

Prepared for Fire Department
Prepared by SVI Dealer
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ROCK SOLID QUALITY

Fire Department

SVI Trucks – Production Specifications

LIABILITY INSURANCE

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

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

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

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

Excess Umbrella Liability coverage of \$6,000,000.00 each occurrence, Aggregate of \$6,000,000.00. Garage Keepers Liability coverage of \$6,000,000.00 combined limit.

All insurance policies must be;

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

INTERNET IN-PROCESS SITE

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

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ENGINEERING DRAWINGS

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

The engineering drawings shall be produced on computer aided design (CAD) equipment to assure critical tolerance and detail only available with CAD equipment. The drawings shall be on "B" size paper, 17" x 11" in size, and views must be 1/4" = 1' - 0" scale. This shall allow the Fire Department the ability to compare drawings of all manufacturers on an "equal" basis. The drawings shall be completed only by the body manufacturer, and must be exactly to Fire Department specifications. Submission of "similar to" drawings or "statements referring to later submission of drawings after award of contract" shall be automatically rejected.

Since the request for proposal package will require extensive evaluation by Fire Department, all Bidders must submit exactly the same engineering drawings at the same scale, on the same size paper. For easy comparison of drawings, they must be on a 17" x 11" sheet as follows:

- All bid drawings will be stamped BID DRAWING.
- All items shown on the drawing will be pre-designed with regards to layout and functionality prior to the completion of the BID DRAWING.
- Two (2) 17" x 11" color drawings will be supplied with the bid proposal. Black and white or blue line drawings will not be accepted.
- There shall be five (5) views of the truck with the doors closed (Top, Left, Right, Front, Rear), four (4) views of the truck with the doors open (Top, Left, Right, Rear) and four (4) views of any walk-in area (Top, Left, Right, Rear).
- All compartment door openings and usable space shall be clearly shown in inches.
- The trucks overall length, height, width, wheelbase and cab-to-axle dimensions shall be clearly shown.
- The angles of approach and departure shall be shown in the maximum loaded condition to the nearest degree.
- All lighting packages will be clearly shown on the drawing and verified accurate per the most current NFPA standards (when applicable).
- The exterior view shall show all scene lights, marker lights, speakers, horns, exhaust, tow points, exterior outlets, windows, winch receivers, tow hitches, exterior ladders and any other item important to the function of the vehicle.
- The open view shall show all trays, shelves, air system components, hydraulic components, tool boards, storage modules and any other items important to the function of the vehicle.
- The interior view for all walk-in areas shall show all seating positions, desks, cabinets, windows, tech equipment, radio locations and any other item important to the function of the vehicle.
- Any changes to the BID drawing will require a revision which will be clearly annotated in the upper right hand side of the drawing showing the revision number, reason for the revision, date and who made the changes.

Text Block Items;

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

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RESPONSIBILITY OF PURCHASER

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

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

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

RESPONSIBILITY OF CONTRACTOR

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

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

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

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

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

VEHICLE STABILITY SUPPLIED WITH CAB/CHASSIS

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

FIRE APPARATUS PERFORMANCE

The fire apparatus shall meet the requirements of this standard at elevations of 2000 ft (600 m) above sea level.

The fire apparatus shall meet all the requirements of this standard while stationary on a grade of 6 percent in any direction.

The fire apparatus shall meet the requirements of this standard in ambient temperature conditions between 32°F (0°C) and 110°F (43°C).

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HIGHWAY PERFORMANCE

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

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

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

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

SERVICEABILITY

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

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

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

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FIRE APPARATUS DOCUMENTATION

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

- 1) The manufacturers record of apparatus construction details, including the following documents:
 - a) Owner's name and address
 - b) Apparatus manufacturer, model, and serial number
 - c) Chassis make, model, and serial number
 - d) GAWR of front and rear axles and GVWR
 - e) Front tire size and total rated capacity in pounds (kilograms)
 - f) Rear tire size and total rated capacity in pounds (kilograms)
 - g) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
 - h) Engine make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio
 - i) Type of fuel and fuel tank capacity
 - j) Electrical system voltage and alternator output in amps
 - k) Battery make, model, and capacity in cold cranking amps (CCA)
 - l) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
 - m) Ratios of all driving axles
 - n) Maximum governed road speed
 - o) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), maximum discharge pressure capability rating, and serial number
 - p) Pump transmission make, model, serial number, and gear ratio
 - q) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
 - r) Water tank certified capacity in gallons or liters
 - s) Foam tank (if provided) certified capacity in gallons (liters)
 - t) Aerial device type, rated vertical height in feet (meters), rated horizontal reach in feet (meters), and rated capacity in pounds (kilograms)
 - u) Paint manufacturer and paint number(s)
 - v) Company name and signature of responsible company representative
 - w) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose)
- 2) Certification of compliance of the optical warning system (see 13.8.16)
- 3) Siren manufacturer's certification of the siren (see 13.9.1.1)
- 4) Written load analysis and results of the electrical system performance tests (see 13.14.1 and Section 13.15)
- 5) Certification of slip resistance of all stepping, standing, and walking surfaces (see 15.7.4.5)
- 6) If the apparatus has a fire pump, the pump manufacturer's certification of suction capability (see 16.2.4.1)
- 7) If the apparatus is equipped with a fire pump and special conditions are specified by the purchaser, the pump manufacturer's certification of suction capacity under the special conditions (see 16.2.4.2)
- 8) If the apparatus has a fire pump, a copy of the apparatus manufacturer's approval for stationary pumping applications (see 16.3.1)
- 9) If the apparatus has a fire pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed (see 16.3.2.2)
- 10) If the apparatus has a fire pump, the pump manufacturer's certification of the hydrostatic test (see 16.5.2.2)
- 11) If the apparatus has a fire pump with a maximum discharge pressure capability rating that exceeds the hydrostatic test pressure of 16.5.2.1, the pump manufacturer's certification of the hydrodynamic test
- 12) If the apparatus has a fire pump, the certification of inspection and test for the fire pump (see 16.13.1.1.5 or 16.13.1.2.4 as applicable)
- 13) If the apparatus is equipped with an auxiliary pump, the apparatus manufacturer's certification of the hydrostatic test (see Section 17.13)
- 14) When the apparatus is equipped with a water tank, the certification of water tank capacity (see Section 18.6)

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- 15) If the apparatus has an aerial device, the certification of inspection and test for the aerial device (*see Section 19.24*)
- 16) If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1911
- 17) If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy (*see 20.10.4.2*) and the final installer's certification the foam proportioning system meets this standard (*see 20.11.2*)
- 18) If the system has a CAFS, the documentation of the manufacturer's pre delivery tests (*see Section 21.9*)
- 19) If the apparatus has a line voltage power source, the certification of the test for the power source (*see 22.15.7.2*)
- 20) If the apparatus is equipped with an air system, air tank certificates (*see 24.5.1.2*), the SCBA fill station certification (*see 24.9.6*), and the results of the testing of the air system installation (*see 24.14.5 and 24.15.4*)
- 21) Any other required manufacturer test data or reports

OPERATIONS AND SERVICE DOCUMENTATION

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

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

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

- 1) Manufacturer's name and address
- 2) Country of manufacture
- 3) Source for service and technical information
- 4) Parts replacement information
- 5) Descriptions, specifications, and ratings of the chassis, pump (if applicable), and aerial device (if applicable)
- 6) Wiring diagrams for low voltage and line voltage systems to include the following information:
 - a) Pictorial representations of circuit logic for all electrical components and wiring
 - b) Circuit identification
 - c) Connector pin identification
 - d) Zone location of electrical components
 - e) Safety interlocks
 - f) Alternator–battery power distribution circuits
 - g) Input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems
- 7) Lubrication charts
- 8) Operating instructions for the chassis, any major components such as a pump or aerial device, and any auxiliary systems
- 9) Precautions related to multiple configurations of aerial devices, if applicable
- 10) Instructions regarding the frequency and procedure for recommended maintenance
- 11) Overall apparatus operating instructions
- 12) Safety considerations
- 13) Limitations of use
- 14) Inspection procedures
- 15) Recommended service procedures
- 16) Troubleshooting guide
- 17) Apparatus body, chassis and other component manufacturer's warranties
- 18) Special data required by this standard
- 19) A material safety data sheet (MSDS) for any fluid that is specified for use on the apparatus

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

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NFPA REQUIRED DOCUMENTATION FORMAT - USB FLASH DRIVE

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

FIRE APPARATUS SAFETY GUIDE

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

STATEMENT OF EXCEPTIONS

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

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

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

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

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CARRYING CAPACITY

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

The estimated in-service weight shall include the following:

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

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

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

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

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

Wording on the label shall indicate that the information shown was current when the apparatus was manufactured and that, if the overall height changes while the vehicle is in service, the fire department must revise that dimension on the plate.

| | | Equipment Allowance | | |
|---|--|--|------------|------------|
| Apparatus Type | Storage Areas | Apparatus Size | lb. | kg. |
| Pumper Fire Apparatus | Equip. minimum of 40 cu ft (1.1 cu mt) of enclosed compartmentation. | Less than 250 cu ft (7 cu mt) compartment space | 2,000 | 910 |
| | Hose minimum of 30 cu ft (0.8 cu mt) for 2 1/2" (65 mm) or larger fire hose. | 250 cu ft (7 cu mt) or more of compartment space | 2,500 | 1,135 |
| | (2) areas for pre-connects each minimum of 3.5 cu.ft. (0.1 cu.mt.) for 1 1/2" (38 mm) or larger fire hose. | | | |
| Compartment space for pumpers is calculated based on the inside dimensions of the enclosed compartment. | | | | |

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TESTING

ROAD TEST

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

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

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

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

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

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

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

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

TEST SEQUENCE

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

1. RESERVE CAPACITY TEST

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

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

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2. ALTERNATOR PERFORMANCE TEST

TEST AT IDLE

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

TEST AT FULL LOAD

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

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

3. LOW VOLTAGE ALARM TEST

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

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

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

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

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

DOCUMENTATION

The manufacturer shall deliver the following with the fire apparatus:

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

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UL PUMP CERTIFICATION

The apparatus upon completion shall be tested and certified by Underwriters Laboratories, Inc. (UL). The certification tests shall follow the guide lines outlined in NFPA 1901 "Standard for Fire Apparatus".

If the fire pump has a rated capacity of 750 gpm (3000 L/min) or greater, the pump shall be tested after the pump and all its associated piping and equipment have been installed on the apparatus.

A three (3) hour pumping test from draft shall be completed and certified to perform as listed below;

- 100% of rated capacity at 150 psi (1,000 kPa) net pressure, 2 hours
- 70% of rated capacity at 200 psi (1,400 kPa) net pressure, 1/2 hour
- 50% of rated capacity at 250 psi (1,700 kPa) net pressure, 1/2 hour

The test shall include at least the pumping test, the pumping engine overload test, the pressure control system test, the priming device tests, and the vacuum test.

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 500 psi (3,400 kPa).

The pump shall comply with the applicable requirements of "Standard for Fire Apparatus 1901, latest edition.

The pump shall be capable of producing fire streams that are free from objectionable pulsation under all normal operating conditions.

If the apparatus is equipped with a pump driven by the chassis engine designed for both stationary pumping and pump-and-roll, the test shall verify that the engine speed control at the pump operator's panel cannot be advanced when either of the following conditions exists:

- (1) The chassis transmission is in neutral, the parking brake is off, and the pump shift status in the driving compartment is disengaged.
- (2) The chassis transmission is in any gear other than neutral, the parking brake is on, and the pump shift in the driving compartment is in the "Pump Engaged" or the "OK to Pump-and-Roll" position.

A test plate shall be provided at the pump operator's panel that gives the rated discharges and pressures together with the speed of the engine as determined by the certification test for each unit, the position of the parallel/series pump as used, and the governed speed of the engine as stated by the engine manufacturer on a certified brake horsepower curve.

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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 Fire Department 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.

UNDERCOAT WARRANTY

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

PAINT LIMITED WARRANTY - TEN (10) YEARS

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

GRAPHICS LIMITED WARRANTY

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

WATEROUS FIVE YEAR PUMP WARRANTY

The fire pump shall be warranted by Waterous for a period of five (5) years from the date of delivery to the Fire Department.

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STAINLESS STEEL PLUMBING WARRANTY

The stainless steel plumbing shall be free of defects in material and 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.

The contractor shall supply details of their warranty information with their bid submission.

AKRON BRASS FIVE YEAR VALVE WARRANTY

The Akron Brass valves shall be warranted by Akron Brass for a period of ten (10) years from the date of delivery to the Fire Department. The warranty for electronics shall be warranted by Akron Brass for a period of five (5) years from date of delivery to the Fire Department.

UPF POLY WATER TANK WARRANTY

The UPF poly water tank shall be provided with a lifetime material and workmanship limited warranty. The manufacturer shall supply details of their warranty information with their bid submission.

OVERALL HEIGHT REQUIREMENT

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

OVERALL LENGTH REQUIREMENT

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

OVERALL WIDTH

The overall width (OAW) of the body at drip rails shall be 97.5" (8' - 1 1/2"), and body shall be 95" (7' - 11").

ANGLE OF APPROACH

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

ANGLE OF DEPARTURE

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

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INSPECTION TRIPS

All required inspection trips shall be the financial responsibility of the Fire Department, including but not limited to transportation, food and lodging.

DELIVERY AND DEMONSTRATION

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

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

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

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CAB CHASSIS SPECIFICATIONS

MANUFACTURER: Ford

Model: 2019 (OR LATEST MODEL YEAR) F550 Super Duty, 4-Door Crew Cab, 4 x 4

G.V.W.R.: 19,500 lbs.

Fire/Rescue Package w/EPA Special Emissions

FRONT AXLE:

Rating: 7,500 lbs.

Type: Dana Super 60 mono beam drive axle, or equal

Shocks: Heavy duty

Front Springs: Mono-beam non-independent and Anti-Roll bar, 7,500 lb. capacity

Steering: Power

REAR AXLE:

Rating: 14,700 lbs.

Type: Dana S130 or equal full floating with 4.88 ratio, Limited-slip, and Anti-Roll bar

Rear Springs: Two-stage, 14,700 lb. capacity

Shocks: Heavy duty

Speed: Limited to 75 MPH.

BRAKES:

Type: Four-wheel power vented disc brakes with ABS and Traction Control Systems

Parking Brake: Cable actuation, foot operated, hand release

TIRES AND WHEELS:

Front Tires: (2) LT225/70R 19.5, Traction Tread

Rear Tires: (4) LT225/70R 19.5, Traction Tread

Wheels: 19.5", 10-hole polished aluminum

FRAME:

Type: Single channel

Rating: 36,000 PSI steel, 10.1 section modulus

Fire Department

SVI Trucks – Production Specifications

CHASSIS SPECIFICATIONS

ENGINE:

Manufacturer: Ford

Model: 6.7 L Power Stroke Turbo Diesel

Rating: 330 GHP @ 2,600 RPM, 750 GT @ 2,000 RPM

Engine Equipment: Operator Command Regeneration, 50 State Emissions with Clean Idle Decal, Heavy duty dry type air cleaner, fuel filter, horizontal muffler and exhaust, block heater.

TRANSMISSION:

Manufacturer: Ford HD TorqShift

Type: Automatic

Speeds: 6 - speed forward with overdrive
1 - speed reverse

Transfer Case: New Venture 273 or equal with skid plate

Electronic Shift On Fly: Manual-locking hubs and auto rotary control on instrument panel.

Power Take Off Provision

ELECTRICAL:

Alternator: 377 amp, Dual

Battery: Dual maintenance free 78 amp/hr, 750 CCA each

FUEL TANK:

Size: 40 total gallons

Location: Mid ship mounted aft of rear axle

Upfitter Interface Module

DEF TANK:

Size: 6 total gallons

Location: Mid ship frame mounted

Fire Department

SVI Trucks – Production Specifications

CAB SPECIFICATIONS

Cab Type: Standard Cab with XLT trim group, Power equipment group

Cab Equipment: Heater and defroster, air conditioning, dome light, sun visor, electric horn, all clearance lights and identification lights required by State and Federal Department of Transportation and all standard equipment, Speed control, Tilt steering wheel, Power door locks, Power windows, Keyless remote entry, Anti-Theft, AM/FM/CD/MP3 stereo/clock, Dual front air bag SRS system. Adjustable pedals, Daytime Running Lights.

Cab Instruments and Gauge: Fuel, Odometer, Tachometer, Engine oil pressure, Engine water temperature, Volt meter.

Electrical Outlet: One (1) 110 volt/400 watt outlet, dash mounted.

Rear View Camera & Prep Kit: Includes rear view camera, frame mounted cabling. Video displayed in dash 4" display.

Seats: Front high back 40/20/40 cloth bench seats with 3-point seat belts, Rear split-bench seat 60/40 with outer 3-point, and center lap seat belts.

Cab Mirrors: Door mounted manual telescopic, powered and heated glass, black trailer tow mirrors

Cab Glass: Tinted solar glass

Bumper: Chromed steel

Grille: Chrome

Windshield Wipers: 2-speed electric with washers

Back-Up Alarm: Exterior Mounted

Cab Color: Ford Vermillion Red

Cab Interior Color: Medium Earth Gray

Floor Mats: Rubber floor mats in lieu of carpet

WARRANTY:

Bumper to Bumper: 3 years / 36,000 miles

Powertrain: 5 years / 60,000 miles

Corrosion (Perforation only): 5 years / Unlimited miles

Roadside Assistance Program: 5 years / 60,000 miles

CAB TO AXLE DIMENSION

Cab to axle will be 84".

Fire Department

SVI Trucks – Production Specifications

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 unequipped vehicle in feet and inches (meters), the length of the completed vehicle in feet and inches (meters to nearest 1/10th), and the GVWR in tons (metric tons).

Wording on the label shall indicate that; "The information shown was current when the apparatus was manufactured. If the overall height changes while the vehicle is in service, the fire department must revise that dimension on the plate".

Fire Department

SVI Trucks – Production Specifications

PERSONNEL CAPACITY

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

SEAT BELT WARNING - FAMA06/07

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

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

EQUIPMENT MOUNTING FAMA10

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

FIRE SERVICE TIRES - FAMA12

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

HELMET WARNING - FAMA15

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

CLIMBING METHOD - FAMA23

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

REAR STEP CROSSWALK WARNING - FAMA24

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

FINAL STAGE MANUFACTURER VEHICLE CERTIFICATION

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

FRONT BUMPER & GRILL GAURD

An SVI custom front bumper and grill guard shall be bolted in place of the OEM bumper. The bumper with grill guard shall be built from steel to provide maximum strength and protection and finished in a black powder coat paint finish. The bumper kit provided shall be for the specified chassis model and year.

FRONT TOW PROVISIONS

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

Fire Department

SVI Trucks – Production Specifications

AIR INTAKE SYSTEM

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

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

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

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

AIR RESTRICTION INDICATOR

An air restriction indicator shall be re-mounted, or provided in the driving compartment and visible to the driver.

EXHAUST TAILPIPE MODIFICATION

The exhaust tailpipe shall be modified from the stock location. The exhaust piping and discharge outlet shall be located or shielded so as not to expose any portion of the apparatus or equipment to excessive heating.

Exhaust pipe discharge shall be directed away from any operator's position.

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

VEHICLE LEVELING KIT

A 1" suspension leveling lift including sway-stoppers shall be provided and installed to level vehicle. Payload nor drive lines shall not be adversely affected by any changes in the suspension.

SEATING MODIFICATION

The center portion of the 40/20/40 split bench seat shall be removed to accommodate the installation of the specified console.

OFFICER SEAT REPLACEMENT

The Ford factory seat shall be removed in the front passengers position. One (1) HO Bostrom Tanker 450 Fold & Hold model #7550-7309F SCBA style seat and riser with SecurAll bracket shall be provided and installed in officers position. Seat shall be a Pacific Gray vinyl trim with gray black Durawear with polyester water proof fabric cushions. Seat shall include a padded one-piece headrest that flips up for easy removal of SCBA's. Seat shall be connected into seat belt Occupant Restraint Indicator (ORI) and Vehicle Data Recorder (VDR), if specified.

In additions, an airbag shunt part #8902-072 shall be installed to prevent airbag indicator light in dash from lighting after removal of factory seat.

Fire Department

SVI Trucks – Production Specifications

REAR CREW AREA SEATS

The Ford factory seats shall be removed in the rear crew area. Two (2) HO Bostrom Tanker 400CT Fold & Hold model #7540-8309F SCBA style seats with SecurAll brackets and seat riser shall be provided and installed in rear outboard positions. Each seat shall be a Pacific Gray vinyl trim with gray black Durawear with polyester water proof fabric cushions. Each seat shall include a padded one-piece headrest that flips up for easy removal of SCBA's. All seats shall be connected into seat belt Occupant Restraint Indicator (ORI) and Vehicle Data Recorder (VDR), if specified.

SEAT BELT COLOR AND MOUNTING

Section 14.1.3.3 of the NFPA 1901 Standards, requires all seat belt webbing in cab to be bright red or bright orange in color, and the buckle portion of the seat belt shall be mounted on a rigid or semi rigid stalk such that the buckle remains positioned in an accessible location.

The seat belt webbing color requirement of 14.1.3.3 shall not apply to vehicles with a GVWR of 19,500 lb (8,845 kg) or less.

SEAT BELT WEB LENGTH - COMMERCIAL CAB

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

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

SEAT BELT MONITORING SYSTEM - COMMERCIAL CAB

Section 14.1.3.9 of the NFPA 1901 Standards, requires that a seat belt warning system be provided. The seat belt warning device is intended to assist the driver or officer in determining whether all occupants are seated and belted before the vehicle is driven.

Per Fire Department specification for a commercial chassis, this emergency vehicle may not have a seat belt monitoring system. Without this device, the driver must manually determine that all occupants are seated and belted before the apparatus is placed in motion. This specification for an emergency fire apparatus for the seat belt monitoring system shall be non-compliant to NFPA 1901 standards, effective at the time of order.

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 valve stem shall be equipped with an LED Tire Alert (or equal), heavy duty valve cap LED indicator that indicates proper tire pressure. The LED Tire Alert valve cap is self-calibrating. When the cap is mounted on the valve stem the first time, it will memorize that tire pressure, and can be set to recognize a drop in pressure as little as 6 psi. It can be checked for functionality and battery condition by simply unscrewing the cap. If it is in working condition, it will immediately start blinking.

HELMET STORAGE

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

Fire Department

SVI Trucks – Production Specifications

HELMET STORAGE

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

CAB MIRRORS, DRIVER ADJUSTABLE

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

CAB RUNNING BOARDS

The chassis shall be provided with running boards each side, below the cab doors. The running boards shall be constructed of aluminum 3003H-14 alloy NFPA nonskid compliant tread plate.

MUDFLAPS

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

CHASSIS ENGINE COOLING SYSTEM DRAIN VALVES

Readily accessible drain valves shall be installed at the lowest point of the cooling system and at such other points as are necessary to permit complete removal of the coolant from the system.

Drain valves shall be designed or positioned such that they will not open accidentally.

ROAD EMERGENCY SAFETY KIT

The completed unit shall be supplied with one (1) set of three (3) dual faced reflective triangles, and three (3) warning flares complete with storage case per DOT requirements.

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

FUEL FILL

There shall be one (1) chassis supplied fuel fill mounted in the streetside exterior wheel well panel, behind the rear axle.

DEF TANK RELOCATION

The cab/chassis supplied DEF tank shall be re-located as required for installation of specified generator or pump. Kit shall include OEM brackets, fasteners, harness extension, (4) connectors, and installation manual.

Fire Department

SVI Trucks – Production Specifications

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 Fire Department to have the body repaired locally in the case where any object has struck the body and caused damage. The use of proprietary extrusions will prevent the Fire Department from such repair and shall NOT be used. All fabricated body components to be cut by a laser or water-jet for superior cut edge quality.

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

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

Fire Department

SVI Trucks – Production Specifications

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 1/8" (.125) aluminum 3003H-14 smooth plate. Interior compartment dividing walls shall be constructed with not less than 1/8" (.125) aluminum 3003H-14 smooth plate. Lighter gauge sheet metal will not be acceptable in these areas.

The 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.

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.

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.

Fire Department

SVI Trucks – Production Specifications

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 1/8" aluminum tubes minimum, the same width as the chassis frame rails. Welded to this tubing shall be cross members of 2" x 4" x 1/8" aluminum. Smaller dimension, lighter gauge tubing or angle material subframe shall not be accepted.

These cross members shall extend the full width of the body to support the compartments. Cross members shall be located at front and rear of the body, below compartment divider walls, and in front and rear of wheel well opening. Additional aluminum cross members shall be located as necessary to support 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 four (4) spring loaded body mounts. Each mount shall be configured using a two-piece encapsulated slide bracket. The two (2) brackets shall be fabricated of heavy duty 1/4" thick steel and shall have a powder coat finish to prevent any corrosion. Each mounting assembly shall utilize one (1) 3/4" diameter x 6" long grade 8 bolts and one (1) heavy duty spring. 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 1/8" steel tubing frame and covered with 3/16" aluminum tread plate. Any stepping surface shall have a grip surface insert to meet NFPA requirements. 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 bumper subframe, below body. The tow eyes shall be fabricated from 1/2" thick steel plate with a 3" diameter opening. Tow eyes shall have a black powder coat finish.

GROUND LIGHTS

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

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

WHEEL WELL EXTERIOR PANEL

The exterior panel of the body wheel well enclosure shall be constructed from 1/8" aluminum smooth plate and will be bolted on for easy removal and replacement.

Fire Department

SVI Trucks – Production Specifications

DIEFORMED BEADED EDGE BODY FENDERS

A die formed beaded edge shall be provided along the radius of the wheel well opening for a finished appearance.

WHEEL WELL LINERS

The wheel wells shall be constructed by the compartment walls that surround the wheel well area. The interior wheel well area shall be designed so that it does not accumulate dirt or water.

SCBA CYLINDER COMPARTMENTS

There shall be three (3) SCBA cylinder storage compartments, two (2) on the curbside and one (1) on the streetside of the body in the rear wheel well area. Each compartment shall have a stainless steel hinge with brushed stainless steel door assembly with a positive catch latch. Each compartment shall have a 8" diameter tube behind the wheel well panel attached to the door assembly. Each compartment shall allow the storage of an SCBA cylinder or a fire extinguisher up to 7-3/4" in diameter x 22" deep. The door shall activate the "Hazard Warning Light" in the cab when not in the closed position.

Fire Department

SVI Trucks – Production Specifications

BODY PAINT SPECIFICATIONS

BODY PAINT PREPARATION

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

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

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

PAINT PROCESS

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

- 1) Clean bare metal with a wax and grease remover using low lint rags.
- 2) Inspect, straighten, and hammer high points, grind all seams, sharp edges, and welds. DA sand entire paintable surfaces using 24-180 grit dry paper. Plastic fill all low spots and DA sand fill areas using 36-180 grit dry paper. Apply pinhole filler and DA sand areas using 80-180 grit dry paper.
- 3) Re-clean bare metal using a wax and grease remover and low lint rags.
- 4) Within 24 hours, a PPG Delfleet® epoxy color primer with proper hardener for corrosion resistance using a pressure pot spray gun and applying 2-5 full wet coats or 1.5-8.0 dry mils max. achieving full hiding and allow to air dry 60 minutes @ 70°F or bake for 45 minutes @ 140°F degree.
- 5) Inspect, putty fill, and dry guild coat entire body surface and DA sand using 180-400 grit dry paper.
- 6) Re-clean bare metal using a wax and grease remover using low lint rags.
- 7) A PPG Delfleet® primer sealer with proper hardener and thinner shall be sprayed using a pressure pot spray gun and applying 1 full wet coat or 1.0-2.0 dry mils achieving full hiding and allow to flash off in spray booth for minimum of 60 minutes @ 70°F.
- 8) A PPG Delfleet® FBCH basecoat (color) with proper hardener and dry additive shall then be sprayed using a pressure pot set @ 45-60 PSI and achieving full hiding or 1.5-2.0 wet mils and allow to flash off in spray booth 45-60 minutes before applying clearcoat.
- 9) A PPG Delfleet® clearcoat with proper hardener and thinner shall be sprayed using a pressure pot spray gun and applying 2-3 full wet coats or 5.0 wet mils for a uniform gloss and allow to flash off in spray booth 10 minutes and bake for 120-140 minutes @ 125°F (surface temp.).
- 10) After cooling, DA sand heavy orange peel or runs using 1000 grit dry sand paper and final DA sand using 1500-2000 grit dry sand paper. Wipe off all surfaces to remove dust and debris. Buff unit as needed using 3M rubbing compound and a white wool pad and inspect until all sand scratches are removed.
- 11) Polish as needed using 3M Perfect-It-Polish and a black foam pad, repeat as necessary and inspect until all sand scratches are removed.

PAINT - ENVIRONMENTAL IMPACT

The contractor shall meet or exceed 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.

Fire Department

SVI Trucks – Production Specifications

FASTENERS

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.

ELECTROLYSIS CORROSION CONTROL

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

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

PAINT FINISH - SINGLE COLOR

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

Touch-up paint shall be provided with completed vehicle.

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

BODY UNDERCOATING

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

UNDERCOAT WARRANTY

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

PAINT WARRANTY

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

Fire Department

SVI Trucks – Production Specifications

COMPARTMENT INTERIOR FINISH

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

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

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

Fire Department

SVI Trucks – Production Specifications

REFLECTIVE STRIPE REQUIREMENTS

Material

All retroreflective materials shall conform to the requirements of ASTM D4956, *Standard Specification for Retroreflective Sheeting for Traffic Control*, Section 6.1.1 for Type I Sheeting.

All retroreflective materials used that are colors not listed in ASTM D4956, Section 6.1.1, shall have a minimum coefficient of retro-reflection of 10 with observation angle of 0.2 degrees and entrance angle of -4 degrees.

Any printed or processed retroreflective film construction used shall conform to the standards required of an integral colored film as specified in ASTM D4956, Section 6.1.1.

Minimum Requirements

A retroreflective stripe(s) shall be affixed to at least 50 percent of the cab and body length on each side, excluding the pump panel areas, and at least 25 percent of the width of the front of the vehicle, not including mirrors or other protrusions.

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

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

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

GRAPHICS PROOF

A color graphics proof of the reflective striping layout shall be provided for approval by Fire Department prior to installation. The graphics proof shall be submitted to Fire Department 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 Scotchlite 680 series graphic film.

- This reflective stripe shall be white in color.

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

- This reflective stripe shall be black in color.

Fire Department

SVI Trucks – Production Specifications

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 series graphic film.

- This reflective stripe shall be white in color.

REFLECTIVE STRIPE - BODY SIDES

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

- This reflective stripe shall be white in color.

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

- This reflective stripe shall be black in color.

The stripe shall extend from the front of cab in a straight line, then just ahead of the rear wheels the stripe shall angle up and extend straight back to the rear of the body.

CHEVRON REFLECTIVE STRIPE - REAR SIDES PANELS

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

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

The stripe material shall be 3M Diamond Grade.

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

Fire Department

SVI Trucks – Production Specifications

LETTERING

GRAPHICS PROOF

A color graphics proof of the lettering layout shall be provided for approval by Fire Department prior to installation. The graphics proof shall be submitted to Fire Department 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;

UPPER BODY SIDE LETTERING

There shall be twenty two (22) 4" high SuperGold letters furnished and installed on the vehicle. Lettering shall have a clear 3M UV Protective Over Laminate applied before installation.

"QUICK ATTACK"

DIAL 911 DECAL

Two (2) "Dial 911" decals shall be provided one (1) on each side rear door. Decals shall be 3M Scotchlite 680 series reflective material.

Fire Department

SVI Trucks – Production Specifications

EXTERIOR COMPARTMENT DOORS

ROLL-UP DOOR CONSTRUCTION - ROBINSON (ROM)

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

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

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

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

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

ROM DOOR BOTTOM RAIL

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

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

Fire Department

SVI Trucks – Production Specifications

FLUSH FITTING HINGED DOOR CONSTRUCTION

The exterior compartment doors shall be a flush style, custom manufactured and built for each compartment. The compartment doors must be able to withstand years of rugged service and wear. For this reason, the compartment door design, metal thickness, and attachments must be strictly adhered to.

The compartment doors shall be all aluminum 3003H-14 alloy construction. The exterior panel shall be of 1/8" thickness smooth plate aluminum and the interior panel shall be of 1/8" thickness smooth plate aluminum. Lighter gauge material will NOT BE ACCEPTABLE in these areas. The double panel doors shall be 1-3/4" thick to completely enclose the door latching assembly. Doors shall have drain hole openings for drainage and ventilation.

The doors shall be flush mounted so that the outer surface is in line with the side body surface. Lap or bevel type constructed doors, doors framed with extrusions, or doors requiring rubber bumpers to prevent unnecessary contact are NOT ACCEPTABLE.

Compartment door openings shall be sealed with closed cell automotive type rubber molding to provide a weather resistant seal around door. In addition, rubber molding shall be provided along hinge to prevent moisture entry. Open cell foam type rubber moldings are NOT ACCEPTABLE.

Hinged compartment doors shall have 14 gauge stainless steel hinge, with 1/4" stainless steel pin. The hinge shall be bolted to the door and body with stainless steel machine screws. A polyester barrier film gasket shall be placed between stainless steel hinge and any dissimilar metals as necessary.

Drip rails shall be installed above all compartment door openings. Drip rails shall be completely removable for easy replacement if necessary.

Each door shall be capable of being opened or closed without unlatching. Door checks shall be bolted to the upper compartment door header and the box pan of the door. Door checks that require unlatching by hand will NOT BE ACCEPTABLE.

Vertically hinged door openings up to 32" wide shall be single door construction. Door openings over 32" shall be double door construction with the forward first opening door overlapping the second opening door.

- The interior door panel shall have a smooth un-painted aluminum panel.

Fire Department

SVI Trucks – Production Specifications

BODY HEIGHT MEASUREMENTS

The vertical body dimensions shall be as follows:

AHEAD OF REAR AXLE

| | <u>Description</u> | <u>Dimension</u> |
|---|--------------------------------------|------------------|
| A | Bottom of Subframe to Top of Body | 47.0" |
| B | Bottom of Subframe to Bottom of Body | 12.0" |
| C | Vertical Door Opening | |
| | -with roll-up door | 43.2" |
| | -with hinged door | 46.7" |

ABOVE REAR AXLE

| | <u>Description</u> | <u>Dimension</u> |
|---|--|------------------|
| D | Vertical Door Opening - Above Rear Wheel | |
| | -with roll-up door | 23.5" |
| | -with hinged door | 27.0" |

BEHIND REAR AXLE

| | <u>Description</u> | <u>Dimension</u> |
|---|-----------------------|------------------|
| E | Vertical Door Opening | |
| | -with roll-up door | 43.2" |
| | -with hinged door | 46.7" |

GENERAL

| | <u>Description</u> | <u>Dimension</u> |
|---|------------------------------------|------------------|
| F | Bottom or Drip Rail to Top of Body | 8.0" |

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

BODY WIDTH DIMENSIONS

The body shall be 95.0" wide, and 97.5" wide at drip rails. Interior compartment depth dimensions shall be approximately:

| <u>Area Description</u> | <u>Dimension</u> |
|----------------------------------|------------------|
| Transverse above subframe | 90.0" |
| Compartment depth below subframe | 19.0" |

Fire Department

SVI Trucks – Production Specifications

STREETSIDE COMPARTMENT - FRONT (S1)

The interior useable compartment width shall be approximately 22.0" wide.

The compartment door opening shall be approximately 16.2" wide.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) adjustable shelf/shelves approximately 18" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
 - The above component(s) shall have a smooth un-painted finish.
- The back wall of compartment shall be covered with PAC Trac single face model 7000 aluminum extrusion with the tracks in a horizontal orientation.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- One (1) OnScene Access LED, full height compartment light, vertically mounted.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

Fire Department

SVI Trucks – Production Specifications

STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S2)

The interior useable compartment width shall be approximately 46.0" wide.

The compartment door opening shall be approximately 41.0" wide.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) adjustable shelf/shelves approximately 18" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
 - The above component(s) shall have a smooth un-painted finish.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.

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SVI Trucks – Production Specifications

STREETSIDE COMPARTMENT - REAR (S3)

The interior useable compartment width shall be approximately 34.5" wide.

The compartment door opening shall be approximately 30.2" wide.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be two (2) adjustable shelf/shelves approximately 18" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
 - The above component(s) shall have a smooth un-painted finish.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

Fire Department

SVI Trucks – Production Specifications

CURBSIDE COMPARTMENT - FRONT (C1)

The interior useable compartment width shall be approximately 22.0" wide.

The compartment door opening shall be approximately 16.2" wide.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- The back wall of compartment shall be covered with PAC Trac single face model 7000 aluminum extrusion with the tracks in a horizontal orientation.
- There shall be one (1) slide-out smooth aluminum vertical tool board(s) approximately 18" deep. Each tool board(s) vertical exterior edge shall have a double 90 degree formed edge to provide an easy grip handle. The top and bottom of tool board(s) shall be provided with Accuride 9300 series slide tracks. Each board shall be rated for a maximum 200 lbs. evenly distributed load. Each tool board shall utilize a pneumatic cylinder to hold the tool board in both the opened and closed positions.
 - The tool board material shall be PAC Trac double face 7040 extrusion with the tracks in a horizontal orientation.
 - Each tool board shall be horizontally adjustable; mounted on aluminum shelf Trac on compartment floor.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- One (1) OnScene Access LED, full height compartment light, vertically mounted.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

Fire Department

SVI Trucks – Production Specifications

CURBSIDE COMPARTMENT - ABOVE REAR WHEELS (C2)

The interior useable compartment width shall be approximately 46.0" wide.

The compartment door opening shall be approximately 41.0" wide.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.

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SVI Trucks – Production Specifications

CURBSIDE COMPARTMENT - REAR (C3)

The interior useable compartment width shall be approximately 34.5" wide.

The compartment door opening shall be approximately 30.2" wide.

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

- The roll-up door shall have an unpainted satin aluminum finish on the door slats and the door trim components.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- A keyed cylinder lock shall be provided on bottom rail of the roll-up door.
- A compartment threshold protection plate shall be installed on the bottom edge of the compartment door opening. The threshold protection shall be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There shall be vertically mounted aluminum Shelf-Trac welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) adjustable shelf/shelves approximately 18" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
 - The above component(s) shall have a smooth un-painted finish.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 18" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
 - The above component(s) shall have a smooth un-painted finish.
- The floor of the compartment above the frame rails shall cover the area directly above the frame rails ONLY (non-extended floor).
- Two (2) OnScene Access LED, full height compartment lights, vertically mounted.
- Two (2) 3-1/2" x 3-1/2" black plastic louvered vents shall be provided in the lower compartment.

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SVI Trucks – Production Specifications

REAR COMPARTMENT - CENTER (RC1)

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

The rear center compartment shall start at the top of the body sub-frame and be as high as the side compartments, unless specified otherwise.

The interior useable compartment width shall be approximately 53.0" wide x 28" deep.

The compartment door opening shall be approximately 49.5" wide.

- This compartment shall have flush fitting vertically hinged compartment door. The door exterior shall be painted job color.
- The interior door panel shall have a smooth un-painted aluminum panel.
- The door shall be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The hinged door(s) shall have a stainless steel 6" offset bent D-ring locking handle. A gasket shall be placed between handle and door. Door latches shall be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.
- The hinged door(s) shall have a pneumatic cylinder to hold door in the open and closed positions. Each door shall be capable of being closed without unlatching. Door checks shall be bolted to the compartment door header and the box pan of the 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 welded to compartment walls for specified component installation. Shelf-Trac extrusion shall have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There shall be one (1) adjustable shelf/shelves approximately 28" deep. Each shelf shall be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.
 - The above component(s) shall have a smooth un-painted finish.
- There shall be one (1) 400 lbs. slide-out tray(s) approximately 28" deep and as wide as the compartment layout or door opening permits. The tray top shall be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks shall extend 100% of the slide length. The tray assembly shall utilize a pneumatic cylinder mounted on underside to hold the tray in both the extended and closed positions.
 - The above component(s) shall have a smooth un-painted finish.

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SVI Trucks – Production Specifications

UPPER BODY COMPARTMENT - STREETSIDE

Above the streetside compartments shall be an upper body compartment for storage of long equipment. The compartment shall be a bolted on module. The compartment shall be fabricated from 1/8" 3003-H14 alloy aluminum treadplate, approximately 108" long (full body length) x 21" wide x 9" high.

Access to the compartment shall be from hose bed area with a full-length outboard hinged lift-up compartment door. Door shall be fabricated from 1/8" 3003-H14 alloy aluminum treadplate with three (3) 16", 16 gauge stainless steel hinges, with 1/4" stainless steel pin, two (2) push to release style latches, and a gas cylinder door holder. A polyester barrier film gasket shall be placed between stainless steel hinge and any dissimilar metals as necessary to prevent corrosion. Door shall overlap compartment vertical sides to prevent entry of moisture and sealed with automotive type rubber molding to provide a weather resistant seal.

Two (2) 16" handrails shall be provided, one (1) on each end to assist in accessing upper hose bed and dunnage areas. Hand railing shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions. One (1) 7" chrome grab handle shall be provided and located in center of door to assist in opening/closing long storage door.

Compartment shall have a flush mounted light near door opening that will be automatically activated when door is opened, and wired to compartment door ajar warning light provided in cab.

The compartment shall be designed to store the following equipment:

PIKE POLE MODULE

A module shall be provided adjacent and inboard of specified curbside storage compartment. Two (2) pike pole(s). Manufacturer, model number of the pike pole shall be provided in equipment section of specification, or at pre-construction meeting when provided by Fire Department.

PLASTIC FLOOR AND SHELF TILE

All compartment floors, shelves, and trays shall be covered with Turtle Tile plastic interlocking grating.

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

EXTERIOR LADDER STORAGE, CURBSIDE

Two (2) "L" type ladder bracket assemblies shall be provided for specified ladders on the curbside body roof. Brackets shall be provided with UHMW pads to protect ladders from damage. A PAC type bracket shall be provided on rear body to secure ladders in place during travel.

Storage shall be provided for the following;

- One (1) 20' 2-section ladder(s). Manufacturer, model number of the ladder shall be provided in equipment section of specification, or at pre-construction meeting when provided by Fire Department.
- One (1) 10' roof ladder(s). Manufacturer, model number of the ladder shall be provided in equipment section of specification, or at pre-construction meeting when provided by Fire Department.
- One (1) 10' folding ladder(s). Manufacturer, model number of the ladder shall be provided in equipment section of specification, or at pre-construction meeting when provided by Fire Department.

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SVI Trucks – Production Specifications

LOWER SIDE BODY PROTECTION - RUB RAIL

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

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

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

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

ROOF ACCESS LADDER

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

The location shall be on the rear streetside of the apparatus body.

WALKWAY/STEP LIGHTS

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

Each light shall be mounted in an extruded aluminum housing to protect against damage from personnel or equipment.

Lighting shall provide illumination at a minimum level of 2 fc (20 lx) on all work surfaces, steps, and walkways. Lighting shall be switchable but activated automatically when the vehicle park brake is set.

REAR BODY HANDRAIL

There shall be one (1) 24" vertical handrail on rear of body. Handrail shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions.

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

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

FOLDING STEP(S)

There shall be three (3) Innovative Controls polished cast aluminum folding step(s) provided and installed on completed vehicle. Each step shall be heavy duty with stainless steel spring and textured step surface meeting NFPA standards. Each step shall include an LED light.

Fire Department

SVI Trucks – Production Specifications

LOW VOLTAGE ELECTRICAL SYSTEM- 12 VDC

General

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

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

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

Wiring

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

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

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

Wiring and Wire Harness Construction

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

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

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

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

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

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

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

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

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

Power Supply

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

Minimum Continuous Electrical Load

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

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

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

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

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

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

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

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SVI Trucks – Production Specifications

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.

Fire Department

SVI Trucks – Production Specifications

12 VOLT MULTIPLEX CONTROL CENTER

The apparatus shall be equipped with a Weldon V-MUX multiplexed 12 volt electrical system that will provide complete diagnostic capability, No Exception. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The system shall be node based to maximize stability so that failure of one node does not affect the operation of the other nodes. The system shall use shielded twisted-pair wire for transmission of system function signals. The shielded wire shall provide protection against EMI and RFI noise interruptions.

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

Outputs:

The outputs shall perform all the following items without added modules to perform any of the tasks;

1. **Load Shedding:** The system shall have the capability to load shed with 8 levels any output. This means you can specify which outputs (barring NFPA restrictions) you would like load shed. Level 1 12.9v, Level 2 12.5V, Level 3 - 12.1V, Level 4 - 11.7V, Level 5 11.3V, Level 6 10.9V, Level 7 10.5, Level 8 10.1. Unlike conventional load shedding devices you can assign a level to any or all outputs.
2. **Load Sequencing:** The system shall be able to sequence from 0 8 levels any output. With 0 being no delay and 1 being a 1 second delay, 2 being a 2 second delay and so on. Sequencing reduces the amount of voltage spikes and drops on your vehicle, and can help limit damage to your charging system.
3. **Output Device:** The system shall have solid-state output devices. Each solid-state output shall be a MOS-FET (Metal Oxide Semiconductor - Field Effect Transistors); MOS-FETs are solid-state devices with no moving parts to wear out. A typical relay when loaded to spec has a life of 100,000 cycles. The life of a FET is more than *100 times* that of a relay.
4. **Flashing Outputs:** The system shall be able to flash any output in either A or B phase, and logic is used to shut down needed outputs in park, or any one of several combined interlocks. The flash rate can be selected at either 80, 160 or 200 FPM. This means any light can be specified with a multiplex truck with no need to add flashers. Flashing outputs can also be used to warn of problems or other unique idea you may come up with.
5. **PWM:** The modules shall have the ability to PWM at some outputs so that a headlight PWM module is not needed.
6. **Diagnostics:** An output should be able to detect either a short or open circuit. The system should be able report in "real time" a text based message that points the maintenance person to a specific output.

Inputs:

1. The inputs shall have the ability to switch by a ground or vbatt signal.
2. The inputs shall be filtered for noise suppression via hardware and software so that RF or dirty power will not trick an input into changing its status.

Auto-Throttle:

The multiplex system shall be able to perform automatic high idle via a network gateway or by using an existing output on a module to provide the proper signals to an OEM Engine ECU. This task should be handled with existing inputs and outputs.

Fire Department

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Displays:

Displays shall be able to provide real time information regarding load shedding and system status, such as network traffic/errors or shorts and open circuits.

System Network:

The multiplex system shall contain a Peer-to-Peer network. A Master Slave Type network is not suitable for this type of unit. A Peer-to-Peer network means that all the modules are equal on the network; a Master is not needed to tell other nodes when to talk, **No Exceptions.**

System Reliability:

The multiplex system shall be able to perform in extreme temperature conditions, from 40° to +85° C (-40° to +185° F.) The system shall be sealed against the environment, moisture, humidity, salt or fluids such as diesel fuel, motor oil or brake fluid. The enclosures shall be rugged to withstand being mounted in various locations or compartments around the vehicle. The modules shall be protected from over voltage and reverse polarity.

WELDON CERTIFICATION

A letter shall be provided with bid submittal that the Contractor has successfully completed the Weldon training requirements for Level 1 of the V-MUX Certified Supplier Program and is authorized to design, build, and service V-MUX electrical systems.

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 multiplex display shall be located in the cab center console for control of all master and emergency lights.

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CAB CONSOLE

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

The rear portion of the console shall be provided with open top storage for notebooks or maps. Two (2) adjustable dividers shall be provided in the storage area. The forward portion of console shall be slanted for easy viewing of the specified multiplex display screen, and any siren or radio equipment and within easy access to both Driver and Officer. Four (4) cup holders shall be provided in console.

The following options shall be provided in specified center console;

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

Fire Department

SVI Trucks – Production Specifications

BATTERY SYSTEM

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

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

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

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

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

One of the following master disconnect switches shall be provided:

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

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

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

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

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

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

BATTERY SWITCH

The chassis ignition key shall activate a heavy duty relay to provide 12 volt battery power to the vehicle. There shall be a green "BATTERY ON" pilot light that is visible from the driver's position.

BATTERY SOLENOID

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

Fire Department

SVI Trucks – Production Specifications

BATTERY CHARGER

One (1) Kussmaul EV Series Model #445-5399-0, Low Profile 20 amp battery charger shall be provided. The unit shall have 2-step charging, with bulk-float, and no overcharging feature. A remote single bar graph display Model #023-5353-1 shall be installed. This display shall include a “charger on” LED light and bar graph, which operates when charger is not in operation.

The charger shall have the following operational specifications:

- a) 120/240 volts AC input at 3.1 amps
- b) 12 volts DC output at 20 amps
- c) Dimensions of: 2.32” high x 6.8” wide x 13.12” deep and weighs 5 lbs.

The lightweight and low profile battery charger shall supply a ‘single battery system’ and with a red powder coat aluminum enclosure. The unit shall include an auxiliary 15 amp output circuit with power source selector for operating accessory loads. The unit shall include front panel connections for a remote display and auxiliary loads. Charger output shall pose no interference with other electronic systems on the vehicle.

SHORE POWER INLET

One (1) Kussmaul 120 VAC, 20 amp Super Auto-Eject shore power inlet(s) shall be provided. The shore power connection shall automatically disengage from vehicle when chassis ignition is engaged.

The protective ground from the shoreline inlet shall be bonded to the vehicle frame.

- The outlet cover shall be yellow.
- The shore power inlet shall be located on the streetside front bumper tail.

ENGINE COMPARTMENT LIGHT

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

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CAB HAZARD WARNING LIGHT

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

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

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

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

The hazard light shall be labeled; "Do not move apparatus when light is on."

In addition, label shall be in both English/French for units built for Canada; "*Ne pas déplacer l'engin lorsque la lumière est allumée.*"

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

BACK-UP ALARM

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

TAIL LIGHTS

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

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

Each light above shall be mounted in an M6FC chrome finish bezel.

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 Mini LED to reduce the need for maintenance and lower the amp draw. Clearance lights shall be wired to the headlight circuit of the chassis.

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CAB STEP LIGHTS / GROUND LIGHTS

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

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

LICENSE PLATE LIGHT

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

ELECTRONIC SIREN

One (1) Whelen model 295SLSA1 electronic siren control with selectable 100 or 200 watt output, hands-free operation, user selectable siren tones, park kill, and standard hard wired microphone shall be provided and installed in cab within easy reach of Driver. Siren power shall be wired through the master warning light switch.

SIREN SPEAKER

One (1) Whelen model SA314B 100 watt aluminum, 6.4" x 6.1" x 3.1" deep siren speaker shall be provided and located behind grille or front bumper with black epoxy coated finish. The solid state siren speaker shall be vibration resistant. The SA314A shall comply with California Title XIII, Class A, and SAE J1849 requirements and with OSHA 1910.95 Guidelines regarding "Permissible Noise Exposure". All mounting hardware shall be stainless steel and covered by a two year factory warranty.

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

FRONT LED FLOODLIGHT

One (1) Rigid Industries E-Series model 120312, 20" combination spot/flood LED light(s) with white housing color and cradle mount brackets shall be provided on front of vehicle. The E-Series 20" LED light(s) shall have 9,200 lumen output each.

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

The lights shall be controlled at the switch panel in cab.

SIDE LED SCENE LIGHTS

There shall be four (4) Whelen M6 Series Model M6ZC, 6" x 4" surface mounted scene light(s) provided on the upper body. Light quantity shall be divided equally per side. The M6ZC configuration shall consist of 12 clear Super-LEDs and a clear gradient optic polycarbonate lens with chrome flange. The scene light is covered by a five year factory warranty.

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

The lights shall be controlled at the switch panel in cab.

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REAR LED SCENE LIGHTS

Two (2) Whelen M6 Series Model M6ZC, 6" x 4" surface mounted scene light(s) shall be provided on the upper rear body to light the work area immediately behind the vehicle. The M6ZC configuration shall consist of 12 clear Super-LEDs and a clear gradient optic polycarbonate lens with chrome flange. The scene light is covered by a five year factory warranty.

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

The lights shall be controlled at the switch panel in cab.

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

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WARNING LIGHT PACKAGE

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

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

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

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

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

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

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

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

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

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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 Freedom F4N0VLED LED 60" lightbar permanently mounted to the cab roof.

The lightbar configuration (streetside to curbside) shall be:

| <u>SECTION</u> | <u>INTERNAL COMPONENTS</u> | <u>LENS COLOR</u> |
|----------------|---|-------------------|
| 1 | Red Rear Corner LED | Clear |
| 2 | Red Front Corner LED | Clear |
| 3 | White Long Super-LED | Clear |
| 4 | White Long Super-LED | Clear |
| 5 | Red Long Super-LED | Clear |
| 6 | Red Long Super-LED | Clear |
| 7 | White Long Super-LED (Opticom if specified) | Clear |
| 8 | White Long Super-LED (Opticom if specified) | Clear |
| 9 | Red Long Super-LED | Clear |
| 10 | Red Long Super-LED | Clear |
| 11 | White Long Super-LED | Clear |
| 12 | White Long Super-LED | Clear |
| 13 | Red Front Corner LED | Clear |
| 14 | Red Rear Corner 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. The lightbar(s) shall be separately controlled at switch panel in the cab.

ZONES B AND D - SIDE WARNING LIGHTS

UPPER REAR CORNER WARNING LIGHTS

There shall be two (2) Whelen M6 series red linear Super-LED lights (M6RC) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

ZONE C - REAR WARNING LIGHTS

There shall be two (2) Whelen M6 series red linear Super-LED lights (M6RC) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

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LOWER LEVEL OPTICAL WARNING DEVICES

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

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

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

ZONE A - FRONT WARNING LIGHTS

There shall be two (2) Whelen M6 series Red Linear Super-LED lights (M6RC) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

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

There shall be two (2) Whelen M6 series Red Linear Super-LED lights (M6RC) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

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

There shall be two (2) Whelen M6 series Red Linear Super-LED lights (M6RC) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

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

There shall be two (2) Whelen M6 series Red Linear Super-LED lights (M6RC) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

There shall be two (2) Whelen M6 series Red Linear Super-LED lights (M6RC) provided, one (1) each side. Each light shall have a clear lens and chrome flange.

The lights shall be controlled at the switch panel in cab.

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SIDE CONTROL PUMP MODULE

The fire pump shall be mounted on steel angles, within the pump module, and this assembly shall then be attached to the aluminum structure. This will permit a solid mounting of the pump assembly to the chassis frame rails and the pump module then bolted to the steel sub-frame. The pump module shall be capable of being removed as a single system, including the pump, plumbing, piping, valves, pump enclosure, and all wiring. The wiring system shall quickly plug into the wiring harness to the cab.

All pump suction and discharge controls are to be mounted on the streetside pump operator's panel so as to permit operation of the pump from a central location. The side mounted pump controls shall be grouped into a full width panel, with intake and discharge controls ergonomically separated across the panel.

All intakes and discharges shall be controlled from the streetside control area, as well as primer, pressure controls, tank controls, and other vital instruments. No controls shall be mounted on the curbside or rear of the vehicle, other than drains or bleeders.

The following controls and equipment shall be provided on the pump panel or within the pump enclosure:

- Primer system
- Pump and plumbing area LED service light(s).
- Pressure control device and/or throttle control.
- Fire pump and engine instruments.
- Pump intakes and discharge controls.
- Master intake and discharge gauges.
- Tank fill control.
- Tank suction control.
- Water tank level gauge.
- Pump panel LED light(s).

PUMP MODULE TOP REAR AREA CLOSED

The remaining area above the pump and behind the cross lays will be enclosed with no external access. The walking surface shall be covered with 1/8" aluminum NFPA compliant treadplate.

CONTROL PANEL

The streetside control panel shall be divided into two sections. The lower section shall be where all valve controls, the primer control, the discharge relief valve controls, and other mechanical controls are located. Openings in the panels for intakes and discharges shall be smooth and free of rough edges.

INSTRUMENT PANEL

The upper section above the control panel shall contain all instruments, gauges, test fittings, and optional controls. All instruments, gauges, and other equipment shall be installed with sufficient slack in any cabling, tubing, or plumbing to allow the panel to swivel to the fully open position. The instrument panel shall be a lift-up style hinged door provided with a positive latching system for service access.

CURBSIDE PUMP PANEL

A single panel shall be provided on the lower curbside of the pump module. This shall be the area where any side discharges, inlets, steamers, and other pump associated equipment are located. This panel shall be easily removable and held in place with quick release push latches and be fully removable for pump and plumbing access without the need to use hand tools. Any electrical equipment that may be installed shall be equipped with connectors so they may be easily separated from the opening created when the below described front access panel is removed.

PUMP MODULE SERVICE LIGHTS

Two (2) On Scene LED work lights shall be provided in the mid ship pump enclosure. The control switch shall be near lights behind the panel.

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PUMP PANEL MATERIAL

The pump operator's control panel and curbside pump panels shall be constructed of smooth plate aluminum with powder coated paint finish.

STREETSIDE RUNNING BOARD - SIDE MOUNT PANEL

The streetside pump panel shall be equipped with a side running board. The running board shall extend along the width of the pump module.

The running board stepping surface shall be constructed of aluminum NFPA compliant tread plate, bolted in place with stainless steel fasteners.

- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.

CURBSIDE RUNNING BOARD - SIDE MOUNT PANEL

The curbside pump panel shall be equipped with a side running board. The running board shall extend along the width of the pump module.

The running board stepping surface shall be constructed of aluminum NFPA compliant tread plate, bolted in place with stainless steel fasteners.

- One (1) OnScene 8" Access LED ground light(s) shall be provided below the body.

PUMP MODULE FINISH

The pump module framework shall be painted to match pump panel color choice.

CROSS LAY

The specified pump module shall have two (2) cross lay(s). The cross lay hose bed(s) shall be located in the upper portion of the pump module.

The cross lay area shall be located at the front of side control pump module and at the rear of top control module. The cross lay area shall span the entire width of the pump module.

CROSS LAY TRIM

Brushed stainless steel trim shall be installed at the openings on each side of the cross lay hose bed area. The trim shall reduce the chaffing of the hose jacket on the edges of the bay area.

If divider(s) are required between the hose bed areas they shall be fabricated from 3/16" smooth aluminum and mounted in a channel on each end for adjustability.

Removable slotted aluminum flooring shall be provided for the hose bed area.

Each end of hose bed shall have a 2" black nylon covered with black 14 oz. vinyl style webbing covers. The covers will be mechanically fastened at the sides of the hose bed and secured using yellow pulls with reflective bungees and shoulder bolts.

Safety sign FAMA22, which warns of the need to secure hose, shall be visible to personnel at each side of hose storage area.

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HOSE STORAGE LIGHTS

No lights shall be provided in the hose storage area.

CROSS LAY BED COVER

A 1/8" aluminum tread plate hinged cover shall be provided over the lay beds complete with full length stainless steel piano hinge. Stops shall be provided to protect cab or other adjacent body components. The hinge shall be located on the forward section of the cover, closest to the chassis cab.

WATEROUS CX FIRE PUMP

A mid-ship mounted Waterous CXS series fire pump shall be provided. The pump shall comply with all applicable requirements of the latest standards for automotive fire apparatus of the National Fire Protection Association, NFPA 1901, and shall have a rated capacity of 1,250 GPM (5,000 LPM).

WATEROUS PUMP ANODES

There shall be two (2) anodes provided with the fire pump. One (1) anode shall be installed in the left steamer port and one (1) shall be installed in the right steamer port.

IMPELLERS

The pump impellers shall be bronze, specifically designed for the fire service and accurately balanced for vibration free running. The stripping edges shall be located on opposite sides of the impellers to reduce shaft deflection.

The impeller shaft shall be stainless steel, accurately ground to size and supported at each end by oil or grease lubricated anti-friction ball bearings for rigid, precise support. The bearings used on the impeller shaft shall be automotive type bearings, easily cross-referenced and readily available at normal parts or bearing stores.

IMPELLER WEAR RINGS

The pump shall be equipped with replaceable bronze wear rings for increased pump life and minimum maintenance cost. The wear rings shall be designed to fit into a groove in the face of the impeller hubs forming a labyrinth that, as the clearance increases with age, directs water from the discharge side in several directions eventually exiting outward, away from the eye of the impeller hub.

PUMP CASING

The pump casing shall be cast as two (2) horizontally split pieces. The casing shall be made of high tensile, close-grained gray iron with a minimum tensile strength of 40,000 PSI.

PUMP MANUAL

Two (2) Pump Operation & Maintenance manual(s) shall be supplied at the time of delivery.

PAINT FINISH

The pump manufacturer shall provide a black finish paint.

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PUMP TRANSMISSION

The pump transmission shall be of the latest design, incorporating a high strength involute tooth-form Morse Hy-Vo chain capable of operating at high speeds while providing smooth and quiet transmission of power. Drive and driven sprockets shall be made of alloy steel with teeth of an involute form. Driveline shafts shall be made from alloy steel forgings, hardened and ground to size. Deep groove, anti-friction ball bearings shall be used throughout the pump transmission. The pump shift engagement shall be accomplished by a free sliding collar that uses an internal locking mechanism to insure that the collar will stay in road or pump position.

An interlock system shall be provided to prevent the pump drive system from being shifted out of "pump engaged" pumping mode of operation when the chassis transmission is in pump gear per NFPA 1901 section 16.

Primary lubrication for the pump transmission bearings, sprockets and chain shall be provided by a splash system. A supplementary pressure system shall also be employed which shall include a strainer, an oil circulation pump driven by the impeller shaft, and a spray bar inside the case to apply oil to the inside of the chain just before it engages the driven sprocket.

The pump and transmission shall be easily separable. A two-piece shaft shall be splined allowing for individual repair of either the pump or transmission, to keep down time to a minimum.

All driveline components shall have a torque rating equal to or greater than the final net engine torque.

AIR OPERATED PUMP SHIFT

A lever type pump actuating mechanism shall be air operated from a valve in the cab identified as "PUMP SHIFT". Full instructions for shifting the pump shall be inscribed on the valve plate.

Two (2) green indicator lights shall be supplied in the cab; one (1) light shall indicate when the chassis transmission is in neutral and labeled "OK TO PUMP", and one (1) light shall indicate when the pump drive (PTO) has been engaged and labeled "PUMP ENGAGED".

Two (2) green indicator lights shall be supplied at the Pump Operator's panel adjacent to the engine throttle controls; one (1) light shall indicate when the pump drive has been engaged and labeled "THROTTLE READY", and one (1) light shall indicate when both the chassis transmission is in neutral and the pump drive (PTO) has been engaged and labeled "OK TO PUMP".

PUMP SHIFT MANUAL OVERRIDE

No pump shift manual override system shall be provided.

PAINT FINISH

The pump manufacturer shall provide a black finish paint.

PUMP DRIVELINE

The pump transmission driveline shall be supplied with 1480 series yokes and bearings to match the cab chassis driveline.

MECHANICAL SEALS

The pump shall be equipped with self-adjusting, maintenance free mechanical shaft seals that shall not require manual adjustment. These seals shall be designed in a manner such that they shall remain functional enough to permit continued use of the pump in the unlikely event of a seal failure.

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FLAME PLATED IMPELLER HUBS

The impeller hubs shall be flame plated with tungsten carbide to a hardness approximately twice that of tool steel to assure maximum pump life and efficiency. During the flame plating process the base metal shall not be allowed to exceed a temperature of 300 degrees Fahrenheit to prevent altering the metallurgical properties of the impeller material

SINGLE STAGE FIRE PUMP

The pump shall be a single stage centrifugal class "A" rated fire pump, designed specifically for the fire service

1/2" PUMP COOLER LINE

There shall be a 1/2" line installed from the discharge side of the pump to the water tank. The line shall be used to cool the pump during long periods of pumping when water is not being discharged. The pump cooler shall be controlled with a quarter-turn ball valve on main pump panel, and shall be clearly labeled "Pump Cooler".

PUMP COOLER CHECK VALVE

There shall be a check valve installed in the pump cooler line to prevent tank water from back flowing into the pump when it is not in use.

WATEROUS FIVE YEAR PUMP WARRANTY

The fire pump shall be warranted by Waterous for a period of five (5) years from the date of delivery to the Fire Department.

FIRE PUMP TEST

The pump shall undergo a fire pump test per applicable sections of NFPA 1901 or 1906 standards, prior to delivery of the completed apparatus.

The test shall include at least the pumping test, the pumping engine overload test, the pressure control system test, the priming device tests, and a vacuum test.

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 500 psi (3400 kPa) for a minimum for 10 min.

The pump shall be capable of producing fire streams that are free from objectionable pulsation under all normal operating conditions.

The results of this test shall be furnished with the vehicle on delivery.

FIRE PUMP TEST LABEL

A test plate shall be provided at the pump operator's panel that gives the rated discharges and pressures together with the speed of the engine as determined by the certification test for each unit, the position of the parallel/series pump as used, and the governed speed of the engine as stated by the engine manufacturer on a certified brake horsepower curve

SAFETY SIGN

A safety sign FAMA25, which warns of the need for training prior to operating the apparatus, shall be located on the pump operators panel.

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ALTITUDE REQUIREMENT

The apparatus shall be designed to meet the specified rating at 5,000 feet (1,525 meters) altitude.

PUMP DRAIN VALVE

The pump drain shall be controlled at the pump operator's panel and identified as "Pump Drain". The control shall be a Waterous push-pull type control that is easily actuated with a gloved hand.

ELECTRIC PRIMING PUMP CONTROL AT PUMP PANEL

The Waterous priming system shall include an oil-free rotary vane priming pump rigidly attached to the pump transmission and activated by a vacuum-activated priming (VAP) valve. Valve actuation may be accomplished while the main pump is in operation, if necessary to assure a complete prime.

The primer shall be capable of priming the pump through a 20' section of suction hose with a 10' lift within 30 seconds for pumps less than 1,500 gpm, and 45 seconds for pumps 1,500 gpm and larger.

PRIMER CONTROL

The priming system shall be controlled at the pump operator's panel. The control shall be provided in the form of a momentary push button that is easily actuated with a gloved hand.

DISCHARGE RELIEF VALVE

The discharge pressure relief shall be controlled by the electronic engine controlled device as specified.

6" SUCTION INLET - STREETSIDE

One (1) 6" (150 mm) un-gated suction intake shall be installed on the streetside pump panel to supply the fire pump from an external water supply. The intake threads shall be 6" NHM threads.

The suction fittings shall include a removable die-cast screen to provide cathodic protection for the pump thus reducing corrosion.

A short steamer barrel may be required to accommodate an intake valve without exceeding the legal overall body width.

SUCTION CAP

The suction inlet shall be equipped with a 6" NH chrome plated, long handled, cap capable of withstanding 500 psi.

6" SUCTION INLET - CURBSIDE

One (1) 6" (150 mm) un-gated suction intake shall be installed on the curbside pump panel to supply the fire pump from an external water supply. The intake threads shall be 6" NHM threads.

The suction fittings shall include a removable die-cast screen to provide cathodic protection for the pump thus reducing corrosion.

A short steamer barrel may be required to accommodate an intake valve without exceeding the legal overall body width.

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SUCTION CAP

The suction inlet shall be equipped with a 6" NH chrome plated, long handled, cap capable of withstanding 500 psi.

HEAT EXCHANGER

A heat exchanger shall be provided on the pump driving engine cooling system that permits water from the discharge side of the pump to cool the coolant circulating through the engine cooling system without intermixing. The heat exchanger should maintain the temperature of the coolant in the pump drive engine not in excess of the engine manufacturer's temperature rating under all pumping conditions.

To prevent damage from freezing, a drain(s) shall be provided to allow draining of the heat exchanger.

The cooling system shall be controlled by a 1/4 turn valve on the pump operator's panel.

INTAKE RELIEF VALVE

An Akron Brass model 53 intake pressure relief valve shall be provided. The intake pressure relief valve shall have a flange to allow mounting to a 4-bolt pump intake flange. The unit shall be adjustable from 50 to 250 psi and be factory set at 125 psi. Provisions for adjusting or servicing the valve {will/shall} be provided.

The relief outlet shall be directed below the pump with the discharge terminating in a 2-1/2" NSTM connection. The discharge shall be away from the pump operator and labeled "DO NOT CAP".

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AQUIS FOAM SYSTEM

The specified fire pump shall be provided with an Aquis 1.5 foam system which delivers a level of performance and reliability typically reserved for more expensive foam proportioners. Aquis 1.5 features a non-corroding brass body pump as well a sensor that measures water flow to create the ideal water to concentrate ratio for superior foam.

Operator Interface Terminal (OIT) Manual Operation

Installed on the pump operator's panel and provides the following functions:

Rotary dial control of foam proportioning rates:

- Class A concentrate: .1% to 1% in infinite increments.
- Class B concentrate: Not available

Calibration of water flow rate.

Warning of low foam concentrate supply:

- *Flashes and the displays a steady "low concentrate" warning when the concentrate tank runs low. Note that system will shut down after two minutes.*
- *Flashes a "no concentrate" warning when the concentrate tank is empty.*

Warning of an electronic malfunction, flashes an error warning.

OIT Panel includes operation instructions.

Remote Activation

Allows Foam Pump to be activated from an external 12 or 24 volt electrical source such as pump-in gear circuit or engine ignition power which eliminates a step in the foam system operation sequence.

Flowmeter and Tee

Installed in the water line from the fire pump. Consists of a paddlewheel type flowmeter installed a brass tee which communicates water flow rate to the microprocessor in the foam pump control box. The brass tees have an external Victaulic groove connection and internal female NPT connection on each end and are available in the following sizes:

- 1.5" Inside Diameter (300 GPM / 1135 L/min)
- 2.0" Inside Diameter (500 GPM / 1893 L/min)
- 2.5" Inside Diameter (750 GPM / 2800 L/min)
- 3.0" Inside Diameter (1250 GPM / 4700 L/min)

Foam Pump

Consists of an electric motor, positive displacement triplex plunger pump and control box mounted on a bracket. *Electric Motor: 1/3 HP (.25 kW) 12 volt. Protected with an electrical load circuit breaker of 80 amps for 12 VDC and 50 amps for 24 VDC. Pump Rating: 1.5 GPM @ 150 psi (5.68 L/min @ 10 bar) with intermittent operating pressures up to 450 psi (31 bar).*

Cables and Wires

Separate industry standard M12 connectors for connection of OIT and flowmeter to foam pump control box. Consists of shielded cables to prevent radio frequency or electro-mechanical interference. Furnished as follows:

- OIT connection to control box: 6 meters long
- Flowmeter connection to control box: 3 meters long
- Foam concentrate tank level switch to foam pump control box: 4 meters long. *(Note that foam tank level switches are optional from Waterous)*

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Foam Concentrate Supply Line Strainer

Installed in the foam concentrate supply line and screens out any concentrate contamination which may harm the foam pump. Consists of a 3/4 in. inline wye type brass strainer with a removable screen.

Foam Concentrate Inject Line Check Valve

Installed in the foam concentrate inject line and prevents water from flowing back into the foam pump. Consists of a 3/8 in. inline brass and stainless steel check valve.

Warranty

All systems have a one-year limited manufacturer's warranty.

Foam System Support

AQUIS is equipped with a USB interface for PC-connectivity which allows a qualified technician to perform upgrades, diagnostics and monitor system functions in real time. The system can also be remotely monitored through the USB interface using any PC with internet access, allowing technicians to easily connect to the Waterous dedicated website to assure proper operation and to update the foam system hardware by uploading new features and functions as they become available.

- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.

HOSE THREADS

Hose threads shall be National Standard (NST) on all base threads on the apparatus intakes and discharges, unless otherwise specified. (NST and NH are the same thread)

PLUMBING SPECIFICATIONS

The fire pump plumbing system shall be fabricated with rigid stainless steel and or flexible piping with stainless steel fittings. Victaulic couplings shall be installed to permit flexing of the plumbing system and allow for quick removal of piping or valves for service. Flexible hose couplings shall be threaded stainless steel or Victaulic connections.

The fire pump and plumbing shall be hydrostatically tested in compliance to applicable sections of NFPA standards, with test results submit with the delivery documentation.

STAINLESS STEEL INTAKE MANIFOLD

The suction manifold assembly shall be fabricated with Schedule 10 type 304 stainless steel. All threaded fittings shall be a minimum of Schedule 10 stainless steel. The suction manifold assembly shall have radiused sweep elbows to minimize water turbulence into the suction volute.

The suction manifold shall be welded and pressure tested prior to installation. The stainless steel manifold assembly shall be attached to the pump intake volute with a heavy-duty, flexible Victaulic coupling.

The entire intake piping system, valves, bleeder valves, and intake closures, excluding the tank-to-pump line on the tank side of the valve, shall be capable of withstanding a hydrostatic pressure of 250 psi (1700 kPa).

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STAINLESS STEEL DISCHARGE MANIFOLD

The discharge manifold assembly shall be fabricated with Schedule #10 type 304 stainless steel. All threaded fittings shall be a minimum of Schedule 10 stainless steel. The discharge manifold assembly shall have radiused sweep elbows to minimize water turbulence into the discharge header.

The manifold shall be welded and pressure tested prior to installation. The stainless steel manifold assembly shall be attached to the pump intake volute with a heavy-duty, flexible Victaulic coupling.

The entire discharge piping system; valves; drain cocks; and outlet closures, excluding the tank fill line on the tank side of the valve and CAF system piping and components that include valves that permit isolation from discharge pressure, shall be capable of withstanding a hydrodynamic discharge pressure of 500 psi (3400 kPa) or 100 psi (700 kPa) over the maximum discharge pressure capability rating of the pump, whichever is greater.

PLUMBING SYSTEM FINISH

The plumbing system shall not be painted. The piping and valves shall remain natural color.

STAINLESS STEEL PLUMBING WARRANTY

The stainless steel plumbing shall be free of defects in material and 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.

The contractor shall supply details of their warranty information with their bid submission.

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INTAKES

The pump shall have a sufficient number and size of intakes to perform the apparatus pump system certification test.

If the couplings on the suction hose carried on the apparatus are of a different size from that of the pump intake(s) or have means of hose attachment other than that provided on the intake(s), an adapter(s) shall be provided to allow connection of the suction hose to the pump intake(s).

Safety sign FAMA25, which warns of the need for training prior to operating the apparatus, shall be located on pump operator's panel. Label shall be in both English/French for units built for Canada;

WARNING: Death or serious injury might occur if proper operating procedures are not followed. The pump operator as well as individuals connecting supply or discharge hoses to the apparatus must be familiar with water hydraulics hazards and component limitations.

AVERTISSEMENT: La mort et de graves blessures peuvent survenir si la marche à suivre pour l'utilisation adéquate n'est pas effectuée. L'opérateur de la pompe, ainsi que les personnes qui raccordent les tuyaux d'alimentation et de refoulement à l'engin, doivent être familières avec le manuel de l'opérateur, les dangers liés à l'hydraulique et les restrictions relatives aux composantes.

Each intake shall have a removable or accessible strainer inside the connection. The strainer(s) shall restrict spherical debris that is too large to pass through the pump.

At least one (1) valved intake shall be provided that can be controlled from the pump operator's position. The valve and piping shall be a minimum 2-1/2 in. (65 mm) nominal size. If the intake is 2-1/2 in. (65 mm) nominal size, the intake shall be equipped with a female swivel coupling with NH threads.

Any 3 in. (75 mm) or larger intake valve except the tank-to-pump intake valve shall be a slow-operating valve.

Each valved intake shall be equipped with a bleeder valve having a minimum 3/4 in. (19 mm) pipe thread connection to bleed off air or water. The bleeder valve shall be operational without the operator having to get under the apparatus. If a valved appliance is attached to an intake, it shall be equipped with a 3/4 in. (19 mm) bleeder valve on each intake. Bleeder valves for valved intakes 4 in. (100 mm) and larger not located at the pump operator's panel shall be located where the bleeder valve controls are visible and operationally functional while the operator remains stationary at the valved intake position.

Each valved intake having a connection size larger than 3 in. (75 mm) shall be equipped with an adjustable automatic pressure relief device installed on the supply side of the valve to bleed off pressure from a hose connected to the valved intake. The automatic pressure relief device shall be adjustable from a minimum of 90 psi (620 kPa) to at least 185 psi (1275 kPa). The pressure relief device, when preset at 125 psi (860 kPa), shall not allow a pressure rise greater than 60 psi (400 kPa) at the device inlet while flowing a minimum of 150 gpm (570 L/min). The pressure relief device shall discharge to atmosphere.

All intakes shall be provided with caps or closures capable of withstanding a hydrostatic gauge pressure of 500 psi (3400 kPa). Intakes having male threads shall be equipped with caps. Intakes having female threads shall be equipped with plugs. Where adapters for special threads or other means for hose attachment are provided on the intakes, closures shall be provided for the adapters in lieu of caps or plugs. Caps, plugs, or closures for 3-1/2 in. (90 mm) and smaller intakes shall remain secured to the apparatus when removed from the intakes.

If the suction inlets are to be equipped with a valve, Siamese, or adapter that will remain in place while the apparatus is in motion, that valve, Siamese, or adapter shall not project beyond the apparatus running board. The purchaser shall specify if any valve, Siamese, or adapter is to be permanently installed on an intake and identify the brand and model of such item.

The completed apparatus shall have the following intake(s);

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2-1/2" INTAKE, STREETSIDE

There shall be one (1) 2-1/2" (65 mm) gated intake(s) located on pump panel. Each intake shall include:

- One (1) Akron Brass 8800 series Gen II, manual type 2-1/2" (65 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
 - Valve(s) shall be controlled with a push/pull type chromed "T" handle connected to the valve. The control handle shall be located adjacent to the plumbing connection.
- Each intake shall have a 2-1/2" (65 mm) NSTF chrome swivel adapter with strainer provided.
 - The specified adapter shall be provided with a 2-1/2" (65 mm) NSTM chrome plated plug with chain.
- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.

TANK TO PUMP CHECK VALVE

There shall be a check valve between the pump suction and the booster tank valve. The check valve shall eliminate back flow into the water tank when the pump is connected to a pressurized source.

TANK TO PUMP VALVE

A 3" (75 mm) full flow ball valve shall be installed between the fire pump and the water tank. The connection between the tank and the pump shall be capable of the flow recommendations as set forth in the latest edition of NFPA 1901. A non collapsible flexible hose shall be incorporated into the tank to pump plumbing to allow movement in the line as the chassis flexes to avoid damage during normal road operation. The tank to pump valve shall be controlled from the pump operator's panel and labeled "TANK TO PUMP".

The tank to pump valve shall be as follows;

- One (1) Akron Brass 8800 series Gen II slow-operating, manual type 3" (75 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
 - Valve(s) shall be controlled with a push/pull type chromed "T" handle connected to the valve. The control handle shall be located adjacent to the plumbing connection.

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DISCHARGES

A minimum of three (3) 2-1/2 in. (65 mm) outlets shall be provided on any pump rated at 750 gpm (3000 L/min) or greater, and a minimum of one (1) 2-1/2 in. (65 mm) outlet shall be provided on any pump rated at less than 750 gpm (3000 L/min).

The piping and valves supplying any preconnected 1-1/2 in. (38 mm), 1-3/4 in. (45 mm), or 2 in. (52 mm) hose line, including the piping to the preconnected hose storage areas shall be at least 2 in. (52 mm) in size.

All discharge outlet connections, except connections to which a hose will be preconnected, shall be equipped with caps or closures capable of withstanding a hydrostatic gauge pressure of 100 psi (700 kPa) over the maximum pump close-off pressure or 500 psi (3400 kPa), whichever is greater.

Where adapters are provided on the discharge outlet connections, the closures shall fit on the adapters.

Caps or closures for outlet connections smaller than 4 in. (100 mm) shall remain secured to the apparatus when removed from the connection.

Each discharge outlet shall be equipped with a valve that can be opened and closed smoothly at pump discharge gauge pressures of 250 psi (1700 kPa).

The flow-regulating element of each valve shall not change its position under any condition of operation that involves discharge pressures to the maximum pressure of the pump.

The means to prevent a change in position shall be incorporated in the operating mechanism and shall be permitted to be manually or automatically controlled.

Any 3 in. (75 mm) or larger discharge valve shall be a slow-operating valve.

All 1-1/2 in. (38 mm) or larger discharge outlets shall be equipped with a drain or bleeder valve having a minimum 3/4 in. (19 mm) pipe thread connection for draining or bleeding off pressure from a hose connected to the outlet.

Any 2-1/2 in. (65 mm) or larger discharge outlet that is located more than 42 in. (1070 mm) above the ground and to which a hose is to be connected, but that is not in a hose storage area, shall be equipped with a sweep elbow of at least 30 degrees downward.

The completed apparatus shall have the following discharge(s);

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STREETSIDE DISCHARGE

2-1/2" DISCHARGE - 250 GPM

There shall be one (1) 2-1/2" (65 mm) gated discharge(s) with control located on pump panel. Each discharge shall include:

- One (1) of the discharge(s) shall flow water only.
- One (1) Akron Brass 8800 series Gen II, manual type 2-1/2" (65 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
 - Valve(s) shall be controlled with a push/pull type chromed "T" handle connected to the valve. The control handle shall be located adjacent to the plumbing connection.
- Each discharge shall have a 2-1/2" (65 mm) NSTF x 2-1/2" (65 mm) NSTM chrome plated 30 degree downsweep elbow provided.
 - The specified elbow shall be provided with a 2-1/2" (65 mm) NSTF chrome plated cap with chain.
- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- One (1) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with blue (water) LED backlighting activated with pump engagement.
 - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
 - Gauge(s) shall have a range from 0 to 400 PSI.
 - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

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CURBSIDE DISCHARGE

2-1/2" DISCHARGE - 250 GPM

There shall be one (1) 2-1/2" (65 mm) gated discharge(s) with control located on pump panel. Each discharge shall include:

- One (1) of the discharge(s) shall flow water only.
- One (1) Akron Brass 8800 series Gen II, manual type 2-1/2" (65 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
 - Valve(s) shall be controlled with a push/pull type chromed "T" handle connected to the valve. The control handle shall be located adjacent to the plumbing connection.
- Each discharge shall have a 2-1/2" (65 mm) NSTF x 2-1/2" (65 mm) NSTM chrome plated 30 degree downsweep elbow provided.
 - The specified elbow shall be provided with a 2-1/2" (65 mm) NSTF chrome plated cap with chain.
- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- One (1) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with blue (water) LED backlighting activated with pump engagement.
 - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
 - Gauge(s) shall have a range from 0 to 400 PSI.
 - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

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4" DISCHARGE - 625 GPM

There shall be one (1) 4" (100 mm) gated discharge(s) with control located on pump panel. Each discharge shall include:

- One (1) of the discharge(s) shall flow water only.
- One (1) Akron Brass 8800 series Gen II slow-operating, actuated type 3-1/2" (89 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
 - Akron valve(s) shall be controlled with a remote handwheel connected to the gear actuated valve.
 - Valve(s) shall be controlled by an Akron 4" handwheel actuator with portrait layout panel and NFPA compliant valve position indicator located on the pump operator's panel.
- Each discharge shall have a 4" (100 mm) rocker lug NSTF swivel x 4" (100 mm) NSTM harcoat finish 30 degree downsweep elbow provided.
 - The specified elbow shall be provided with a 4" (100 mm) NSTF chrome plated cap with chain.
- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- One (1) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with blue (water) LED backlighting activated with pump engagement.
 - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
 - Gauge(s) shall have a range from 0 to 400 PSI.
 - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

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REAR CURBSIDE DISCHARGE

Each discharge(s) shall have a stainless steel trim ring.

2-1/2" DISCHARGE - 250 GPM

There shall be one (1) 2-1/2" (65 mm) gated discharge(s) with control located on pump panel. Each discharge shall include:

- One (1) of the discharge(s) shall flow water and foam.
- One (1) Akron Brass 8800 series Gen II, manual type 2-1/2" (65 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
 - Valve(s) shall be controlled with a push/pull type chromed "T" handle connected to the valve. The control handle shall be located adjacent to the plumbing connection.
- Each discharge shall have a 2-1/2" (65 mm) NSTF x 2-1/2" (65 mm) NSTM chrome plated 30 degree downsweep elbow provided.
 - The specified elbow shall be provided with a 2-1/2" (65 mm) NSTF chrome plated cap with chain.
- One (1) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- One (1) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with red (foam) LED backlighting activated with pump engagement.
 - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
 - Gauge(s) shall have a range from 0 to 400 PSI.
 - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

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MISCELLANEOUS DISCHARGE

3" DECK GUN DISCHARGE

There shall be one (1) 3" (75 mm) gated discharge located on the upper deck above the pump compartment. Piping shall rise high enough for a mounted deluge gun to be operated in a 360 degree circle to a lower angle of 15 degrees without being impeded by any part of the apparatus or equipment.

The discharge plumbing shall terminate as required by deck gun model. The discharge shall include:

- One (1) of the discharge(s) shall flow water only.
- One (1) Akron Brass 8800 series Gen II slow-operating, actuated type 3" (75 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
 - Akron valve(s) shall be controlled with a remote handwheel connected to the gear actuated valve.
 - Valve(s) shall be controlled by an Akron 4" handwheel actuator with portrait layout panel and NFPA compliant valve position indicator located on the pump operator's panel.
- One (1) Innovative Controls model 3003000, ¾" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- One (1) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with blue (water) LED backlighting activated with pump engagement.
 - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
 - Gauge(s) shall have a range from 0 to 400 PSI.
 - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

DECK GUN MONITOR

A TFT Crossfire model XFC-52 portable deck monitor package with 1,250 GPM capacity, deck gun shall be provided with completed unit with following features;

- SAFE-TAK Base, 3" NH
- CROSSFIRE Storage Bracket
- CROSSFIRE Monitor Top, 2.5" NH
- Master Stream model M-R1250SNJ, 1,250 Automatic Nozzle
- Quad Stack Tips, MST-4NJ, 2.5" NH
- Stream Straightener, 5" or 10" (127 or 254 mm)

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TELESCOPING WATERWAY - MANUAL

The specified deck gun shall be mounted on a TFT model XG12VL-PL 12" manually telescopic waterway. For storage, it can be lowered to deck level, or raised to its extended position 12" (30.5 cm) by lifting the quick release and raising by hand until the non-rotating pipe locks into position, while maintaining the ability to horizontally rotate the monitor device 360 degrees. This gives greater clearance of other equipment on the apparatus, greater freedom of movement and allows a more comfortable operating position. The Extend-A-Gun offers a full 3" waterway (3" Victaulic inlet, and 3" male NPT outlet), hardcoat anodized finish, and built-in sensor for connection to "monitor raised" light or truck open compartment warning. The unit shall be covered by a five-year warranty.

2" CROSS LAY(S)

There shall be two (2) 2" cross lay(s) located in pump module, or per the itemized compartment list. The crosslay(s) shall be transverse of the pump module or body with access from either side.

Each cross lay shall have a minimum storage capacity of 200' of 1-3/4" double jacket hose and nozzle.

- Two (2) of the discharge(s) shall flow water and foam.
- Two (2) Akron Brass 8900 series Gen II, manual type 2" (52 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
 - Valve(s) shall be controlled with a push/pull type chromed "T" handle connected to the valve. The control handle shall be located adjacent to the plumbing connection.
- There shall be a 2" (52 mm) VFC x 1-1/2" (38 mm) NSTM brass or chrome plated 90 degree swivel elbow provided for each discharge.
- Two (2) Innovative Controls model 3003000, 3/4" brass 90 degree ball type drain valve(s) with lift type handle which can be opened under pressure, with color coded label shall be provided. Valve(s) shall be located on bottom of pump panel or drain the lowest point in the plumbing.
- Two (2) Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with red (foam) LED backlighting activated with pump engagement.
 - Gauge(s) shall have a white background with black text and blue (water) or red (foam) pie indicator.
 - Gauge(s) shall have a range from 0 to 400 PSI.
 - The gauge shall have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels shall be UV and scratch resistant and meet SAE standards where applicable.

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TANK FILL VALVE

There shall be one (1) 2" (52 mm) tank fill valve plumbed with 2" plumbing from the pump to the tank. Installation shall be completed with 2" rubber hose and stainless steel hose couplings. The tank fill valve shall be controlled from the operator's control panel and labeled "TANK FILL".

- One (1) Akron Brass 8800 series Gen II, manual type 2" (52 mm) valve(s), Stainless Steel ball with HydroMax technology. Each valve shall be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
 - Valve(s) shall be controlled with a push/pull type chromed "T" handle connected to the valve. The control handle shall be located adjacent to the plumbing connection.

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PUMP PANEL

The side mount pump control panel shall be hinged, or bolted in place allowing it to be easily removed to gain access to plumbing components.

The pump controls shall be mounted on an aluminum control panel with a black powdercoat painted finish.

PUMP PANEL LOCATION

The pump control panel shall be side mounted.

The pump panel shall include the following items;

PUMP PANEL ACCESS

The pump panel shall be open to the side of the truck. The Pump Operator shall NOT be required to open a compartment door to access the pump control panel.

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PRESSURE GOVERNOR and ENGINE MONITORING DISPLAY

A Fire Research PumpBoss series PBA406-C00 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8". The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored engine information shall be from an installed J1939 Translator Module. Outputs for engine control shall be on engine specific wiring. Inputs from the pump discharge and intake pressure sensors shall be electrical.

The following continuous displays shall be provided:

- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Engine oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display
- Pressure and RPM operating mode LEDs
- Pressure / RPM setting; shown on a dot matrix message display
- Throttle ready LED.

A dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and night time operation.

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

| | |
|--|---|
| • High Battery Voltage | • Low Engine Oil Pressure |
| • Low Battery Voltage (Engine Off) | • High Engine Coolant Temperature |
| • Low Battery Voltage (Engine Running) | • Out of Water (visual alarm only) |
| • High Transmission Temperature | • No Engine Response (visual alarm only). |

The program features shall be accessed via push buttons located on the front of the control module. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor and display shall be programmed to interface with a Ford 6.7L diesel engine.

TRANSLATOR MODULE

Fire Research translator module, option code –JM2, for a Ford 6.7L engine model years 2017 and newer shall be installed. It shall provide engine information to the J1939 input of a Fire Research display. The translator module shall connect to the OBD-II connector with the included harness.

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ENGINE OIL PRESSURE

An engine oil pressure sending unit shall be provided and connected to specified pressure governor.

MASTER INTAKE/PRESSURE GAUGES

There shall be one (1) Innovative Controls/NoShok 4" liquid filled gauge to display the Master Intake Pressure, and labeled "PUMP INTAKE".

There shall be one (1) Innovative Controls/NoShok 4" liquid filled gauge to display the Master Discharge Pressure. Gauge shall be labeled "PUMP DISCHARGE".

Both gauges shall have a die cast zinc, chrome plated bezel and color-coded. The left side (Pump Intake) bezel shall be color coded red, and the right side (Pump Discharge) bezel shall be colored black.

A test gauge port manifold shall be integrated into lower center bezel.

- Gauge(s) shall have a white background with black text.
- Gauge(s) shall have a range from -30" to 400 PSI.

PUMP SAFETY AND TEST LABELS

Safety, information, data, and instruction labels for apparatus shall be provided and installed at the operator's instrument panel.

The labels shall include rated capacities, pressure ratings, and engine speeds as determined by the certification tests. The no-load governed speed of the engine, as stated by the engine manufacturer, shall also be included.

The labels shall be provided with all information and be attached to the apparatus prior to delivery.

PUMP PANEL LIGHTING

All gauges and controls on the pump operator's panel shall be adequately illuminated by a full panel width shielded light assembly with full width OnScene Solutions LED light (each panel, if equipped). The light shall be activated by a weather-proof type switch on the pump operator's panel as well as automatically when pump is engaged. This switch shall also activate any area step lighting.

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POLY WATER TANK

The water tank capacity shall be approximately 300 US gallon or 249 Imperial gallons. Certification of the tank capacity shall be recorded on the manufacturer's record of construction and shall be provided to the purchaser upon delivery of the apparatus.

CONSTRUCTION

The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

The water tank shall be of a specific configuration and designed to be completely independent of the body and compartments. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include PolyProSeal™ technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" PT3™ polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design™. Tolerances in design allow for a maximum variation of 1/8" on all dimensions.

WATER FILL TOWER AND COVER

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" PT3™ polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower shall have a 1/4" thick removable polypropylene screen and a PT3™ polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of 4" that is designed to run through the tank, and shall be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction.

The tank cover shall be constructed of 1/2" thick PT3™ polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall accommodate the necessary lifting hardware.

SUMP

There shall be one (1) sump standard per tank. The sump shall be constructed of a minimum of 1/2" PT3™ polypropylene and be located in the left front quarter of the tank, unless specified otherwise. On all tanks that require a front suction, a 3" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall have a minimum 3" N.P.T. threaded outlet on the bottom for a drain plug per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3" above the inside floor.

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OUTLETS

There will be two (2) standard tank outlets: one for the tank-to-pump suction line, which shall be sized to provide adequate water flow to the pump; and, one for tank fill line, which shall be sized according to the NFPA minimum size chart for booster tanks. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates of up to 1000 G.P.M. The addition of rear suction fittings, nurse valve fittings, dump valve fittings, and through-the-tank sleeves to accommodate rear discharge piping must be specified. All auxiliary outlets and inlets must meet all NFPA guidelines in effect at the time of manufacture.

MOUNTING

The tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area.

The tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4" x 1" and a Shore A Hardness of approximately 60 durometer. The rubber must be installed so it will not become dislodged during normal operation of the vehicle. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both in the front and rear as well as side to side to prevent tank from shifting during vehicle operation.

A picture frame type cradle mount with a minimum of 2" x 2" x 1/4" mild steel, stainless steel, or aluminum angle shall be provided or the use of corner angles having a minimum dimension of 4" x 4" x 1/4" by 6" high are permitted for the purpose of capturing the tank.

Although the tank is designed on a free floating suspension principle, it is required that the tank have adequate vertical hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on top of the tank, half way between the front and the rear on each side of the tank. These stops can be constructed of steel, stainless steel or aluminum angle having minimum dimensions of 3" x 3" x 1/4" and shall be approximately 6" to 12" long. These brackets must incorporate rubber isolating pads with a minimum thickness of 1/4" inch and a hardness of 60 durometer affixed on the underside of the angle. The angle should then be bolted to the body side walls of the vehicle while extending down to rest on the top outside edge of the upper side wall of the tank. Hose beds floors must be so designed that the floor slat supports extend full width from side wall to side wall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur. Tank top must be capable of supporting loads up to 200 lbs per sq. foot when evenly distributed. Other equipment such as generators, portable pumps, etc. must not be mounted directly to the tank top unless provisions have been designed into the Poly-Tank® III for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

CENTER OF GRAVITY

A center of gravity calculation shall be determined for each tank and provided as requested in order to provide the apparatus manufacturer with the necessary data to design and certify the apparatus with respect to the NFPA requirements regarding rollover stability.

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WATER TANK LEVEL GAUGE

There shall be one (1) Innovative Controls SL series 10-LED water tank level gauge(s) for indicating water tank level. The tank level gauge shall indicate the liquid level on an easy to read display.

Each tank level gauge system shall include:

- A pressure transducer that is mounted on the outside of the tank in an easily accessible area.
- A super bright LED bar graph display with a visual alarm at 1/4 of a tank. The display shall also provide an output to activate an audible alarm or secondary visual alarm at 1/4 of a tank.
- A set of weather resistant connectors to connect the digital display to the pressure transducer and to the apparatus power.

UPF POLY WATER TANK WARRANTY

The UPF poly water tank shall be provided with a lifetime material and workmanship limited warranty. The manufacturer shall supply details of their warranty information with their bid submission.

FILL TOWER PROTECTION

The fill tower(s) shall be boxed in with an aluminum panel for protection from damage.

CLASS A POLYPROPYLENE FOAM CELL

There shall be one (1) 20 US gallon or 16.6 Imperial gallons polypropylene foam cell incorporated into the polypropylene water tank. This foam tank capacity shall be deducted from water tank size specified.

There shall be one (1) pressure/vacuum vent installed on the foam tank.

A minimum 1 in. (25 mm) inside diameter full flow drain valve and piping shall be provided at the lowest point of any foam concentrate tank. The drain shall be piped to drain directly to the surface beneath the apparatus without contacting other body or chassis components.

A label that reads "Foam Tank Fill" shall be placed at or near the foam concentrate tank fill opening.

A label that specifies the following shall be placed at or near any foam concentrate tank fill opening:

1. Type(s) of foam concentrate the system is designed to use.
2. Any restrictions on the type of foam concentrate that can be used with the system.
3. A FAMA 19 label that reads "Warning: Do Not Mix Brands and Types of Foam". In addition, label shall be in both English/French for units built for Canada; "*Avertissement : Ne pas mélanger les marques et les types d'émulseur*".

FOAM TANK LEVEL GAUGE

There shall be one (1) Innovative Controls SL series 10-LED foam tank level gauge(s) for indicating foam tank level. The gauge shall indicate the liquid level on an easy to read display.

Each tank level gauge system shall include:

- A pressure transducer that is mounted on the outside of the tank in an easily accessible area.
- A super bright LED bar graph display with a visual alarm at 1/4 of a tank. The display shall also provide an output to activate an audible alarm or secondary visual alarm at 1/4 of a tank.
- A set of weather resistant connectors to connect the digital display to the pressure transducer and to the apparatus power.

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HOSE BED STORAGE AREA

Hose bed storage area shall be located over water tank and body, and shall exit at the rear of the apparatus. The interior of storage area shall be free from all projections such as nuts, sharp angles, or brackets that may damage equipment.

ALUMINUM HOSE BED DECKING

The hose bed deck shall be constructed from 3" x 3/4" hollow aluminum extrusions welded into a one-piece grid to allow ventilation and water drainage. The extrusions shall have a radiused ribbed top surface. The deck will be completely removable for easy access to the booster tank. The booster tank fill tower shall be protected as necessary to prevent damage from equipment located in the storage area.

WALKWAY/STEP LIGHTS

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

Each light shall be mounted in an extruded aluminum housing to protect against damage from personnel or equipment.

Lighting shall provide illumination at a minimum level of 2 fc (20 lx) on all work surfaces, steps, and walkways. Lighting shall be switchable but activated automatically when the vehicle park brake is set.

FILL TOWER PROTECTION

The fill tower(s) shall be boxed in with an aluminum panel for protection from damage.

HOSE BED STORAGE

The following fire hose shall be stored in hose bed storage area;

- Four (4) 50' lengths of 2-1/2" double jacket hose, flat lay.
- Five (5) 100' lengths of 5" rubber hose, flat lay.

HOSE BED DIVIDER(S)

One (1) adjustable aluminum hose bed divider(s) shall be provided in the hose bed storage area. The dividers(s) shall be fabricated from 3/16" smooth aluminum with 1" round split aluminum tubing welded to the top and rear edges. A radiused hand-hold opening shall be provided on rear of divider to assist in access to hose bed area. Hose pay-out shall be unobstructed by the divider.

VINYL HOSE BED COVER

A red 22 oz. marine grade vinyl hose bed cover shall be provided with yellow pulls with reflective bungee.

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EQUIPMENT PAYLOAD WEIGHT ALLOWANCE

In compliance with NFPA 1901 standards, the pumper shall be designed for an equipment loading allowance of 2,000 lbs. of Fire Department provided equipment based on the body having less than 250 cu. ft. of storage space.

EQUIPMENT

The following equipment shall be furnished with the completed pumper vehicle;

- One (1) container of assorted stainless steel nuts, bolts, screws and washers used in the construction of the apparatus shall be provided with the completed apparatus.
- There shall be two (2) Zico AC-32, NFPA approved aluminum wheel chocks provided for 32" diameter tires that together will hold the vehicle when loaded to its GVWR or GCWR, on a hard surface with a 20% grade, with the transmission in neutral, and the parking brake released.
 - The wheel chock(s) shall be mounted behind rear wheels, below body on streetside.
- One (1) Duo-Safety 900-A series 20' 2-section extension ladder(s) shall be provided with the completed unit.
 - The ladder(s) shall be mounted on specified ladder rack.
- One (1) Duo-Safety 775A series 10' aluminum roof ladder(s) shall be provided with the completed unit.
 - The ladder(s) shall be mounted on specified ladder rack.
- One (1) Duo-Safety 585-A 10' aluminum folding ladder(s) shall be provided with the completed unit.
 - The ladder(s) shall be mounted on specified ladder rack.
- One (1) Duo-Safety 8' fiberglass pike pole(s) shall be provided with the completed unit.
 - The above specified pike pole will not have a D handle attached
 - The pike pole(s) shall be mounted on vehicle, per itemized compartment list.
- Two (2) Streamlight Survivor, C4 LED flashlight(s) shall be provided with 140 lumens, and 3.5/14 hour run time. Each flashlight shall be orange in color and have a 12 volt DC charger and vehicle mount kit. Each flashlight shall have an LED spotlight style bulbs and reflectors. The flashlight(s) shall be wired to battery direct unless otherwise specified by Fire Department.
- Two (2) flashlight(s) shall be mounted in cab on sides of center console.
- Fire Department supplied NFPA required fire hose and nozzles shall be provided on completed unit before placing vehicle in service.

REMAINING NFPA MINOR EQUIPMENT BY PURCHASER

All other minor equipment not specified above, but required by NFPA 1901 for pumpers, section 5.9.4 shall be supplied and mounted by Fire Department before the unit is placed in emergency service.