# ST. PETERSBURG FIRE & RESCUE
## AIR / LIGHT APPARATUS
### SVI #865 PRODUCTION SPECIFICATION

## Contents

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**INTERNET IN-PROCESS SITE**

The Bidder shall post and maintain a website where the St. Petersburg Fire and Rescue 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.

**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.

**ROADABILITY**

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

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

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

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

**SERVICEABILITY**

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

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

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

**CONSTRUCTION DOCUMENTATION**

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

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

1. Owner's name and address
2. Apparatus manufacturer, model, and serial number
3. Chassis make, model, and serial number
    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 Automotive Fire Apparatus
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
    h. Lubrication charts
7. Operating instructions for the chassis, any major components such as a pump or aerial device, and any auxiliary systems
8. Precautions related to multiple configurations of aerial devices, if applicable
9. Instructions regarding the frequency and procedure for recommended maintenance
10. Overall apparatus operating instructions
11. Safety considerations
12. Limitations of use
13. Inspection procedures
14. Recommended service procedures
15. Troubleshooting guide
16. Apparatus body, chassis and other component manufacturer's warranties
17. Special data required by this standard
18. A material safety data sheet (MSDS) for any fluid that is specified for use on the apparatus

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

**NFPA REQUIRED DOCUMENTATION FORMAT - 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.

**STATEMENTOF 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.

**TESTING**

**ROAD TEST**

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

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

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

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

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

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

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

**LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST**

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

**TEST SEQUENCE**

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

**1. RESERVE CAPACITY TEST**

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

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

**2. ALTERNATOR PERFORMANCE TEST**

**TEST AT IDLE**

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

**TEST AT FULL LOAD**

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

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

**3. LOW VOLTAGE ALARM TEST**

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

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

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

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

**LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST**

**DOCUMENTATION**

The manufacturer shall deliver the following with the fire apparatus:

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

**UL 120/240 VAC CERTIFICATION**

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

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

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

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

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

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

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

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

1. Altitude
2. Barometric pressure
3. Relative humidity

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

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

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

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

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

**DOCUMENTATION**

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

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

**DIELECTRIC VOLTAGE WITHSTAND TEST**

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

The test shall be conducted as follows:

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

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

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

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

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

**WARRANTY**

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

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

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

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

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

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

**LOW VOLTAGE ELECTRICAL WARRANTY - FIVE (5) YEARS**

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

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

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

**PAINT LIMITED WARRANTY - TEN (10) YEARS**

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

**GRAPHICS LIMITED WARRANTY**

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

**CONSTRUCTION PERIOD**

The completed vehicle shall be delivered within three hundred sixty (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 St. Petersburg Fire and Rescue as to delays and to what extent these delays have in completing vehicle within the stated construction time period.

**OVERALL WIDTH**

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

# ST. PETERSBURG FIRE & RESCUE
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## SVI #865 PRODUCTION SPECIFICATION

**CAB CHASSIS SPECIFICATIONS**

**Freightliner**

M2 CHASSIS 4-DOOR CREW CAB
2014 MODEL YEAR SPECIFIED
SET BACK AXLE - TRUCK
STRAIGHT TRUCK PROVISION
LH PRIMARY STEERING LOCATION

### General Service

TRUCK CONFIGURATION
DOMICILED, USA (EXCLUDING CALIFORNIA AND CARB OPT-IN STATES)
RESCUE AND EMERGENCY SERVICE
EMERGENCY VEHICLES BUSINESS SEGMENT
FIXED LOAD COMMODITY
TERRAIN/DUTY: 100% (ALL) OF THE TIME, IN TRANSIT, IS SPENT ON PAVED ROADS
MAXIMUM 8% EXPECTED GRADE
SMOOTH CONCRETE OR ASPHALT PAVEMENT - MOST SEVERE IN-TRANSIT (BETWEEN SITES) ROAD SURFACE
MEDIUM TRUCK WARRANTY
EXPECTED FRONT AXLE(S) LOAD : 12000.0 lbs
EXPECTED REAR DRIVE AXLE(S) LOAD : 23000.0 lbs
EXPECTED GROSS VEHICLE WEIGHT CAPACITY : 35000.0 lbs
RATED MAXIMUM VEHICLE CAPACITY - GVWR : 35000.0 lbs

### Truck Service

RESCUE - STRAIGHT (NON DROP) FRAME NO MAIN DRIVELINE DRIVEN SPLIT-SHAFT PTO
EXPECTED BODY/PAYLOAD CG HEIGHT ABOVE FRAME "XX" INCHES : 32.0 in

### Engine

CUM ISC-350 350 HP @ 2000 RPM; 2200 GOV, 1000 LB/FT @ 1400 RPM

### Electronic Parameters

68 MPH ROAD SPEED LIMIT
CRUISE CONTROL SPEED LIMIT SAME AS ROAD SPEED LIMIT
PTO MODE ENGINE RPM LIMIT - 1100 RPM
PTO MODE BRAKE OVERRIDE - SERVICE BRAKE ONLY ENABLED
PTO RPM WITH CRUISE SET SWITCH - 700 RPM
PTO RPM WITH CRUISE RESUME SWITCH - 800 RPM
PTO MODE CANCEL VEHICLE SPEED - 5 MPH

PTO GOVERNOR RAMP RATE - 250 RPM PER SECOND
PTO MINIMUM RPM - 700
REGEN INHIBITIT SPEED THRESHOLD - 5 MPH

## Engine Equipment

2013 ONBOARD DIAGNOSTICS/2010 EPA/CARB EMISSION CERTIFICATION
NO 2008 CARB EMISSION CERTIFICATION
ENGINE MOUNTED OIL CHECK AND FILL
ONE PIECE VALVE COVER
SIDE OF HOOD AIR INTAKE WITH NFPA COMPLIANT EMBER SCREEN AND FIRE RETARDANT DONALDSON AIR CLEANER
DR 12V 275 AMP 40-SI QUADRAMOUNT PAD ALTERNATOR WITH REMOTE BATTERY VOLTAGE SENSE
(2) ALLIANCE MODEL 1231, GROUP 31, 12 VOLT MAINTENANCE FREE 2250 CCA THREADED STUD BATTERIES
BATTERY BOX FRAME MOUNTED
STANDARD BATTERY JUMPERS
SINGLE BATTERY BOX FRAME MOUNTED LH SIDE UNDER CAB
WIRE GROUND RETURN FOR BATTERY CABLES WITH ADDITIONAL FRAME GROUND RETURN
NON-POLISHED BATTERY BOX COVER
POSITIVE LOAD DISCONNECT WITH CAB MOUNTED CONTROL SWITCH WITH LOCKING PROVISION MOUNTED OUTBOARD DRIVER SEAT
POSITIVE AND NEGATIVE POSTS FOR JUMPSTART LOCATED ON FRAME NEXT TO STARTER
CUMMINS 18.7 CFM AIR COMPRESSOR WITH INTERNAL SAFETY VALVE
STANDARD AIR COMPRESSOR GOVERNOR
AIR COMPRESSOR DISCHARGE LINE
GVG, FIRE AND EMERGENCY SERVICE VEHICLES ENGINE WARNING
CUMMINS EXHAUST BRAKE INTEGRAL WITH VARIABLE GEOMETRY TURBO WITH ON/OFF DASH SWITCH
RH OUTBOARD UNDER STEP MOUNTED HORIZONTAL AFTERTREATMENT SYSTEM ASSEMBLY WITH RH B-PILLAR MOUNTED VERTICAL TAILPIPE
ENGINE AFTERTREATMENT DEVICE, AUTOMATIC OVER THE ROAD REGENERATION AND DASH MOUNTED REGENERATION REQUEST SWITCH
STANDARD EXHAUST SYSTEM LENGTH
RH HORIZONTAL TAILPIP, EXIT FORWARD OF REAR TIRES
6 GALLON DIESEL EXHAUST FLUID TANK
STANDARD DIESEL EXHAUST FLUID PUMP MOUNTING
LH MEDIUM DUTY STANDARD DIESEL EXHAUST FLUID TANK LOCATION
STANDARD DIESEL EXHAUST FLUID TANK CAP

HORTON DRIVEMASTER ON/OFF FAN DRIVE
AUTOMATIC FAN CONTROL WITHOUT DASH SWITCH, NON ENGINE MOUNTED
CUMMINS SPIN ON FUEL FILTER
COMBINATION FULL FLOW/BYPASS OIL FILTER
1100 SQUARE INCH ALUMINUM RADIATOR
ANTIFREEZE TO -34F, ETHYLENE GLYCOL PRE-CHARGED SCA HEAVY DUTY COOLANT
GATES BLUE STRIPE COOLANT HOSES OR EQUIVALENT
CONSTANT TENSION HOSE CLAMPS FOR COOLANT HOSES
RADIATOR DRAIN VALVE
LOWER RADIATOR GUARD
NO FRONT ENGINE PTO
ALUMINUM FLYWHEEL HOUSING
ELECTRIC GRID AIR INTAKE WARMER
DELCO 12V 38MT HD STARTER WITH INTEGRATED MAGNETIC SWITCH

## Transmission

ALLISON 3000 EVS AUTOMATIC TRANSMISSION WITH PTO PROVISION

## Transmission Equipment

NO AUXILIARY TRANSMISSION
WTEC CALIBRATION - 5 SPEED EVS WITH AUTO NEUTRAL (PACKAGE 174)
VEHICLE INTERFACE WIRING WITH BODY BUILDER CONNECTOR MOUNTED END OF FRAME
ELECTRONIC TRANSMISSION CUSTOMER ACCESS CONNECTOR FIREWALL MOUNTED
CUSTOMER INSTALLED CHELSEA 277 SERIES PTO
PTO MOUNTING, LH SIDE OF MAIN TRANSMISSION
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, IN RADIATOR END TANK
TRANSMISSION OIL CHECK AND FILL WITH ELECTRONIC OIL LEVEL CHECK
SYNTHETIC TRANSMISSION FLUID (TES-295 COMPLIANT)

## Front Axle and Equipment

DETROIT DA-F-14.7-3 14,700# FF1 71.5 KPI/3.74 DROP SINGLE FRONT AXLE
BENDIX ADB22X-V AIR DISC FRONT BRAKES
FIRE AND EMERGENCY SEVERE SERVICE, NON-ASBESTOS FRONT LINING
FRONT DISC BRAKE ROTORS

SKF SCOTSEAL PLUS XL FRONT OIL SEALS
VENTED FRONT HUB CAPS WITH WINDOW, CENTER AND SIDE PLUGS - OIL
STANDARD SPINDLE NUTS FOR ALL AXLES
FRONT AIR DISC BRAKE INTERNAL ADJUSTERS
TRW TAS-60 POWER STEERING
POWER STEERING PUMP
2 QUART SEE THROUGH POWER STEERING RESERVOIR
SYNTHETIC 75W-90 FRONT AXLE LUBE

## Front Suspension

13,300# TAPERLEAF FRONT SUSPENSION
MAINTENANCE FREE RUBBER BUSHINGS - FRONT SUSPENSION
FRONT SHOCK ABSORBERS

## Rear Axle and Equipment

RS-23-160 23,000# R-SERIES SINGLE REAR AXLE
5.38 REAR AXLE RATIO
IRON REAR AXLE CARRIER WITH STANDARD AXLE HOUSING
MXL 17T MERITOR EXTENDED LUBE MAIN DRIVELINE WITH HALF ROUND YOKES
BENDIX ADB22X-V AIR DISC BRAKES
FIRE AND EMERGENCY SEVERE SERVICE NON-ASBESTOS REAR BRAKE LINING
STANDARD BRAKE CHAMBER LOCATION
REAR DISC BRAKE ROTORS
SKF SCOTSEAL PLUS XL REAR OIL SEALS
AIR DISC LONGSTROKE 1-DRIVE AXLE SPRING PARKING CHAMBERS
REAR AIR DISC BRAKE INTERNAL ADJUSTERS
SYNTHETIC 75W-90 REAR AXLE LUBE

## Rear Suspension

24,000# FLAT LEAF SPRING REAR SUSPENSION WITH HELPER,WITH RADIUS ROD FOR FIRE/EMERGENCY SERVICE
SPRING SUSPENSION - NO AXLE SPACERS
STANDARD U-BOLT PAD
FORE/AFT CONTROL RODS

## Brake System

AIR BRAKE PACKAGE
WABCO 4S/4M ABS WITH TRACTION CONTROL
REINFORCED NYLON, FABRIC BRAID AND WIRE BRAID CHASSIS AIR LINES
FIBER BRAID PARKING BRAKE HOSE
STANDARD BRAKE SYSTEM VALVES

STANDARD AIR SYSTEM PRESSURE PROTECTION AND 85 PSI PRESSURE PROTECTION FOR AIR HORN(S)
STD U.S. FRONT BRAKE VALVE
RELAY VALVE WITH 5-8 PSI CRACK PRESSURE, NO REAR PROPORTIONING VALVE
BW AD-9 BRAKE LINE AIR DRYER WITH HEATER
AIR DRYER FRAME MOUNTED
STEEL AIR BRAKE RESERVOIRS
BW DV-2 AUTO DRAIN VALVE WITH HEATER - WET TANK

## Wheelbase & Frame

5650MM (222 INCH) WHEELBASE
11/32X3-1/2X10-15/16 INCH STEEL FRAME (8.73MMX277.8MM/0.344X10.94 INCH) 120KSI
1600MM (63 INCH) REAR FRAME OVERHANG
FRAME OVERHANG RANGE: 61 INCH TO 70 INCH
CALC'D BACK OF CAB TO REAR SUSP C/L (CA) : 109.2 in
CALCULATED EFFECTIVE BACK OF CAB TO REAR SUSPENSION C/L (CA) : 106.2
CALC'D FRAME LENGTH - OVERALL : 314.39
CALC'D SPACE AVAILABLE FOR DECKPLATE : 109.2 in
FRAME SPACE LH SIDE : 72.82 in
FRAME SPACE RH SIDE : 136.81 in
SQUARE END OF FRAME
FRONT CLOSING CROSSMEMBER
STANDARD WEIGHT ENGINE CROSSMEMBER
STANDARD MIDSHIP #1 CROSSMEMBER(S)
STANDARD REARMOST CROSSMEMBER
HEAVY DUTY SUSPENSION CROSSMEMBER

## Chassis Equipment

THREE-PIECE 14 INCH CHROME STEEL BUMPER WITH COLLAPSIBLE ENDS AND LH WING CUTOUT FOR FEDERAL MS100 SPEAKER
FRONT TOW HOOKS - FRAME MOUNTED
BUMPER MOUNTING FOR SINGLE LICENSE PLATE
NO MUDFLAP BRACKETS
NO REAR MUDFLAPS
FENDER AND FRONT OF HOOD MOUNTED FRONT MUDFLAPS
CLEAR FRAME RAILS FROM TRANSMISSION PTO OPENING TO 36 INCHES BACK OF CAB OUTBOARD/INSIDE/BELOW BOTH RAILS
GRADE 8 THREADED HEX HEADED FRAME FASTENERS

## Fuel Tanks

60 GALLON/227 LITER RECTANGULAR ALUMINUM FUEL TANK - LH
RECTANGULAR FUEL TANK(S)

POLISHING OF FUEL/HYDRAULIC TANK(S) WITH PAINTED BANDS
FUEL TANK(S) FORWARD
PLAIN STEP FINISH
FUEL TANK CAP(S)
ALLIANCE FUEL FILTER/WATER SEPARATOR
EQUIFLO INBOARD FUEL SYSTEM
HIGH TEMPERATURE REINFORCED NYLON FUEL LINE

## Tires

GOODYEAR G661 HSA 12R22.5 16 PLY RADIAL FRONT TIRES (MATCH MARKED)
GOODYEAR G288 11R22.5 16 PLY RADIAL REAR TIRES

## Hubs

CONMET PRE-SET BEARING IRON FRONT HUBS
CONMET PRE-SET BEARING IRON REAR HUBS

## Wheels

ALCOA 89464X 22.5X9.00 10-HUB PILOT 5.96 INSET ALUMINUM DISC FRONT WHEELS
ALCOA LVL ONE 88367X 22.5X8.25 10-HUB PILOT ALUMINUM DISC REAR WHEELS
POLISHED FRONT WHEELS; OUTSIDE ONLY
POLISHED REAR WHEELS; OUTSIDE OF OUTER WHEELS ONLY
FRONT WHEEL MOUNTING NUTS
REAR WHEEL MOUNTING NUTS

## Cab Exterior

154 INCH BBC HIGH ROOF ALUMINUM CONVENTIONAL CREW CAB
AIR CAB MOUNTS
CAB ROOF REINFORCEMENTS FOR ROOF MOUNTED COMPONENTS
NONREMOVABLE BUGSCREEN MOUNTED BEHIND GRILLE

LH AND RH EXTERIOR GRAB HANDLES WITH SINGLE RUBBER INSERT
HOOD MOUNTED CHROMED PLASTIC GRILLE
CHROMED HOOD MOUNTED AIR INTAKE GRILLE
FIBERGLASS HOOD
TUNNEL/FIREWALL LINER
DUAL 25 INCH ROUND STUTTER TONE HOOD MOUNTED AIR HORNS
SINGLE ELECTRIC HORN
DOOR LOCKS AND IGNITION SWITCH KEYED THE SAME
REAR LICENSE PLATE MOUNT END OF FRAME

INTEGRAL HEADLIGHT/MARKER ASSEMBLY WITH CHROME BEZEL
(5) AMBER MARKER LIGHTS
DAYTIME RUNNING LIGHTS
OMIT STOP/TAIL/BACKUP LIGHTS AND PROVIDE WIRING WITH SEPARATE STOP/TAIL WIRES TO 7 FEET BEYOND END OF FRAME
STANDARD FRONT TURN SIGNAL LAMPS
DUAL WEST COAST BRIGHT FINISH HEATED MIRRORS WITH LH AND RH REMOTE
DOOR MOUNTED MIRRORS
102 INCH EQUIPMENT WIDTH
LH AND RH 8" BRIGHT FINISH CONVEX MIRRORS MOUNTED UNDER PRIMARY MIRRORS
STANDARD SIDE/REAR REFLECTORS
63X14 INCH TINTED REAR WINDOW
TINTED DOOR GLASS LH AND RH WITH TINTED NON-OPERATING WING WINDOWS
MANUAL DOOR WINDOW REGULATORS
TINTED WINDSHIELD
2 GALLON WINDSHIELD WASHER RESERVOIR WITHOUT FLUID LEVEL INDICATOR, FRAME MOUNTED

## Cab Interior

OPAL GRAY CLOTH INTERIOR
MOLDED PLASTIC DOOR PANEL WITHOUT VINYL INSERT WITH ALUMINUM KICKPLATE LOWER DOOR
MOLDED PLASTIC DOOR PANEL WITHOUT VINYL INSERT WITH ALUMINUM KICKPLATE LOWER DOOR
BLACK MATS WITH SINGLE INSULATION
NO DASH MOUNTED ASH TRAYS AND LIGHTER
FORWARD ROOF MOUNTED CONSOLE WITH UPPER STORAGE COMPARTMENTS WITHOUT NETTING
IN DASH STORAGE BIN
(2) CUP HOLDERS LH AND RH DASH
GRAY/CHARCOAL FLAT DASH
SMART SWITCH EXPANSION MODULE
HEATER, DEFROSTER AND AIR CONDITIONER
STANDARD HVAC DUCTING
MAIN HVAC CONTROLS WITH RECIRCULATION SWITCH
STANDARD HEATER PLUMBING
DENSO HEAVY DUTY AIR CONDITIONER COMPRESSOR
BINARY CONTROL, R-134A
STANDARD INSULATION
SOLID-STATE CIRCUIT PROTECTION AND FUSES
12V NEGATIVE GROUND ELECTRICAL SYSTEM
DOME LIGHT WITH 3-WAY SWITCH ACTIVATED BY LH AND RH DOORS
CAB DOOR LATCHES WITH MANUAL DOOR LOCKS
(1) 12 VOLT POWER SUPPLY IN DASH

SEATS INC 911 UNIVERSAL SERIES HIGH BACK NON SUSPENSION DRIVER SEAT WITH FORE/AFT ADJUSTMENT, UNDERSEAT STORAGE AND NFPA 1901-2009 COMPLIANT SEAT SENSOR
SEATS INC 911 UNIVERSAL SERIES HIGH BACK NON SUSPENSION PASSENGER SEAT WITH UNDERSEAT STORAGE AND NFPA 1901-2009 COMPLIANT SEAT SENSOR

SEATS INC 911 UNIVERSAL SCBA NON SUSPENSION LH AND RH REAR PASSENGER SEATS WITH UNDER SEAT STORAGE AND NFPA 1901-2009 COMPLIANT SEAT SENSOR
LH AND RH INTEGRAL DOOR PANEL ARMRESTS
GRAY VINYL DRIVER SEAT COVER WITH GRAY CORDURA CLOTH BOLSTER AND HEADREST
GRAY VINYL FRONT PASSENGER SEAT COVER WITH GRAY CORDURA CLOTH BOLSTER AND HEADREST

GRAY VINYL REAR PASSENGER SEAT COVERS WITH GRAY CORDURA CLOTH BOLSTER AND HEADREST
3 POINT HIGH VISIBILITY ORANGE RETRACTOR DRIVER, RH FRONT AND REAR PASSENGER SEAT BELTS WITH NFPA 1901-2009 COMPLIANT SENSOR AND DASH HARNESS
ADJUSTABLE TILT AND TELESCOPING STEERING COLUMN
4-SPOKE 18 INCH (450MM) STEERING WHEEL
DRIVER AND PASSENGER INTERIOR SUN VISORS

## Instruments & Controls

GRAY DRIVER INSTRUMENT PANEL
GRAY CENTER INSTRUMENT PANEL
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
ELECTRONIC CRUISE CONTROL WITH SWITCHES IN LH SWITCH PANEL
IGNITION SWITCH WITH NON REMOVABLE KEY
ODOMETER/TRIP/HOUR/DIAGNOSTIC/VOLTAGE DISPLAY: 1X7 CHARACTER, 26 WARNING LAMPS, DATA LINKED, ICU3
DIAGNOSTIC INTERFACE CONNECTOR, 9 PIN, SAE J1939, LOCATED BELOW DASH
2 INCH ELECTRIC FUEL GAUGE
PROGRAMMABLE RPM CONTROL - ELECTRONIC ENGINE
ELECTRICAL ENGINE COOLANT TEMPERATURE GAUGE
2 INCH TRANSMISSION OIL TEMPERATURE GAUGE
ENGINE AND TRIP HOUR METERS INTEGRAL WITHIN DRIVER DISPLAY

ENHANCED STABILITY CONTROL
ELECTRIC ENGINE OIL PRESSURE GAUGE
NO RADIO
ELECTRONIC MPH SPEEDOMETER WITH SECONDARY KPH SCALE, WITHOUT ODOMETER
STANDARD VEHICLE SPEED SENSOR
ELECTRONIC 3000 RPM TACHOMETER
IGNITION SWITCH CONTROLLED ENGINE STOP
(1) RH FOOT SWITCH WITH DASH SWITCH FOR HORN BUTTON TO CONTROL AIR HORN, DEFAULT TO ELECTRIC <85 PSI

DIGITAL VOLTAGE DISPLAY INTEGRAL WITH DRIVER DISPLAY
SINGLE ELECTRIC WINDSHIELD WIPER MOTOR WITH DELAY
MARKER LIGHT SWITCH INTEGRAL WITH HEADLIGHT SWITCH
ONE VALVE PARK BRAKE SYSTEM WITH DASH VALVE CONTROL AUTONEUTRAL AND WARNING INDICATOR
SELF CANCELING TURN SIGNAL SWITCH WITH DIMMER, WASHER/WIPER AND HAZARD IN HANDLE
INTEGRAL ELECTRONIC TURN SIGNAL FLASHER WITH HAZARD LAMPS OVERRIDING STOP LAMPS

## Design

PAINT: ONE SOLID COLOR

## Color

CAB COLOR A: L0764EB LT RED ELITE BC
BLACK, HIGH SOLIDS POLYURETHANE CHASSIS PAINT

**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

**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".

**WEARING HELMET WARNING**

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

**FRONT BUMPER**

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

**AIR HORN(S)**

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

**FRONT TOW PROVISIONS**

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

**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
Exhaust shall be vertical.

**12 VDC ACCESSORY PLUG**

There shall be two (2) 12 volt accessory plug(s) furnished and installed in the cab area. The location of accessory plugs shall be determined by the St. Petersburg Fire and Rescue at the pre-construction meeting.
SHOP NOTES
12V power ports shall be located in the cab console

**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;

**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)

**STORAGE MODULE**

A storage module shall be provided in the cab. The module 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 paint shall match the interior cab color.

The final design and location of console shall be determined by the St. Petersburg Fire and Rescue at the pre-construction meeting.

**IGNITION KEY**

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

**SIX (6) – LED TIRE PRESSURE VISUAL INDICATORS**

Each tire shall be equipped with a VECSAFE heavy duty valve cap (or equal) LED indicator that indicates proper tire pressure.

**TIRE PRESSURE PLACARDS**

There shall be one (1) placard placed above each wheel for a total of four (4) placards. The placards shall have the correct tire pressure information for its respective tire.

**CAB CRASH TEST CERTIFICATION**

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

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

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

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

**CAB STEP COVER AND BATTERY COMPARTMENT**

The stock chassis step and fuel tank brackets shall be overlaid with 1/8" aluminum tread plate covers. The stepping surface of the covers will be overlaid with a non-slip NFPA approved stepping surface. There will be a removable panel to access and replace the chassis batteries and a hinged fuel fill access door.

The following options will be cut into the step cover:

**BATTERY JUMPER STUDS**

Two (2) battery jumper studs, one (1) positive with a red weather cover, and one (1) negative with a black weather cover shall be provided in the lower front portion of the driver step area. Jumper studs shall be identified with color coded label.

These studs shall allow this vehicle to be jump started due to a battery failure, or to allow easy access to assist another vehicle.

**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 St. Petersburg Fire and Rescue.

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.

**ROAD EMERGENCY SAFETY KIT**

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

One (1) 2.5 lb. ABC type vehicle fire extinguisher with bracket per DOT requirements shall be provided with the completed apparatus.

**INTERIOR OUTLET**

There shall be one (1) 120 VAC, 20 amp, duplex straight-blade receptacle (NEMA 5-20R) outlet(s) provided on the officers side of the cab center console.

- Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.

# ST. PETERSBURG FIRE & RESCUE
## AIR / LIGHT APPARATUS
### SVI #865 PRODUCTION SPECIFICATION

**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 St. Petersburg Fire and Rescue 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 St. Petersburg Fire and Rescue from such repair and shall NOT be used.

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

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

**EXTERIOR ALUMINUM BODY**

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

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

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

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

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

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

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

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

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

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

**DRIP RAILS**

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

**ROOF CONSTRUCTION**

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

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

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

**BODY SUBFRAME**

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

The body subframe shall be constructed from 6061T6 aluminum alloy tubing. Subframe shall consist of two (2) 2" x 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 on 16" centers, or as necessary to support walkway or heavy equipment.

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

**BODY MOUNTING**

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

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

**10" REAR STEP BUMPER**

The full width rear bumper shall be constructed from 2" x 2" x 1/4" aluminum tubing frame and covered with 3/16" NFPA compliant aluminum tread plate. The bumper shall extend from the rear vertical body panel 10" and provide a rear step with a minimum of 1/2" space at body for water drainage.

**REAR TOW EYES**

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

There shall be two (2) OnScene 9" Premium LED light(s) installed below bumper capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the vehicle in areas designed for personnel to climb onto or descend from the vehicle to the ground level.

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

**WHEEL WELL EXTERIOR PANEL**

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

**BODY FENDERETTES**

Formed rubber fenderettes shall be provided along the radius of the wheel well opening for a finished appearance.

**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.

# ST. PETERSBURG FIRE & RESCUE
# AIR / LIGHT APPARATUS
## SVI #865 PRODUCTION SPECIFICATION

**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, 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 per approved customer sprayout.

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.
SHOP NOTES
No undercoating.

- Paint Color: Match cab/chassis supplied paint color.

**PAINT WARRANTY**

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

**COMPARTMENT INTERIOR FINISH**

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

## REFLECTIVE STRIPE REQUIREMENTS

Material

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

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

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

Minimum Requirements

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

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

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

## GRAPHICS PROOF

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

## REFLECTIVE STRIPE - CAB SIDE

The reflective stripe material shall be 6" wide, 3M Scotchcal 680 series.
SHOP NOTES
The 6" stripe shall have 1/2" gold stripes on the top and bottom to make a 7" stripe.

- This reflective stripe shall be white in color.

## REFLECTIVE STRIPE - CAB FRONT

The reflective stripe material shall be 6" wide, 3M Scotchcal 680 series.
SHOP NOTES
The 6" stripe shall have 1/2" gold stripes on the top and bottom to make a 7" stripe.

- This reflective stripe shall be white in color.

**CHEVRON STRIPE - CAB BUMPER**

A reflective stripe shall be affixed to the front of cab. The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.
The approximate 10" wide Chevron retroreflective stripe shall be affixed to at least 25 percent of the width of the front of the apparatus with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees. Each stripe shall be 6" width. Chevron panels shall have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use. Chevron panels shall have a minimum 10 year warranty for material failure, and colorfastness.

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

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

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

**REFLECTIVE STRIPE - 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**

The reflective stripe material shall be 6" wide, 3M Scotchcal 680 series.
SHOP NOTES
The 6" stripe shall have 1/2" gold stripes on the top and bottom to make a 7" stripe.

- This reflective stripe shall be white in color.

The stripe shall remain in a straight line from the front of the front of cab to the rear body.

**CHEVRON REFLECTIVE STRIPE - REAR SIDES PANELS**

At least 50 percent of the rear-facing vertical surfaces, visible from the rear of the apparatus, excluding any pump panel areas not covered by a door, shall be equipped with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees. Each stripe 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. Each chevron panel shall be a full sheet and shall have a 3M UV over laminate to protect from UV rays, scene damage, and everyday use. Chevron panel shall have a minimum 10 year warranty for material failure, and colorfastness.

The stripe material shall be 3M Diamond Grade.
This reflective chevron stripe shall alternate red and fluorescent yellow-green in color.

## LETTERING

### GRAPHICS PROOF

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

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

### SIDE CAB DOOR LETTERING

There shall be forty (40) 3" high reflective letters furnished and installed on the vehicle.

- This reflective lettering shall be gold in color.

### UPPER BODY SIDE LETTERING

There shall be thirty (30) 10" high reflective letters furnished and installed on the vehicle.

- This reflective lettering shall be gold in color.

There shall be fourteen (14) 11" high reflective letters furnished and installed on the vehicle.

- This reflective lettering shall be red in color.

### CUSTOM DECAL LOGO - 12" -18"

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

One (1) copy of the above custom logo shall be provided and located on the completed vehicle as directed by St. Petersburg Fire and Rescue.
SHOP NOTES
These decals shall be located on the (S2 & C2) doors.

**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
- 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
- Slats are to have interlocking joints with a folding locking flange to provide security and prevent penetration by sharp objects
- Slats to be double-wall extrusion 1.366" high by .315" thick. Exterior surface to be flat and interior surface to be concave to prevent loose equipment from interfering with door operation
- Latch system to be a full width one piece lift bar operable by one (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
- Will be free from manufacturing defects for a period of up to 7 years from date of purchase provided that the Product is used under conditions of normal use, that regular periodic maintenance and service is performed and that the product was installed in accordance with R•O•M's instructions.

Each 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.

# ST. PETERSBURG FIRE & RESCUE
## AIR / LIGHT APPARATUS
### SVI #865 PRODUCTION SPECIFICATION

**BODY HEIGHT MEASUREMENTS**

The vertical body dimensions shall be as follows:

AHEAD OF REAR AXLE

| | Description | Dimension |
|---|---|---|
| A | Bottom of Subframe to Top of Body | 74.0" |
| B | Bottom of Subframe to Bottom of Body | 22.5" |
| C | Vertical Door Opening | |
| | -with roll-up door | 67.5" |
| | -with hinged door | 71.5" |

ABOVE REAR AXLE

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

BEHIND REAR AXLE

| | Description | Dimension |
|---|---|---|
| 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

| | Description | Dimension |
|---|---|---|
| G | Bottom of Drip Rail to Top of Body | 23.5" |

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

**BODY WIDTH DIMENSIONS**

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

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

**STREETSIDE COMPARTMENT - FRONT (S1)**

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

The compartment door opening shall be approximately 63.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- 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 LAYOUT**

- There shall be vertically mounted aluminum shelf-trac for specified component installation.
- There shall be one (1) adjustable shelf/shelves approximately 24" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges
- There shall be one (1) SCBA cylinder storage module for 8" OD (maximum) SCBA bottles. The maximum length of the SCBA cylinder shall be 24.75". The module shall have an exterior shell fabricated from 1/8" (.125) 3003H-14 aluminum alloy sheet. The module shall have a 2" slope, front to back to prevent cylinders from sliding out. The SCBA cylinder storage tubing shall be fabricated from PVC pipe to prevent damage or abrasion to cylinders. In addition there shall be rubber matting provided in the base of each storage tube for bottle protection and to prevent slipping.

SHOP NOTES
Located above fill station 5 wide 1 high
Brand: MSA Diameter: 7.25" (Must be less than 7.625") Length: 22" (with valve)

  - The SCBA cylinder module shall be capable of storing five (5) SCBA cylinders up to 7.5" diameter.

– There shall be one (1) SCBA cylinder storage module for 8" OD (maximum) SCBA bottles. Each PVC tube shall be capable of storing two (2) cylinders, end-to-end. The module shall have an exterior shell fabricated from 1/8" (.125) 3003H-14 aluminum alloy sheet. The module shall have a 2" slope, front to back to prevent cylinders from sliding out. The SCBA cylinder storage tubing shall be fabricated from PVC pipe to prevent damage or abrasion to cylinders. In addition there shall be rubber matting provided in the base of each storage tube for bottle protection and to prevent slipping.

SHOP NOTES
Located above frame forward compartment
Brand: MSA Diameter: 7.25" (Must be less than 7.625") Length: 22" (with valve)

  - The SCBA cylinder module shall hold twenty (20) individual 7.5" diameter PVC tubes with a capacity of (2) SCBA cylinders per tube.

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

- Two (2) OnScene 64" Access LED compartment lights, vertically mounted.

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

- There shall be one (1) 240 volt outlet(s) located in this compartment mounted on the forward wall unless noted otherwise.

SHOP NOTES
This outlet shall be dedicated for the Sierra Booster and located accordingly.

- The outlet receptacle(s) shall be 20 amp, twist-lock (NEMA L6-20R).

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

- One (1) Bauer model CFSII-2S, two (2) position SCBA cylinder filling station with built-in 4-bank manual cascade control panel shall be provided and installed with proper reinforcement for weight of fill station.

  - A Sierra 9000A-2, 5,000 PSI electrically driven air booster shall be provided with the air system.

  - An air storage refill port shall be provided on the fill station.

  - One (1) high pressure air hose reel gauge(s), adjustable regulator(s), and fill control(s) shall be provided on front panel with outlet port located on the rear of the fill station.

  - The fill station fill whip(s) shall terminate in a high pressure 4,500 PSI, CGA-347 threaded SCBA connectors.

- One (1) OnScene 9" LED ground light shall be provided below the body.

**STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S2)**

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

The compartment door opening shall be approximately 57.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- 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 LAYOUT**

**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 high in the compartment providing protection from equipment storage. Low pressure supply for outlet shall come from chassis air system. The connector shall be supplied by the St. Petersburg Fire and Rescue.

- There shall be vertically mounted aluminum shelf-trac for specified component installation.
- There shall be one (1) adjustable shelf/shelves approximately 24" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges
- There shall be one (1) bolt-in vertical compartment rear partition.

SHOP NOTES
Back Wall

- One (1) Hannay ECR1616-17-18 electric cable reel(s) capable of storing 150' of 10/3 electric cable. Reel(s) shall be designed to hold 110% of the capacity of cord length, with fully enclosed 45 amp, three (3) conductor collector rings. Reel(s) shall be mounted to channel structure that allows for side-to-side adjustment of reel position.
    - Power rewind control(s) shall be in a position where the operator can observe the rewinding operation and not be more than 72 in. (1830 mm) above the operator's standing position, and shall be marked with a label indicating its function.
    - A label shall be provided in a visible location adjacent to reel with following information: Current rating, Current type, Phase, Voltage, and Total cord length.

- The cable reel shall equipped with 150' of 10/3 SEOW black cable, a molded plastic ball clamp, and a single heavy duty L5-30 twist-lock female plug at the end.

SHOP NOTES
There shall be a label at each reel stating: "FAN MUST PLUG DIRECTLY IN TO CORD REEL"

- One (1) Akron model EJB series, cast aluminum electrical power distribution box with yellow powder coat painted finish shall be provided. The power distribution box shall meet all requirements described in NFPA 1901. The power distribution box shall include the following outlets mounted on a backlit face plate;

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

  - One (1) L5-20 single twist lock receptacle

  - One (1) L5-20 single twist lock receptacle

  - One (1) L5-20 single twist lock receptacle

  - One (1) L5-20 single twist lock receptacle

- One (1) Akron EJB treadplate vertical apparatus mounting bracket shall be provided.

SHOP NOTES
Junction box shall be mounted on the floor below the electric reel.

- The fairlead roller shall be mounted directly to the reel.

- Two (2) OnScene 36" Access LED compartment lights, vertically mounted.

- Air storage consisting of six (6) 491 SCF @ 6,000 PSI, ASME air storage cylinders with gauges and valves.

SHOP NOTES
Located center body over frame.

  - There will be a heavy walled welded steel rack with powder coat painted hammertone gray finish to hold all DOT or ASME cylinders.

**STREETSIDE COMPARTMENT - REAR (S3)**

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.

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

- 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 LAYOUT**

- There shall be vertically mounted aluminum shelf-trac for specified component installation.

- There shall be one (1) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.

- There shall be one (1) OnScene Solutions 84 series aluminum tray base with 90% extension, and rating of 250 lbs. Slide-out tray(s) base shall be approximately 24" deep and as wide as the compartment layout or door opening permits. It shall be located above the level of the chassis frame rails and shall be vertically adjustable in height. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will hold the tray in the closed position. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".

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

- Two (2) OnScene 64" Access LED compartment lights, vertically mounted.

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

**CURBSIDE COMPARTMENT - FRONT (C1)**

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

The compartment door opening shall be approximately 63.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- 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 LAYOUT**

- There shall be vertically mounted aluminum shelf-trac for specified component installation.
- There shall be one (1) OnScene Solutions 81 series aluminum tray base with 100% extension, and rating of 1,000 lbs. Slide-out tray(s) base shall be approximately 70" deep and as wide as the compartment layout or door opening permits located above the level of the chassis frame rails. Each slide base shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will lock the tray in the closed and full extension positions. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and shall have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
- There shall be one (1) OnScene Solutions 84 series aluminum tray base with 90% extension, and rating of 150 lbs. Slide-out tray(s) base shall be approximately 46" deep and as wide as the compartment layout or door opening permits. It shall be located above the level of the chassis frame rails and shall be vertically adjustable in height. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will hold the tray in the closed position. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
- 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.
- The 12 volt electrical distribution panel shall be located in the front transverse compartment above the subframe.
- Two (2) OnScene 64" Access LED compartment lights, vertically mounted.
- One (1) 120/240 VAC load center.
- The generator gauge panel.

**CURBSIDE COMPARTMENT - ABOVE REAR WHEEL (C2)**

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

The compartment door opening shall be approximately 57.0" wide.

This compartment shall have a ROM roll-up door.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- 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 LAYOUT**

**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 high in the compartment providing protection from equipment storage. Low pressure supply for outlet shall come from chassis air system. The connector shall be supplied by the St. Petersburg Fire and Rescue.

- There shall be vertically mounted aluminum shelf-trac for specified component installation.
- There shall be one (1) OnScene Solutions 84 series aluminum tray base with 90% extension, and rating of 150 lbs. Slide-out tray(s) base shall be approximately 30" deep and as wide as the compartment layout or door opening permits. It shall be located above the level of the chassis frame rails and shall be vertically adjustable in height. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will hold the tray in the closed position. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
- One (1) Hannay ECR1616-17-18 electric cable reel(s) capable of storing 150' of 10/3 electric cable. Reel(s) shall be designed to hold 110% of the capacity of cord length, with fully enclosed 45 amp, three (3) conductor collector rings. Reel(s) shall be mounted to channel structure that allows for side-to-side adjustment of reel position.
    - Power rewind control(s) shall be in a position where the operator can observe the rewinding operation and not be more than 72 in. (1830 mm) above the operator's standing position, and shall be marked with a label indicating its function.
    - A label shall be provided in a visible location adjacent to reel with following information: Current rating, Current type, Phase, Voltage, and Total cord length.

- The cable reel shall equipped with 150' of 10/3 SEOW black cable, a molded plastic ball clamp, and a single heavy duty L5-30 twist-lock female plug at the end.

SHOP NOTES
Cord to be a different color, other than black or yellow if possible.
There shall be a label at each reel stating: "FAN MUST PLUG DIRECTLY IN TO CORD REEL"

- One (1) Akron model EJB series, cast aluminum electrical power distribution box with yellow powder coat painted finish shall be provided. The power distribution box shall meet all requirements described in NFPA 1901. The power distribution box shall include the following outlets mounted on a backlit face plate;

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

  - One (1) L5-20 single twist lock receptacle

  - One (1) L5-20 single twist lock receptacle

  - One (1) L5-20 single twist lock receptacle

  - One (1) L5-20 single twist lock receptacle

- One (1) Akron EJB treadplate vertical apparatus mounting bracket shall be provided.

SHOP NOTES
Junction box shall be mounted on the floor below the electric reel.

- The fairlead roller shall be mounted directly to the reel.

- Two (2) OnScene 36" Access LED compartment lights, vertically mounted.

**CURBSIDE COMPARTMENT - REAR (C3)**

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.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The roll-up doors shall be equipped with an electric power lock system. All doors shall be locked or unlocked with activation from a single switch located in the cab.

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

**COMPARTMENT LAYOUT**

- There shall be vertically mounted aluminum shelf-trac for specified component installation.
- There shall be two (2) OnScene Solutions 84 series aluminum tray base with 90% extension, and rating of 250 lbs. Slide-out tray(s) base shall be approximately 24" deep and as wide as the compartment layout or door opening permits. It shall be located above the level of the chassis frame rails and shall be vertically adjustable in height. Each slide shall have a cable operated, spring loaded latch complimented by a large hand opening and red pull handle (Pull to Release) which will hold the tray in the closed position. Each tray shall be fabricated from 3/16" 3003 aluminum sheet and have welded corners to form a box type tray surface with an internal depth of approximately 3 ½".
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- Two (2) OnScene 64" Access LED compartment lights, vertically mounted.
- One (1) 12 volt terminal block(s) installed to provide 12 VDC power for equipment supplied by the St. Petersburg Fire and Rescue. Exact location shall be determined at the pre-construction meeting.

SHOP NOTES
Shall be located on the lower back wall at the forward side of the compartment, adjacent to the 120V Quad outlet.

- There shall be one (1) 120 volt quad outlet box located in this compartment on the lower back wall, adjacent to specified 12 volt terminal block..
- The outlet receptacle(s) shall be 20 amp, straight-blade (NEMA 5-20R).
    - Outlet(s) shall be powered by both the on-board generator and shore power system through a relay system.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

**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 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.

- The roll-up door slats and the door trim components shall be painted to match the single tone exterior color.

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

- 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 LAYOUT**

- There shall be vertically mounted aluminum shelf-trac for specified component installation.

- There shall be one (1) adjustable shelf/shelves approximately 46" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.

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

- There shall be one (1) module fabricated from 3/16" (.188) 3003H-14 aluminum alloy smooth sheet. The module will be designed for the following long tools and equipment:

  - The list of items to be stored in the transverse module shall be determined at the pre-construction meeting.

  - Six (6) St. Petersburg Fire and Rescue supplied sheets of 4' x 8' x ¾" sheets of plywood.

SHOP NOTES
Sheets can be cut if necessary. provide dimensions.

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

- One (1) Hannay ECR1616-17-18 electric cable reel(s) capable of storing 150' of 10/3 electric cable. Reel(s) shall be designed to hold 110% of the capacity of cord length, with fully enclosed 45 amp, three (3) conductor collector rings. Reel(s) shall be mounted to channel structure that allows for side-to-side adjustment of reel position.
  - Power rewind control(s) shall be in a position where the operator can observe the rewinding operation and not be more than 72 in. (1830 mm) above the operator's standing position, and shall be marked with a label indicating its function.
  - A label shall be provided in a visible location adjacent to reel with following information: Current rating, Current type, Phase, Voltage, and Total cord length.
  - The cable reel shall equipped with 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.

SHOP NOTES
There shall be a label at each reel stating: "FAN MUST PLUG DIRECTLY IN TO CORD REEL"

- One (1) Akron model EJB series, cast aluminum electrical power distribution box with yellow powder coat painted finish shall be provided. The power distribution box shall meet all requirements described in NFPA 1901. The power distribution box shall include the following outlets mounted on a backlit face plate;
  - A 12" pigtail that terminates in an L5-30 configuration to match the cable on the cord reel. The outlet configuration shall include:
  - One (1) L5-20 single twist lock receptacle
  - One (1) L5-20 single twist lock receptacle
  - One (1) L5-20 single twist lock receptacle
  - One (1) L5-20 single twist lock receptacle
- One (1) Akron EJB treadplate vertical apparatus mounting bracket shall be provided.

SHOP NOTES
Junction box shall be mounted on the shelf below the electric reel.

- The fairlead roller shall be mounted directly to the reel.
- Two (2) OnScene 64" Access LED compartment lights, vertically mounted.

**SIDE BODY PROTECTION - RUB RAIL**

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

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

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

**REAR BODY HANDRAILS**

There shall be two (2) vertical handrails on the rear of the body. Handrails shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions.

**ROOF ACCESS HATCH COVER**

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

**LOW VOLTAGE ELECTRICAL SYSTEM- 12 VDC**

General

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

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

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

Wiring

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

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

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

Wiring and Wire Harness Construction

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

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

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

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

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

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

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

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

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

Power Supply

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

Minimum Continuous Electrical Load

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

- The propulsion engine and transmission
- All legally required clearance and marker lights, headlights, and other electrical devices except windshield wipers and four-way hazard flashers
- 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)
- 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
- The minimum optical warning system, where the apparatus is blocking the right-of way
- The continuous electrical current required to simultaneously operate any fire pumps, aerial devices, and hydraulic pumps
- Other warning devices and electrical loads defined by the purchaser as critical to the mission of the apparatus

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

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

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

If electrical system voltage is monitored, the alarm shall sound if the system voltage at the battery or at the master load disconnect switch drops below 11.8 V for 12 V nominal systems, 23.6 V for 24 V nominal systems, or 35.4 V for 42 V nominal systems for more than 120 seconds.
A voltmeter shall be mounted on the driver's instrument panel to allow direct observation of the system voltage.

Electromagnetic Interference

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

Wiring Diagram

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

Low Voltage Electrical System Performance Test

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

**12 VOLT 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.

The final design of console shall be determined by the St. Petersburg Fire and Rescue at the pre-construction meeting.
SHOP NOTES
Console color shall be hammertone gray.

**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.

**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.

**BATTERY CONDITIONER**

One (1) Kussmaul model Auto Charge 1000 single battery conditioner, with 120 VAC input and 15 amp, 12 volt output shall be provided. This system shall monitor the condition of batteries and provide an electrical current at variable rates to overcome battery failure. A display shall be provided with charge indicator, remote mounted.

**SHORE POWER INLET**

One (1) Kussmaul 120 VAC, 20 amp shore power inlet with weather resistant snap cover shall be provided. 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".

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

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

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

**BACK-UP ALARM**

The body manufacturer shall furnish and install one (1) 107 dB(A) electronic back-up alarm. Back-up alarm to actuate automatically when the transmission gear selector is placed in reverse.

**REAR VIEW CAMERA**

There shall be one (1) ASA Voyager rear observation camera system provided and installed on completed unit. The system shall include one (1) model VCC150 high resolution CCD color camera installed on the rear body.

The camera image shall be displayed on a model AOM713, 7" color flat panel display (up to 3 camera inputs) located within the driver's range of view.
SHOP NOTES
Camera display location shall be review/determined upon chassis arrival to SVI.

**TAIL LIGHTS**

Rear body tail lights shall be vertically mounted and located per Federal Motor Vehicle Safety Standards, FMVSS and Canadian Motor Vehicle Safety Standards CMVSS. The following lights shall be furnished;

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

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

**MIDSHIP MARKER/TURN SIGNAL**

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

**MARKER LIGHTS**

The body shall be equipped with all necessary clearance lights and reflectors in accordance with Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS) regulations. All body clearance lights shall be Truck-Lite Model 18 LED to reduce the need for maintenance and lower the amp draw. Clearance lights shall be wired to the headlight circuit of the chassis.
SHOP NOTES
Add 2 part #047-15462 red lights and 2 part #047-15463 amber lights if not included with rubrails

**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 LIGHT**

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

**ELECTRONIC SIREN**

One (1) Federal EQ2B 200 watt, electronic siren/amplifier with digital output control head shall be provided. The siren control head shall be mounted within reach of the Driver.

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

**SIREN ACTIVATION**

There shall be two (2) foot switches 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
Siren activation shall also be added to the steering wheel horn button. Also, the siren shall be tied to the Emergency Master to prevent accidental activation.

**SIREN SPEAKER**

One (1) Federal BP200-EF, 200 watt siren speaker shall be provided and recess mounted behind the front bumper.

- The siren speaker shall be located on the center of front bumper.

**SIDE SCENE LIGHTS**

There shall be four (4) Whelen Super LED 900 series (9" x 7") recess mounted scene lights (9SC0ENZR) provided on the upper body. Light quantity shall be divided equally per side. Each light will have twenty-four LED diodes that draw a total of 4.0 amps, with 3,000 lumens. The light shall be an 8-32 degree gradient lens and chrome flange.
Two (2) switches shall be provided, one (1) for the streetside scene lights, and one (1) for the curbside scene lights.
SHOP NOTES
The rearward side scene lights shall activate when the transmission is placed in reverse as well as the rear scene lights

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

**REAR SCENE LIGHTS**

Two (2) Whelen Super LED 900 series (9" x 7") recess mounted scene lights (9SC0ENZR) shall be provided on the upper rear body to light the work area immediately behind the vehicle to a level of at least 3 fc (30 lx) within a 10 ft × 10 ft (3 m × 3 m) square. Each light will have twenty-four LED diodes that draw a total of 4.0 amps, with 3000 Lumens. The light shall be an 8-32 degree gradient lens and chrome flange.

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

The rear scene lights shall also be activated when the apparatus is in reverse.
SHOP NOTES
The rearward side scene lights shall activate when the transmission is placed in reverse as well as the rear scene lights

**WARNING LIGHT PACKAGE**

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

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

For the purposes of defining and measuring the required optical performance, the upper and lower warning levels shall be divided into four (4) warning zones. The four zones shall be determined by lines drawn through the geometric center of the apparatus at 45 degrees to a line drawn lengthwise through the geometric center of the apparatus. The four (4) zones shall be designated A, B, C, and D in a clockwise direction, with zone A to the front of the apparatus.

Each optical warning device shall be installed on the apparatus and connected to the apparatus's electrical system in accordance with the requirements of this standard and the requirements of the manufacturer of the device.

A master optical warning system switch that energizes all the optical warning devices shall be provided.

The optical warning system on the fire apparatus shall be capable of two (2) separate signaling modes during emergency operations. One (1) mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right-of-way. One (1) mode shall signal that the apparatus is stopped and is blocking the right-of-way. The use of some or all of the same warning lights shall be permitted for both modes provided the other requirements of this chapter are met.

A switching system shall be provided that senses the position of the parking brake or the park position of an automatic transmission. When the master optical warning system switch is closed and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for the right-of-way shall be energized. When the master optical warning system switch is closed and the parking brake is on or the automatic transmission is in park, the warning devices signaling the blockage of the right-of-way shall be energized. The system shall be permitted to have a method of modifying the two (2) signaling modes.

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

**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:

| SECTION | INTERNAL COMPONENTS | LENS COLOR |
|---|---|---|
| 1 | Red Side Linear LED | Clear |
| 2 | Red Front Corner Linear LED | Clear |
| 3 | Clear Linear LED | Clear |
| 4 | Blank | Clear |
| 5 | Red Linear LED | Clear |
| 6 | Blank (Opticom if specified) | Clear |
| 7 | Blank (Opticom if specified) | Clear |
| 8 | Red Linear LED | Clear |
| 9 | Blank | Clear |
| 10 | Clear Linear LED | Clear |
| 11 | Red Front Corner Linear LED | Clear |
| 12 | Red Side Linear LED | Clear |

All clear lights shall shut down when the parking brake is set to comply with "Blocking" mode requirements as outlined in NFPA 1901.
SHOP NOTES
Add MK8H lightbar mount on Wecad program if there is a brow light on cab
There shall be clear Take Down lights in positions 4 & 9 on the lightbar

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 900 series (9" x 7") Red Linear Super-LED lights (90RR5FRR) 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.

UPPER FORWARD CORNER WARNING LIGHTS

There shall be two (2) Whelen 900 series (9" x 7") Red Linear Super-LED lights (90RR5FRR) 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 900 series (9" x 7") Linear Super-LED lights (90RR5FRR) provided, two (2) each side. Each light shall have a red lens and chrome flange.

There shall be one (1) Whelen 900 series (9" x 7") Linear Super-LED lights (90AA5FAR) provided, two (2) each side. Each light shall have a amber lens and chrome flange. It shall be centered on the upper rear body panel.
SHOP NOTES
There shall be one (1) amber warning light, centered on the upper rear body panel.

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.

# ST. PETERSBURG FIRE & RESCUE
## AIR / LIGHT APPARATUS
### SVI #865 PRODUCTION SPECIFICATION

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 400 series (4" x 3") red Linear Super-LED lights (40R02ZRR) 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 WHEELWELL AREA)

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 - BODY INTERSECTOR LIGHT (BODY REAR CORNERS)

There shall be two (2) Whelen 500 series (5" x 2") TIR6 Super-LED lights (50R03ZRR) provided, one (1) each side. Each light shall have a red lens and chrome finished flange.
SHOP NOTES
Located at rear door jamb.

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.
SHOP NOTES
Located lower position in taillight bezel.

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

**LINE VOLTAGE ELECTRICAL SYSTEM**

**ONAN PTO GENERATOR**

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

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

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

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

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

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

**GENERATOR ENGAGEMENT**

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

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

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

**WARRANTY PERIOD**

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

**GENERATOR SPLASH GUARD**

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

**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.

**ENGINE SPEED CONTROL**

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

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

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

**LOADCENTER**

The loadcenter shall be a Cutler Hammer, BR Series, specifically designed for protection and distribution of 120/240 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.

**GENERATOR MONITORING PANEL**

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

- Generator frequency in hertz
- 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.

**SHORE POWER INLET - BATTERY CHARGER**

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

**LINE VOLTAGE ELECTRICAL SYSTEM**

**GENERAL REQUIREMENTS**

Stability

Any fixed line voltage power source producing alternating current (ac) shall produce electric power at 60 Hz, ±3 Hz when producing power at all levels between no load and full rated power. Any fixed line voltage power source shall produce electric power at the rated voltage ±10 percent when producing power at all levels between no load and full rated power.

The maximum voltage supplied to portable equipment shall not exceed 275 volts to ground. Higher voltage shall be permitted only when used to operate fixed wired, permanently mounted equipment on the apparatus.

Conformance with National Electrical Code

All components, equipment, and installation procedures shall conform to *NFPA 70*, *National Electrical Code*, except where superseded by the requirements of this chapter. Where the requirements of this chapter differ from those in *NFPA 70*, the requirements in this chapter shall apply.

Where available, line voltage electrical system equipment and materials included on the apparatus shall be listed and used only in the manner for which they have been listed. All equipment and materials shall be installed in accordance with the manufacturer's instructions.

Location Ratings

Any equipment used in a dry location shall be listed for dry locations. Any equipment used in a wet location shall be listed for wet locations.

Any equipment, except a PTO-driven generator, used in an underbody or under chassis location that is subject to road spray shall be either listed as Type 4 or mounted in an enclosure that is listed as Type 4.

If a PTO-driven generator is located in an underbody or under chassis location, the installation shall include a shield to prevent road spray from splashing directly on the generator.

Grounding

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

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

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

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

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

Bonding

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

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

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

Ground Fault Circuit Interrupters

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

Power Source General Requirements

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

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

Power Source Rating

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

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

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

Instrumentation

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

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

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

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

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

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

Operation

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

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

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

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

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

Power Supply Assembly

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

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

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

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.

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.

Wiring Methods

Fixed wiring systems shall be limited to the following:

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

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

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

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

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

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

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

Splices shall be made only in a listed junction box.

Additional Requirements for Flexible Cord Installations

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

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

Wiring Identification

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

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

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

Wiring System Components

Only stranded copper conductors with an insulation rated for temperatures of at least 194°F (90°C) and wet locations shall be used. Conductors in flexible cord shall be sized in accordance with Table 400.5(A) of *NFPA 70*. Conductors used in conduit shall be sized in accordance with 310.15, "Ampacities for Conductors Rated 0–2000 Volts," of *NFPA 70*. Aluminum or copper-clad aluminum conductors shall not be used.

All boxes shall conform to and be mounted in accordance with Article 314, "Outlet, Device, Pull, and Junction Boxes; Conduit Bodies; Fittings; and Manholes," of *NFPA 70*. All boxes shall be accessible using ordinary hand tools. Boxes shall not be permitted behind welded or pop-riveted panels.

The maximum number of conductors permitted in any box shall be in accordance with 314.16, "Number of Conductors in Outlet, Device, and Junction Boxes, and Conduit Bodies," of *NFPA 70*.

All wiring connections and terminations shall provide a positive mechanical and electrical connection. Connectors shall be installed in accordance with the manufacturer's instructions. Wire nuts or insulation displacement and insulation piercing connectors shall not be used.

Each switch shall indicate the position of its contact points (i.e., open or closed) and shall be rated for the continuous operation of the load being controlled. All switches shall be marked with a label indicating the function of the switch. Circuit breakers used as switches shall be "switch rated" (SWD) or better. Switches shall simultaneously open all associated line voltage conductors. Switching of the neutral conductor alone shall not be permitted.

Line voltage circuits controlled by low voltage circuits shall be wired through properly rated relays in listed enclosures that control all non-grounded current-carrying conductors.

Receptacles and Inlet Devices

Wet and Dry Locations

All wet location receptacle outlets and inlet devices, including those on hardwired, remote power distribution boxes, shall be of the grounding type, provided with a wet location cover, and installed in accordance with Section 406.8, "Receptacles in Damp or Wet Locations," of *NFPA 70*.

All receptacles located in a wet location shall be not less than 24 in. (600 mm) from the ground. Receptacles on off road fire apparatus shall be a minimum of 30 in. (750 mm) from the ground. All receptacles located in a dry location shall be of the grounding type and shall be at least 12 in. (300 mm) above the interior floor height. No receptacle shall be installed in a face-up position.

The face of any wet location receptacle shall be installed in a plane from vertical to not more than 45 degrees off vertical.

Receptacle Label

Each receptacle shall be marked with a label indicating the nominal line voltage (120 volts or 240 volts) and the current rating in amps of the circuit. If the receptacle is DC or other than single phase, that information shall also be marked on the label.

All receptacles and electrical inlet devices shall be listed to UL 498, *Standard for Safety Attachment Plugs and Receptacles*, or other recognized performance standards.

Receptacles used for DC voltages shall be rated for DC service.

Wiring Schematics

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

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

**120/240 VAC SCENE LIGHTING**

**LIGHT TOWER**

One (1) Command Light, CL Series light tower(s) shall be provided and installed on the completed unit. A flashing warning light shall be provided in cab, indicating when a light tower is not in nested position as required by NFPA 1901.

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

The light tower shall extend 130" above the mounting surface and shall extend to full upright position in less than 15 seconds. The overall size of nested light tower shall be approximately 40" wide x 73" long x 12" high and weigh approximately 310 pounds.

Light Tower Construction and Design

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

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

Light Tower Electrical System

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

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

Light Tower Floodlights

The Command Light CL615-MH2 shall be equipped with the following bank of floodlights:

| | |
|---|---|
| Floodlight manufacturer: | Command Light |
| Number of lamp heads: | Four (4) 1,500 watt Quartz Halogen<br>Two (2) 1,000 watt Metal Halide |
| Voltage: | 120/240 volts |
| Total watts of light tower: | 8,000 watts |
| Configuration: | The light heads shall be mounted with three (3) on each side of the light tower, giving two (2) vertical lines of three (3) when the lights are in the upright position. |

Light Tower Backlight Option

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

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

Light Tower Paint

The light tower shall be electrostatically powder coated with a hammer tone gray color.

Light Tower Controls

The light tower shall be operated with a hand-held 12-foot umbilical line remote control. The storage station for the remote control unit shall be equipped with a button to activate the "Auto-Park" automatic nesting feature. The remote control shall be located per the itemized compartment list and include;

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

Light Tower Mounting

The specified light tower(s) shall be recessed into the roof of body to allow light tower(s) to be stowed below roof level. The floor and side walls of recessed area shall be fabricated as a separate module from 3/16" aluminum treadplate with an overlapping 3" flange around perimeter roof line. The recessed area shall be completely water tight. All electrical connections made to light tower shall be located on sidewalls for a water tight connection.

The recessed area shall have two (2) water drain holes (in opposite corners) with flexible 1" diameter hose routed to the area below the body.

# ST. PETERSBURG FIRE & RESCUE
## AIR / LIGHT APPARATUS
### SVI #865 PRODUCTION SPECIFICATION

**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 St. Petersburg Fire and Rescue 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.

- There shall be two (2) NFPA approved folding aluminum wheel chocks provided for 44" diameter tires that together will hold the vehicle when loaded to its GVWR or GCWR, on a hard surface with a 20 % grade, with the transmission in neutral, and the parking brake released.

    - The wheel chock(s) shall be mounted on the apparatus, location as per the St. Petersburg Fire and Rescue.

SHOP NOTES
Wheel chocks shall be mounted at the streetside rear wheels, one (1) chock in front of the wheels and one (1) chock behind the wheels.

- Two (2) Streamlight FireBox halogen flashlight(s) shall be provided. Each flashlight shall be orange in color and have a 12 volt DC charger and vehicle mount kit. Each flashlight shall have a 8 watt halogen spotlight style bulb and reflector with 2 ultra-bright LED taillights. The flashlight(s) two (2) be wired to battery direct unless otherwise specified by St. Petersburg Fire and Rescue.

    - The flashlight(s) shall be mounted on the completed unit in the lower area of compartment S1 and compartment (C1).

- Two(2) delaer supplied Pelican 9420 XL tri-pod lights

**REMAINING NFPA MINOR EQUIPMENT BY PURCHASER**

All other minor equipment not specified above, but required by NFPA 1901, section 10.5.1 shall be supplied and mounted by St. Petersburg Fire and Rescue before the unit is placed in emergency service.