SAN LOUIS OBISPO COUNTY

Type 3 Brush Rig

Production Specs

SVI #994

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LIABILITY INSURANCE

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

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

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

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

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

All insurance policies must be;

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

INTERNET IN-PROCESS SITE

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

VEHICLE STABILITY SUPPLIED WITH CAB/CHASSIS

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

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 10 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).

ROADABILITY

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

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

The maximum top speed of fire apparatus with a GVWR over 33,000 lb (11,800 kg) shall not exceed 68 mph (105 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

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

The vehicle shall be capable of maneuvering across a 20 percent grade and up and down a 25 percent grade.

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.

WILDLAND DOCUMENTATION

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

1. The manufacturer’s record of apparatus construction details, including the following information:
   (b) Owner’s name and address
   (c) Apparatus manufacturer, model, and serial number
   (d) Chassis make, model, and serial number
   (e) GAWR of front and rear axles and GVWR
   (f) Front tire size and total rated capacity in pounds (kilograms)
   (g) Rear tire size and total rated capacity in pounds (kilograms)

(h) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
(i) For each engine: make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio
(j) Type of fuel and fuel tank capacity
(k) Electrical system voltage and alternator output in amps
(l) Battery make, model, and capacity in cold cranking amps (CCA)
(m) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
(n) Ratios of all driving axles
(o) Maximum governed road speed
(p) For each pump: make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
(q) For each pump transmission: make, model, serial number, and gear ratio
(r) Reserved
(s) Water tank certified capacity in gallons or liters
(t) Reserved
(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 water tank full but without personnel, equipment, and hose)

2. Certification of compliance of the optical warning system
3. Siren manufacturer's certification of siren
4. Written load analysis and results of the electrical system performance tests
5. Certification of slip resistance of all stepping, standing, and walking surfaces
6. The wildland fire pump manufacturer's certification of suction capability
7. If special conditions are specified by the purchaser of the wildland fire pump, the pump manufacturer's certification of suction capacity under the special conditions
8. A copy of the apparatus manufacturer's approval for stationary pumping applications of the wildland fire pump
9. For each pump, the pump manufacturer's certification of the hydrostatic test
10. For each pump, the certification of inspection and test for the pump
11. The certification of water tank capacity
12. If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy and the final installer's certification that the foam proportioning system meets this standard
13. If the system has a CAFS, the documentation of the manufacturer's pre delivery tests
14. If the apparatus has a line voltage power source, the certification of the test for the power source *(see NFPA 1901, Standard for Automotive Fire Apparatus, 22.15.7.2)*
15. If the apparatus is equipped with an air system, air tank certificates *(see NFPA1901, 24.5.1.2)*, the SCBAfill station certification *(see NFPA 1901, 24.9.7)*, and the results of the testing of the air system installation *(see NFPA 1901, 24.14.5 and NFPA 1901, 24.15.4)*
16. Certification of vehicle side slope stability, including the weight distribution assumed for the calculations or as loaded on the vehicle for the tilt table test
17. Any other required manufacturer test data or reports

OPERATIONS AND SERVICE DOCUMENTATION

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

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

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

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

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

NFPA REQUIRED DOCUMENTATION FORMAT - USB FLASH DRIVE

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

FIRE APPARATUS SAFETY GUIDE

A Fire Apparatus Safety Guide published by Fire Apparatus manufacturer's Association {will/shall} be provided with delivered vehicle. This manual includes essential safety information for fire fighters, fire

chiefs, apparatus mechanics, and fire department safety officers. The guide is applicable to municipal, wildland, and airport fire fighting apparatus manufactured on either custom or commercial chassis.

STATEMENTOF EXCEPTIONS

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

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

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

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

CARRYING CAPACITY

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

The estimated in-service weight shall include the following:

5) The chassis, body and tank(s)
1. Full fuel, lubricant, and other chassis or component fluid tanks or reservoirs
2. Full water and other agent tanks
3. *250 lb (114 kg) in each seating position
4. Fixed equipment such as pumps, aerial devices, generators, reels and air systems as installed
5. Ground ladders, suction hose, designed hose load in their hose beds and on their reels
6. An allowance for miscellaneous equipment that is the greatest of the following:
   7. The values shown in Table 12.1.2 below
   h) A purchaser-provided list of equipment to be carried with weights
   i) A purchaser-specified miscellaneous equipment allowance
8. If the apparatus is designed to accommodate SCBA, an additional 25 lb. (11.4 kg) per seating position shall be added to the 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.

GVWR	**Chassis**		**Storage Area**		**Equipment Weight**		**Ground Clearance**	
Apparatus Type	**lb.**	**kg.**	**ft.3**	**m3**	**lb.**	**kg.**	**in.**	**mm.**
Wildland Fire Apparatus	15,000	7,000	20	0.56	200	90	12	300
	15,001 - 20,000	7,001 - 9,000	50	1.42	500	225	13	330
	20,001 - 26,000	9,001 - 12,000	50	1.42	500	225	15	380
	>26,000	>12,000	75	2.12	750	340		
Wildland Mobile Water Supply Fire Apparatus	All	All			200	90		

TESTING

ROAD TEST

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

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

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

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

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

If the apparatus is equipped with an air brake system, the service brakes shall bring the apparatus, when loaded to its GVWR, to a complete stop from an initial speed of 20 mph (32.2 km/hr) in a distance not

exceeding 35 ft (10.7 m) by actual measurement on a paved, level, dry surface road that is free of loose material, oil or grease.

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

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

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

TEST SEQUENCE

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

1. RESERVE CAPACITY TEST

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

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

2. ALTERNATOR PERFORMANCE TEST

TEST AT IDLE

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

TEST AT FULL LOAD

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

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

3. LOW VOLTAGE ALARM TEST

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

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

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

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

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

DOCUMENTATION

The manufacturer shall deliver the following with the fire apparatus:

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

MANUFACTURER PUMP CERTIFICATION

The apparatus upon completion {will/shall} be tested and certified by the manufacturer. The certification tests {will/shall} follow the guide lines outlined in NFPA 1901 "Standard for Fire Apparatus".

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

The fire pump {will/shall} be tested and results certified to perform as listed below;

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

The test {will/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, {will/shall} be hydrostatically tested to a pressure of 500 psi (3,400 kPa).

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

The pump {will/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 {will/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.

WARRANTY

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

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

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

GENERAL LIMITED WARRANTY - TWO (2) YEARS

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

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

LOW VOLTAGE ELECTRICAL WARRANTY - FIVE (5) YEARS

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

STRUCTURAL WARRANTY - TEN (10) YEARS

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

UNDERCOAT WARRANTY

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

PAINT LIMITED WARRANTY - TEN (10) YEARS

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

GRAPHICS LIMITED WARRANTY

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

HALE FIVE YEAR PUMP WARRANTY

The fire pump {will/shall} be warranted by Hale for a period of five (5) years from the date of delivery to the {Company}. Within this warranty period Hale {will/shall} cover parts and labor for the first two (2) years and parts only for years three (3) through five (5).

STAINLESS STEEL PLUMBING WARRANTY

The stainless steel plumbing {will/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 {will/shall} supply details of their warranty information with their bid submission.

AKRON BRASS FIVE YEAR VALVE WARRANTY

The Akron Brass valves {will/shall} be warranted by Akron Brass for a period of ten (10) years from the date of delivery to the {Company}. The warranty for electronics {will/shall} be warranted by Akron Brass for a period of five (5) years from date of delivery to the {Company}.

UPF POLY WATER TANK WARRANTY

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

CONSTRUCTION PERIOD

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

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

OVERALL HEIGHT REQUIREMENT

The overall height (OAH) of the vehicle {will/shall} **NOT** exceed a maximum of 117" (9' - 9") from the ground. This measurement {will/shall} be taken on flat ground with the tires properly inflated, in the unloaded condition, at that highest point of the vehicle.

OVERALL LENGTH

The overall length (OAL) of the vehicle {will/shall} be approximately 324“ (27' - 0").

OVERALL WIDTH

The overall width (OAW) of the body at drip rails {will/shall} be 100" (8' - 4"), and body {will/shall} be 98" (8' - 2").

ANGLE OF APPROACH

The angle of approach for this vehicle {will/shall} not be less than twenty (20) degrees when it is loaded to the estimated in-service weight as specified by the current edition of NFPA 1906.

ANGLE OF DEPARTURE

The angle of departure for this vehicle {will/shall} not be less than twenty (20) degrees when it is loaded to the estimated in-service weight as specified by the current edition of NFPA 1906.

PRE-CONSTRUCTION CONFERENCE

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

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

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FINAL INSPECTION CONFERENCE

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

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

DELIVERY AND DEMONSTRATION

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

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

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

CAB CHASSIS SPECIFICATION

MISSION:	Requested GVWR: 35000. Calc. GVWR: 37000 Calc. Start / Grade Ability: 37.31% / 2.06% @ 55 MPH Calc. Geared Speed: 86.3 MPH
DIMENSION:	Wheelbase: 183.00, CA: 62.10, Axle to Frame: 63.00
ENGINE, DIESEL:	{Navistar N9} EPA 2010, SCR, 330 HP @ 2000 RPM, 950 lb-ft Torque @ 1200 RPM, 2200 RPM Governed Speed, 330 Peak HP (Max)
TRANSMISSION, AUTOMATIC:	{Allison 3500EVS_P} 5th Generation Controls; Wide Ratio, 6-Speed; With Double Overdrive, Includes Oil Level Sensor, With Provision for PTO, Less Retarder, With 80,000-lb GVW & GCW Max.
CLUTCH:	Omit Item (Clutch & Control)
AXLE, FRONT DRIVING:	{Meritor MX-14-120 EVO} Single Reduction, 14,000-lb Capacity
AXLE, REAR, SINGLE:	{Meritor RS-23-160} Single Reduction, 23,000-lb Capacity, With 200 Wheel Ends Gear Ratio: 4.89
CAB:	Conventional 6-Man Crew Cab
TIRE, FRONT:	(2) 12R22.5 G282 MSD (GOODYEAR) 481 rev/mile, load range H, 16 ply
TIRE, REAR:	(4) 12R22.5 G282 MSD (GOODYEAR) 481 rev/mile, load range H, 16 ply
SUSPENSION, RR, SPRING, SINGLE:	Vari-Rate; 23,500-lb Capacity
PAINT:	Cab schematic 100GM Location 1: 2570, Viper Red (Prem) Chassis schematic N/A

Description

Base Chassis, Model 7400 SFA 4X4 with 181.00 Wheelbase, 62.10 CA, and 63.00 Axle to Frame.

FRAME RAILS Heat Treated Alloy Steel (120,000 PSI Yield); 10.250" x 3.610" x 0.375" (260.4mm x 91.7mm x 9.5mm); 456.0" (11582mm) Maximum OAL

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BUMPER, FRONT Stainless Steel Clad Aluminum, Swept Back

FRAME EXTENSION, FRONT Integral; 20" In Front of Grille

WHEELBASE RANGE 181" (460cm) Through and Including 205" (520cm)

AXLE, FRONT DRIVING {Meritor MX-14-120 EVO} Single Reduction, 14,000-lb Capacity

AXLE, FRONT DRIVING, LUBE {EmGard FE-75W-90} Synthetic Oil; 1 thru 29.99 Pints

SUSPENSION, FRONT, SPRING Parabolic, Taper Leaf; 14,000-lb Capacity; With Shock Absorbers
Includes
: SPRING PINS Rubber Bushings, Maintenance-Free

BRAKE SYSTEM, AIR Dual System for Straight Truck Applications
Includes
: BRAKE LINES Color and Size Coded Nylon
: DRAIN VALVE Twist-Type
: DUST SHIELDS, FRONT BRAKE
: DUST SHIELDS, REAR BRAKE
: GAUGE, AIR PRESSURE (2) Air 1 and Air 2 Gauges; Located in Instrument Cluster
: PARKING BRAKE CONTROL Yellow Knob, Located on Instrument Panel
: PARKING BRAKE VALVE For Truck
: QUICK RELEASE VALVE Bendix On Rear Axle for Spring Brake Release: 1 for 4x2, 2 for 6x4
: SLACK ADJUSTERS, FRONT Automatic
: SLACK ADJUSTERS, REAR Automatic
: SPRING BRAKE MODULATOR VALVE R-7 for 4x2, SR-7 with relay valve for 6x4

DRAIN VALVE {Bendix DV-2} Automatic; With Heater; for Air Tank
Includes
: DRAIN VALVE Mounted in Wet Tank

AIR BRAKE ABS {Bendix AntiLock Brake System} With Electronic Stability Program (4-Channel) With Automatic Traction Control

AIR DRYER {Bendix AD-IP} With Heater
Includes
: AIR DRYER LOCATION Outside Left Rail, Back of Cab
BRAKE CHAMBERS, FRONT AXLE {MGM} 20 SqIn

BRAKE CHAMBERS, REAR AXLE {Bendix EverSure} 30/30 Spring Brake

BRAKES, FRONT, AIR CAM S-Cam; 16.5" x 5.0"; Includes 20 Sq. In. Long Stroke Brake Chambers

SLACK ADJUSTERS, FRONT {Haldex} Automatic

SLACK ADJUSTERS, REAR {Haldex} Automatic

BRAKES, REAR, AIR CAM S-Cam; 16.5" x 7.0"; Includes 30/30 Sq.In. Long Stroke Brake Chamber and Spring Actuated Parking Brake

AIR COMPRESSOR {Bendix Tu-Flo 750} 16.5 CFM Capacity

AIR DRYER LOCATION Mounted Inside Left Rail, Behind Transfer Case Mounting

STEERING COLUMN Tilting and Telescoping

SAN LOUIS OBISPO COUNTY

Type 3 Brush Rig

Production Specs

SVI #994

STEERING WHEEL 2-Spoke, 18" Diam., Black

STEERING GEAR {Sheppard M-110} Power

EXHAUST SYSTEM Switchback Horizontal Aftertreatment Device, Frame Mounted Right Side Outside of Frame Rail; Includes Single Horizontal Tail Pipe, Frame Mounted Right Side Back of Cab, for All- Wheel Drive or Applications Requiring Exhaust Mounted Outside of Frame Rail

ENGINE COMPRESSION BRAKE for Navistar N9/10 I6 Engines; Electronically Activated

SWITCH, FOR EXHAUST 2 Position, Lighted & Latching, ON/OFF Type, Mounted in IP, Inhibits Diesel Particulate Filter Regeneration as Long as Switch is in ON Position

ELECTRICAL SYSTEM 12-Volt, Standard Equipment
Includes
: DATA LINK CONNECTOR For Vehicle Programming and Diagnostics In Cab
: FUSES, ELECTRICAL SAE Blade-Type
: HAZARD SWITCH Push On/Push Off, Located on Top of Steering Column Cover
: HEADLIGHT DIMMER SWITCH Integral with Turn Signal Lever
: HEADLIGHTS (2) Sealed Beam, Round, with Chrome Plated Bezels
: JUMP START STUD Located on Positive Terminal of Outermost Battery
: PARKING LIGHT Integral with Front Turn Signal and Rear Tail Light
: RUNNING LIGHT (2) Daytime, Included With Headlights
: STARTER SWITCH Electric, Key Operated
: STOP, TURN, TAIL & B/U LIGHTS Dual, Rear, Combination with Reflector
: TURN SIGNAL SWITCH Self-Cancelling for Trucks, Manual Cancelling for Tractors, with Lane Change Feature
: WINDSHIELD WIPER SWITCH 2-Speed with Wash and Intermittent Feature (5 Pre-Set Delays), Integral with Turn Signal Lever
: WINDSHIELD WIPERS Single Motor, Electric, Cowl Mounted
: WIRING, CHASSIS Color Coded and Continuously Numbered

CIGAR LIGHTER Includes Ash Cup

FOG LIGHTS Prewire; Includes Auxiliary Toggle Switch and Wiring to Front Bumper, for Driving Lights or Fog Lights Mounted by Customer

POWER SOURCE Cigar Type Receptacle without Plug and Cord

ALTERNATOR {Leece-Neville 14931PAH} Brush Type, 12 Volt 320 Amp. Capacity, Pad Mount

BODY BUILDER WIRING Back of Standard Cab at Left Frame or Under Extended or Crew Cab at Left Frame; Includes Sealed Connectors for Tail/Amber Turn/Marker/ Backup/Accessory Power/Ground and Sealed Connector for Stop/Turn

BATTERY SYSTEM {International} Maintenance-Free (3) 12-Volt 2775CCA Total

2-WAY RADIO Wiring Effects; Wiring With 20 Amp Fuse Protection, Includes Ignition Wire With 5 Amp Fuse, Wire Ends Heat Shrink and 10' Coil Taped to Base Harness

RADIO AM/FM/WB/Clock/3MM Auxiliary Input, with Multiple Speakers

BATTERY DISCONNECT SWITCH {Cole-Hersee 75920-06} 300 Amp; Battery Box Mounted, Disconnects Charging Circuits, Locks with Padlock

BACK-UP ALARM Electric, 102 dBA

HORN, ELECTRIC Disc Style

HORN, AIR ACCOMMODATION PACKAGE; less Horn

HEADLIGHTS Long Life Halogen; for Two Light System

CLEARANCE/MARKER LIGHTS (5) {Truck Lite} Amber LED Lights, Flush Mounted on Cab or Sunshade

STARTING MOTOR {Delco Remy 39MT} 12 Volt; Gear Reduced, With Thermal Over-Crank Protection

COURTESY LIGHT (4) Mounted In Front & Rear Map Pocket Left and Right Side
Notes
: Feature included with CAB INTERIOR TRIM, Premium

INDICATOR, LOW COOLANT LEVEL With Audible Alarm

INDICATOR, BATTERY WARNING Green BATTERY ON Indicator, Mounted on Left Side of Instrument Panel, To be Used with Factory Installed or Customer Mounted Battery Disconnect Switch

CIRCUIT BREAKERS Manual-Reset (Main Panel) SAE Type III With Trip Indicators, Replaces All Fuses Except For 5-Amp Fuses

BATTERY BOX Steel with Plastic Cover, 30" Wide, 2, 3 or 4 Battery Capacity, Mounted Left Side Under Cab

TURN SIGNALS, FRONT LED, Includes LED Side Marker Lights, Mounted on Fender

FENDER EXTENSIONS Rubber

INSULATION, UNDER HOOD for Sound Abatement

GRILLE Stationary, Chrome

INSULATION, SPLASH PANELS for Sound Abatement

BUG SCREEN Front End; Mounted Behind Grille

FRONT END Tilting, Fiberglass, With Three Piece Construction; for 2007 & 2010 Emissions

GRILLE EMBER SCREEN Mounted to Grille and Cowl Tray to Keep Hot Embers out of Engine and HVAC Air Intake System

PAINT SCHEMATIC, PT-1 Single Color, Design
Includes
: PAINT SCHEMATIC ID LETTERS "GM"

TOOL KIT Rim Wrench and Handle Only

PAINT TYPE Base Coat/Clear Coat, 1-2 Tone

PAINT CLASS Premium Color

VEHICLE REGISTRATION IDENTITY ID for the State of California

SAN LOUIS OBISPO COUNTY

Type 3 Brush Rig

Production Specs

SVI #994

CLUTCH Omit Item (Clutch & Control)

ANTI-FREEZE Red, Extended Life Coolant; To -40 Degrees F/ -40 Degrees C, Freeze Protection

BLOCK HEATER, ENGINE {Phillips} 120 Volt/1250 Watt
Includes
: BLOCK HEATER SOCKET Receptacle Type; Mounted below Drivers Door

ENGINE, DIESEL {Navistar N9} EPA 2010, SCR, 330 HP @ 2000 RPM, 950 lb-ft Torque @ 1200 RPM, 2200 RPM Governed Speed, 330 Peak HP (Max)
Includes
: AIR COMPRESSOR AIR SUPPLY LINE Naturally-Aspirated (Air Brake Chassis Only)
: COLD STARTING EQUIPMENT Intake Manifold Electric Grid Heater with Engine ECM Control
: CRUISE CONTROL Electronic; Controls Integral to Steering Wheel
: ENGINE OIL DRAIN PLUG Magnetic
: ENGINE SHUTDOWN Electric, Key Operated
: FUEL FILTER Included with Fuel/Water Separator
: FUEL/WATER SEPARATOR Fuel/Water Separator and Fuel Filter in a Single Assembly; With Water-in-Fuel Sensor; Engine Mounted
: GOVERNOR Electronic
: OIL FILTER, ENGINE Spin-On Type
: WET TYPE CYLINDER SLEEVES

FAN DRIVE {Horton Drivemaster Polar Extreme} Direct Drive Type, Two Speed, With Residual Torque Device for Disengaged Fan Speed
Includes
: FAN Nylon

RADIATOR Aluminum, Cross Flow, Series System; 1228 SqIn Core and 648 SqIn Charge Air Cooler and With Transmission Oil Cooler

FEDERAL EMISSIONS {Navistar N9 & N10} EPA, OBD and GHG Certified for Calendar Year 2016

AIR CLEANER Dual Element
Includes
: GAUGE, AIR CLEANER RESTRICTION Air Cleaner Mounted

THROTTLE, HAND CONTROL Engine Speed Control for PTO; Electronic, Stationary Pre-Set, Two Speed Settings; Mounted on Steering Wheel

ENGINE CONTROL, REMOTE MOUNTED Provision for; Includes Wiring for Body Builder Installation of PTO Controls; With Ignition Switch Control for MaxxForce and Navistar post 2007 Emissions Electronic Engines

FAN OVERRIDE Manual; With Electric Switch on Instrument Panel, (Fan On With Switch On)

ENGINE WATER COOLER {Sen-Dure} Auxiliary, For Use With Fire Trucks

EMISSION COMPLIANCE Engine Shutdown System Exempt Vehicles, Complies With California Clean Air Regulations

TRANSMISSION, AUTOMATIC {Allison 3500EVS_P} 5th Generation Controls; Wide Ratio, 6-Speed; With Double Overdrive, Includes Oil Level Sensor, With Provision for PTO, Less Retarder, With 80,000-lb GVW & GCW Max.

TRANSFER CASE {Meritor T-4210 2} 2 Spd, 10000 lb-ft Total Capacity, Without Provision for PTO, With Electric Over Air Control, With Lube Pump

SAN LOUIS OBISPO COUNTY

Type 3 Brush Rig

Production Specs

SVI #994

Includes
: LIGHT, INDIC, ALL-WHEEL DRIVE Illuminates With All Wheel Drive Engaged, Located on Instrument Panel

TRANSMISSION SHIFT CONTROL {Allison} Push-Button Type; for Allison 3000 & 4000 Series Transmission

TRANSFER CASE LUBE {EmGard 50W} Synthetic; 1 thru 14.99 Pints

OIL COOLER, TRANSFER CASE Remote Mounted Back of Cab

TRANSMISSION OIL Synthetic; 29 thru 42 Pints

ALLISON SPARE INPUT/OUTPUT for Emergency Vehicle Series (EVS); Without Split Shaft PTO

SHIFT CONTROL PARAMETERS Allison 3000 or 4000 Series Transmissions, 5th Generation Controls, Performance Programming

AXLE, REAR, SINGLE {Meritor RS-23-160} Single Reduction, 23,000-lb Capacity, With 200 Wheel Ends . Gear Ratio: 4.89
Includes
: REAR AXLE DRAIN PLUG (1) Magnetic, For Single Rear Axle

SUSPENSION, RR, SPRING, SINGLE Vari-Rate; 23,500-lb Capacity

SPRINGS, REAR AUXILIARY Multileaf; 4,500-lb Capacity

SHOCK ABSORBERS, REAR (2)

DEF TANK 9.5 U.S. Gal. 36.0L Capacity, Frame Mounted Outside Left Rail, Back of Cab

FUEL TANK Top Draw; Polished Aluminum, 26" Diam., 70 U.S. Gal., 265L Capacity Mounted Left Side, Back of Cab

CAB Conventional 6-Man Crew Cab
Includes
: ARM REST (2) Molded Plastic; One Each Door
: COAT HOOK, CAB Located on Rear Wall, Centered Above Rear Window
: CUP HOLDERS Two Cup Holders, Located in Lower Center of Instrument Panel
: DOME LIGHT, CAB Rectangular, Door Activated and Push On-Off at Light Lens, Timed Theater Dimming, Integral to Console, Center Mounted
: GLASS, ALL WINDOWS Tinted
: GRAB HANDLE, CAB INTERIOR (1) "A" Pillar Mounted, Passenger Side
: GRAB HANDLE, CAB INTERIOR (2) Front of "B" Pillar Mounted, One Each Side
: GRAB HANDLE, CAB INTERIOR (4) Two Each Side, Rear Door Mounted at Hinge Side and "C" Pillar Mounted
: INTERIOR SHEET METAL Upper Door (Above Window Ledge) Painted Exterior Color
: STEP (8) Two Steps Per Door
Notes
: 43.9" CA Loss

HEATER HOSES Silicone

GAUGE CLUSTER English With English Electronic Speedometer
Includes
: GAUGE CLUSTER (6) Engine Oil Pressure (Electronic), Water Temperature (Electronic), Fuel (Electronic), Tachometer (Electronic), Voltmeter, Washer Fluid Level
: ODOMETER DISPLAY, Miles, Trip Miles, Engine Hours, Trip Hours, Fault Code Readout
: WARNING SYSTEM Low Fuel, Low Oil Pressure, High Engine Coolant Temp, and Low Battery Voltage (Visual and Audible)

GAUGE, TEMPERATURE, AMBIENT Sensor Wiring with Display Unit Mounted in Cluster

GAUGE, OIL TEMP, AUTO TRANS , for Allison Transmission

GAUGE, AIR CLEANER RESTRICTION {Filter-Minder} With Black Bezel Mounted in Instrument Panel

IP CLUSTER DISPLAY On Board Diagnostics Display of Fault Codes in Gauge Cluster

GAUGE, DEF FLUID LEVEL

SEAT, DRIVER {National 2000} NFPA Compliant, Air Suspension, High Back With Integral Headrest, Vinyl, Isolator, 1 Chamber Lumbar, 2 Position Front Cushion Adjust, -3 to +14 Degree Back Angle Adjust
Includes
: SEAT BELT 3-Point, Lap and Shoulder Belt Type

SEAT, PASSENGER {National 2000} NFPA Compliant, Air Suspension, High Back With Integral Headrest, Vinyl, Isolator, 1 Chamber Lumbar, 2 Position Front Cushion Adjustment, -3 to +14 Degree Back Angle Adjust
Includes
: SEAT BELT 3-Point, Lap and Shoulder Belt Type

GRAB HANDLE (2) Chrome Towel Bar Type With Anti-Slip Rubber Inserts; for Cab Entry, Mounted Left and Right, Each Side at "B" Pillar

SEAT, REAR {National} 2-Single Seats; 2000 NFPA Compliant, Air Suspension, High Back With Integral Headrest, Vinyl, Isolator, 1 Chamber Lumbar, 2 Position Front Cushion Adjustments

MIRRORS (2) {Lang Mekra} Rectangular, Power Both Sides, Thermostatically Controlled Heated Heads, LED Clearance Lights, Bright Finish Heads and Arms, with Black Brackets, Breakaway Type, 7.55" x 14.1" Integral Convex Both Sides, 102" Inside Spacing

SEAT BELT All Orange; 4 to 6

AIR CONDITIONER {Blend-Air} With Integral Heater & Defroster
Includes
: HEATER HOSES Premium
: HOSE CLAMPS, HEATER HOSE Mubea Constant Tension Clamps
: REFRIGERANT Hydrofluorocarbon HFC-134A

CAB SOUND INSULATION Includes Dash Insulator and Engine Cover Insulator
Notes
: Feature included with CAB INTERIOR TRIM, Premium

HOSE CLAMPS, HEATER HOSE {Breeze} Belleville Washer Type

INSTRUMENT PANEL Center Section, Flat Panel

WINDOW, POWER (4) And Power Door Locks, Front and Rear Doors, Left and Right, Includes Express Down Feature

HVAC FRESH AIR FILTER

STORAGE POCKET, DOOR Molded Plastic, Full Width; Mounted on Passenger Door

HOURMETER, PTO for Customer Provided PTO; With Indicator Light and Hourmeter in Gauge Cluster
Includes Return Wire for PTO Feedback Switch

CAB INTERIOR TRIM Deluxe; for Crew Cab
Includes
: "A" PILLAR COVER Molded Plastic
: CAB INTERIOR TRIM PANELS Cloth Covered Molded Plastic, Full Height; All Exposed Interior Sheet Metal is Covered Except for the Following: with a Two-Man Passenger Seat or with a Full Bench Seat the Back Panel is Completely Void of Covering
: CONSOLE, OVERHEAD Molded Plastic; With Dual Storage Pockets with Retainer Nets and CB Radio Pocket
: DOOR TRIM PANELS Molded Plastic; Driver and Passenger Doors
: FLOOR COVERING Rubber, Black
: HEADLINER Soft Padded Cloth
: INSTRUMENT PANEL TRIM Molded Plastic with Black Center Section
: STORAGE POCKET, DOOR (1) Molded Plastic, Full-Length; Driver Door
: SUN VISOR (2) Padded Vinyl with Driver Side Toll Ticket Strap, Integral to Console

CAB REAR SUSPENSION Air Bag Type

WHEEL, SPARE, DISC 22.5"x8.25" Rim, Polished Aluminum, 10-Stud, 285.75mm BC, Hub-Piloted for Front Application Only

WHEELS, FRONT DISC; 22.5"x8.25" Rims, Polished Aluminum, 10-Stud, 285.75mm BC, Hub-Piloted, Flanged Nut, with Steel Hubs

WHEELS, REAR DUAL DISC; 22.5"x8.25" Rims, Polished Aluminum, 10-Stud, 285.75mm BC, Hub-Piloted, Flanged Nut, with Steel Hubs
: Polished Surface Outside Dual Only

(2) TIRE, FRONT 12R22.5 G282 MSD (GOODYEAR) 481 rev/mile, load range H, 16 ply

(4) TIRE, REAR 12R22.5 G282 MSD (GOODYEAR) 481 rev/mile, load range H, 16 ply

MISCELLANEOUS 08ZGJ Battery Box

AIR TANK LOCATION delete 4DVU

Services Section:
WARRANTY Standard for WorkStar 7300/7400 (4x2, 4x4, 6x4, 6x6), Effective with Vehicles Built January 2, 2015 or Later, CTS-2002U

Total Component Weight: 9310/5185 14495

CAB TO AXLE DIMESION

Cab to axle will be 62”.

CAB/CHASSIS PREPAYMENT

The specified cab/chassis {will/shall} be prepaid by {Company} within 30 days of invoice. {Company} understands that if payment is made after 30 days, additional interest charges may apply.

CHASSIS MODIFICATIONS

LUBRICATION AND TIRE DATA PLATE

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

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

VEHICLE DATA PLATE

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

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

OVERALL HEIGHT, LENGTH DATA PLATE (US)

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

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

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

PERSONNEL CAPACITY

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

SEAT BELT WARNING - FAMA06/07

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

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

EQUIPMENT MOUNTING FAMA10

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

FIRE SERVICE TIRES - FAMA12

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

HELMET WARNING - FAMA15

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

CLIMBING METHOD - FAMA23

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

REAR STEP CROSSWALK WARNING - FAMA24

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

FINAL STAGE MANUFACTURER VEHICLE CERTIFICATION

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

FRONT BUMPER EXTENSION

The front bumper of the chassis {will/shall} be extended approximately 20" ahead of the cab using Junior I-beams.

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

BUMPER GRAVEL SHIELD

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

BUMPER HOSEWELL COMPARTMENTS

There {will/shall} be three (3) hosewells in the front extended bumper. Each hosewell {will/shall} be constructed of .125" smooth aluminum and contain drain holes.

The curbside hosewell {will/shall} be approximately 28.25" wide x 11.5" deep x 7" front to back with a tapered side to the right side of the hosewell (1.38 cubic foot). The curbside hosewell shall include a diamond plate hinged cover with stainless steel D-Ring handle and a gas shock to hold the lid in the open position. The left forward corners of the lid shall have a cutout to allow a pre-connected hose to be stored with the hosewell cover closed.

The center hosewell (mounted between the frame rails) {will/shall} be 26" wide x 11.5" deep x 9.5" front to back (1.65 cubic foot). The center hosewell shall include a diamond plate hinged cover. The cover shall be manufactured with bevel style ends. A stainless steel D-Ring handle {will/shall} be used to open the lid with a gas shock to hold the lid in the open position.

The streetside hosewell {will/shall} be approximately 28.25" wide x 11.5" deep x 7" front to back with a tapered side to the right side of the hosewell (1.38 cubic foot). The streetside hosewell shall include a diamond plate hinged cover with stainless steel D-Ring handle and a gas shock to hold the lid in the open position. The right forward corners of the lid shall have a cutout to allow a pre-connected hose to be stored with the hosewell cover closed.

AIR HORN

One (1) Grover 24" Stuttertone chrome plated air horn shall be recessed mounted in the front bumper on the curbside side. An emergency air shut off valve shall be provided in the cab.

AIR HORN ACTIVATION

The air horn(s) shall be operated by the steering wheel horn button and a foot switch on the cab floor at the officer's position.

AIR HORN / ELECTRIC HORN SWITCH

There shall be a switch which allows the driver to select the steering column horn ring operation. This switch shall allow the driver to select either the air horn or electric horn activation.

BUMPER MOUNTED FOG LIGHTS

Two (2) rectangular PERLUX 500 Series fog lights with clear lens {will/shall} be mounted recessed in the front bumper.

FRONT TOW EYES

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

FRONT TOW PLATE

A horizontal full frame width, 1/2" thick steel plate, center pull, front tow eye shall be furnished and installed through or below the front bumper. The tow eye plate shall be triangle shaped extended 6" beyond the front bumper with a 3" x 4" rectangle tow eye. The tow eye must be braced and gusseted to prevent frame rail or bumper damage and bolted to the front frame rail web with eight (8) 5/8" SAE Grade 8 frame bolts and lock nuts.

AIR INTAKE SYSTEM

An air filter {will/shall} be provided in the engine's air intake system by the commercial cab/chassis manufacturer. Air inlet restrictions {will/shall} not exceed the engine manufacturer's recommendations. The air inlet {will/shall} be equipped with a means of separating water and burning embers from the air intake system.

In addition to the engine's air intake, the cab fresh air intake and/or outside cab vent {will/shall} be equipped with a means of separating water and burning embers from the air intake system

This requirement {will/shall} be permitted to be achieved by either of the following methods:

- 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.

1. 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.

EXHAUST

The existing exhaust tailpipe shall be extended to ahead of the rear axle on the curbside.

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.

PLYMOVENT EXHAUST ADAPTER

A Plymovent 5" exhaust adapter flange for Plymovent pneumatic systems {will/shall} be provided and installed on the chassis engine exhaust tailpipe.

EXHAUST SYSTEM WRAP

The exhaust system {will/shall} include a removable insulation high temperature wrap. The wrap {will/shall} be designed to encase the complete exhaust system under the cab to reduce heat transfer into the crew area.

BATTERY JUMPER STUDS

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

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

12 VDC ACCESSORY PLUG

There {will/shall} be {qty} 12 volt accessory plug(s) with protective rubber plug(s) provided and installed in the cab area, wired battery direct. The sockets {will/shall} be mounted one (1) each side of the rear of the cab console beside the handi-talkie holder and four (4) on the front of the consol above the fuse blocks on either side of the intercom.

AM/FM radio speakers shall be installed two (2) in the front cab area and two (2) in the rar crew area. Provide or relocate as necessary.

SCBA SEAT AIR PACK BRACKETS

No SCBA air pack bracket(s) {will/shall} be provided in specified commercial cab SCBA seats. {Company} will provide and install necessary bracket(s) after delivery.

SEAT BELT COLOR

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

SEAT BELT WEB LENGTH - COMMERCIAL CAB

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

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

SEAT BELT / VDR SYSTEM

The seat belt warning and vehicle data recorder systems {will/shall} not be provided on completed unit per {Company}.

IGNITION KEY

If the vehicle is specified to have an ignition key it will be removable from the ignition.

SIX (6) – LED TIRE PRESSURE VISUAL INDICATORS

Each tire shall be equipped with a VECSAFE heavy duty valve cap (or equal) LED indicator that indicates proper tire pressure. The VECSAFE 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 4 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.

HELMET STORAGE

No helmet storage is required in the cab crew area.

CAB CRASH TEST CERTIFICATION

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

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

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

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

CAB MIRRORS, DRIVER ADJUSTABLE

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

ADD UPPER SECOND COLOR

The cab exterior (door jambs not painted unless specified otherwise) shall be re-painted with a second color over the main cab color from the bottom of the glass up over cab roof with PPG Delfleet Evolution paint.

Color: **WHITE**

Paint Number: FBCH 2185.

CHASSIS PAINT WARRANTY

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

CAB STEP OVERLAYS

CURBSIDE UNDER CAB COMPARTMENT

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

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

No compartments {will/shall} be provided beneath the cab doors on streetside with specified cab and chassis fuel tank, and air brake system tank locations.

There {will/shall} be a aluminum compartment mounted beneath the crew door on the curbside of the cab. The compartment shall have approx. dimensions of 28" wide x 10" high x 22" deep. The clear door compartment dimensions {will/shall} be 28" wide x 10" high.

Door {will/shall} be a single pan design with the material being 12-gauge stainless steel. The horizontally hinged door {will/shall} have a polished stainless steel 1/4" piano hingewith a locking Eberhard latch, with a chrome "D" ring with a 5-degree bend for easier grasping of each door handle with gloved hands. The latch {will/shall} be provided with a keyed lock.

The following options will be cut into the step cover:

BATTERY CHARGING RECEPTACLE LOCATION

The specified Kussmaul battery charging receptacle and/or display panel {will/shall} be located below driver door area. Install Horizontally directly above the DEF fill spout. Hinged cover to open forward.

SVI shall modify the chassis block heater so it is wired into the auto eject plug.

HUB AND NUT COVERS

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

MUDFLAPS

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

AIR BRAKE SYSTEM QUICK BUILD-UP

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

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

CHASSIS AIR TANK VALVES

The cab/chassis air brake system tank drains {will/shall} be extended to Class 1 brass petcock valves with chrome plated zinc handle located on forward streetside lower body. Each air tank and valve {will/shall} be inter-piped with color coded reinforced nylon tubing. Brass compression type fittings shall be used on the nylon tubing, meeting all DOT requirements where applicable.

Each handle {will/shall} be properly labeled with colored tag to identify each tank.

DRIVELINE GUARD

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

FUEL TANK VENT EXTENSION

The OEM fuel tank vent line {will/shall} be extended from the fuel tank check valve and vented to the atmosphere. The vent line {will/shall} extend vertically from the tank to the bottom of the cab rear window and then bend 180 degrees towards the ground. A vent plug orifice (#60 drill size) {will/shall} be installed into the upper end of each line. No fuel tank roll over protection check valves {will/shall} be removed from the fuel system.

FUEL AND DEF TANK SKID PLATE

A heavy duty removable skid plate that is painted to match the color of the vehicle’s frame {will/shall} be fastened to the bottom side of the fuel and DEF tank hangers. This removable skid plate {will/shall} be turned up on the front and rear sides to prevent the tank mounting system from digging into the ground when the apparatus is high centered in off-road conditions.

ROAD EMERGENCY SAFETY KIT

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

One (1) 10 lb. ABC type vehicle fire extinguisher with bracket per DOT requirements shall be provided and mounted inside cab area.

ADDITIONAL EQUIPMENT

One (1) 33 MM wheel lug wrench and related handle; one (1) 20-ton bottle jack and related handle; and one (1) heavy-duty set of jumper cables {will/shall} be provided.

DEF FLUID FILL

The DEF fluid fill {will/shall} be as supplied by commercial cab/chassis manufacturer.

BODY DESIGN

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

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

The sheet metal material requirements, including alloy and material thickness, throughout the specifications are considered to be a minimum. Since such materials are available to all Manufacturers, the material specifications {will/shall} be strictly adhered to. {No Exceptions}

The fabrication of the body {will/shall} be formed sheet metal. Formed components {will/shall} allow the {Company} to have the body repaired locally in the case where any object has struck the body and caused damage. The use of proprietary extrusions will prevent the {Company} from such repair and {will/shall} NOT be used. {No Exceptions}

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

The sheet metal fabrication of the body {will/shall} be performed using inert gas continuous feed welders only. The entire body {will/shall} be welded construction. The use of pop rivets in any portion of structural construction may allow premature failure of the body structure. Therefore, pop rivets {will/shall} NOT be used in the construction of the structural portions of the body. This includes side body sheets, inner panels of compartment doors, and any other structural portions of the body. {No Exceptions}

EXTERIOR ALUMINUM BODY

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

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

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

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

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

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

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

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

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

DRIP RAILS

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

ROOF CONSTRUCTION

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

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

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

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

BODY SUBFRAME

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

The body subframe {will/shall} be constructed from 6061T6 aluminum alloy tubing. Subframe {will/shall} consist of two (2) 2" x 4" x 1/4" aluminum tubes minimum, the same width as the chassis frame rails. Welded to this tubing {will/shall} be cross members of 2" x 4" x 1/4" aluminum. Smaller dimension, lighter gauge tubing or angle material subframe {will/shall} not be accepted.

These cross members {will/shall} extend the full width of the body to support the compartments. Cross members {will/shall} be located at front and rear of the body, below compartment divider walls, and in front and rear of wheel well opening. Additional aluminum cross members {will/shall} be located on 16" centers, or as necessary to support walkway or heavy equipment.

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

BODY MOUNTING

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

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

10" REAR STEP BUMPER

The rear bumper {will/shall} be framed with heavy-duty stainless steel in a three-piece design to allow severe twist of the apparatus without damage to the apparatus body or rear bumper assembly. The structural framing {will/shall} enclose an extruded anti-skid plate material; full body width in a 10" deep stand-off type design. A .50" gap between bumper and body is required. The outermost 4.75" of each end {will/shall} be custom angled to prevent dragging of corners in high angle of approach/departure areas.

The bumper {will/shall} be hinged. The center section of the bumper {will/shall} have a pivot design to allow access to the apparatus rear tow eyes for vehicle recovery purposes. A hinged swing-up type rear bumper step {will/shall} be located in the center area of the rear bumper. It {will/shall} be aligned flat on top of the bumper when the step is folded into storage. This step is to reduce the stepping height from the ground to the rear bumper, and {will/shall} allow for safer access to the rear side body steps of the vehicle, where personnel must gain access to the top rear hose bed and storage compartments. The flip-down step {will/shall} have a break-away stop in the lowered position in the event the apparatus is backed into an

object with the step in the down position. The rear step pin {will/shall} have a T-handle with detent, and a hole in the rectangular tube to hold step in a half open position.

REAR TOW EYES

There {will/shall} be two (2) heavy duty rear mounted tow eyes securely attached to the chassis frame and mounted above the rear bumper. The tow eyes {will/shall} be fabricated from 1" thick steel plate with a 3" diamater opening. Tow eyes {will/shall} have a chromed finish.

GROUND LIGHTS

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

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

WHEEL WELL EXTERIOR PANEL

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

UNPAINTED ALUMINUM BODY FENDERS

The body wheel well openings {will/shall} be provided with a "more square" radius, unpainted ALUMINUM fenderettes. The fenderettes {will/shall} be bolted and easily replaceable if damaged. The fenderettes {will/shall} be installed using a rubber gasket to reduce buildup of moisture and/or debris.

WHEEL WELL LINERS

The wheel wells {will/shall} be provided with an easily removable 1/8" smooth aluminum, circular inner fender liner. The inner liner {will/shall} be bolted to the wheel well with stainless steel bolts and spaced away from the wheel well so the liner will not accumulate dirt or water.

NOTE: The fender liners shall be left UNPAINTED.

SCBA CYLINDER COMPARTMENTS

There {will/shall} be four (4) SCBA cylinder storage compartments, two (2) on each side of body in the rear wheel well area. Each compartment {will/shall} have a Cast Products aluminum door assembly with a positive catch latch. Each compartment {will/shall} have a 8" diameter aluminum tube behind the wheel well panel attached to the Cast Products door assembly. Each compartment {will/shall} allow the storage of an SCBA cylinder or a fire extinguisher up to 7-3/4" in diameter. The door shall activate the "Hazard Warning Light" in the cab when not in the closed position.

WHEELWELL DRAWING COMPARTMENT (StreetSide)

Storage compartment(s) to be provided in body wheelwell panel directly above axle and below specified wheelwell compartment S1.

2) This compartment {will/shall} have a flush fitting horizontally hinged, drop-down style compartment door. The door exterior {will/shall} be painted job color.

- The interior door panel {will/shall} have a smooth un-painted aluminum panel.
- The door {will/shall} be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The hinged door(s) {will/shall} have a stainless steel 6" offset bent D-ring non-locking handle. A gasket {will/shall} be placed between handle and door. Door latches {will/shall} be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.

COMPARTMENT LAYOUT

- There {will/shall} be {qty} Austin Front Drawer Release (FDR) 400 lbs. slide-out tray(s) approximately 24" deep and as wide as the compartment layout or door opening permits. The tray top {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 3" vertical lip and welded corners to form a box type tray surface. The sliding tracks {will/shall} extend 100% of the slide length.
    - The above component(s) {will/shall} have a smooth un-painted finish.

BODY PAINT SPECIFICATIONS

BODY PAINT PREPARATION

After the body and components have been fabricated they {will/shall} be disassembled so when vehicle is complete there {will/shall} be finish paint beneath the removable components. The body {will/shall} be

removed from chassis during the paint process to insure proper paint coverage. The body and components {will/shall} be metal finished as follows to provide a superior substrate for painting.

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

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

PAINT PROCESS

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

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

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

PAINT - ENVIRONMENTAL IMPACT

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

FASTENERS

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

ELECTROLYSIS CORROSION CONTROL

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

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

PAINT FINISH - SINGLE COLOR

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

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

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

BODY UNDERCOATING

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

UNDERCOAT WARRANTY

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

PAINT WARRANTY

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

COMPARTMENT INTERIOR FINISH

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

protection.

REFLECTIVE STRIPE REQUIREMENTS

Material

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

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

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

Minimum Requirements

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

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

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

GRAPHICS PROOF

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

REFLECTIVE STRIPE - CAB SIDE

The reflective stripe material {will/shall} be 6" wide, 3M Scotchcal 680 series.

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

REFLECTIVE STRIPE - CAB DOOR INTERIOR

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

The stripe material {will/shall} be 3M Scotchlite 680.

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

SAN LOUIS OBISPO COUNTY

Type 3 Brush Rig

Production Specs

SVI #994

REFLECTIVE STRIPE - BODY SIDES

The reflective stripe material {will/shall} be 6" wide, 3M Scotchcal 680 series.

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

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

CHEVRON REFLECTIVE STRIPE - REAR SIDES PANELS

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

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

The stripe material {will/shall} be 3M Diamond Grade.

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

LETTERING

GRAPHICS PROOF

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

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

SIDE CAB DOOR LETTERING

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

"SAN LUIS OBISPO" - Arched above door seal.
"COUNTY" - Straight below door seal.

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

There shall be {qty} 6" high reflective letters furnished and installed on the vehicle.

"FIRE" - Center of front cab doors, in-line with the main 6" stripe.

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

UPPER BODY SIDE LETTERING

There shall be {qty} 6" high reflective letters furnished and installed on the vehicle.

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

REAR BODY LETTERING

FRONT OF CAB LETTERING

SUPPLIED DECALS

The bidder shall install {qty} {Company} supplied decal(s) on the vehicle, located {User Function 4}.

FLUSH FITTING HINGED DOOR CONSTRUCTION

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

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

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

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

Each door {will/shall} be capable of being opened or closed without unlatching. Door checks {will/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 {will/shall} be single door construction. Door openings over 32" {will/shall} be double door construction with the forward first opening door overlapping the second opening door.

BODY HEIGHT MEASUREMENTS

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

ABOVE REAR AXLE

	Description	Dimension
A	Bottom of Subframe to Top of Body	80.0"
B	Bottom of Subframe to Bottom of Body	14.0"
C	Vertical Door Opening	
	-with roll-up door	40.0"
	-with hinged door	44.0"

BEHIND REAR AXLE

	Description	Dimension
D	Bottom of Subframe to Bottom of Body	14.0"
E	Vertical Door Opening	
	-with roll-up door	56.5"
	-with hinged door	60.5"

GENERAL

	Description	Dimension
F	Bottom of Drip Rail to Top of Body	24.0"
G	Hose Bed Height	28.0"

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

TWO (2) UPPER BODY COMPARTMENTS (OPEN)

There {will/shall} be two (2) compartments parallel to the streetside of body. Each of these compartments {will/shall} be 102.0" long x 10.0" wide x 10" deep. The side compartments {will/shall} be open under each door sill to allow for long equipment.

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

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

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

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

Each compartment {will/shall} have a horizontally mounted OnScene Solutions LED light on the underside of the door. The light and NFPA door ajar system shall be automatically activated by an individual switch per compartment.

Each compartment {will/shall} include an aluminum shelf that permanently divides the storage compartment, to store two (2) 4” x 8' hard suction hoses on the left side, and two (2) 4” x 8' hard suction hoses on the right side. An aluminum tray {will/shall} be provided on floor to protect the body from damage.

BODY WIDTH DIMENSIONS

The wildland body {will/shall} be 98.0" wide, not including drip rail or non-permanent fixtures. Interior compartment depth dimensions {will/shall} be approximately:

Area Description	Dimension
Transverse Area above Subframe (If Specified)	93.0"
Compartment Depth above Subframe (Streetside)	22.5"
Compartment Depth above Subframe (Curbside)	12.5"
Compartment Depth below Subframe	22.5"

STREETSIDE COMPARTMENT - ABOVE REAR WHEELS (S1)

The interior useable compartment width shall be approximately 54.0" wide.

The compartment door opening shall be approximately 49.5" wide.

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

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

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

- The hinged door(s) {will/shall} have a rod and spring style device to hold door in the open and closed positions. Each door {will/shall} be capable of being closed without unlatching. Door checks {will/shall} be bolted to the upper compartment door header and the box pan of the door.

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

COMPARTMENT LAYOUT

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

- There {will/shall} be {qty} adjustable shelf/shelves approximately 22" deep. Each shelf {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edge.
    - 3M™ Diamond Grade™ Conspicuity striping {will/shall} be provided on the front face of the shelf. The striping {will/shall} be red/white in color.

– There {will/shall} be {qty} Zico ULLH walkaway type SCBA air pack bracket(s) with "V" type clip and strap assembly to hold SCBA in place located in the lower left corner of the compartment.

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

STREETSIDE COMPARTMENT - REAR (S2)

The interior useable compartment width shall be approximately 47.0" wide.

The compartment door opening shall be approximately 42.0" wide.

- This compartment {will/shall} have flush fitting vertically hinged compartment door. The door exterior {will/shall} be painted job color.
- The door {will/shall} be equipped with a CPI harsh environment mechanical type door ajar switch located inside compartment interior lower door track.
- The hinged door(s) {will/shall} have a stainless steel 6" offset bent D-ring locking handle. A gasket {will/shall} be placed between handle and door. Door latches {will/shall} be a two-point rotary slam, double-catch latch, recessed inside the double panel door with striker plate.
- The hinged door(s) {will/shall} have a rod and spring style device to hold door in the open and closed positions. Each door {will/shall} be capable of being closed without unlatching. Door checks {will/shall} be bolted to the upper compartment door header and the box pan of the door.
- A compartment threshold protection plate {will/shall} be installed on the bottom edge of the compartment door opening. The threshold protection {will/shall} be fabricated from an aluminum extrusion with an anodized exterior finish.

COMPARTMENT LAYOUT

- There {will/shall} be vertically mounted aluminum Shelf-Trac for specified component installation. Shelf-Trac extrusion {will/shall} have side extruded channels for use in mounting or securing special ancillary items, without need for drilling into body.
- There {will/shall} be {qty} adjustable shelf/shelves approximately 22" deep. Each shelf {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edge.
    - 3M™ Diamond Grade™ Conspicuity striping {will/shall} be provided on the front face of the shelf. The striping {will/shall} be red/white in color.

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

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

CURBSIDE COMPARTMENT - ABOVE REAR WHEELS (C1)

The interior useable compartment width shall be approximately 54.0" wide.

The compartment door opening shall be approximately 49.5" wide.

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

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

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

- The hinged door(s) {will/shall} have a rod and spring style device to hold door in the open and closed positions. Each door {will/shall} be capable of being closed without unlatching. Door checks {will/shall} be bolted to the upper compartment door header and the box pan of the door.

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

COMPARTMENT LAYOUT

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

- There {will/shall} be {qty} adjustable shelf/shelves approximately 12" deep. Each shelf {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.

    - 3M™ Diamond Grade™ Conspicuity striping {will/shall} be provided on the front face of the shelf. The striping {will/shall} be red/white in color.

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

CURBSIDE COMPARTMENT - REAR (C2)

The interior useable compartment width shall be approximately 47.0" wide.

The compartment door opening shall be approximately 42.0" wide.

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

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

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

- The hinged door(s) {will/shall} have a rod and spring style device to hold door in the open and closed positions. Each door {will/shall} be capable of being closed without unlatching. Door checks {will/shall} be bolted to the upper compartment door header and the box pan of the door.

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

COMPARTMENT LAYOUT

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

- There {will/shall} be {qty} adjustable shelf/shelves approximately 12" deep. Each shelf {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edges.

    - 3M™ Diamond Grade™ Conspicuity striping {will/shall} be provided on the front face of the shelf. The striping {will/shall} be red/white in color.

– There {will/shall} be {qty} adjustable shelf/shelves approximately 22" deep. Each shelf {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edge.

    - 3M™ Diamond Grade™ Conspicuity striping {will/shall} be provided on the front face of the shelf. The striping {will/shall} be red/white in color.

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

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

REAR COMPARTMENT - CENTER (RC1)

The rear center compartment {will/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 50.0" wide.

The compartment door opening shall be approximately 48.0" wide.

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

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

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

- The hinged door(s) {will/shall} have a rod and spring style device to hold door in the open and closed positions. Each door {will/shall} be capable of being closed without unlatching. Door checks {will/shall} be bolted to the upper compartment door header and the box pan of the door.

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

COMPARTMENT LAYOUT

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

- There {will/shall} be {qty} adjustable shelf/shelves approximately 25" deep. Each shelf {will/shall} be fabricated from 3/16" 3003 aluminum sheet with a 2" vertical flange along the front and rear edge.

    - 3M™ Diamond Grade™ Conspicuity striping {will/shall} be provided on the front face of the shelf. The striping {will/shall} be red/white in color.

- There {will/shall} be two (2) aluminum handrail sections with brackets assembled under the hose bed extension step. Brackets {will/shall} be designed to hold the handrails in position with a quick pin to hold in place for operation. Inside the right rear ladder compartment door {will/shall} be a storage bracket to hold the handrails when not in use. The I-Zone brackets are provided to lace the hose between when moving from house to house during structure fire protection operations.

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

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.

ROPE ANCHOR OR PORTABLE WINCH RECEIVERS

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

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

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

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

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

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

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

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

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

- There {will/shall} be {qty} 2" x 2" x 1/4" wall steel receiver tube(s) with powder coat paint finish located at the front bumper for use with removable rope anchor point and/or a portable electric winch (when specified) and/or a removable hose roller.
    - The receiver(s) {will/shall} have {qty} rubber cover(s) provided.
- There {will/shall} be {qty} 2" x 2" x 1/4" wall steel receiver tube(s) located at the rear bumper for use with removable rope anchor point and/or a portable electric winch (when specified) and/or a removable hose roller.
    - The receiver(s) {will/shall} have {qty} rubber cover(s) provided.

LADDER / EQUIPMENT STORAGE, REAR CURBSIDE

There {will/shall} be a ladder and/or equipment storage compartment located on the rear curbside of vehicle. The bottom of compartment {will/shall} be located at approximate top of fender height exteding thru body behind the streetside compartments and the booster tank.

Access to the compartment {will/shall} be from a rear facing vertically hinged compartment door. The door {will/shall} be fabricated from 3/16" smooth aluminum with full length 14 gauge stainless steel hinge, with 1/4" stainless steel pin, a 6" stainless steel locking "D" ring handle. A polyester barrier film gasket {will/shall} be placed between stainless steel hinge and any dissimilar metals as necessary to prevent corrosion. Door {will/shall} overlap body surface to prevent entry of moisture and sealed with automotive type rubber molding to provide a weather resistant seal.

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

Devices to secure equipment, compartment dividers, or UHMW plastic angles, or sheeting {will/shall} be used for storage of specified equipment as required to prevent damage to equipment.

Storage {will/shall} be provided for the following ladders and equipment with proper labeling;

- {Quantity} 20' 3-section ladder(s). Manufacturer, model number of the ladder {will/shall} be provided in equipment section of specification, or at pre-construction meeting when provided by {Company}.

- {Quantity} pike pole(s). Manufacturer, model number of the pike pole {will/shall} be provided in equipment section of specification, or at pre-construction meeting when provided by {Company}.

- {Quantity} rubbish hook(s). Manufacturer, model number of the rubbish hook {will/shall} be provided in equipment section of specification, or at pre-construction meeting when provided by {Company}.

- {Quantity} backboard(s). Manufacturer, model number of the backboard {will/shall} be provided in equipment section of specification, or at pre-construction meeting when provided by {Company}.

- {Quantity} digger bar(s). Manufacturer, model number of the digger bar {will/shall} be provided in equipment section of specification, or at pre-construction meeting when provided by {Company}.

SIDE BODY PROTECTION - RUB RAIL

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

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

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

FRONT PROTECTION PANELS

To protect areas subject to intensive wear, scuffing or abuse, protection panels {will/shall} be installed on the front vertical body panels and wrapped around to the front compartment door opening. The protection panels {will/shall} be fabricated from 1/8" aluminum treadplate.

REAR BODY HANDRAILS

There shall be two (2) 24" vertical handrails on the rear of the body. Handrails shall be NFPA compliant 1-1/4" knurled aluminum tubing with LED backlighting and end stanchions.

REAR BODY HANDRAILS

There shall be two (2) 24" horizontal handrails on the rear of the body. Handrails shall be NFPA compliant 1-1/4" knurled aluminum tubing with LED backlighting and end stanchions.

There shall be two (2) 24" horizontal handrails on the aluminum treadplate hosebed cover, mounted on the rear facing edge. Handrails shall be NFPA compliant 1-1/4" knurled aluminum tubing with LED backlighting and end stanchions.

PUMP MODULE HANDRAILS

There shall be two (2) 24" handrails, one (1) each side of pump module for access to upper dunnage area. Handrails shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions.

FOLDING STEP(S)

There shall be {qty} Cast Products 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 will include integrated upper and lower LED lights.

The steps {will/shall} be split evenly on the streetside and curbside rear of the apparatus.

Location(s): One each side front of body, adjacent to pump panel.

LOW VOLTAGE ELECTRICAL SYSTEM- 12 VDC

General

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

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

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

Wiring

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

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

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

Wiring and Wire Harness Construction

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

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

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

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

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

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

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

- SAE J156, *Fusible Links*

1) SAE J553, *Circuit Breakers*
2) SAE J554, *Electric Fuses (Cartridge Type)*
3) SAE J1888, *High Current Time Lag Electric Fuses*
4) 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:

5) The propulsion engine and transmission
1) All legally required clearance and marker lights, headlights, and other electrical devices except windshield wipers and four-way hazard flashers
2) 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)
3) 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
4) The minimum optical warning system, where the apparatus is blocking the right-of way
5) The continuous electrical current required to simultaneously operate any fire pumps, aerial devices, and hydraulic pumps
6) Other warning devices and electrical loads defined by the purchaser as critical to the mission of the apparatus

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

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

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

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

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

Electromagnetic Interference

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

Wiring Diagram

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

Low Voltage Electrical System Performance Test

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

12 VOLT MULTIPLEX CONTROL CENTER

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

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

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 {will/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.

MULTIPLEX SYSTEM INTERFACE DISPLAY

{Quantity} Weldon V-MUX Vista IV multiplex system interface display(s) with touch-screen control {will/shall} be provided in cab easily accessible to driver and/or passenger. The full-color Vista interface display allows the user to control warning and scene lighting, HVAC controls (when specified), and view on-board diagnostics including service information. This display has a wide operating temperature range, automatic screen switching in response to current conditions, and a sleep mode option to eliminate night glare. The following features {will/shall} be included;

7) 800 x 480 resolution
- Four video ports
- Flash updates with USB memory stick
- Display inside and outside temperature (when specified)
- Automatic climate control (when specified)
- 100% Configurable (OEM Level)
- Field re-programmable
- Peer to peer network
- On-board diagnostics / service information
- Colors change to indicate button status

- Video Ready for: Backup camera, Thermal camera, DVD, GPS...

The Vista display shall be located above the cab windshield in the center area. To be mounted onto a "Johnny Ray" or equal swivel/tilt bracket.

CAB CONSOLE

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

The rear portion of the console {will/shall} be provided with open top storage for notebooks or maps. Two (2) adjustable dividers {will/shall} be provided in the storage area. The forward portion of console {will/shall} be slanted for mounting of siren head, radio or 12 volt control panel, and etc, with easy access to both Driver and Officer.

The final design of console {will/shall} be determined by the {Company} at the pre-construction meeting.

Console to match Dallas SVI#984 with black powder coat texture finish.

12 VDC USB, DUAL PORT PLUG

There {will/shall} be {qty} Blue Sea brand 12 volt dual port USB plug(s) provided and installed in the cab area, wired battery direct. The location of the USB plugs {will/shall} be on cab center console.

BATTERY SYSTEM

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

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

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

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

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

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

- A master body disconnect switch that disconnects all electrical loads not provided by the chassis manufacturer

1) A master load disconnect switch that disconnects all electrical loads on the apparatus except the starter

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

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

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

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

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

BATTERY SWITCH

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

BATTERY SOLENOID

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

BATTERY CONDITIONER

One (1) Kussmaul Auto Charge model #091-20/20, 20 amp battery charger and 20 amp Battery Saver shall be installed. The unit shall be equipped with two (2) integral amp meters, one for Battery Saver and one for battery charging mounted on the front panel of the charger.

The Battery Saver component shall eliminate drain on vehicle’s battery system when in vehicle is not in use. The system shall automatically disconnect auxiliary vehicle loads from battery when the charger is energized. A 20 amp output automatic overload limiter shall be installed.

Front panel LED indicators shall include the following:

a) AC power applied
b) Battery Saver circuit overloaded

The charger shall have the following operational specifications:

a) 120 volts AC input at 8 amps
b) 12 volts DC output at 20 amps
c) Battery Saver: 20 amps 12 volt DC output
d) Dimensions of: 13.25” high x 7.00” wide x 5.25” deep and weight 21 lbs.

The battery charger shall supply a ‘single battery bank’ with automatic operation and with an aluminum enclosure. The system shall have a built-in sense circuit to check battery voltage 120 times a second; the system shall compensate for voltage drop in charging wires and provide quick recharging with no overcharging.

A display {will/shall} be provided with charge indicator, remote mounted.

SHORE POWER INLET

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

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

2) The outlet cover shall be yellow.

- The shore power plug {will/shall} be located near the Driver door area.

Locate dirctly above the DEF fill spout.
NOTE: Mount the Kussmaul auto eject in a horizontal position so the hinged cover opens forward.

ENGINE COMPARTMENT LIGHT

There {will/shall} be {qty} 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) {will/shall} operate only when the master battery switch is turned "On".

MAP LIGHT

There shall be {qty} 18" goose neck 12 volt Red/White LED map light(s) provided and installed on the officer side dash area. Light shall be a Little Lite model L-5/18 LED.

INTERIOR CAB LIGHT, LED

{Quantity} OnScene Solution model #70152, 10” x 6” x 7/8”, 10-30 VDC, surface mount dual red and white LED light(s) with clear lens {will/shall} be provided on cab ceiling. Each light shall be individually switched with a high/low intensity setting. In addition light(s) will be capable of a 5 second delay after switching off.

CAB SPOTLIGHT

There shall be {qty} NovaTech hand held 100,000 candle power (50w halogen) spotlight provided with completed vehicle. Includes a momentary switch, with a 2-12’ stretchable 18 gauge SVO coiled cord. A heavy duty stainless steel J-hook for mounting the light {will/shall} be provided on the front of the console.

CHASSIS HEADLIGHT WIG/WAG

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

The lights {will/shall} be switched at the siren control head in the cab console.

CAB HAZARD WARNING LIGHT

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

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

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

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

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

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

BACK-UP ALARM

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

REARVIEW CAMERA SYSTEM

There {will/shall} be {qty} Zone Defense rear/side observation camera system provided and installed on the apparatus. The system {will/shall} include the following components:

- One (1) model CAM.313.SH.4P color camera with IR, high speed shutter mechanism, and automatic heater installed on the rear the body.

- One (1) model CAM.313.MS compact color cameras with IR installed on the right cab side on the rear view mirror.

The camera feeds {will/shall} be viewable through the Vista Display when the apparatus is in motion.

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 {will/shall} be mounted in an M6FC chrome finish bezel.

MIDSHIP MARKER/TURN SIGNAL

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

MARKER LIGHTS

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

CAB STEP LIGHTS / GROUND LIGHTS

There {will/shall} be {qty} 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 {will/shall} be switchable from the vista panel in the cab and a switch on the pump operators panel, 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 {will/shall} be

provided and installed in cab within easy reach of Driver. Siren power {will/shall} be wired through the master warning light switch.

NOTE: Locate siren in the center console.

SIREN SPEAKER

One (1) Whelen Projector model SA314A, 100 watt aluminum, siren speaker shall be provided, recessed in the front bumper with chrome plated polycarbonate grille. The solid state siren speaker shall be vibration resistant. All mounting hardware shall be stainless steel and covered by a two year factory warranty.

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

FRONT LED FLOODLIGHT

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

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

The lights {will/shall} be controlled at the multiplex display(s) in the cab.

SIDE SCENE LIGHTS

There shall be {qty} Whelen Super LED 600 series (6" x 4") recess mounted scene lights (60C0ELZR) provided on the upper body. Light quantity shall be divided equally per side. Each light will have twelve LED diodes. The light shall be an 8-32 degree gradient lens and chrome flange.

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

The lights {will/shall} be controlled at the specified siren control head in the cab.

REAR SCENE LIGHTS

Two (2) Whelen Super LED 600 series (6" x 4") recess mounted scene lights (60C0ELZR) shall be provided on the upper rear body to light the work area immediately behind the vehicle. Each light will have twelve LED diodes. The light shall have an 8-32 degree gradient lens and chrome flange.

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

The lights {will/shall} be controlled at the specified siren control head in the cab.

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

TELESCOPIC LED SCENE LIGHTS

Thers {will/shall} be {qty} Fire Research Spectra LED Scene Light model SPA530-Q20 side mount push up telescopic light {will/shall} be provided and installed. The light pole {will/shall} be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall rotate 360 degrees. The outer pole {will/shall} be a grooved aluminum extrusion and qualify as an NFPA compliant handrail. The pole mounting brackets {will/shall} have a 2 3/4" offset. Wiring shall extend from the pole bottom with a 4' retractile cord.

The lamphead {will/shall} have eighty four (84) ultra-bright white LEDs, 72 for flood lighting and 12 to provide a spot light beam pattern. It {will/shall} operate at 12/24 volts DC, draw 18/9 amps, and generate 20,000 lumens of light. The lamphead {will/shall} have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead {will/shall} be no more than 5 3/8" high by 14" wide by 3 3/4" deep and have a heat resistant handle. The lamphead and mounting arm {will/shall} be powder coated.

ON / OFF SWITCH FOR SPECTRA LAMPHEAD

Each light {will/shall} be provided with –ON option switch shall be installed on the Spectra LED lamphead. The weatherproof on-off toggle switch shall be mounted in a switch box below the lamphead. The switch box shall be powder coated white.

Located one each side of chassis cab.

TRAFFIC DIRECTIONAL LIGHT

There {will/shall} be one (1) Whelen model TAL65 36.01" long x 2.84" high x 2.24" deep, amber LED traffic directional warning device with 30' control cable {will/shall} be located on upper rear body. The control head {will/shall} be located in the cab within easy reach of Driver.

The Whelen model TACTLD1 control head will be included with this installation. The auxiliary warning mode will be activated with the control head only.

The traffic directional light {will/shall} be surface mounted on upper rear body.

WARNING LIGHT PACKAGE

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

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

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

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

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

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

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

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

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

UPPER LEVEL OPTICAL WARNING DEVICES

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

ZONE A - FRONT WARNING LIGHTS

There {will/shall} be one (1) Whelen Liberty II LED 59" lightbar permanently mounted to the cab roof.

The lightbar configuration (streetside to curbside) {will/shall} be:

SECTION	INTERNAL COMPONENTS	LENS COLOR
1	Red Rear Corner LED	Clear
2	Red Front Corner LED	Clear
3	Red Long Super-LED	Clear
4	White Long Super-LED	Clear
5	Red Long Super-LED	Clear
6	Opticom	Clear
7	Opticom	Clear

8	Red Long Super-LED	Clear
9	White Long Super-LED	Clear
10	Red Long Super-LED	Clear
11	Red Front Corner LED	Clear
12	Red Front Corner LED	Clear

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

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

ZONES B AND D - SIDE WARNING LIGHTS

UPPER REAR CORNER WARNING LIGHTS

There {will/shall} be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FCR) provided, one (1) each side. Each light {will/shall} have a clear lens and chrome flange.

The lights {will/shall} be controlled at the specified siren control head in the cab.

ZONE C - REAR WARNING LIGHTS

There {will/shall} be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FCR) provided, one (1) each side. Each light {will/shall} have a clear lens and chrome flange.

The lights {will/shall} be controlled at the specified siren control head in the cab.

LOWER LEVEL OPTICAL WARNING DEVICES

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

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

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

ZONE A - FRONT WARNING LIGHTS

There {will/shall} be two (2) Whelen ION V-Series Super-LED surface mount lights (IONSV3RC) with combination 180° warning and puddle lights provided, one (1) each side. Puddle lights will be turned on with specified scene lighting. Each light {will/shall} have a clear lens and chrome die cast flange.

The lights {will/shall} be switched at the siren control head in the cab console.

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

There {will/shall} be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FCR) provided, one (1) each side. Each light {will/shall} have a clear lens and chrome flange.

The lights {will/shall} be controlled at the specified siren control head in the cab.

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

There {will/shall} be four (4) Whelen ION V-Series Super-LED surface mount lights (IONSV3RC) with combination 180° warning and puddle lights provided, two (2) each side. Puddle lights will be turned on with specified scene lighting. Each light {will/shall} have a clear lens and chrome die cast flange.

The lights {will/shall} be switched at the siren control head in the cab console.

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

There {will/shall} be two (2) Whelen ION V-Series Super-LED surface mount lights (IONSV3RC) with combination 180° warning and puddle lights provided, one (1) each side. Puddle lights will be turned on with specified scene lighting. Each light {will/shall} have a clear lens and chrome die cast flange.

The lights {will/shall} be switched at the siren control head in the cab console.

ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

There {will/shall} be two (2) Whelen 600 series (6" x 4") red Linear Super-LED lights (60R02FCR) provided, one (1) each side. Each light {will/shall} have a clear lens and chrome flange.

The lights {will/shall} be controlled at the specified siren control head in the cab.

WILDLAND SIDE MOUNT PUMP MODULE

The 74" (measured laterally across vehicle width) x 29" wide side mount pump enclosure {will/shall} be removable and supported from the chassis frame rails with spring type body mounts. This enclosure {will/shall} allow independent flexing of the pump enclosure from the body and allow for quick removal. The support structure {will/shall} be constructed of extruded aluminum tubing and angle.

All pump suction and discharge controls are to be mounted on the driver side pump operator's panel so as to permit operation of the pump from a central location. The fire pump, valves and controls shall be accessible for service and maintenance as required by applicable sections of NFPA standards.

The "master" gauges shall be suitably enclosed and mounted on a full pump compartment width "hinged" gauge panel constructed of the same material as the pump operators control panel, allowing access to

the backside of all gauges and gauge lines. The individual gauges {will/shall} be mounted inline with the control handle or adjacent to the control handle. Panel is to include a stainless steel piano hinge, flush mounted chrome plated trigger latch, and stainless steel cable end stops. Electrical wiring and all gauge lines shall be properly tie wrapped to prevent kinking or cutting of the lines when the panel is opened.

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

- Electric primer.

1) Pump and plumbing area service lights.
2) Pressure control device and throttle control.
3) Fire pump and engine instruments.
4) Pump intakes and discharge controls.
5) Master intake and discharge gauges.
6) Tank fill control.
7) Tank suction control.
8) Water tank level gauge.
9) Pump panel lights.
10) Air horn switch.
11) Side and rear work light switches.
12) Ground light switch.
13) Hose bed light switch.

PUMP COMPARTMENT SERVICE ACCESS

The front portion of the pump compartment structure (directly behind the chassis cab) {will/shall} not be overlaid to provide an opening for access to the midship fire pump.

PUMP PANEL - SIDE MOUNT

The pump operator's panel, along with the lower streetside and curbside pump panels {will/shall} be constructed of stainless steel with a brushed finish, fastened to the pump enclosure with 1/4" stainless steel bolts.

The instrument area {will/shall} have a stainless steel continuous hinge that shall swing towards the front of the module for easy access to gauges.

STREETSIDE PUMP PANEL - BOLTED

The streetside pump panel {will/shall} be fastened to the pump enclosure with 1/4" stainless steel bolts and nutserts.

LOWER CURBSIDE PUMP PANEL - BOLTED

The curbside pump panel {will/shall} be fastened to the pump enclosure with 1/4" stainless steel bolts and nutserts.

PUMP MODULE EQUIPMENT STORAGE COMPARTMENT

There {will/shall} be one (1) equipment compartment located on the upper curbside of the pump module. It {will/shall} have dimensions of 22" wide x 26" high. The clear door compartment dimensions {will/shall} be 20.5" wide x 23" high x 12" deep with the door closed. An OnScene LED light shall illuminate the interior of the compartment when the door is open.

The equipment compartment {will/shall} be provided with a flush style hinged door. The doors {will/shall} be provided with a high quality, continuous double seal type weather stripping to prevent moisture and dust from entering the exterior compartment. The door {will/shall} be double pan design with the outer door material being 1/8" aluminum door with a 1/8" aluminum removable inner liner that {will/shall} have a natural finish to provide reflective qualities during night operations. The vertically hinged door {will/shall} have a gas shock and polished stainless steel 1/4" piano hinge.

The door latch {will/shall} be an Eberhard locking slam latch, with a chrome "D" ring with a 5-degree bend for easier grasping of each door handle with gloved hands. The door {will/shall} be provided with a keyed lock.

The exterior of the door {will/shall} be painted to match the lower job color. The interior {will/shall} be painted to match the compartment interior paint specified.

There {will/shall} be two (2) large removable panels provided on the inside of the compartment. These panels shall provide an opening for service access to the right side of the interior of the pump module and to the bottom side of the diesel pump.

WHEEL CHOCK COMPARTMENT

Below the equipment storage compartment {will/shall} be a wheel chock compartment. This compartment {will/shall} be equipped with a plate lap style 1/8" aluminum door mounted on a piano hinge with a push latch. The compartment {will/shall} have clear door dimensions of 8.3" wide x 13.5" high x 13-.5" deep with the door closed.

PUMP COMPARTMENT TOP OVERLAY

The top of the pump compartment {will/shall} be overlaid with materials of a non slip 1/8" NFPA compliant aluminum treadplate.

DUNNAGE AREA

A single wall 3/16" aluminum diamond plate dunnage area {will/shall} be provided above the pump house compartment for equipment mounting and storage space. The dunnage area {will/shall} be as wide as possible from side to side, and as deep as allowed with the available space.

STREETSIDE RUNNING BOARD - SIDE MOUNT PANEL

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

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

14) {Quantity} OnScene 8" Access LED ground light(s) {will/shall} be provided below the body.

CURBSIDE RUNNING BOARD - SIDE MOUNT PANEL

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

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

- {Quantity} OnScene 8" Access LED ground light(s) {will/shall} be provided below the body.

PUMP MODULE FINISH

The upper exterior sides above pump panels {will/shall} be constructed of 1/8" smooth plate aluminum and painted body color. The upper exterior front and rear of pump module {will/shall} be constructed of 1/8" treadplate aluminum.

CROSS LAY

The specified pump module shall have {qty} cross lay(s). The cross lay hose bed(s) {will/shall} be located in the upper portion of the pump module.

The cross lay area {will/shall} be divided with one hose lay on streetside and one hose lay on curbside with a bolted divider located in center (rear of hoselays).

CROSS LAY TRIM

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

The divider(s) between the hose bed areas {will/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.

The pump module cross lay(s) {will/shall} have two (2) OnScene Rough Service 9" LED lights provided, one (1) each end to light the interior cross lay hose bed area.

Each end of hose bed {will/shall} have a black nylon style webbing cover. The covers will be mechanically fastened at the top of the hose bed and the bottom edges will be secured using elastic cord and shoulder bolts.

A safety sign FAMA22, which warns of the need to secure hose, {will/shall} be visible to personnel at each hose storage area.

CROSS LAY BED COVER

A 1/8" aluminum tread plate hinged cover {will/shall} be provided over the lay beds complete with full length stainless steel piano hinge. Stops {will/shall} be provided to protect cab or other adjacent body

components. The hinge {will/shall} be located on the forward section of the cover, closest to the chassis cab.

HALE MBP SINGLE STAGE FIRE PUMP

PUMP ASSEMBLY

- The pump shall be of a size and design to mount on the chassis rails of commercial and or a custom truck chassis, and have the capacity of up to 1,000 GPM (4,000 LPM), NFPA 1901 rated performance.

1. The entire pump shall be assembled and tested at the pump manufacturer's factory.

2. The pump shall be driven by a the truck transmission mounted PTO. The engine shall provide sufficient horsepower and RPM to enable pump to meet and exceed its rated performance within the torque rating of the PTO, truck transmission and drive line components.

3. The entire pump shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA Pamphlet No. 1901. Pump shall be free from objectionable pulsation and vibration.

4. The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (2069 bar). All metal moving parts in contact with water shall be of high quality bronze or stainless steel. Pump utilizing castings made of lower tensile strength cast iron not acceptable.

5. Pump body shall be vertically split, on a single plane for easy removal of entire impeller assembly including clearance rings.

6. Pump shaft to be rigidly supported by two bearings for minimum deflection. The bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.

7. The pump impeller shall be hard, fine grain bronze of the mixed flow design; accurately machines, hand-ground and individually balanced. The vanes of the impeller intake eye shall be hand ground and polished to a sharp edge, and be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower.

8. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body.

9. The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox.

ANODES

To reduce the effect of galvanic action, the fire pump {will/shall} be equipped with two (2) easily replaceable sacrificial catalytic action 3/4" magnesium anodes. One anode {will/shall} be installed on the inlet (suction) side of the system, and one anode {will/shall} be installed on the pressure (outlet) side of the main fire pump.

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CERTIFICATION

The pump will perform and meet the following tests:

100% of rated capacity @150 PSI net pump pressure.
100% of rated capacity @ 165 PSI net pumps pressure.
70% of rated capacity @ 200 PSI net pump pressure.
50% of rated capacity @ 250 PSI net pump pressure

Pump shall be tested at manufacturer under full NFPA suction conditions.

GEARBOX

1. Pump gearbox shall be of sufficient size to withstand up to 16,000 lbs. ft. of torque of the engine. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature..

2. The gearbox drive shafts shall be of heat-treated chrome nickel steel and at least 2-3/4 inches in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine.

3. All gears, both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened, to give an extremely accurate gear for long life, smooth, quiet running, and higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust. (No exceptions.)

4. The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

5. If the gearbox is equipped with a power shift, the shifting mechanism shall be a heat treated, hard anodized aluminum power cylinder, with stainless steel shaft. An in-cab control for rapid shift shall be provided that locks in road or pump.

6. For automatic transmissions, three green warning lights shall be provided to indicate to the operator(s) when the pump has completed the shift from Road to Pump position. Two green lights to be located in the truck driving compartment and one green light on pump operators panel adjacent to the throttle control. For manual transmissions, one green warning light will be provided for the driving compartment. All lights to have appropriate identification/instruction plates.

PAINT FINISH

The paint finish will be black finish paint.

PUMP DRIVE SYSTEM

The water system pump shall be driven by a Chelsea "Hot-Shift" transmission PTO and mounted directly to the transmission of the chassis. The drive line shall be hollow tube type, with heavy duty universals and splined shaft to allow movement of the chassis components and pump.

The engagement of the PTO shall be in the chassis cab with a rocker switch and red pilot light to note engagement of the PTO.

The power supply to the PTO engagement control shall be wired to a neutral position transmission switch to prevent engagement unless the vehicle is in neutral with the parking brake set.

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

One (1) green indicator light shall be supplied at the Pump Operator's panel adjacent to the engine hand throttle. The green light shall be energized when both the chassis transmission is in neutral and the pump drive (PTO) has been engaged. Green light shall be labeled "OK TO PUMP".

Model part number {will/shall} be Chelsea 859XSFJP-B5XV, 128% Ratio.

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

THERMAL PROTECTION DEVICE

A Hale TRV120 thermal protection device shall be included on the pump that monitors pump water temperature and opens to relieve water to cool the pump.

The thermal protection device shall be set to relieve water when the temperature of the pump water exceeds 120 degrees F (49 C).

The components of the thermal protection device shall be manufactured of brass and stainless steel and be compatible with most foam concentrates.

The thermal protection device shall have 1-1/4" NPT threads for easy adaptability to existing pump discharge openings. The discharge line shall be 3/8" diameter tubing vented to atmosphere or back to the booster tank.

The thermal protection device shall have a hydrostatic test rating of 600 PSIG.

MECHANICAL SEALS

The Hale pump {will/shall} be equipped with a mechanical seal in place of pump packing on the suction (inboard) side of the pump. The mechanical seal must be two (2) inches in diameter and {will/shall} be spring loaded, maintenance free and self-adjusting. Mechanical seal construction {will/shall} be a carbon sealing ring, stainless steel coil spring, Viton rubber cup, and a tungsten carbide seat with Teflon backup seal.

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.

HALE FIVE YEAR PUMP WARRANTY

The fire pump {will/shall} be warranted by Hale for a period of five (5) years from the date of delivery to the {Company}. Within this warranty period Hale {will/shall} cover parts and labor for the first two (2) years and parts only for years three (3) through five (5).

MANUFACTURER FIRE PUMP TEST

The pump {will/shall} undergo a manufacturer's test per applicable sections of NFPA 1901 standards, prior to delivery of the completed apparatus.

The test {will/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, {will/shall} be hydrostatically tested to a pressure of 500 psi (3400 kPa) for a minimum for 10 min. The pump shall be fully tested at the pump manufacturer's factory to the performance specifications as outlined by applicable NFPA 1901 standards.

The results of this test {will/shall} be furnished with the vehicle on delivery.

FIRE PUMP TEST LABEL

A test plate {will/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

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

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

SAFETY SIGN

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

ALTITUDE REQUIREMENT

The apparatus shall be designed to meet the specified rating at 2,000 feet (610 meters) altitude.

PUMP DRAIN VALVE

A manifold drain valve assembly {will/shall} be supplied. This drain {will/shall} provide the capability to drain the entire pump by pulling a single control. The valve assembly {will/shall} consist of a stainless steel plunger in a bronze body with multiple ports.

PUMP DRAIN CONTROL

The pump drain {will/shall} be controlled at the pump operator's panel and identified as "Pump Drain". The control {will/shall} be provided in the form of a "T" handle control that is easily actuated with a gloved hand.

AIR PRIMING PUMP CONTROL AT PUMP PANEL

The priming pump {will/shall} be a Trident Emergency Products compressed air powered, high efficiency, multi-stage venturi based AirPrime System.

The priming pump {will/shall} be rigidly attached to the pump transmission and utilizes air supplied from the chassis air system to operate the pump primer. The AirPrime is more efficient and reliable than the conventional electric motor driven primers, and virtually eliminates the impact load on the vehicles electrical system improving the reliability of the vehicle. AirPrime also improves performance in the elapsed time for establishing water supply resulting in improved fire ground operations and safety.

A manual rocker switch with Auto-Prime / Off / Manual-Prime {will/shall} be provided on main pump operator's panel.

The primer {will/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.

DISCHARGE RELIEF VALVE

The discharge pressure relief {will/shall} be controlled by the electronic engine controlled device as specified.

6" SUCTION INLET - STREETSIDE

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

The intake {will/shall} be provided with a removable screen.

LONG SUCTION TUBE

The specified pump intake {will/shall} be provided with a long suction tube. Suction tube {will/shall} have built-in zinc anode protection and multiple suction flanges per pump configuration.

SUCTION INTAKE VALVE (6" ELECTRIC)

The suction intake {will/shall} be provided with an Akron Brass 7960 series slow-operating, actuated type 6" (150 mm) butterfly valve with an air bleeder valve behind pump panel. Valve {will/shall} have a 6" male NH thread through panel opening.

10. An Akron portrait layout with 5" handwheel actuator with NFPA compliant valve position indicator {will/shall} be located on the pump operator's panel.

- {Quantity} 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 {will/shall} be provided. Valve(s) {will/shall} be located on bottom of pump panel and drain the lowest point in the plumbing.

SUCTION CAP

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

HEAT EXCHANGER

A heat exchanger {will/shall} be provided on the pump driving engine cooling system that uses water from the discharge side of the pump to cool the engine coolant through the use of a closed heat exchanger. The water from the pump and the engine coolant {will/shall} not be intermixed. This cooling system {will/shall} be controlled by a 1/4 turn valve on the pump operator's panel.

INTAKE RELIEF VALVE

There {will/shall} be a Task Force Tips model A18 series brass intake relief valve installed on the suction side of the pump. The system {will/shall} be incrementally adjustable from 90 to 300 PSI and include an off position. Valve {will/shall} be designed to prevent vibration from altering the setting of the valve. The system {will/shall} be factory set at 150 PSI prior to delivery.

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

AUXILIARY DIESEL PUMP

There {will/shall} be a Hale model HPX200-KBD24 diesel engine auxiliary pump provided in upper pump module. The auxiliary pump {will/shall} only provide pressure to all 2" discharge valves including the hose reel and be capable of re-circulating tank water through the 2" tank filler valve.

The pump {will/shall} be plumbed in common with that of the main pump for pump and roll applications. The pump shall have a minimum rated capacity of 150 GPM @ 100 PSI.

The pump {will/shall} be mounted above the main fire pump and its engine fuel and electrical system shall be common with the truck chassis. The oil drain will be extended below the chassis frame rail.

PERFORMANCE

The pump/engine shall be capable of meeting the NFPA 1906 performance ratings of 150 GPM @ 100 PSI and 50 GPM @ 150 PSI. Typical pump performance from 5 foot draft at sea level shall be: 120 GPM @ 150 PSI, 165 GPM @ 125 PSI, 205 GPM @ 100 PSI, and 290 GPM @ 25 PSI.

PUMP

The pump body shall be made of anodized alloy aluminum castings coupled together with a stainless

steel band clamp with an O-ring seal which allows quick pump volute removal for servicing. The pump end shall be factory hydrostatically tested to 200 PSI. The impeller shall be bronze. The renewable clearance rings shall be made of bronze to inhibit galvanic corrosion. The impeller shall be 8.75" (222.25mm) in diameter and designed with a sleeve back end to prevent water from coming in contact with the engine shaft. The pump shaft seal shall be an automatically adjusting, maintenance free, mechanical type. The pump body shall be equipped with a petcock drain valve.

SUCTION/DISCHARGE

The suction and discharge ports shall be female pipe thread, designed and located to accept applicable hose thread adapters (3" NPT / 4" Victaulic Suction, 2.5" NPT Discharge flange).

ENGINE

The engine shall be a 4 cycle diesel Kubota D902 radiator liquid cooled design. Engine rating shall be 24.8 BHP at 3600 RPM with a torque of 41.3 lb-ft at 2600 rpm. Engine displacement shall be 898cc and the engine shall be EPA Tier 4 compliant. A 12-volt electric system shall be provided with electric starter and a 40 amp alternator. Engine shall be with USDA approved spark arrestor.

Fuel system shall be designed to draw fuel from the apparatus fuel tank thru the use of an inline 12 volt automotive electric fuel pump, Stewart Warner #235A-D, or equal. The fuel tank pick-up tube shall be designed so as to assure the auxiliary engine will not exhaust the fuel supply of the vehicle. (minimum 10 gallon reserve). A marine grade one way check valve shall be installed in the fuel line to eliminate the possibility of air locks in the fuel line.

A 1/2" crankcase oil drain extension line routed below the frame to facilitate oil changes, with Aeroquip style hose, threaded fittings and drain plug.

DIMENSIONS

32" L x 20"W x 40"H, 355 lbs. (161 kg)

MOUNTING PLATFORM

The pump/engine shall be isolation mounted on engine mounting legs.

INSTRUMENTATION

The pump shall be supplied with a mounted control panel. The control panel shall include a throttle lever, primer lever, master switch, starter push button, oil pressure warning light and a 2.5" liquid filled discharge gauge.

REMOTE START IN CAB

There {will/shall} be a remote start assembly provided in cab area for the portable pump. This panel shall contain the following:

- Auxiliary pump water pressure gauge (Class 1 dry type, 0-400 psi, white face with black numerals, LED back lighted (red in color).
- Vernier throttle cable
- Pump ignition on/off/start switch

- Low Oil Pressure indicator light
- Engine Overheat indicator light
- Glow Plug operational light
- Primer

AUXILIARY PUMP PRESSURE GAUGES

All auxiliary pump pressure gauges shall be 0/400 lbs. liquid less style, stainless steel case, chrome bezel with a white face and black numerals. Two (2) gauges shall be supplied; one (1) 2" mounted on the pump operator's panel, and one (1) 2-1/2" mounted inside the cab within clear view of the vehicle operator's position and labeled as to their function. The in-cab gauge shall be an LED back lighted style gauge, red in color. The light shall be controlled by the auxiliary pump ignition switch and both gauges shall be properly labeled as to their function.

AUXILIARY PUMP CONTROLS

An auxiliary pump control panel and a back lighted pressure gauge shall be provided inside the apparatus cab located in an area readily accessible to the vehicle operator. A second set of controls and pressure gauges shall be located on the left exterior main pump operator's panel.

The auxiliary pump engine control switches shall be marine grade weather proof toggle type switches. Key type ignition switches will not be provided. The apparatus electrical system (Master Switch) shall provide the power for the operation of the auxiliary pump assembly.

The wiring for the auxiliary pump assembly shall be run in a separate loom isolated from the main apparatus wiring loom. The pump engine ignition circuit shall be wired so that the pump may be started from either control panel without regard to the position of the same switch at the other location. The mounting locations for the pump controls and pressure gauges shall be in cab and left pump panel controls shall each consist of the following:

- Vernier cable type adjustable throttle controls on both pump panels (lockable type). Electronic throttle controls shall not be provided.
- Ignition and Kill switch.
- Ignition "on" green panel light.
- Starter button.
- Low oil pressure indicator lamp.
- Coolant overheat indicator lamp.
- Pump pressure gauges, shall be located in the cab and on the left pump panel.

The in-cab pressure gauge shall be back-lighted Red and the light shall be controlled by the auxiliary pump ignition switch. Note: Glow plugs (if necessary) shall be automatically controlled by the ignition switch.

An electric hour meter shall be provided for the auxiliary pump for the recording of pump operating hours. The hour meter shall be remote mounted on either pump panel and must be labeled "Auxiliary Pump Hours" and in a location where it can be easily read.

AUXILIARY PUMP PLUMBING

The auxiliary pump shall be plumbed in common with the main pump and shall only provide discharge pressure and foam concentrate to all 1" and 2" discharge valves. Plumbing between the tank sump or

main manifold and the auxiliary pump suction eye shall be 2" schedule 10 stainless steel with Victaulic couplings, Gates 4684CF 2" flexible wire reinforced suction hose with threaded fittings or combination of both.

A 2" one way full flow check valve shall be installed in the auxiliary pump suction hose as close to the tank sump as possible to ensure that the auxiliary pump remains primed at all times.

PORTABLE PUMP PIPING

The inlet to the diesel pump shall be connected to the 4" intake manifold for the PTO pump with 2" stainless steel pipe and wire reinforced high pressure hose coupled with stainless steel fittings. There shall be a 2" check valve at the connection to the 4" intake manifold to prevent back flow from the 2" line with the 4" line under vacuum.

The discharge of the diesel pump shall be piped with 2" stainless steel pipe and wire reinforced high pressure hose coupled with stainless steel fittings to a double check valve. The other inlet to the double check valve shall be connected to the PTO pump pressure side. The double check valve shall prevent water from the PTO pump and the diesel pump from back feeding under pressure. The check valve outlet shall feed the foam manifold upstream of the foam system check valve.

PUMP PANEL CONTROL

The auxiliary pump shall have a control panel located on the midship pump module operator's position. This panel shall contain the following:

- Auxiliary pump water pressure gauge (Class 1 dry type, 0-400 psi, white face with black numerals).
- Vernier throttle cable
- Pump ignition on / off / start switch
- Low Oil Pressure indicator light
- Engine Overheat indicator light
- Glow Plug operational light
- Primer

AUXILIARY PUMP MOUNTING

The pump and water cooled diesel power unit assembly shall be mounted on a sub frame on the upper right side of the apparatus above the main pump module and in such a manner so as to eliminate vibration while operating and will provide suitable access for performing routine maintenance. The pump and power unit assembly shall be designed so the entire assembly may be easily removed as a unit to gain access to plumbing or components below.

A slotted hinged cover with suitable latches shall be provided over the pump and power unit assembly. The area around the assembly shall remain open for maintenance and air circulation and the radiator shall be located behind a removable or swing-away expanded metal screen. All parts (e.g. auxiliary pump, power unit and bracketing) shall be commercially available.

Unit shall run off the chassis fuel tank (provisions will need to be made on tank) with a 1-way check valve for fuel feed to pump must be accessible.

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FOAM SYSTEM

The apparatus shall be equipped with a FoamPro 2002 electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system. The system shall be capable of handling Class A foam concentrates and most Class B foam concentrates. The foam proportioning operation shall be based on direct measurement of water flows, and remain consistent within the specified flows and pressures. System must be capable of delivering accuracy to within 5% of calibrated settings over the advertised operation range when installed according to factory standards. The system shall be equipped with a digital electronic control display suitable for installation on the pump panel. Incorporated within the control display shall be a microprocessor that receives input from the system flowmeter(s), while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump.

Paddlewheel-type flowmeter(s) shall be installed in the discharges specified to be “foam capable.” When the use of more than one flowmeter is required, an interface electronics module will be provided to totalize these flows and send the flow total to the microprocessor in the computer control display.

The digital computer control display shall enable the pump operator to perform the following control and operation functions for the foam proportioning system:

- Provide push-button control of foam proportioning rates from 0.1% to 9.9%, in 0.1% increments
- Show current flow-per-minute of water
- Show total volume of water discharged during and after foam operations are completed
- Show total amount of foam concentrate consumed
- Simulate flow rates for manual operation
- Perform setup and diagnostic functions for the computer control microprocessor
- Flash a “low concentrate” warning when the foam concentrate tank(s) runs low
- Flash a “no concentrate” warning and shut the foam concentrate pump off, preventing damage to the pump, should the foam tank(s) empty

A 12-volt electric motor drive positive displacement foam concentrate pump, rated up to 5 gpm @ 150 psi with operating pressures up to 400 psi, shall be installed in a suitable, accessible location. The system will draw a maximum of 40 amps @ 12 VDC. A pump motor electronic driver (mounted to the base of the pump) shall receive signals from the computer control display and power the 3/4 hp electric motor directly coupled to the concentrate pump in a variable speed duty cycle to ensure that the correct proportion of concentrate preset by the pump operator is injected into the water stream.

Full flow check valve shall be provided to prevent foam contamination of fire pump and water tank or water contamination of foam tank.

Components of the complete proportioning system shall include:

- Operator control and display
- Paddlewheel flowmeter(s)
- Pump and electric motor/motor driver
- Wiring harnesses
- Low level tank switch
- Foam injection check valve
- Main waterway check valve

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An installation and operation manual shall be provided for the unit, along with a one-year limited warranty by the manufacturer. The system must be installed and calibrated by a Certified FoamPro Dealer.

The system design shall have passed environmental testing which simulates heavy use on off-road mobile apparatus. Testing shall have been conducted in accordance to SAE standards.

A means {will/shall} be provided to prevent water back flow into the foam proportioning system and the foam concentrate storage tank.

A remote start/stop feature shall be available to be incorporated into the 2000/3012 series proportioners. This option shall allow the operator to start and/or stop the operation of the proportioner from more than one location on the apparatus. Included in this option are a special control module, a local start/stop switch with LED lamp for mounting near the control module, a remote start/stop switch with LED lamp for remote mounting, and the 20 foot interface cable.

FOAM TANK REFILL SYSTEM

The apparatus {will/shall} be equipped with an electronic, automatic, concentrate refill system. System {will/shall} operate independently of the foam proportioner allowing simultaneous use. Refill operation {will/shall} not require apparatus or fire pump to be running. The system {will/shall} be capable of handling Class A or Class B foam concentrates, emulsifiers, gels and decontamination concentrates. The apparatus {will/shall} be plumbed from the externally accessed intake/flush ports to the concentrate cell following manufacturer's recommendations. External fill and flush connections to be quick-connect, cam-lock type. Internal piping to incorporate check valves to prevent back flow. Concentrate tank inlet shall be positioned to minimize agitation per manufacturer's recommendations. The refill operation {will/shall} be based on direct measurement of concentrate level in tank. System must be capable of automatically stopping when cell is full and include a manual override feature. The system shall be equipped with an electronic control suitable for installation on the pump panel. Incorporated within the control {will/shall} be a microprocessor that receives input from the system while controlling foam concentrate pump output. An all bronze three-way valve {will/shall} be included to allow the operator to flush system after use. Valve control, intake and flush ports shall be located within corresponding panel plate.

The system {will/shall} enable the operator to perform the following control/operation functions and status indicators for the refill operation:

- Provide push-button start/stop control of foam refill
- Solid green light advises operator concentrate cell is full
- Flashing green indicates system is running
- Green light off, system off
- Allow override of "full tank" condition
- Provide a means to flush the pump and intake piping

System {will/shall} include a 12 volt electric motor driven, positive displacement concentrate pump. Pump {will/shall} deliver minimum flow of 10 gpm (37.8 L/min) @ 20 psi with all concentrates currently utilized in fire apparatus. Pump body to be of all bronze construction and other wetted components and piping to be constructed of non-corrosive materials. The system will draw a maximum of 38 amps @ 12 VDC. A pump/motor solenoid (mounted to the base of the pump) shall receive signals from the computer control display and power the 1/2 hp (0.4 kW) electric motor directly coupled to the concentrate pump. The system {will/shall} receive readings when the concentrate tank is full and stop operation to prevent overfill.

Components of the complete refill system {will/shall} include:

- Operator control and display with Weather-Pac connectors
- Refill/flush quick-connect cam-lock fittings and cap
- Check valves
- Pump/motor assembly and solenoid
- Strainer
- Tank level switch
- Three-way fill/flush valve
- Stainless steel pick-up wand and 6' of reinforced suction hose, 1" diameter to allow maximum flow
- Panel placards

An installation and operation manual {will/shall} be provided, along with a one-year limited warranty by the manufacturer. The system must be installed and plumbed by a Certified FoamPro Dealer. When two types of concentrates are to be used, a separate refill system must be specified for each.

PLUMBING SPECIFICATIONS

The fire pump plumbing system shall be of rigid 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).

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.

STAINLESS STEEL PLUMBING WARRANTY

The stainless steel plumbing {will/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 {will/shall} supply details of their warranty information with their bid submission.

STREETSIDE INTAKE - 2-1/2"

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

- {Quantity} Akron Brass 8900 series Gen II, manual type 2-1/2" (65 mm) valve(s) with Fusion CF composite ball. Each valve {will/shall} be equipped with a brass type valve adapter on inlet side, and discharge side with drain port.
    - Valve(s) {will/shall} be controlled with a handle for direct valve operation through panel.
- Each intake {will/shall} have a 2-1/2" (65 mm) NSTF chrome swivel adapter with strainer provided.
    - The specified adapter {will/shall} be provided with a 2-1/2" (65 mm) NSTM chrome plated plug with chain.
- {Quantity} Class 1, 3/4" brass 90 degree ball type drain valve {will/shall} be provided for the above plumbing item. There {will/shall} be a 1/4 turn control to manually open the drain valve when the line is under pressure located on pump panel and plumbed to drain the lowest point in the plumbing.

CURBSIDE INTAKE - 2-1/2"

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

- {Quantity} Akron Brass 8900 series Gen II, manual type 2-1/2" (65 mm) valve(s) with Fusion CF composite ball. Each valve {will/shall} be equipped with a brass type valve adapter on inlet side, and discharge side with drain port.
    - Valve(s) {will/shall} be controlled with a handle for direct valve operation through panel.
- Each intake {will/shall} have a 2-1/2" (65 mm) NSTF chrome swivel adapter with strainer provided.
    - The specified adapter {will/shall} be provided with a 2-1/2" (65 mm) NSTM chrome plated plug with chain.
- {Quantity} Class 1, 3/4" brass 90 degree ball type drain valve {will/shall} be provided for the above plumbing item. There {will/shall} be a 1/4 turn control to manually open the drain valve when the line is under pressure located on pump panel and plumbed to drain the lowest point in the plumbing.

DIRECT TANK FILL

{Quantity} 2-1/2" (65 mm) direct tank fill(s) {will/shall} be located on streetside rear body panel with check valve.

- {Quantity} Akron Brass 8900 series Gen II, manual type 2-1/2" (65 mm) valve(s) with Fusion CF composite ball. Each valve {will/shall} be equipped with a brass type valve adapter on inlet side, and discharge side with drain port.
    - Valve(s) {will/shall} be controlled with a handle for direct valve operation through panel.
- Each intake {will/shall} have a 2-1/2" (65 mm) NSTF chrome swivel adapter with strainer provided.
    - The specified adapter {will/shall} be provided with a 2-1/2" (65 mm) NSTM chrome plated plug with chain.

TANK TO PUMP CHECK VALVE

There {will/shall} be a check valve between the pump suction and the booster tank valve. The check valve {will/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 {will/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. The valve {will/shall} be flanged to bolt directly to the pump and {will/shall} incorporate a chromium plated bronze ball. The remaining internal moving parts {will/shall} be stainless steel for years of dependable service. 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 {will/shall} be controlled from the pump operator's panel.

- Valve(s) {will/shall} be controlled with a push/pull type chromed "T" handle with adjustable linkage connected to the valve. The valve handle will be pulled for the closed valve position. The control handle shall be located adjacent to the plumbing connection.

FRONT DISCHARGE

There shall be {qty} 2" (52 mm) gated discharge(s) located in front bumper.Each discharge shall include:

- {Quantity} of the discharge(s) {will/shall} flow water and foam.
- {Quantity} Akron Brass 8000 series, manual type 2" (52 mm) valve(s) located in the front bumper extension. Each valve {will/shall} be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.

SHOP NOTE:
Match layout to the Dallas FD jobs, #887 and 888.

- Valve(s) {will/shall} be controlled with a handle for direct valve operation through openings in front bumper.

SHOP NOTE:
Match layout to the Dallas FD units #887 and 888.

- There {will/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.

– {Quantity} Class 1, 3/4" brass 90 degree ball type drain valve {will/shall} be provided for the above plumbing item. There {will/shall} be a 1/4 turn control to manually open the drain valve when the line is under pressure and located under the front bumper and offset to the side so it doesn't hang down so far.

- {Quantity} Class 1, 2-1/2" liquid filled gauge(s)
  - Gauge(s) {will/shall} have a white background with black text.
  - Gauge(s) {will/shall} have a range from 0 to 400 PSI.
  – The gauge {will/shall} have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels {will/shall} be UV and scratch resistant and meet SAE standards where applicable.

STREETSIDE DISCHARGE

There shall be {qty} 2-1/2" (65 mm) gated discharge(s) located on pump panel. Each discharge shall include:

– {Quantity} of the discharge(s) {will/shall} flow water only.

– {Quantity} Akron Brass 8900 series Gen II, manual type 2-1/2" (65 mm) valve(s) with Fusion CF composite ball. Each valve {will/shall} be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
  - Valve(s) {will/shall} be controlled with a handle for direct valve operation through panel.

- Each discharge {will/shall} have a 2-1/2" (65 mm) NSTF x 2-1/2" (65 mm) NSTM chrome plated 30 degree downsweep elbow provided.

– There {will/shall} be a 2-1/2" (65 mm) NSTF x 1-1/2" (38 mm) NSTM chrome plated rigid adapter provided for discharge(s).
  - The specified elbow {will/shall} be provided with a 1-1/2" (38 mm) NSTF chrome plated cap with chain.

- {Quantity} Class 1, 3/4" brass 90 degree ball type drain valve {will/shall} be provided for the above plumbing item. There {will/shall} be a 1/4 turn control to manually open the drain valve when the line is under pressure located on pump panel and plumbed to drain the lowest point in the plumbing.

– {Quantity} Class 1, 2-1/2" liquid filled gauge(s)
  - Gauge(s) {will/shall} have a white background with black text.

- Gauge(s) {will/shall} have a range from 0 to 400 PSI.

– The gauge {will/shall} have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels {will/shall} be UV and scratch resistant and meet SAE standards where applicable.

CURBSIDE DISCHARGE

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

– {Quantity} of the discharge(s) {will/shall} flow water only.

– {Quantity} Akron Brass 8900 series Gen II, manual type 2-1/2" (65 mm) valve(s) with Fusion CF composite ball. Each valve {will/shall} be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.

- Valve(s) {will/shall} be controlled with a handle for direct valve operation through panel.

- Each discharge {will/shall} have a 2-1/2" (65 mm) NSTF x 2-1/2" (65 mm) NSTM chrome plated 30 degree downsweep elbow provided.

– There {will/shall} be a 2-1/2" (65 mm) NSTF x 1-1/2" (38 mm) NSTM chrome plated rigid adapter provided for discharge(s).

- The specified elbow {will/shall} be provided with a 1-1/2" (38 mm) NSTF chrome plated cap with chain.

- {Quantity} 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 {will/shall} be provided. Valve(s) {will/shall} be located on bottom of pump panel and drain the lowest point in the plumbing.

– {Quantity} Innovative Controls/NoShok 2-1/2" liquid filled gauge(s) with blue (water) LED backlighting.

- Gauge(s) {will/shall} have a white background with black text and blue (water) or red (foam) pie indicator.

- Gauge(s) {will/shall} have a range from 0 to 400 PSI.

– The gauge {will/shall} have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels {will/shall} be UV and scratch resistant and meet SAE standards where applicable.

REAR STREETSIDE DISCHARGE

There shall be {qty} 2-1/2" (65 mm) gated discharge(s) located on pump panel. Each discharge shall include:

– {Quantity} of the discharge(s) {will/shall} flow water only.

- {Quantity} Akron Brass 8900 series Gen II, manual type 2-1/2" (65 mm) valve(s) with Fusion CF composite ball. Each valve {will/shall} be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
    - Valve(s) {will/shall} be controlled with a handle for direct valve operation through panel.
- Each discharge {will/shall} have a 2-1/2" (65 mm) NSTF x 2-1/2" (65 mm) NSTM chrome plated 30 degree downsweep elbow provided.
- There {will/shall} be a 2-1/2" (65 mm) NSTF x 1-1/2" (38 mm) NSTM chrome plated rigid adapter provided for discharge(s).
    - The specified elbow {will/shall} be provided with a 1-1/2" (38 mm) NSTF chrome plated cap with chain.
- {Quantity} Class 1, 3/4" brass 90 degree ball type drain valve {will/shall} be provided for the above plumbing item. There {will/shall} be a 1/4 turn control to manually open the drain valve when the line is under pressure located on pump panel and plumbed to drain the lowest point in the plumbing.
- {Quantity} Class 1, 2-1/2" liquid filled gauge(s)
    - Gauge(s) {will/shall} have a white background with black text.
    - Gauge(s) {will/shall} have a range from 0 to 400 PSI.
    - The gauge {will/shall} have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels {will/shall} be UV and scratch resistant and meet SAE standards where applicable.

REAR CURBSIDE DISCHARGE

There shall be {qty} 2-1/2" (65 mm) gated discharge(s) located on pump panel. Each discharge shall include:

- {Quantity} of the discharge(s) {will/shall} flow water and foam.
- {Quantity} Akron Brass 8900 series Gen II, manual type 2-1/2" (65 mm) valve(s) with Fusion CF composite ball. Each valve {will/shall} be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.
    - Valve(s) {will/shall} be controlled with a handle for direct valve operation through panel.
- Each discharge {will/shall} have a 2-1/2" (65 mm) NSTF x 2-1/2" (65 mm) NSTM chrome plated 30 degree downsweep elbow provided.
- There {will/shall} be a 2-1/2" (65 mm) NSTF x 1-1/2" (38 mm) NSTM chrome plated rigid adapter provided for discharge(s).
    - The specified elbow {will/shall} be provided with a 1-1/2" (38 mm) NSTF chrome plated cap with chain.

- {Quantity} Class 1, 3/4" brass 90 degree ball type drain valve {will/shall} be provided for the above plumbing item. There {will/shall} be a 1/4 turn control to manually open the drain valve when the line is under pressure located on pump panel and plumbed to drain the lowest point in the plumbing.

- {Quantity} Class 1, 2-1/2" liquid filled gauge(s)

  - Gauge(s) {will/shall} have a white background with black text.

  - Gauge(s) {will/shall} have a range from 0 to 400 PSI.

  - The gauge {will/shall} have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels {will/shall} be UV and scratch resistant and meet SAE standards where applicable.

2" CROSS LAY(S)

There {will/shall} be one (1) 2" cross lay hose bed located in pump module. The crosslay {will/shall} be transverse of the pump module and include a bolted center divider seperating either side of the hose bed.

Each side of the cross lay {will/shall} have a minimum storage capacity of 150' of 1-3/4" double jacket hose and nozzle.

- {Quantity} of the discharge(s) {will/shall} flow water and foam.

- {Quantity} Akron Brass 8900 series Gen II, manual type 2" (52 mm) valve(s) with Fusion CF composite ball. Each valve {will/shall} be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port. The valve(s) will be located directly below the hose bed, one (1) per side.

  - Valve(s) {will/shall} be controlled with a handle for direct valve operation through panel.

Valves to be externally mounted directly below hose lays.

- There {will/shall} be a 2" (52 mm) VFC x 1-1/2" (38 mm) NSTM brass or chrome plated adapter provided on the discharge valve, one (1) each side.

- {Quantity} Class 1, 3/4" brass 90 degree ball type drain valve {will/shall} be provided for the above plumbing item. There {will/shall} be a 1/4 turn control to manually open the drain valve when the line is under pressure located on pump panel and plumbed to drain the lowest point in the plumbing.

- {Quantity} Class 1, 2-1/2" liquid filled gauge(s)

  - Gauge(s) {will/shall} have a white background with black text.

  - Gauge(s) {will/shall} have a range from 0 to 400 PSI.

  - The gauge {will/shall} have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels {will/shall} be UV and scratch resistant and meet SAE standards where applicable.

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BOOSTER REEL

There {will/shall} be {qty} Hannay SBEF24-23-24-12 (26" wide x 23.5" high x 20.5" deep) polished aluminum booster hose reel discharge(s) with electric rewind motor located in upper pump module or lower compartment per itemized compartment layout. Reel {will/shall} be capable of holding 100' of 1" or 150' of 3/4" booster hose.

- Power rewind control(s) {will/shall} be in a position where the operator can observe the rewinding operation and not be more than 72 in. (1830 mm) above the operator's standing position, and {will/shall} be marked with a label indicating its function.

- Each booster hose reel {will/shall} be equipped with a Hannay FH-3 hose guide rollers.

- Each booster hose reel {will/shall} be supplied with 150' x 3/4" diameter, 800 PSI rubber booster hose with 3/4" NST hardcoat aluminum couplings. Color of hose {will/shall} be red.

- No nozzle is required with specified booster hose reel(s).

- {Quantity} of the discharge(s) {will/shall} flow water and foam.

- {Quantity} Akron Brass 8900 series Gen II, manual type 1-1/2" (38 mm) valve(s) with Fusion CF composite ball. Each valve {will/shall} be equipped with a Class 1 stainless steel weld type valve adapter on inlet side, and discharge side with drain port.

    - Valve(s) {will/shall} be controlled with a push/pull type chromed "T" handle with adjustable linkage connected to the valve. The control handle shall be located adjacent to the plumbing connection.

- {Quantity} Class 1, 3/4" brass 90 degree ball type drain valve {will/shall} be provided for the above plumbing item. There {will/shall} be a 1/4 turn control to manually open the drain valve when the line is under pressure located on pump panel and plumbed to drain the lowest point in the plumbing.

- {Quantity} Class 1, 2-1/2" liquid filled gauge(s)

    - Gauge(s) {will/shall} have a white background with black text.

    - Gauge(s) {will/shall} have a range from 0 to 400 PSI.

    - The gauge {will/shall} have a die cast zinc, chrome plated bezel with color-coded labels insert and a color-coded gauge trim ring. Labels {will/shall} be UV and scratch resistant and meet SAE standards where applicable.

TANK FILL VALVE

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

- {Quantity} Akron Brass 8900 series Gen II, manual type 2" (52 mm) valve(s) with Fusion CF composite ball. Each valve {will/shall} be equipped with a brass type valve adapter on inlet side, and discharge side with drain port.

- Valve(s) {will/shall} be controlled with a push/pull type chromed "T" handle with adjustable linkage connected to the valve. The control handle shall be located adjacent to the plumbing connection.

PUMP PANEL

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

Provide a pump panel layout drawing to customer, prior to fabrication.

The pump controls {will/shall} be mounted on 304L stainless steel with brushed 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.

ENGINE GAUGES

The cab/chassis engine gauges {will/shall} be provided with the specified pump pressure governor system.

PRESSURE GOVERNOR and ENGINE MONITORING DISPLAY

A Fire Research PumpBoss series PBA400-A00 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 a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or 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 monitoring pressure display shall be programmed at installation for a specific engine.

PRESSURE GOVERNOR and MONITORING DISPLAY BUZZER

Fire Research PumpBoss –Z1 option for an audible alarm buzzer shall be installed. The buzzer shall sound when a signal from the PumpBoss activates it.

MASTER INTAKE GAUGE

There {will/shall} be one (1) Innovative Controls/NoShok 4" liquid filled gauge to display the Master Intake Pressure. Gauge {will/shall} be labeled "MASTER INTAKE".

MASTER DISCHARGE GAUGE

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

Master pump intake and pump discharge pressure gauges shall be located within 8 in. (200 mm) of each other, edge to edge, with the intake pressure gauge to the left of or below the pump discharge pressure gauge.

- Gauge(s) {will/shall} have a white background with black text.

- Gauge(s) {will/shall} have a range from -30" to 600 PSI.

- The gauge {will/shall} have a die cast zinc, chrome plated bezel with color-coded labels insert. Labels {will/shall} be UV and scratch resistant and meet SAE standards where applicable.

PUMP SAFETY AND TEST LABELS

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

The labels {will/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, {will/shall} also be included.

The labels {will/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 {will/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 {will/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 {will/shall} also activate any area step lighting.

PUMP PANEL AIR HORN SWITCH

A switch to activate the cab/chassis air horn(s) {will/shall} be provided on pump panel. Switch {will/shall} be constantly illuminated and labeled.

LOW PRESSURE AIR OUTLET

There shall be one (1) air outlet connection to supply low pressure air for general maintenance. The outlet shall terminate in a 1/4" NPT threaded port. Air outlet {will/shall} be located on lower pump operator's panel. The connector shall be supplied by the {Company}.

BACK PACK FILLER VALVE

A Class 1 brass, 3/4", quarter turn ball valve with chrome T-handle {will/shall} be supplied and labeled "Back Pack Filler". The valve {will/shall} be installed on the streetside lower forward side of the pump panel with the discharge hose terminating at the outside of the apparatus body. The valve plumbing {will/shall} be 3/4" I.D. properly routed and clamped from the tank sump to the filler valve.

TEST TAPS

An Innovative Controls 4-port test gauge manifold with chrome bezel for pump intake and pump pressure {will/shall} be provided on the pump panel and properly labeled.

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POLY WATER TANK

The water tank capacity {will/shall} be approximately 500 US gallon or 416 Imperial gallons. Certification of the tank capacity {will/shall} be recorded on the manufacturer's record of construction and {will/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.

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.

WATER TANK LEVEL GAUGE

There shall be {qty} Fire Research TankVision model WLA200-A00 tank indicator level gauge(s) provided. The kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of aluminum, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall place on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

CAB MOUNTED WATER TANK INDICATOR

There {will/shall} be {qty} Class 1 Mini 4-light, remote tank level gauge for indicating water level installed in cab. The tank level gauge {will/shall} indicate the liquid level or volume on an easy to read red LED display and show increments of 1/4 of a tank.

The Mini remote gauge will receive data from the same source as the Master Display. No additional transducers shall be required.

WATER TANK LEVEL INDICATOR

There {will/shall} be {qty} Whelen Strip-Lite model PSTANK LED lights provided to indicate the water tank level and connected to tank level sensor in water tank. The four tank levels to be indicated as follows;

Green = “Full”
Blue = “3/4”
Amber = “1/2”
Red = “1/4”

The red “1/4” level light shall flash when the tank level drops below "1/4" of the tank capacity. Each light will be installed in a vertical orientation. The gauge lights shall be deactivated whenever the parking brake is released.

The lights {will/shall} be located one (1) per side on the pump module, adjacent to the cross lay hose bed. The lights {will/shall} be wired to activate onlty when the main or auxiliary pump is engaged.

UPF POLY WATER TANK WARRANTY

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

FILL TOWER PROTECTION

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

CLASS A POLYPROPYLENE FOAM CELL

There {will/shall} be {qty} 20 US gallon or 16.6 Imperial gallons polypropylene foam cell incorporated into the polypropylene water tank. This foam tank capacity {will/shall} be deducted from water tank size specified.

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

There {will/shall} be one (1) drain hose connected to the foam cell. The drain {will/shall} have a 1/4 turn valve installed inside the pump house and it {will/shall} drain below the frame rail of the chassis.

A label {will/shall} be affixed to the foam tank fill indicating: "WARNING" Class A foam tank fill, do not mix brands or types of foam.

FOAM TANK LEVEL GAUGE, CLASS A

There shall be {qty} Fire Research TankVision model WLA260-A00 tank gauge(s) provided. The kit shall include an electronic indicator module, a pressure sensor, a 10' sensor cable and a tank vent. The indicator shall show the volume of Class A foam concentrate in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of aluminum, and have a distinctive green label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a datalink to connect remote indicators. Low foam warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the foam tank near the bottom. No probe shall place on the interior of the tank. The foam tank vent shall be installed on the foam fill tower. Wiring shall be weather resistant and have automotive type plug-in connectors.

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

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

Lighting shall provide illumination at a minimum level of 2 fc (20 lx) on all work surfaces, steps, and walkways. Lighting {will/shall} be switchable from the pump operators panel.

FILL TOWER PROTECTION

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

HOSE BED DIVIDER(S)

{Quantity} adjustable aluminum hose bed partition(s) shall be provided in the hose storage area. The partition(s) shall be 3/16" smooth aluminum with split aluminum tubing welded to the top and rear edges.

ALUMINUM HOSE BED COVER

A two-section hose bed cover {will/shall} be provided. Each door {will/shall} be fabricated from 1/8" NFPA aluminum treadplate with formed hat sections for bracing. Doors {will/shall} be hinged along each side of the hose body using stainless steel piano hinge. The top surface of each section {will/shall} slant down with the highest point in the center of the hose bed area and {will/shall} be supported from underneath by at least one (1) adjustable hose bed divider.

Each section {will/shall} be constructed to support the weight of a person (300 lbs).

Each section {will/shall} utilize pneumatic cylinders to assist with opening and closing. There shall be one (1) 24" vertical handrail on each door to assist in raising and lowering hose bed door. Handrails shall be NFPA compliant 1-1/4" knurled 304 stainless steel with welded end stanchions.

Each door {will/shall} have a horizontally mounted On Scene LED light on the underside of the door that will be automatically activated when the door is opened and wired to the compartment door ajar warning light provided in cab.

A vinyl hose bed flap {will/shall} be provided attached to each door and extend downward to bottom of hose bed to protect hose and equipment from weather and dust. The center where both doors come together {will/shall} have a Velcro seam to join two-pieces of vinyl together. Bottom of each flap {will/shall}

be weighted for quick deployment of hose. Vinyl color {will/shall} be color coordinated with upper vehicle colors unless specified otherwise.

HOSE BED ACCESS STEP

A bolt-on type hose bed access step {will/shall} be provided 10" deep x 41" long. Step {will/shall} be fabricated from 3/16" NFPA compliant treadplate aluminum with side gusset supports to body. The specified center rear marker lights {will/shall} be located on rear facing edge.

The underside of step {will/shall} have a 36" OnScene LED light to light the bumper or compartment area below.

HOSEBED EQUIPMENT COMPARTMENTS

In the center of the hosebed area a top loading equipment compartment {will/shall} run the length of the hosebed. The compartment {will/shall} be constructed of 1/8" smooth aluminum with a total volume of 10.8 cubic feet. Inside dimensions shall be approximately 80" long x 18" high and 13" wide. The top of the compartment {will/shall} be open and covered by the hose bed doors.

Two (2) outer hard suction storage compartments shall be provided one each side of the hosebed area. The compartments {will/shall} be constructed of 1/8" smooth aluminum with a total volume of 16.6 cubic feet. Inside dimensions shall be approximately 80" long x 18" high and 10" wide.

A rear access door {will/shall} be provided for each compartment and constructed of aluminum with smooth finished inside panels and painted to match job color on the exterior.

The compartment floor shall be formed with a recess ribbed design for strength and to create a depressed area that will allow any accumulated debris or moisture to collect without the equipment resting in the contaminant. The depressed area is to be covered with open grating material. There shall be large diameter drain holes with removable plugs placed in the depresses area of the compartment floor for cleaning out the compartment.

The compartment door shall be wired into the door open warning circuit. Inside the compartment there shall be lights activated when the door is open for low ambient light operating conditions. The compartment shall be bolted in place and removable for water tank service.

An OnScene LED light {will/shall} be provided that runs from front to back of the compartment.

EQUIPMENT PAYLOAD WEIGHT ALLOWANCE

In compliance with NFPA 1906 standards, the vehicle {will/shall} be designed for an equipment loading allowance of 500 lbs. of {Company} provided equipment based on the wildland body having at least 50 cu. ft. of storage space under 26,000 GVWR, and an equipment loading allowance of 750 lbs with 75 cu. ft. of storage space over 26,000 GVWR.

EQUIPMENT

The following equipment shall be furnished with the completed wildland 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 {will/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) {will/shall} be mounted behind rear wheels, below body one streetside and one curbside.
- {Quantity} Duo-Safety 912 series 20' 3-section extension ladder(s) shall be provided with the completed unit.
    - The ladder(s) {will/shall} be located in specified ladder compartment.
- {Quantity} 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) {will/shall} be mounted on vehicle, per itemized compartment list.
- {Quantity} 5 lb. ABC dry chemical aluminum fire extinguisher(s) shall be provided with the completed unit.
    - The above specified fire extinguisher(s) shall be installed on the completed unit, location to be determined by the {Company}.
- {Quantity} Zico QM-CSM-L chain saw mount(s) shall be provided with the completed apparatus.
- {Quantity} Porter 60" model 17700 (or equal) painted steel compound lever bar(s) shall be provided with the completed apparatus.
    - The above specified tool(s) shall be installed on completed unit using chrome plated brass mounting brackets, location to be determined by the {Company} at the pre-construction meeting.
- {Quantity} Kochek 4.0" x 8' clear PVC flexible suction hose(s) {will/shall} be provided with completed unit. The hose {will/shall} have light weight Storz couplings provided.
- {Quantity} 4" NST barrel strainers with foot valve to match hard suction hose provided shall be provided with completed unit.

REMAINING NFPA MINOR EQUIPMENT BY PURCHASER

All other minor equipment not specified above, but required by NFPA 1906 for wildland vehicles, section 5.7 {will/shall} be supplied and mounted by {Company} before the unit is placed in emergency service.