>	<u>Dimension</u>
D	Vertical Door Opening - Above Rear Wheel	
	-with roll-up door	34.0"
	-with hinged door	37.0"

##### BEHIND REAR AXLE

	<u>Description</u>	<u>Dimension</u>
E	Bottom of Subframe to Bottom of Body	20.0"
F	Vertical Door Opening	
	-with roll-up door	62.0"
	-with hinged door	66.0"

##### GENERAL

	<u>Description</u>	<u>Dimension</u>
G	Bottom of Drip Rail to Top of Body	23.5"

(Dimensions are generic and subject to change during the actual design process)

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#### **FOUR (4) UPPER BODY COMPARTMENTS**

There shall be four (4) compartments parallel to the sides of the body, two (2) on each side. Each of these compartments shall be 66.0" long x 28.0" wide x 18.5" deep. The side compartments shall be open under each door sill to allow for long equipment.

Each compartment shall have a lift-up type compartment door hinged on the outboard side. Each door shall be fabricated from 3/16" aluminum tread plate. Each door shall have two (2) pneumatic type cylinders, one (1) at each end, attached to cast aluminum brackets mounted to the interior surface of the door to hold the door in both the opened and closed positions. Each door shall be mounted using 16" long, equally spaced, 14 gauge stainless steel hinges, with 1/4" stainless steel pin. A polyester barrier film gasket shall be placed between stainless steel hinge and the body mounting surface as necessary to prevent corrosion caused by dissimilar metals.

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

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

Each compartment shall have a horizontally mounted OnScene Solutions LED Night Stik on the underside of the door. The light will be automatically activated by a gravity-driven, sealed, ball-style tilt switch mounted to one of the pneumatic cylinders and also wired to the NFPA required hazard warning light in cab.

#### **SIDE ROOF COMPARTMENT - SHELF TRAC**

There shall be four (4) roof compartment(s) provided with horizontally mounted Shelf Trac on front and rear walls for vertical partition installation.

#### **ROOF COMPARTMENT - VERTICAL PARTITION**

There shall be two (2) vertical partition(s) provided in the roof compartment(s). The partitions shall be designed for holding equipment in place during travel. Each partition shall be fabricated from 3/16" smooth aluminum and bolted to specified Shelf Trac for ease of adjustment.

#### **UPPER BODY WALKWAY**

A 34" wide, upper body walkway shall be provided at the center of body and recessed into the roof structure. The walkway shall be finished with NFPA compliant 3/16" aluminum tread plate with continuously welded seams to prevent moisture penetration into apparatus body. Drains shall be installed at front of walkway to allow water to drain to the ground through flexible drain hose.

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#### **WALKWAY LIGHTS**

There shall be two (2) OnScene Solutions 9" LED Night Stik lights provided to illuminate the upper body walkway area. The lights shall be activated when the parking brake is set.

Each light shall be mounted in a ball burnished cast aluminum housing to protect against damage from personnel or equipment.

#### **ACCESS LADDER**

The top of the body shall be accessible from the ground by a OnScene Solutions folding ladder. The ladder design will have a main ladder section and a folding lower step section for better angle of departure. Ladder stores in a folded position and then pulls out to a comfortable climbing angle.

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 curbside of the body.

#### **ROOF ACCESS HANDRAIL**

There shall be one (1) handrail mounted on top of body to assist in roof access. Handrails shall be NFPA compliant 1-1/4" extruded aluminum tubing with chrome plated end stanchions.

#### **BODY WIDTH DIMENSIONS**

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

<u>Area Description</u>	<u>Dimension</u>
Transverse Area:	95.5"
- Above Top of Subframe	
Compartment Depth:	24.5"
- Below Top of Subframe	
- Ahead of Rear Axle	
Compartment Depth:	23.5"
- Below Top of Subframe	(Eng. Note)
- Behind the Rear Axle	

(Dimensions are generic and subject to change during the actual design process)



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

The interior useable compartment width shall be approximately 41.0" wide.

The compartment door opening shall be approximately 34.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
  - There shall be NO keyed lock on this roll-up compartment door.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.

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

#### **COMPARTMENT COMPONENTS**

- There shall be vertically mounted aluminum shelf trac for shelving installation.
- There shall be one (1) 1,000 lbs. slide-out tray(s) with a SlideMaster base approximately 46" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails.

3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- There shall be one (1) vertical compartment partition dividing the compartment into left and right sides.

**SHOP NOTES**  
This Vertical partition wall will be located in the 46" OSS Tray and located as far to the rear side of tray as possible - Engineering- reference pre con sales drawing for preferred location.
- 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 ECR1616-17-18 cable reel(s) capable of storing 150' of 10/3 electric cable. Each reel shall be designed to hold 110 percent of the capacity needed for the intended cord length. Each 120 volt cord reel shall be equipped with fully enclosed 45 amp, three (3) conductor collector rings. Each reel shall be mounted to channel structure located in the upper portion of the compartment. The channel mounts will allow for side-to-side adjustment in reel position.

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#### **Cord Reel General Requirements**

All permanently mounted cord reels shall be rated for continuous duty and installed to be accessible for removal, cord access, maintenance, and servicing.

The wiring from the generator system shall be through Carflex electrical weatherproof conduit, with stranded copper wiring. The wiring shall terminate in a sealed conduit box at the reel with mechanical type connectors for quick removal of wiring.

The power rewind cord reel spool area shall be visible to the operator during the rewind operation, or the reel spool shall be encapsulated to prevent cord from spooling off the reel.

The 12 volt reel rewind system shall be directly wired to the chassis battery system with heavy duty stranded copper wire.

#### **Rewind Provision**

Power rewind type reels shall have the control in a position where the operator can observe the rewinding operation. If a reel is in an enclosure or out of direct view, the cord entry point to the enclosure shall be visible to the operator of the reel control. The rewind control or crank shall not be more than 72 in. (1830 mm) above the operator's standing position. The rewind control shall be marked with a label indicating its function.

#### **Identification**

A label that indicates the following information shall be provided in a visible location adjacent to any permanently connected reel:

- Current rating
- Current type
- Phase
- Voltage
- Total cord length
  
- The cable reel shall be equipped with 150' of 10/3 SEOW yellow cable, a molded plastic ball clamp, and a single heavy duty L5-30 twist-lock female plug at the end.
  
- One (1) Akron model EJB, cast aluminum electrical power distribution box with yellow powder coat painted finish shall be provided. The power distribution box shall meet all requirements described in NFPA 1901. The power distribution box shall include:
  - One (1) L5-20 single twist lock receptacle
  - One (1) L5-20 single twist lock receptacle
  - One (1) 5-20 duplex straight-blade receptacle

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- One (1) 5-20 duplex straight-blade receptacle
  
- One (1) Akron EJB treadplate vertical apparatus mounting bracket shall be provided.  
The reel roller assembly shall extend out from the reel to prevent cable from rubbing on the door edge or side walls.
  
- One (1) vertically mounted OnScene Solutions LED Nightstik.
  
- The controls for the specified light tower(s).
  
- The 12 volt electrical distribution panel shall be located in the streetside front lower compartment.

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#### **STREETSIDE COMPARTMENT - AHEAD OF REAR WHEELS (S2)**

The interior useable compartment width shall be approximately 41.0" wide.

The compartment door opening shall be approximately 34.0" wide.\

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
  - There shall be NO keyed lock on this roll-up compartment door.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.

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

#### **COMPARTMENT COMPONENTS**

- There shall be vertically mounted aluminum shelf trac for shelving installation.
- There shall be one (1) 1,000 lbs. slide-out tray(s) with a SlideMaster base approximately 24" deep and as wide as the compartment layout or door opening permits located below the level of the chassis frame rails.

3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- There shall be two (2) 1,000 lbs. slide-out tray(s) with a SlideMaster base approximately 46" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails.

#### **SHOP NOTES**

The forward tray will have a vertical wall with uni-strut to hold three (3) Fire Department supplied air packs.

- 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- There shall be one (1) transverse module fabricated from 3/16" (.188) 3003H-14 aluminum alloy smooth sheet. The module will be designed for the following long tools and equipment:

#### **SHOP NOTES**

The transverse module shall be installed on the roof of the compartment as close to the aft bulkhead of the compartment as possible and shall extend to the curbside intermediate compartment.

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- Four (4) Texico Fire Department supplied backboard(s). Manufacturer, model number and dimensions of the backboard(s) shall be provided during the pre-construction meeting.

#### SHOP NOTES

The backboard storage shall be provided as forward as possible within the transverse module and shall be constructed so that the backboards would store vertical

- There shall be one (1) OnScene Solutions cargo straps provided to secure the stored equipment.
- The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.

- Two (2) vertically mounted OnScene Solutions LED Nightstiks.

#### SHOP NOTES

One light to be vertical and one to be horizontal. NOTE: vertical light to be mounted to the Aft side of the compartment door opening.

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

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### Build Specification

#### **STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S3)**

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

The compartment door opening shall be approximately 52.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
  - There shall be NO keyed lock on this roll-up compartment door.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.

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

#### **COMPARTMENT COMPONENTS**

- There shall be vertically mounted aluminum shelf trac for shelving installation.
- There shall be one (1) 250 lbs. slide-out and tilt down tray(s) with a SlideMaster base 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 will be vertically adjustable in height.

3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- One (1) vertically mounted OnScene Solutions LED Nightstik.
- Air storage module consisting of four (4) 6,000 psi, ASME air storage cylinders.
- There will be a 2" x 2" x 1/4" welded steel rack with powder coat painted hammertone gray finish to hold all DOT or ASME cylinders.

#### **SHOP NOTES**

There shall be a 3 section removable cover over the ASME storage cylinders, (sides and top) to prevent any items to be stored in compartment to falling into the ASME cylinders and rack.

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### Build Specification

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

The interior useable compartment width shall be approximately 49.0" wide.

The compartment door opening shall be approximately 42.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
  - There shall be NO keyed lock on this roll-up compartment door.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.

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

#### **COMPARTMENT COMPONENTS**

- There shall be vertically mounted aluminum shelf trac for shelving installation.
- There shall be two (2) adjustable shelf/shelves approximately 24" deep. Each shelf shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate with a 2" vertical flange along the front and rear edges

#### **SHOP NOTES**

The three (3) adjustable shelves shall be provided in intermediate and upper portion of the compartment.

- There shall be one (1) 1,000 lbs. slide-out tray(s) with a SlideMaster base approximately 24" deep and as wide as the compartment layout or door opening permits located below the level of the chassis frame rails.

3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.

- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- One (1) vertically mounted OnScene Solutions LED Nightstik.

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- One (1) 12 volt terminal block(s) installed to provide 12 VDC power for equipment supplied by the Texico Fire Department. Exact location shall be determined at the pre-construction meeting.

#### SHOP NOTES

Battery direct: The terminal block shall be provided and located as per described in the pre construction sales drawing.

One (1) 120 VAC, 20 amp duplex, straight-blade receptacle ( NEMA 5-20R ).

#### SHOP NOTES

This outlet is to be wired to both generator and shore power - reference pre con sales drawing for approved location.

- 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 41.0" wide.

The compartment door opening shall be approximately 34.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
  - There shall be NO keyed lock on this roll-up compartment door.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.

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

#### **COMPARTMENT COMPONENTS**

- There shall be vertically mounted aluminum shelf trac for shelving installation.
- There shall be one (1) 1,000 lbs. slide-out tray(s) with a SlideMaster base approximately 24" deep and as wide as the compartment layout or door opening permits located below the level of the chassis frame rails.

3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.

- There shall be one (1) 1,000 lbs. slide-out tray(s) with a SlideMaster base approximately 46" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails.

3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.

- There shall be one (1) vertical compartment partition dividing the compartment into left and right sides.

#### **SHOP NOTES**

This Vertical partition wall will be located in the 46" OSS Tray

- The floor of the compartment above the frame rails shall be extended to the interior edge of the door. The floor shall have a 2" vertical lip and a 1" return to increase strength.
- One (1) Hannay ECR1616-17-18 cable reel(s) capable of storing 150' of 10/3 electric cable. Each reel shall be designed to hold 110 percent of the capacity needed for the intended cord length. Each 120 volt cord reel shall be equipped with fully enclosed 45 amp, three (3) conductor

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collector rings. Each reel shall be mounted to channel structure located in the upper portion of the compartment. The channel mounts will allow for side-to-side adjustment in reel position.

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#### **Cord Reel General Requirements**

All permanently mounted cord reels shall be rated for continuous duty and installed to be accessible for removal, cord access, maintenance, and servicing.

The wiring from the generator system shall be through Carflex electrical weatherproof conduit, with stranded copper wiring. The wiring shall terminate in a sealed conduit box at the reel with mechanical type connectors for quick removal of wiring.

The power rewind cord reel spool area shall be visible to the operator during the rewind operation, or the reel spool shall be encapsulated to prevent cord from spooling off the reel.

The 12 volt reel rewind system shall be directly wired to the chassis battery system with heavy duty stranded copper wire.

#### **Rewind Provision**

Power rewind type reels shall have the control in a position where the operator can observe the rewinding operation. If a reel is in an enclosure or out of direct view, the cord entry point to the enclosure shall be visible to the operator of the reel control. The rewind control or crank shall not be more than 72 in. (1830 mm) above the operator's standing position. The rewind control shall be marked with a label indicating its function.

#### **Identification**

A label that indicates the following information shall be provided in a visible location adjacent to any permanently connected reel:

- Current rating
  - Current type
  - Phase
  - Voltage
  - Total cord length
- 
- The cable reel shall be equipped with 150' of 10/3 SEOW yellow cable, a molded plastic ball clamp, and a single heavy duty L5-30 twist-lock female plug at the end.
  - One (1) Akron model EJB, cast aluminum electrical power distribution box with yellow powder coat painted finish shall be provided. The power distribution box shall meet all requirements described in NFPA 1901. The power distribution box shall include:
    - One (1) L5-20 single twist lock receptacle
    - One (1) L5-20 single twist lock receptacle
    - One (1) 5-20 duplex straight-blade receptacle

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- One (1) 5-20 duplex straight-blade receptacle
  
- One (1) Akron EJB treadplate vertical apparatus mounting bracket shall be provided.  
The reel roller assembly shall extend out from the reel to prevent cable from rubbing on the door edge or side walls.
  
- One (1) vertically mounted OnScene Solutions LED Nightstik.
  
- One (1) 120/240 VAC load center.
  
- The FRC FROG-D generator gauge panel.

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### Build Specification

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

The interior useable compartment width shall be approximately 41.0" wide.

The compartment door opening shall be approximately 34.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
  - There shall be NO keyed lock on this roll-up compartment door.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.

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

#### **COMPARTMENT COMPONENTS**

- There shall be vertically mounted aluminum shelf trac for shelving installation.
- There shall be one (1) 1,000 lbs. slide-out tray(s) with a SlideMaster base approximately 24" deep and as wide as the compartment layout or door opening permits located below the level of the chassis frame rails.

3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- There shall be two (2) 1,000 lbs. slide-out tray(s) with a SlideMaster base approximately 46" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails.

#### **SHOP NOTES**

The forward tray will have a vertical wall with uni-strut to hold three (3) Fire Department supplied air packs.

- 3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- There shall be one (1) transverse module(s) which extends to the opposite side of the body. (Specified in opposite side compartment.)

#### **SHOP NOTES**

The transverse module extending to the street side intermediate compartment shall be for the storage of one (1) stokes basket and three (2) backboards

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

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- 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) vertically mounted OnScene Solutions LED Nightstiks.  
**SHOP NOTES**  
One light to be vertical and one to be horizontal
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

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### **Build Specification**

#### **CURBSIDE COMPARTMENT - ABOVE REAR WHEEL (C3)**

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

The compartment door opening shall be approximately 52.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
  - There shall be NO keyed lock on this roll-up compartment door.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.

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

#### **COMPARTMENT COMPONENTS**

- There shall be vertically mounted aluminum shelf trac for shelving installation.
- There shall be one (1) 250 lbs. slide-out and tilt down tray(s) with a SlideMaster base approximately 46" deep and as wide as the compartment layout or door opening permits, located above the level of the chassis frame rails.

3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray. The striping shall be 2" wide and red/white in color.
- One (1) vertically mounted OnScene Solutions LED Nightstik.
- Air storage module for cascade system.

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### **Build Specification**

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

The interior useable compartment width shall be approximately 49.0" wide.

The compartment door opening shall be approximately 42.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
  - There shall be NO keyed lock on this roll-up compartment door.
- One (1) aluminum drip pan/door finish guard shall be provided with the rollup door.

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

#### **COMPARTMENT COMPONENTS**

- There shall be one (1) slide-out smooth aluminum vertical tool board(s) approximately 24" deep.
- Each tool board shall be horizontally adjustable; mounted on aluminum shelf trac on compartment floor.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- Two (2) vertically mounted OnScene Solutions LED Nightstiks.
- One (1) horizontally mounted OnScene Solutions LED Nightstik mounted at the top of the compartment toward the compartment door opening.
- One (1) Bauer model CFSII-1S (Containment Type), single position filling station(s) with cascade controls.
- One (1) refill port shall be located on the front of the right side panel on the filling station.
- The fill station fill whip(s) shall terminate in a high pressure 4,500 psi, CGA-347 threaded SCBA connectors.
- 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 start at the bottom of the body and shall be as high as the body permits. The frame shall extend at least 20" into the Rear Center Compartment to allow for the spring mounts.

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

The compartment door opening shall be approximately 38.0" wide.

This compartment shall have a ROM roll-up door.

#### **SHOP NOTES**

Customer requests no Paint or Roll Up door protection on this door only

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
  - There shall be NO keyed lock on this roll-up compartment door.

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

#### **COMPARTMENT COMPONENTS**

- There shall be one (1) 1,000 lbs. slide-out tray(s) with a SlideMaster base approximately 30" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails.

3M™ Diamond Grade™ Conspicuity striping shall be provided on the front and side faces of the tray.  
The striping shall be 2" wide and red/white in color.

- There shall be one (1) vertical compartment partition dividing the compartment into left and right sides.

#### **SHOP NOTES**

This will be located in the 30" Deep OSS Tray

- There shall be one (1) air bag storage module(s). The module shall be fabricated from 1/8" (.125) 3003H-14 aluminum alloy sheet. Circular notches shall be provided along the front edge to ease the access to the air bags. Each bay shall be sized to hold the air bag and a matching piece of plywood. The make, model and exact dimensions of the air bags shall be provided during the pre-construction meeting.

#### **SHOP NOTES**

Layout per sales drawing - Holmatro Lift bag set model #64

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- There shall be four (4) OnScene Solutions cargo straps provided to secure the stored equipment.
- Two (2) Hannay EF2016-17-18 hydraulic hose reel(s) capable of storing 100' of dual line hydraulic hose. The rewind button for each reel shall be located adjacent to the reel it controls.

#### SHOP NOTES

##### LOW PRESSURE HURST SYSTEM

The reels shall be installed on the roof of the compartment with the hose feeding off the bottom and toward the rear of the compartment through the fairlead rollers on the permanent divider installed on the roll-out tray.

- One (1) Dealer Supplied, 100' Hurst Tinline (Orange) w/end swivel (reel end) and other end streamline coupling shall be provided and installed on the reel
- One (1) Dealer Supplied 100' Hurst Tinline (Blue) w/end swivel (reel end) and other end streamline coupling shall be provided and installed on the reel
- The fairlead rollers shall be an OnScene Solutions extendable type to allow hoses or cords to be extended away from compartment door edges, slide trays, or shelving that may result in wear damage.

#### SHOP NOTES

Unsure if right part number for reel - please double check before ordering.

- The two (2) hydraulic reels shall be connected to the hydraulic pump with two (2) 6' Hurst pigtails. One shall be orange, One shall be blue.
- Two (2) vertically mounted OnScene Solutions LED Nightstiks.
- One (1) Dealer supplied electric hydraulic power unit(s). One (1) 240 VAC twist lock receptacle with switch shall be provided on wall within easy reach of operator for turning the power unit ON/OFF.

#### SHOP NOTES

Change Mounting of HPU to Upper body roof compartment (rear curbside) - to be mounted in a tray to hold HPU (2) gallon jugs of Hydraulic Fluid - there shall be a drain that goes from the HPU hydraulic tank to below the body to drain fluid from HPU. The 240 volt receptacle shall also move to the Upper body compartment. this UBC will be vented to the walkway wall for air flow and remote switched to compartment RC1.

- Mounting provisions for two (2) dealer supplied hydraulic ram(s).
- Mounting provisions for one (1) Texico Fire Department supplied hydraulic cutter(s).

#### SHOP NOTES

Make: HurstModel: JL-20C, JL-30C & JL-60C

#### SHOP NOTES

Make: Hurst Model: X-Tractor

- Mounting provisions for one (1) dealer supplied hydraulic spreader(s).

#### SHOP NOTES

Make: Hurst Model: ML-32

- Mounting provisions for one (1) dealer supplied hydraulic combination tool(s).

#### SHOP NOTES

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### **Build Specification**

Make: Hurst

Model: ML-16S

- One (1) Dealer supplied Hurst ML-28 Defender Spreader w/Streamline Couplings shall be provided.
- One (1) Dealer Supplied Hurst X-Tractor C Combination Tool w/Streamline Couplings shall be provided.
- One (1) Dealer Supplied Hurst MOC Cutter w/Streamline couplings shall be provided
- One (1) Dealer Supplied Hurst T-59 Telescoping Ram w/Streamline Couplings shall be provided.
- One (1) Dealer Supplied Hurst T-41 Telescoping Ram w/Streamline Couplings shall be Provided.

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#### **PLASTIC FLOOR AND SHELF TILE**

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

- The plastic floor tile shall be black.
- The plastic edge trim shall be black.

#### **SIDE BODY PROTECTION - RUB RAIL**

There shall be side rub rails provided below the compartment door openings on both the streetside and curbside. The rub rail shall be fabricated from 6063 extruded aluminum, measuring approximately 2-3/4" high x 1-3/8" thick with tapered aluminum end caps. The rub rail shall be bolted to the body using stainless steel bolts and 1-1/2" diameter x 5/8" thick rubber mount isolators to prevent damage to the body. The rails shall incorporate LED clearance marker lighting recessed into the rail fascia to avoid damage to the light in case of impact. The rub rail shall have an accessory mounting track integrated into the backside of the rail to allow mounting of accessories such as ground lighting.

- 3M™ Diamond Grade™ Conspicuity striping shall be provided in the rub rail. The striping shall be white in color.

#### **COMPARTMENT COMPONENTS DESCRIPTIONS**

All interior compartment components shall be fabricated as follows:

#### **ADJUSTABLE SHELVING HARDWARE**

Adjustable shelving hardware shall be provided indicated in the numbered compartment list.

The shelving hardware shall include a minimum of four (4) aluminum shelf tracs mounted vertically on compartment side walls or vertical partitions. There shall be one (1) cast aluminum shelf bracket per vertical shelf trac to mount each shelf, tray, or adjustable storage module. Shelving hardware shall be of heavy duty quality with unlimited vertical adjustment settings.

#### **ADJUSTABLE SHELF/SHELVES**

Adjustable shelf/shelves shall be provided in exterior compartment as indicated in the numbered compartment list.

Shelves shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate with a 2" vertical flange along the front and rear edges. Shelves shall be designed to be used with flanges either in the upward position to hold various equipment on shelf, or in the downward position for sweep-out shelf surface.

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All shelves shall be fully adjustable, from top to bottom of the compartment. There shall be at least four (4) vertical mounting channels and shelving hardware, two (2) each side of compartment. Shelving hardware shall be of heavy duty quality with unlimited vertical adjustment settings.

#### **HEAVY DUTY SLIDE-OUT EQUIPMENT TRAYS - (1,000 LB.CAPACITY)**

Heavy duty slide-out equipment tray(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

Trays shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate. Trays shall be built with welded corners to form a box type tray surface with an internal depth of approximately 3 1/2 inches. Tray shall be mounted on a SlideMaster 3-rail heavy duty structural steel frame with twelve (12) sealed 1,000 lbs. static load ball bearings. The slide-out tray shall be rated for a maximum 1,000 lbs. evenly distributed load.

The tray shall be locked in its stored position as well as at 50%, and 100% of extension for loading or as a stationary work surface.

#### **HEAVY DUTY EQUIPMENT TRAYS - SLIDE-OUT/TILT-DOWN - (250# CAPACITY)**

Heavy duty slide-out/tilt-down equipment tray(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

Trays shall be fabricated from 3/16" (.188) aluminum 3003H-14 alloy smooth plate. Trays shall be built with welded corners to form a box type tray surface with an internal depth of approximately 3 1/2 inches. Tray shall be mounted on a SlideMaster 2-rail heavy duty structural steel frame with sealed 500 lbs. static load ball bearings. The slide-out tray shall be rated for a maximum 250 lbs. distributed load.

The tray shall be locked in its stored position and 90% of extension for loading. There shall be a plate attached to the lower bar of the tray that will automatically swing the locking mechanism over the outer structural cross member.

#### **SLIDE-OUT TOOL BOARD (SMOOTH ALUMINUM)**

Slide-out tool board(s) shall be provided in the exterior compartment as indicated in the numbered compartment list.

Tool boards shall be fabricated of 3/16" (.188) aluminum 3003H-14 alloy smooth plate with double 90 degree formed edge to provide an easy grip handle. The top and bottom of tool board shall be provided with Accuride 502 series slide tracks. The length shall be per numbered compartment list and the extension shall be 100% of the slide length. Slide tracks shall be constructed from formed steel with ball bearings in triple track rails. The board shall be rated for a maximum 200 lbs. evenly distributed load.

Tool board(s) shall utilize a pneumatic cylinder to hold the tool board in both the opened and closed positions.

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#### **TRANSVERSE STORAGE MODULE**

Transverse storage module for long equipment shall be provided as indicated in the numbered compartment list.

The module shall be fabricated from 1/8" (.125") thick smooth aluminum. Exact size and layout shall be approved prior to construction.

#### **COMPARTMENT LIGHTING**

Each enclosed equipment compartment greater than 4 ft<sup>3</sup> (0.1 m<sup>3</sup>) in volume and having an opening greater than 144 in.<sup>2</sup> (92,900 mm<sup>2</sup>) shall have sufficient compartment lighting to provide a minimum of 2 fc (20 lx) at any location on the floor of the compartment without any shelves, dividers, or equipment in the compartment.

Compartments such as ladder tunnels, pike pole storage tubes, or underbody compartments designed around the volumetric requirements of specific equipment that can be removed without the use of article illumination shall not be required to have compartment lighting.

All compartments shall be equipped with OnScene Nightstik LED lights with the following minimum light requirements;

- Full Height Compartments, 63" Section (42 LED's)
- Wheel well Compartments, 36" Section (24 LED's)
- Rear Rescue Compartment, 63" Section (42 LED's)
- Low Compartments, 18" Section (12 LED's), Vertical
- Low Compartments, 36" Section (24 LED's), Horizontal

The OnScene Nightstik lights shall be rated at 100,000 hours of service and shall be provided with a 5 year free replacement warranty.

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#### **ELECTRIC CORD REEL**

Electric cord reel(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

The 120 volt cord reel(s) shall be Hannay with electric rewind, equipped with fully enclosed 45 amp, three (3) conductor collector rings.

The 12 volt reel rewind system shall be directly wired to the chassis battery system with heavy duty stranded copper wire, with guarded finger type rewind button located within easy reach of the operator.

Each reel shall have a Hannay 4-way roller assembly to permit cable to feed directly off the reel and away from compartment. Plastic roller assemblies are not acceptable.

The wiring from the generator system shall be through Carflex electrical weatherproof conduit, with stranded copper wiring. The wiring shall terminate in a sealed conduit box at the reel with mechanical type connectors for quick removal of wiring.

#### **Cord Reel General Requirements**

All permanently mounted cord reels shall be rated for continuous duty and installed to be accessible for removal, cord access, maintenance, and servicing.

The power rewind cord reel spool area shall be visible to the operator during the rewind operation, or the reel spool shall be encapsulated to prevent cord from spooling off the reel.

Rollers or guides shall be provided, where required, to prevent damage to the cord at reel spools or compartment openings.

#### **Rewind Provision**

Power rewind type reels shall have the control in a position where the operator can observe the rewinding operation. If a reel is in an enclosure or out of direct view, the cord entry point to the enclosure shall be visible to the operator of the reel control.

The rewind control or crank shall not be more than 72 in. (1830 mm) above the operator's standing position. The rewind control shall be marked with a label indicating its function and shall be guarded to prevent accidental operation.

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#### Cord

The reel shall be designed to hold 110 percent of the capacity needed for the intended cord length.

The wire size shall be in accordance with *NFPA 70*, Table 400.5(A), but in no case shall it be smaller than 12AWG. Electrical cord shall be Type SEOW, Type SOOW, or Type STOOW.

A label that indicates the following information shall be provided in a visible location adjacent to any permanently connected reel:

- Current rating
  - Current type
  - Phase
  - Voltage
- Total cord length

#### **POWER DISTRIBUTION BOX**

Where a power distribution box is hardwired to the end of a cord that is stored on a fixed cord reel or other fixed storage means, the following requirements shall apply;

The remote power distribution box shall be listed for use in a wet location.

The distribution box shall be as follows:

- Protected from corrosion
- capable of being carried with a gloved hand
- Designed to keep the exterior electrical components above 2 in. (51 mm) of standing water

Inlets, receptacles, circuit breakers, or GFCI devices shall not be mounted on the top surface of the horizontal plane.

Branch circuit breakers shall be installed in the remote power distribution box if the overcurrent device protecting the feed cord to the box is too large to protect the wiring supplying the devices plugged onto the distribution box.

Remote power distribution boxes shall have a light on the box to indicate the power is on. The light shall be visible in a 360 degree plane from a minimum of 200 ft (60 m) in complete darkness. The light shall be mechanically protected to prevent damage.

The hardwired portable cord connection to the box shall have strain relief and meet the intended usage requirements.



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#### HYDRAULIC POWER UNIT

Hurst low pressure model JL-AC-SI, 3 HP, 240 VAC electric hydraulic power unit(s) shall be provided in exterior compartment as indicated in the numbered compartment list.

Each power unit shall be capable of simultaneous rescue tool operation of two (2) individual tools. Each power unit shall be mounted in compartment, but easily removable from the apparatus for maintenance purposes. Each power unit shall be approx. 17.3" W x 19.7" H x 18.9" D, and weight 88 lbs.

#### HYDRAULIC HOSE REEL

Hydraulic hose reel shall be Hannay EF2014-17-18 high pressure, electric rewind, hydraulic hose reel with a capacity of 100' of dual hose.

The 12 volt electrical rewind circuit shall be directly wired to the chassis battery system with heavy duty stranded copper cable. The rewind button shall be located adjacent to the hose reel within easy access of Operator.

Each reel shall have a Hannay 4-way roller assembly to permit cable to feed directly off the reel and away from compartment. **Plastic roller assemblies are not acceptable.**

Hydraulic hose shall have a ball clamp located near end of hose.

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#### **BREATHING AIR STORAGE SYSTEM**

Breathing air system shall be provided with a air storage module consisting of:

- Four (4) 6,000 psi, ASME air storage cylinders shall be provided which comply with 49 CFR 178.37, "Specification 3AA and 3AAX seamless steel cylinders," or 29 CFR 1910.169, "Air receivers". Each cylinder shall be permanently stamped or identified in accordance with DOT or ASME regulations.

Each cylinder shall have a working pressure of 6,000 psi with a 3:1 safety factor and nominal capacity of 491 cu. ft. at 6,000 psi.

If the air storage was cascaded the system would be capable of filling approximately forty five (45) 45 cu.ft. 2,216 psi, or twenty nine (29) 45 cu.ft. 4,500 psi SCBA bottles (based on residual pressure of 500 Psig).

There shall be a label which reads, "HIGH PRESSURE - 6,000 psi BREATHING AIR".

The air tank manufacturer shall provide a copy of either the U.S. Department of Transportation (DOT) certificate

Report of Inspection of Gas Cylinders or the ASME certificate Manufacturers Data Report for Pressure Vessels, and the certificate shall be delivered with the fire apparatus.

Relief valves on transportable air tanks shall be of the ASME type on ASME cylinders and of the DOT type on DOT cylinders or equal for the rated pressure.

Valves installed on air tanks shall meet the requirements of the Compressed Gas Association regarding pressure and usage with compressed air.

If the installation utilizes cylinders that require periodic testing, a label shall be placed on or near the operators panel that provides the following:

- (1) The original cylinder test date stamped on the cylinders
- (2) The recommended testing interval
- (3) Five additional open spaces, appropriately labeled, for the user to enter actual retesting dates

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

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#### **Air Tank Mounting**

Air tanks shall be mounted in an arrangement that will hold the tanks in all types of mobile use.

A protective device(s) shall be provided to protect the air tank valve(s) and associated piping from damage as a result of accidental impact. The protective device(s) shall not prevent access for operation and inspection.

The air tank mounting shall facilitate removal of air tanks for inspection, testing, or service.

Air tanks shall be installed so that all air tanks, control valves, and associated piping are readily accessible.

Air tanks shall be mounted in such a fashion to permit visual inspection of external surfaces and emergency access to shutoff of tank valves.

The air tank location shall be away from any heat producing devices such as the generator engine or exhaust.

#### **BREATHING AIR SYSTEM TESTING AND DELIVERY**

The complete air system shall be tested by the final system installer after its installation on the fire apparatus is complete, using the testing procedure prescribed by the system manufacturer.

The following items shall be tested or verified on all air systems:

- Pressure test the system to its maximum operational pressure and check all connections made as a part of the installation for leaks with a leak detection device, which could include bubble fluid or electronic means.
- Verify that any leaks detected during the testing are repaired.
- Visually verify the relief valve set points and working pressure of the air tank.
- Verify the accuracy of all pressure gauges.
- Fully test the operational capabilities of the fill station as established by the manufacturer of the fill station.
- Seal all fill adapter connections to eliminate the introduction of contaminants prior to shipment.

If the system's air supply includes a compressor/ purification system, the following additional items shall be tested or verified:

- Confirm that the fluid levels are at the manufacturer's recommended levels, including the lubricant and coolant if the system is liquid cooled.
- Verify the expiration date of the purification filters and cartridges and that they have been installed as required by the manufacturer of the system.
- Operate the air compressor for a minimum of 2 hours or the period required to completely fill the onboard air tanks, whichever is longer.
- Confirm that all compressor interstage pressures are within guidelines as established by the

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compressor manufacturer.

Confirm the operation of the compressor shutdown switch at the pressure requested by the purchaser

#### **FILL STATION**

There shall be one (1) Bauer model CFSII-1S (Containment Type) filling station(s) with cascade controls furnished and installed in the apparatus body per the itemized compartment list.

This specification is for a containment type fill station to refill self-contained breathing apparatus (SCBA). The fill station shall be designed for a maximum working pressure of 6,000 psig. All equipment shall be new and of current design and manufacture. Used and/or refurbished equipment is unacceptable.

#### **"CONTAINMENT TYPE" FILL STATION**

A front loading, single position, containment type fill station shall totally enclose the SCBA cylinders during the refilling process. The fill station shall contain the cylinder and any fragments of the cylinder in the unlikely event of a cylinder exploding during the refilling process. The filling station shall vent the expanding air away from the Operator.

The fill station shall incorporate a 1/4" thick steel plate door reinforced by one (1), 1/4" thick steel SCBA holders, providing a total 1/2" thick steel protective safety barrier between the Operator and the cylinder refilling process, and a 1/4" thick steel outer enclosure. The fill station shall be ergonomically designed for maximum Operator safety and convenience during the refilling process. The fill station door and cylinder holder assembly shall tilt out towards the Operator providing unobstructed access to the cylinder holder to load and unload the cylinders at waist height. Each cylinder holder shall be lined with UHMW polyethylene strips to prevent scuffing the outer surface of the cylinders. For complete Operator protection, the fill station shall include a 3-point pneumatic safety interlock system. An interlock shall prevent refilling the cylinders while the fill station door is open. A manually activated door interlock shall latch the fill station door in the closed position. The third interlock verifies that the fill station door is closed and latched. The refilling process can commence only when all three (3) safety interlocks are satisfied, **NO EXCEPTIONS.**

One (1) fill hose shall be located within the fill station's steel outer enclosure. Each fill hose shall be equipped with a bleed valve and fill adapter of choice. There shall be CGA 346 male adapters to anchor the fill hoses when not in use.

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#### **CONTROL AND FILLING PANEL**

The central fill/control panel shall be furnished to facilitate the filling of SCBA bottles from the storage system. All of the filling and air flow control shall be controlled and monitored from this central panel.

The top control panel shall include:

- Inlet pressure gauge from storage
- One (1) 0-6,000 psi adjustable regulators with relief valve set for storage bottle pressure
- One (1) fill pressure gauge
- One (1) fill pressure gauges and "On/Off" valve
- Door interlock switch

The side control panel shall include:

- Storage pressure gauge for each air storage cylinder.
- High pressure valve for each air storage cylinder.
- External supply air connection for filling storage cylinders.

The panel shall be designed in such a way so that each filling whip can be protected with its own individual relief valve. This will allow for a full range of filling pressures offering maximum protection.

All piping and tubing shall be properly supported and protected to prevent damage from vibration during shipment, operation or maintenance. Piping and tubing shall be installed in a neat and orderly arrangement, adapting to the contours of the station. All instrument tubing shall be 300 series stainless steel.

All control panel mounted pressure gauges shall have a 2-1/2" diameter face and be liquid filled. All panel mounted components shall be labeled with an engraved nameplate.

#### **TESTING AND PREPARATION OF FILL STATION**

The fill station design shall have been tested and certified by an independent third-party testing organization per NFPA 1901. Proof of such testing shall be available for review upon the Fire Department's request. Each fill station shall be bench tested by the Manufacturer prior to shipment. A copy of the Manufacturer's test report shall accompany the unit at shipment, **NO EXCEPTIONS**.

An Operator's instruction and maintenance manual shall be supplied with the unit. The manual shall be as detailed as possible, outlining all operating and maintenance instructions. The manual shall include detailed illustrated drawings along with a complete parts list for all illustrated components. Warnings and safety precautions shall be included in the manual.

A fill station nameplate shall be securely affixed to station's frame in a conspicuous location.

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

Step and ground lights shall be OnScene Solutions 9" LED Nightstik and be placed at any entry door and step where personnel climb on or descend from the apparatus to ground level. OnScene LED lights shall have 6 LED lights per 9" light, and shall be rated at 100,000 hours of service. On Scene Solutions LED lights shall be have a 5 year free replacement warranty.

All of the required step and ground lights shall be activated when the parking brake is set.

#### **LOW VOLTAGE ELECTRICAL SYSTEM- 12 VDC**

##### **General**

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

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

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

##### **Wiring**

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

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

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

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#### Wiring and Wire Harness Construction

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

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

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

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

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

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

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

- 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.

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#### Minimum Continuous Electrical Load

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

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

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

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

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

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

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

#### Electromagnetic Interference

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

#### Wiring Diagram

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



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#### Low Voltage Electrical System Performance Test

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

#### 12 VOLT DIAGNOSTIC RELAY CONTROL CENTER

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

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

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

#### ROCKER SWITCH PANEL

The control of the 12 volt equipment installed on chassis and body shall be centrally located in the cab. The individual rocker style switches shall be located on a separate electrical panel, complete with backlit name tags describing function of each individual switch. The back lighting shall have two (2) levels of intensity, low level lights activated when the vehicle lights or ignition switch is turned "On", and high level lights activated when individual switch is turned "On". An internally lighted rocker switch shall be furnished to the left of specified emergency lighting switches, and identified as "MASTER EMERGENCY SWITCH".

Switch circuitry shall be on a printed circuit board. The lights shall be solid state type and have a 100,000 hour life span.

The rocker switch panel shall be located in the cab center console for all master switches and emergency light switches.

#### 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 mounting of siren head, radio or 12 volt control panel, and etc, with easy access to both Driver and Officer.

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The final design of console shall be determined by the Texico Fire Department at the pre-construction meeting.

#### **ELECTRICAL SYSTEM MANAGER**

##### **LOAD MANAGEMENT**

If the total continuous electrical load exceeds the minimum continuous electrical output rating of the installed alternator(s), an automatic electrical load management system shall be required. The minimum continuous electrical loads shall not be subject to automatic load management.

The apparatus 12 volt electrical system shall be provided with a system manager for:

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

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

##### **BATTERY MONITORING**

The system manager shall monitor the vehicle battery voltage. When electrical loads exceed the alternator output and the voltage drops, the load manager shall start shutting down electrical outputs. The system shall shut down only as many outputs required to maintain the system voltage. A special indicator to show different states of the electrical system by flashing at rate proportional to the battery discharge.

##### **LOAD SEQUENCING AND SHEDDING**

The system shall be capable of sequentially switching and shedding 12 volt loads. The Master light switch starts the sequential switch when it is turned "On". Likewise turning the Master Switch "Off" will sequentially de-energize the loads.

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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.

A master load disconnect switch shall be provided between the starter solenoid(s) and the remainder of the electrical loads on the apparatus. The starter solenoids shall be connected directly to the batteries.

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

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

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

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

#### **BATTERY SWITCH**

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

#### **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 091-9-1000) "Pump-Plus 1000" single battery charger/air compressor, with 120 VAC input and 12 VDC, 15 amp output battery conditioner and a 12 volt, 80 psi air compressor shall be provided. This system shall monitor the condition of battery(s) and provide an electrical current at variable rates to overcome battery failure. The air compressor shall maintain air pressure in the chassis air brake system. A Kussmaul bar graph type indicator panel shall be provided for showing status of battery conditioner.

#### **SHORE POWER INLET**

One (1) Kussmaul 120 VAC, 20 amp Super Auto-Eject shore power inlet(s) shall be provided. 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 yellow.
- The shore power plug shall be located near the Driver door area.

#### **ENGINE COMPARTMENT LIGHT**

There shall be one (1) 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".

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#### **CAB HAZARD WARNING LIGHT**

A red flashing or rotating light, located in the driving compartment, shall be illuminated automatically whenever the vehicles parking brake is not fully engaged and any of the following conditions exist:

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

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

- The volume is less than or equal to 4 ft<sup>3</sup> (0.1 m<sup>3</sup>).
- The compartment has an opening less than or equal to 144 in.<sup>2</sup> (92,900 mm<sup>2</sup>).
- The open door does not extend sideways beyond the mirrors or up above the top of the fire apparatus.
- All equipment in the compartment is restrained so that nothing can fall out if the door is open while the apparatus is moving.
- Manually raised pole lights with an extension of less than 5 ft (1.5 m).

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

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

#### **BACK-UP ALARM**

The body manufacturer shall furnish and install a automatic sound sensing electronic back-up alarm. The back-up alarm shall actuate automatically when the transmission gear selector is placed in reverse. The alarm automatically adjusts its sound output, maintaining a minimum of five dB(A) above noise level, up to maximum rated output of 112 dB(A).

#### **TAIL LIGHTS**

Rear body tail lights shall be vertically mounted per Federal Motor Vehicle Safety Standards. The following lights shall be furnished:

- Two (2) Whelen amber LED 600 Series 60A00TAR turn signal lights
- Two (2) Whelen red LED 600 Series 60R00XRR stop/tail lights
- Two (2) Whelen Halogen 600 Series 60J000CR back-up lights with clear lens

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

#### **MIDSHIP MARKER/TURN SIGNAL**

Two (2) Whelen LED midship body clearance marker/turn signal lights (T0A00MAR) shall be installed. There shall be one (1) light on each side of the body, in the wheel well, ahead of the rear axle. Both lights shall have an amber lens and operate with the chassis clearance marker and turn signals.

#### **MARKER LIGHTS**

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

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

There shall be two (2) OnScene Solutions 9" LED Nightstik 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 MOUNTING BRACKET**

There shall be one (1) Cast Products aluminum license plate mounting with chrome shielded license plate light mounted on the rear of the body.

#### **SIDE SCENE LIGHTS**

There shall be four (4) Federal GHSCENE recess mounted halogen scene lights provided on the upper body. Each light has two (2) 20W adjustable lamps and clear lens. They will be equally divided between the curbside and streetside.

Two (2) switches shall be provided, one (1) for the streetside scene lights, and one (1) for the curbside scene lights.

The lights shall be switched at the 12 volt control panel in the cab.

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#### **REAR SCENE LIGHTS**

There shall be two (2) Federal GHSCENE recess mounted halogen scene lights provided on the upper rear body. Each light has two (2) 20W adjustable lamps and clear lens.

The lights shall be switched at the 12 volt control panel in the cab.

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

#### **WARNING LIGHT PACKAGE**

Each apparatus shall have a system of optical warning devices that meets or exceeds the requirements of this section.

The optical warning system shall consist of an upper and a lower warning level. The requirements for each level shall be met by the warning devices in that particular level without consideration of the warning devices in the other level.

For the purposes of defining and measuring the required optical performance, the upper and lower warning levels shall be divided into four 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 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 separate signaling modes during emergency operations. One mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right-of-way. One mode shall signal that the apparatus is stopped and is blocking the right-of-way. The use of some or all of the same warning lights shall be permitted for both modes provided the other requirements of this chapter are met.

A switching system shall be provided that senses the position of the parking brake or the park position of an automatic transmission. When the master optical warning system switch is closed and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for the right-of-way shall be energized. When the master optical warning system switch is closed and the parking brake is on or the automatic transmission is in park, the warning devices signaling the blockage of the right-of-way shall be energized. The system shall be permitted to have a method of modifying the two signaling modes.

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The optical warning devices shall be constructed or arranged so as to avoid the projection of light, either directly or through mirrors, into any driving or crew compartment(s). The front optical warning devices shall be placed so as to maintain the maximum possible separation from the headlights.

#### UPPER LEVEL OPTICAL WARNING DEVICES

The upper-level optical warning devices shall be mounted as high and as close to the corner points of the apparatus as is practical to define the clearance lines of the apparatus. The upper-level optical warning devices shall not be mounted above the maximum height, specified by the device manufacturer.

#### ZONE A - FRONT WARNING LIGHTS

There shall be one (1) Whelen Edge FN60QLED LED 60" lightbar permanently mounted to the cab roof.

The lightbar configuration (streetside to curbside) shall be:

<u>SECTION</u>	<u>INTERNAL COMPONENTS</u>	<u>LENS COLOR</u>
1	One (1) Red Linear LED - Side Facing	Clear
2	One (1) Red Corner LED	Clear
3	Clear Linear LED	Clear
4	Red Linear LED	Clear
5	Red Linear LED	Clear
6	Red Linear LED	Clear
7	Red Linear LED	Clear
8	Red Linear LED	Clear
9	Red Linear LED	Clear
10	Clear Linear LED	Clear
11	One (1) Red Corner LED	Clear
12	One (1) Red Linear LED - Side Facing	Clear

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 shall be separately switched at the 12 volt control panel in the cab.

#### ZONES B AND D - SIDE WARNING LIGHTS

#### UPPER REAR CORNER WARNING LIGHTS

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FRR) provided,



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one (1) each side. Each light shall have a red lens and chrome flange.

The lights shall be switched at the 12 volt control panel in the cab.

#### **UPPER FORWARD CORNER WARNING LIGHTS**

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FRR) provided, one (1) each side. Each light shall have a red lens and chrome flange.

The lights shall be switched at the 12 volt control panel in the cab.

#### **ZONE C - REAR WARNING LIGHTS**

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FRR) provided, one (1) each side. Each light shall have a red lens and chrome flange.

The lights shall be switched at the 12 volt control panel in the cab.

#### **LOWER LEVEL OPTICAL WARNING DEVICES**

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

The optical center of the lower-level optical warning devices at the rear of the vehicle shall be mounted on or behind the rear axle centerline and as close to the rear corners of the apparatus as is practical. The optical center of any lower-level device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground for large apparatus, and 18 in. and 48 in. (460 mm and 1220 mm) above level ground for small apparatus.

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

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

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FRR) provided, one (1) each side. Each light shall have a red lens and chrome flange.

The lights shall be switched at the 12 volt control panel in the cab.

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

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FRR) provided,

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one (1) each side. Each light shall have a red lens and chrome flange.

The lights shall be switched at the 12 volt control panel in the cab.

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

There shall be two (2) Whelen 500 series (5" x 2") red Linear Super-LED lights (50R02ZRR) provided, one (1) each side. Each light shall have a red lens and chrome flange.

The lights shall be switched at the 12 volt control panel in the cab.

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

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FRR) provided, one (1) each side. Each light shall have a red lens and chrome flange.

The lights shall be switched at the 12 volt control panel in the cab.

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

There shall be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FRR) provided, one (1) each side. Each light shall have a red lens and chrome flange.

The lights shall be switched at the 12 volt control panel in the cab.

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#### **LINE VOLTAGE ELECTRICAL SYSTEM**

##### **ONAN PTO GENERATOR**

The vehicle shall be equipped with an Onan Protec PTO generator system with a capacity of 25,000 watts at 120/240 VAC, 208/104 amps, single phase. Current frequency shall be stable at 60 hertz.

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

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

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

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

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

##### **GENERATOR ENGAGEMENT**

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

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

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

##### **WARRANTY PERIOD**

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

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#### **GENERATOR SPLASH GUARD**

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

#### **GENERATOR MOUNTING**

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

#### **MANUALS AND SCHEMATICS**

Two (2) complete manuals on parts list, maintenance, wiring schematics, hydraulic schematics, circuit boards, voltage regulator board and other components shall be provided on delivery.

#### **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.

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 277XMFJPB5XD, 129% Ratio.

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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.

#### **GENERATOR MONITORING PANEL**

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

This unit shall be manufactured by FRC model FROG-D and mounted next to the circuit breaker panel. This generator output display shall consolidate five (5) generator monitoring instruments into one device. The display case shall be waterproof and have dimensions not to exceed 4 1/4" high by 4 1/4" wide by 3 1/4" deep.

The following continuous displays shall be provided with super bright LED digits more than 1/2" high:

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

The program shall support the accumulation of elapsed generator hours. Generator hours shall be displayed at the push of a button.

#### **LOADCENTER**

The loadcenter shall be a Cutler Hammer, BR Series, specifically designed for protection and distribution of 120/240 volt AC, such as lighting and small motor branch circuits. The loadcenter enclosure shall be made of 16 gauge galvanized sheet steel. The galvanized coating provides corrosion protection and as such does not require paint. All trims used on the BR Loadcenter shall be chromate sealed and finished with electro disposition epoxy paint (ASA61) which exceeds requirements for outdoor and indoor applications. A combination surface/flush cover with integral door shall be supplied.

The loadcenter shall be UL / CSA listed, **NO EXCEPTIONS** will be allowed.

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#### **OUTLETS AND CIRCUITS**

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

Two (2) 120 volt exterior outlets, one (1) each side rear of body.

- The outlet receptacle shall be 20 amp, twist-lock (NEMA L5-20R).

#### **LINE VOLTAGE ELECTRICAL SYSTEM**

##### **GENERAL REQUIREMENTS**

###### **Stability**

Any fixed line voltage power source producing alternating current (ac) shall produce electric power at 60 Hz,  $\pm 3$  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  $\pm 10$  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.

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#### Grounding

Grounding shall be in accordance with 250.34(A) and 250.34(B) of *NFPA 70*. Ungrounded systems shall not be used.

Only stranded or braided copper conductors shall be used for grounding and bonding.

The grounded current-carrying conductor (neutral) shall be insulated from the equipment-grounding conductors and from the equipment enclosures and other grounded parts.

The neutral conductor shall be colored white or gray in accordance with 200.6, "Means of Identifying Grounded Conductors," of *NFPA 70*.

Any bonding screws, straps, or buses in the distribution panel board or in other system components between the neutral and equipment-grounding conductor shall be removed and discarded.

#### Bonding

The neutral conductor of the power source shall be bonded to the vehicle frame. The neutral bonding connection shall occur only at the power source. In addition to the bonding required for the low voltage return current, each body and each driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor.

The conductor shall have a minimum ampere rating, as defined in 310.15, "Ampacities for Conductors Rated 0–2000 Volts," of *NFPA 70*, of 115 percent of the rated ampere on the power source specification label.

A single conductor that is sized to meet the low voltage and line voltage requirements shall be permitted to be used.

#### Ground Fault Circuit Interrupters

In special service vehicles incorporating a lavatory, sink, toilet, shower, or tub, 120 V, 15 or 20 A receptacles within 6 ft (1.8 m) of these fixtures shall have ground fault circuit interrupter (GFCI) protection. GFCIs integrated into outlets or circuit breakers or as stand-alone devices shall be permitted to be used in situations.

#### Power Source General Requirements

All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.

The power source shall be shielded from contamination that would prevent the power source from operating within its design specifications.



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#### Power Source Rating

For power sources of 8 kW or larger, the power source manufacturer shall declare the continuous duty rating that the power source can provide when installed on fire apparatus according to the manufacturer's instructions and run at 120°F (49°C) air intake temperature at 2000 ft (600 m) above sea level.

The rating on the power source specification label shall not exceed the declared rating from the power source manufacturer.

Access shall be provided to permit both routine maintenance and removal of the power source for major servicing. The power source shall be located such that neither it nor its mounting brackets interfere with the routine maintenance of the fire apparatus.

#### Instrumentation

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

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

- 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.

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#### 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).

#### Overcurrent Protection

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

#### Power Source Protection

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

The size of the main over current protection device shall not exceed 100 percent of the rated 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.

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#### Branch Circuit Overcurrent Protection

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

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

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

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

#### 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 prewiring 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*

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*and Receptacles*, or other recognized performance standards.

#### Wiring Schematics

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

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

#### **120/240 VAC SCENE LIGHTING**

##### **REAR TRIPOD SCENE LIGHTS**

Two (2) Fire Research Focus; model FCA656-S75, 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 endcaps. 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.

The lamphead shall have one (1) quartz halogen 750 watt 120 volt bulb. The bulb shall draw 6.3 amps and generate 19,600 lumens. The bulb shall be accessible through the front. The lamphead shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall incorporate heat-dissipating fins and be no more than 5" deep by 3 3/8" high by 10" wide. Scene lights shall be provided with a lens or a means for preventing damage from water spray and shall be listed for wet location usage.

A weatherproof on-off toggle switch shall be mounted in a switchbox 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.

#### **SHOP NOTES**

Make: Fire Research

Model: Focus

P/N: FCA656-S75-ON-6F3

Both lights on one side

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#### **COMMAND LIGHT TOWER WITH METAL HALIDE BULB OPTION AND LOWER BANK BACKLIGHT**

The apparatus shall be equipped with one (1) all-electric Command Light(s). The unit shall not require tapping into vehicle braking system to be operated, eliminating the chance for vehicle brake problems. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the all-electric light tower specified.

The light bank shall have four (4) weatherproof, 1,500 watt, 240-volt quartz halogen lights and (2) two 1,000 watt metal halide lights. Light heads shall be mounted in three (3) pairs, giving two (2) vertical lines of three (3) when the lights are in the upright position. Power for light bank shall be transmitted through power collecting rings thus allowing 360+ degree continuous rotation in either direction

The lower pair of light heads shall be capable of being rotated about a horizontal axis to provide light down on the vehicle or to the opposite side of the vehicle.

Positioning of the light bank shall be accomplished with maintenance free, heavy-duty 12-volt linear actuators.

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

Light tower shall be controlled with a hand-held umbilical line remote control. Command Light to be equipped with "Auto-Park" automatic nesting feature.

Command Light controls shall feature:

- Three (3) switches, one (1) for each light bank
- One (1) light bank rotation switch
- One (1) switch for elevating lower stage
- One (1) switch for elevating upper stage
- One (1) light to indicate when light bank is out of roof nest position
- One (1) light to indicate when light bank is rotated to proper nest position

Command Light controls shall be located per itemized compartment list.

The light tower shall have a full extension of 10' - 6" from mounted position and shall extend from nested position to full upright in 20 seconds.

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The overall size of the nested light tower shall be approximately 48" wide x 73" long x 15.1/4" high, and weigh approximately 350 lbs.

A flashing warning light signal shall be provided indicating when a light tower is not in nested position as required by NFPA 1901.

The operational envelope of the mast shall be automatically illuminated whenever the mast assembly is being raised, lowered, or rotated as required by NFPA 1901.

The Command Light shall be covered by a One Year limited warranty from defects in materials and workmanship.

The specified light tower(s) shall be recessed into the roof of the apparatus body. The recessed area shall have two (2) water drain holes (in opposite corners) with flexible 1" diameter hose routed to the area below the body.

#### **EQUIPMENT PAYLOAD WEIGHT ALLOWANCE**

In compliance with NFPA 1901 standards, the special service vehicle shall be designed for an equipment loading allowance of 4,000 lbs. of Texico Fire Department provided loose 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.
- One (1) Duo-Safety 1000-A series 14' aluminum 2-section extension ladder(s) shall be provided with the completed unit.
  - The ladder(s) shall be mounted on upper side wall of walkway.
- Two (2) Streamlight LiteBox Vehicle Mounting Systems shall be provided. Each flashlight shall be orange in color. Each flashlight shall have a 12 volt DC charger and vehicle mount kit. Each flashlight shall have a 20 watt spotlight style bulb and reflector. The flashlights shall be wired to battery direct unless otherwise specified by the customer.
  - The flashlight(s) shall be mounted on the completed unit, locations as per the Texico Fire Department.



# **Texico Fire Department**

## **SVI # 793**

### **Build Specification**

#### **NFPA EQUIPMENT DEALER SUPPLIED**

- One (1) 10# ABC Fire Extinguisher with Heavy Duty Vehicle Bracket
- One (1) 2-1/2 Gallon Pressurized Water Fire Extinguisher with Heavy Duty Vehicle Bracket
- One (2) #25 First Aid Kit
- Twelve (12) 28" Fluorescent Traffic Cones (NFPA)
- Two (2) Sets of six Power flare LED Traffic Control Lights
- Forty Eight (48) 30 Minute Road Flares W/Spike
- One (1) Six Pound Flat Head Axe with Mounting Hardware
- One (1) Six Pound Pick Head Axe with Mounting Hardware
- One (1) 6' Fiberglass Pike Pole W/D Handle & Mounting Hardware
- One (1) 8' Fiberglass Pike Pole W/D Handle & Mounting Hardware
- One (1) 10' Fiberglass Pike Pole Mounting Hardware
- One (1) 24" Insulated Bolt Cutters
- One (1) 30" Halligan Type Pro-Bar
- Two (2) Class 1 Life Safety Harness
- Two (2) 7/16" x 150' Life Safety Rope
- One (1) 1/2" x 150' Utility Rope
- Three (3) Rope Bags
- Two (2) 12' x 14' Vinyl Salvage Cover
- One (1) Holmatro Lift Bag Set Package #64
- One (1) Hurst Quick Strut Stabilization Kit (HU-362A491)
- Eight (8) Gallons Hurst Blue Fluid to Charge Power Unit, Hoses, Reels & Tools.

#### **REMAINING NFPA MINOR EQUIPMENT BY PURCHASER**

All other minor equipment not specified above, but required by NFPA 1901 before the unit is placed in service shall be supplied and mounted by Texico Fire Department.