

Maui County Fire Department

2000 Gallon Extreme Duty Wildland Engine (Tatra 6x6 Tanker)

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GENERAL PROVISIONS

The apparatus will be constructed with due consideration to the nature of the load to be sustained, and to the general characteristics of the service. Specifically, the unit shall be specially designed for off-road use. Features that differentiate this unit from other apparatus that are used mainly on paved road shall include central tire inflation system (CTIS) and independent suspension.

The successful bidder shall submit a detailed engineering "C" size drawing of the driver side, passenger side, and rear of the completed unit.

The following items will accompany the apparatus upon delivery:

- 1) Record of construction details
- 2) Electrical system load analysis
- 3) Certification of satisfactory electrical system performance testing per NFPA standards
- 4) Certification of pump and piping hydrostatic testing per NFPA standards
- 5) Certification of water tank capacity per NFPA standards
- 6) Certified weight scale ticket of the completed apparatus with full water tank
- 7) Detailed drawings of the as-built electrical system
- 8) Statement of pump performance in accordance with the required standard practice for testing of pumping engines
- 9) Complete manuals for both the pump and the apparatus body
- 10) Copy of warranty outlining coverage on the vehicle
- 11) Product support CD as described elsewhere in these specifications

The bid price does not include any local, state, or federal taxes. SVI Trucks will not be liable for any state or federally mandated tax or program after the sale of this apparatus.

Details of construction and materials, not otherwise specified, are left to the discretion of SVI Trucks who will be solely responsible for the design and construction of all features.

INTERNET IN-PROCESS SITE

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

ROADABILITY

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

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

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

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

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SERVICEABILITY

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

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

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

CONSTRUCTION DOCUMENTATION

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

- (1) The manufacturers record of apparatus construction details, including the following information:
 - (a) Owner's name and address
 - (b) Apparatus manufacturer, model, and serial number
 - (c) Chassis make, model, and serial number
 - (d) GAWR of front and rear axles and GVWR
 - (e) Front tire size and total rated capacity in pounds (kilograms)
 - (f) Rear tire size and total rated capacity in pounds (kilograms)
 - (g) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
 - (h) Engine make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio
 - (i) Type of fuel and fuel tank capacity
 - (j) Electrical system voltage and alternator output in amps
 - (k) Battery make, model, and capacity in cold cranking amps (CCA)
 - (l) Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
 - (m) Ratios of all driving axles
 - (n) Maximum governed road speed
 - (o) Pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
 - (p) Pump transmission make, model, serial number, and gear ratio
 - (q) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
 - (r) Water and Foam tank certified capacity in gallons or liters
 - (s) Paint manufacturer and paint number(s)
 - (t) Company name and signature of responsible company representative
 - (u) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose)
- (2) Certification of compliance of the optical warning system
- (3) Siren manufacturer's certification of the 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) If the apparatus has a fire pump, the pump manufacturer's certification of suction capability
- (7) If the apparatus is equipped with a fire pump and special conditions are specified by the purchaser, the pump manufacturer's certification of suction capacity under the special conditions
- (8) If the apparatus has a fire pump, a copy of the apparatus manufacturer's approval for stationary pumping applications

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- (9) If the apparatus has a fire pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed
- (10) If the apparatus has a fire pump, the pump manufacturer's certification of the hydrostatic test
- (11) If the apparatus has a fire pump, the certification of inspection and test for the fire pump
- (12) If the apparatus is equipped with an auxiliary pump, the apparatus manufacturer's certification of the hydrostatic test
- (13) When the apparatus is equipped with a water tank, the certification of water tank capacity
- (14) If the apparatus has an aerial device, the certification of inspection and test for the aerial device
- (15) If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy and the final installer's certification the foam proportioning system meets this standard
- (16) If the system has a CAFS, the documentation of the manufacturer's pre delivery tests
- (17) If the apparatus has a line voltage power source, the certification of the test for the power source
- (18) If the apparatus is equipped with an air system, air tank certificates, the SCBA fill station certification (see 24.9.7), and the results of the testing of the air system installation
- (19) Any other required manufacturer test data or reports

OPERATIONS AND SERVICE DOCUMENTATION

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

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

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

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

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

NFPA REQUIRED DOCUMENTATION FORMAT - CD-ROM

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

- There shall be two (2) printed copies of the manual provided with the apparatus.

STATEMENT OF EXCEPTIONS

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

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

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

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

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

CARRYING CAPACITY

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

The estimated in-service weight shall include the following:

- (1) The chassis, body, and tank(s)
- (2) Full fuel, lubricant, and other chassis or component fluid tanks or reservoirs
- (3) Full water and other agent tanks
- (4) *250 lb (114 kg) in each seating position
- (5) Fixed equipment such as pumps, aerial devices, generators, reels, and air systems as installed
- (6) Ground ladders, suction hose, designed hose load in their hose beds and on their reels
- (7) An allowance for miscellaneous equipment that is the greatest of the values for type of vehicle per NFPA 1901, a Purchaser provided list of equipment to be carried with weights, or a Purchaser specified miscellaneous equipment allowance.

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

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

TESTING

ROAD TEST

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

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

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

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

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

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

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

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

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

TEST SEQUENCE

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

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1. RESERVE CAPACITY TEST

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

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

2. ALTERNATOR PERFORMANCE TEST

TEST AT IDLE

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

TEST AT FULL LOAD

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

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

3. LOW VOLTAGE ALARM TEST

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

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

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

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

LOW VOLTAGE - ELECTRICAL SYSTEM PERFORMANCE TEST

DOCUMENTATION

The manufacturer shall deliver the following with the fire apparatus:

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

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WARRANTY

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

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

The Body Manufacturer shall warrant all materials and accessories used on the vehicle(s), whether fabricated by manufacturer or purchased from an outside source, and will deal directly with the Maui County Fire Department **Error! Bookmark not defined.** on all warranty work.

GENERAL LIMITED WARRANTY - ONE (1) YEAR

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

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

LOW VOLTAGE ELECTRICAL WARRANTY - FIVE (5) YEARS

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

STRUCTURAL WARRANTY - TEN (10) YEARS

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

PAINT LIMITED WARRANTY - TEN (10) YEARS

The body be free of bubbling, or peeling as a result of a defect in the method of manufacture for a period of ten (10) years, or 100,000 miles whichever occurs first, starting thirty (30) days after the original invoice date.

CONSTRUCTION PERIOD

The completed vehicle shall be delivered within 365 days after receipt of a purchase order, or contract.

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

INSPECTION TRIPS

Inspection trips shall be provided by Harmer Radio and Electronics, Inc. as negotiated with the Maui County Fire Department. Anticipated date of completion shall be transmitted at least 30 days prior to approximate date so arrangements for travel can be made in a timely manner.

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DELIVERY AND DEMONSTRATION

The contractor shall be responsible for the delivery of the completed unit to the Maui County Fire Department's location. On initial delivery of the apparatus, the contractor shall supply a qualified representative for **three (3) days** to demonstrate the apparatus and provide initial instruction to representatives of the Maui County Fire Department regarding the operation, care, and maintenance of the apparatus and equipment supplied at the Maui County Fire Department's location. Additionally, the contractor shall supply a qualified representative for **two (2) days** to provide training in truck operations at the Maui County Fire Department's location.

The delivery engineer shall set delivery and instruction schedule with the person appointed by Maui County Fire Department.

After delivery of the apparatus, the Maui County Fire Department shall be responsible for ongoing training of its personnel to proficiency regarding the proper and safe use of the apparatus and associated equipment as defined in NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, and NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.

CAB/CHASSIS

TATRA 6X6 CREW CAB CHASSIS

The apparatus shall be built on a Tatra 6x6 crew cab chassis. This chassis shall be designed using Tatra technology for extreme off-road use. The construction of the body frame shall be specially designed to fit this chassis. Fording depth shall be 30".

FOUR DOOR CREW CAB - 6 PASSENGER

The cab shall be configured as a four door crew cab with seating for up to six (6) personnel. The front driver's seat shall have a fully adjustable air suspension. The front and rear passenger seats shall be fixed high back seats.

The four outboard seats shall have a three-point seat belt. The two inboard rear seats shall have a two-point lap belt.

FRAME CONSTRUCTION

The frame shall be built around a rigid, full-length 10.5 inch diameter backbone tube bolted to the axle final drive housings and cross beams. This tube shall encase the drive shafts, ring/pinion assemblies, and differential locks.

This design shall include exceptional rigidity and torsional resistance.

A separate high strength steel welded frame with closed section profile shall be provided for body mounting. This frame shall be tapered at the mid-length of the body. All body mounting shall be attached directly to this frame.

CHASSIS SUSPENSION

The front suspension shall consist of two (2) independent, driving, swinging half axles integrated into the backbone tube. It shall include a torsion bar suspension with heavy-duty hydraulic telescoping shocks and anti sway bar.

The rear suspension shall consist of four (4) independent, driving, swinging half axles integrated into the backbone tube and incorporating a combination airbag over steel coil suspension providing adjustable ride height control. This suspension shall also include heavy-duty hydraulic telescoping shock absorbers and center axle anti sway bar.

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BRAKES

The brakes shall be a dual-circuit, full air, automatic self-adjusting, load sensing wedge type system acting on all wheels. The system shall have a WABCO anti-lock braking system and a WABCO air dryer. The parking brakes shall have a spring-loaded, manual brake valve control acting on all rear wheels.

CHASSIS PERFORMANCE DIMENSIONS AND WEIGHT RATINGS

The chassis shall have the following ratings and measurements:

GVWR:	57,230 lbs
Front axle:	17,637 lbs
Tandem rear axles:	39,682 lbs
Payload (On- and off-road):	30,864 lbs
Towing Capacity:	55,115 lbs
Wheelbase:	189.6 in
Ground Clearance:	15.35 in
Approach/Departure Angle:	35/37 degrees
Front & Rear Axle Track:	81.6 in
Maximum Speed:	68 mph

CUMMINS 400 HP ENGINE

The chassis shall be equipped with a Cummins ISM 400, EPA 2007 diesel engine. The engine shall be rated at 400 horsepower at 1900-2000 rpm and 1550 ft-lbs of torque at 1200 rpm. The engine shall be equipped with a 411 Jacobs auxiliary engine compression brake.

TWIN DISC AUTOMATIC TRANSMISSION

The chassis shall be equipped with a Twin-Disc TD-61-1177 six speed automatic transmission with power shift, electronic control, and on-board diagnostics. The transmission shall include a hydraulic torque converter mounted to the engine flywheel case and equipped with a clutch lock and two (2) PTO ports. The transmission shall also have flat tow capability. PTO shall be a TD804 PTO with reversing gear box.

ALTERNATOR AND BATTERIES

The chassis shall be provided with a Leece-Neville 28 volt / 140 amp alternator and two 12 volt batteries. The batteries shall be located under the rear doors of the cab. The engine shall have a Delco-Remy 28 volt starter motor.

ENGINE EQUIPMENT

The engine shall be equipped with a 30.3 CFM WABCO air compressor for the air brake and central tire inflation system. The exhaust shall be a single horizontal muffler with a vertical tailpipe mounted on the left side of the chassis cab.

110 GALLON FUEL TANK

The chassis shall be equipped with a 110 gallon diesel fuel tank located behind the cab on the left side (driver side). The tank shall be painted black in color and shall meet all federal regulations. The tank shall have a second fuel pick-up for the pump engine designed to leave capacity for chassis engine only. The fuel system shall have a Fleetguard FS 1003 fuel filter, WIF sensor, and water /sludge separator.

Maui County Fire Department

2000 Gallon Extreme Duty Wildland Engine (Tatra 6x6 Tanker)

Build Specification

CAB EQUIPMENT

The cab shall have an ergonomically designed instrumentation and a single one-piece windshield with three wiper / washers. The mirrors shall be heated / remotely-adjustable west coast-style mirrors with convex insets. The cab shall have multiple storage areas throughout and shall have a minimum of two 12 volt outlets with dome and map lights in the front.

TILT AND TELESCOPING STEERING WHEEL

The steering wheel shall adjust to the driver's preferred position via a tilt and telescoping mechanism. The chassis shall have power steering with 4.5 turns from lock to lock.

AIR CONDITIONING

The chassis shall have air conditioning. The controls shall be located in the cab in a location convenient to both the driver and front seat passengers.

TIRES

The chassis tires shall be Michelin 16.00 R20 XZL all terrain tubeless radials. Two (2) spare tires shall be provided but not mounted on the vehicle. The rims shall be steel two-piece with bead lock. The central-tire inflation system shall be controlled from the dash with preset functions.

WINDSHIELD PROTECTION BARS

A protection bar/rail shall be installed on or near the "A" post next to the windshield for added brush protection.

CHASSIS MODIFICATIONS

LUBRICATION AND TIRE DATA PLATE

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

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

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VEHICLE DATA PLATE

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

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

OVERALL HEIGHT, LENGTH DATA PLATE (US)

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

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

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

ACCIDENT PREVENTION

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

PERSONNEL CAPACITY

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

ACCIDENT PREVENTION

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

WEARING HELMET WARNING

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

FRONT BUMPER

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

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2000 Gallon Extreme Duty Wildland Engine (Tatra 6x6 Tanker)

Build Specification

AIR HORN

Two (2) Grover 14" chrome plated air horn (or equivalent) mounted on the front bumper as room permits. An emergency air shut off valve shall be provided in the cab.

AIR HORN ACTIVATION

The air horn(s) shall be operated by a foot switch on the cab floor located at the driver and officer positions.

OFF-ROAD LIGHTS

Two (2) Custom Accessories 7" round off road HID lights shall be installed in the front bumper. The lights shall be controlled from the switch panel in the cab. (Lights available through Krage.com)

FRONT TOW PROVISIONS

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

EXHAUST SYSTEM (VERTICAL)

The existing exhaust tailpipe shall be modified to a vertical exhaust pipe, extending above the body height.

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.

RADIO/ANTENNA INSTALLATION

There shall be one (1) Harmer Radio and Electronics, Inc. supplied 24V EF Johnson 700/800 MHz ES Dual Control, head remote mount, 512 channel/talk group radio with analog FM, Multi-Net Trunking and MDC122 protocols and antenna installed in the center of the forward headliner of the cab within easy reach of driver and officer.

All necessary equipment shall be provided for a complete and fully functional communications system on the County of Maui radio network.

SEAT BELT COLOR AND MOUNTING

Per the Maui County Fire Department specification for a commercial chassis, this emergency vehicle may not have the required seat belt webbing colors or buckle in an accessible location. These belts may not provide visibility to driver that seat belts are on or buckle is easily accessible. This specification for an emergency fire apparatus for these seat belts shall be non-compliant to NFPA 1901 standards.

SEAT BELT WEB LENGTH - COMMERCIAL CAB

Per the Maui County Fire Department specification for a commercial chassis, this emergency vehicle may not have seat belts of this required length. These belts may not provide sufficient length for large firefighters in bunker gear. This specification for an emergency fire apparatus for these seat belts shall be non-compliant to NFPA 1901 standards.

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SEAT BELT MONITORING SYSTEM - COMMERCIAL CAB

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

IGNITION KEY

The ignition key will be attached to steering column or dash with vinyl covered steel cable.

HELMET STORAGE

No helmet storage shall be provided in the cab driving or crew area.

CAB TESTING CERTIFICATION

Section 14.3.2 of the NFPA 1901 standards, 2009 edition, require the cabs on apparatus with a GVWR greater than 26,000 lb. (11,800 kg) shall meet the requirements of one of the following sets of standards:

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

Per the Maui County Fire Department specification for a commercial chassis, this emergency vehicle may not have a cab that has been tested to these standards. This specification for an emergency fire apparatus for the cab testing requirements shall be non-compliant to NFPA 1901 standards.

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.

SIDE SLOPE INDICATOR

One (1) Niken Digital Car Inclinator (side slope indicator) model 10530001 BK/WH shall be installed on the cab dash visible to the driver and officer. The device shall indicate the angle of the apparatus from side to side.

CAB GEAR STORAGE MODULES

Two (2) cab gear storage modules shall be provided in the rear of the cab behind the driver and officer seats. The modules shall be approximately 16"L x 20"W x 39"H and fabricated of 1/8" smooth aluminum. There shall be one (1) fixed shelf mounted in the center (top to bottom) of each module. The module opening shall face the rear of the cab and include a removable nylon cover to prevent equipment from falling out during travel. A dark gray textured powder coat paint finish shall be provided for durability and finished appearance.

The final design and location of the storage modules shall be determined by Maui County Fire Department at the pre-construction meeting.

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2000 Gallon Extreme Duty Wildland Engine (Tatra 6x6 Tanker)

Build Specification

REAR CAB AIR CONDITIONER

One (1) Red Dot model R-6100-0-24 24V air conditioner shall be provided and installed on the rear cab roof. The unit shall be rated at 16,000 BTU cooling capacity with a single speed 265 CFM fan.

The roof mounted air conditioner shall be approximately 7-1/2" high x 25-1/4" wide x 31" long and shall protrude approximately 1" into the cab compartment. The opening in roof shall be properly reinforced to support the air conditioner and shall be supplied with a 1" rise to minimize moisture condensation under the unit.

CAB PAINT

The finish paint and color as provided from the cab/chassis manufacturer shall be provided. Cab shall not be repainted.

MUDFLAPS

There shall be two (2) mud flaps installed on rear of apparatus behind rear wheels so that they do not reach the tire when pushed forward. This will prevent the mud flap from being pinched between the tire and objects on the ground while the apparatus is in operation off-road.

AIR BRAKE SYSTEM QUICK BUILD-UP

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

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

ROAD EMERGENCY SAFETY KIT

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

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

ENGINE DIAGNOSTICS KIT

One (1) Cummins InSite engine diagnostic software kit and interface cable compatible with the specified engine shall be furnished with the completed apparatus.

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2000 Gallon Extreme Duty Wildland Engine (Tatra 6x6 Tanker)

Build Specification

2000 GALLON EXTREME DUTY WILDLAND ENGINE

The apparatus shall be a wildland fire apparatus designed specifically for use in the extreme off-road environment. The body shall be constructed specifically to withstand the stresses of off-road firefighting and shall carry 2000 gallons of water/foam. The chassis shall be an American Truck Company three axle all wheel drive design utilizing the Tatra suspension technology. Additionally, the apparatus shall meet all requirements as described in NFPA 1906, Standard for Wildland Fire Apparatus. Specific details of the apparatus shall be as described below.

HEAVY DUTY BODY / TANK / PUMP FRAME CONSTRUCTION

The entire body assembly shall be designed to provide maximum strength and durability in the off-road environment. To that end, the material requirements, including alloy and material thickness, throughout the specifications are considered to be a minimum.

The main tank and pump frame support structure shall be constructed from 3/16" 6061T6 aluminum alloy tubing as a ladder style frame. The tank frame sides shall be 2" x 6" x 1/4" box sections that run the full length of the tank. The crossmembers shall be 2" x 2" x 1/4" box sections spaced at 16" on center intervals. The entire frame shall have 3003H-14 alloy smooth plate aluminum installed on the top to provide flooring for the bottom of the tank. The entire ladder frame shall be constructed on 2" x 3" x 1/4" box members designed to raise the body and tank above the wheels to provide sufficient clearance for the tires to articulate through their full range. These mounting boxes shall in turn be mounted on 3" x 3" x 1/4" angle sections designed to cradle the chassis frame and prevent side to side movement.

The tank shall have full support around the bottom perimeter. The outer sides shall be framed in with 4" x 4" angle sections to hold the tank steady and prevent movement.

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

BODY MOUNTING

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

STAINLESS STEEL WHEEL WELL EXTENSIONS

There shall be two (2) stainless steel wheel well extensions, one each side in front of the rear wheels, to minimize mud and road spray from hitting the plumbing and pump platforms.

PAINT FINISH - SINGLE COLOR

The body shall be painted with a single color of PPG Delfleet® Evolution paint matched to the cab/chassis

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

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Build Specification

BODY UNDERCOATING

The entire underside of apparatus body and frame shall be sprayed with black automotive undercoating. Undercoating shall cover all areas to retard corrosion under the apparatus.

UNDERCOAT WARRANTY

The undercoating shall be provided with a warranty by its manufacturer for the lifetime of the vehicle. The re-spray warranty shall be transferable between vehicle owners. Should the coating applied to the underside of the body and wheel wells of the vehicle ever flake off, peel, chip or crack due to drying out, the damaged area shall be re-sprayed without charge to the vehicle owner.

PAINT WARRANTY

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

COMPARTMENT INTERIOR FINISH

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

REFLECTIVE STRIPE

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

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

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

REFLECTIVE STRIPE - CAB SIDE

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

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

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

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

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

- This reflective stripe shall be black in color.

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Build Specification

REFLECTIVE STRIPE - CAB FRONT

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

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

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

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

- This reflective stripe shall be black in color.

REFLECTIVE STRIPE - CAB DOOR INTERIOR

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

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

REFLECTIVE STRIPE - BODY SIDES

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

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

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

- This reflective stripe shall be black in color.

The stripe shall extend from the chassis to the body where it will angle up and then extend straight back to the rear of the body.

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CHEVRON REFLECTIVE STRIPE - REAR SIDES PANELS

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

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

- The stripe material shall be 3M Diamond Grade.

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

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

LETTERING

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

SIDE CAB DOOR LETTERING

There shall be sixteen (16) reflective letters furnished and installed on the crew cab doors. The lettering shall state:

"T8" and "Kapoho"

This reflective lettering shall be white in color with 1/4" red outline.

UPPER BODY SIDE LETTERING

There shall be thirty-eight (38) reflective letters furnished and installed on the upper body sides. The lettering shall state:

"MAUI COUNTY FIRE DEPT."

- This reflective lettering shall be white in color with 1/4" red outline.

REAR BODY LETTERING

There shall be seven (7) reflective letters furnished and installed on the rear of the body. The lettering shall be in an arched design and state:

"TANKER 8"

- This reflective lettering shall be white in color with 1/4" red outline.

FRONT OF CAB LETTERING

There shall be seven (7) reflective letters furnished and installed on the upper front of the body. The lettering shall state:

"TANKER 8"

- This reflective lettering shall be white in color with 1/4" red outline.

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Build Specification

CAB ROOF LETTERING

There shall be two (2) reflective letters furnished and installed on the cab roof. The lettering shall state:

"T8"

- This reflective lettering shall be black in color.

DOOR DECALS

The Manufacturer shall provide and install two (2) 22K Silver Maltese decals on the front cab doors matching previous Maui County Fire Department vehicles. The Maltese decals shall have a clear 3M UV protective over-laminate applied before installation.

EXTERIOR COMPARTMENT DOORS

HINGED DOOR CONSTRUCTION

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

The compartment doors shall be all aluminum 3003H-14 alloy construction. The exterior panel shall be of 1/8" thickness smooth plate aluminum and the interior panel shall be of 1/8" thickness smooth plate aluminum. The double panel doors shall be 1-3/4" thick to completely enclose the door latching assembly. Doors shall have openings for drainage and ventilation.

The doors shall be flush mounted so that the outer surface is in line with the side body surface.

Compartment door openings shall be sealed with closed cell automotive type rubber molding to provide a weather resistant seal around door. In addition, rubber molding shall be provided along hinge to prevent moisture entry.

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

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

The latching mechanism of hinged compartment doors shall include stainless steel 6" Hansen offset bent D-ring keyed handles. A gasket shall be placed between stainless steel handle and door. Door latches shall be a double catching two-point rotary slam latch, recessed inside the double panel door with striker plate.

All compartment doors shall have a pneumatic cylinder to hold door in the open and closed positions. Each door shall be capable of being closed without unlatching. Door checks for vertically hinged doors shall be bolted to the upper compartment door header and the box pan of the door. All horizontally hinged compartment doors shall have a door check as specified with each door.

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COMPARTMENT CONSTRUCTION

All clear dimensions shall include clearance for door jambs and headers. The floor, rear wall, side wall, and top of each compartment shall be of smooth plate aluminum. The compartment panels shall be formed and welded in place using a MIG/TIG procedure with a gas shield.

The sides of the compartments at the welds must not have weld markings or stitching showing. All interior weld marks and weld discoloration shall be polished or removed to present a clean, smooth finish. The interior of the compartments shall remain unfinished smooth plate aluminum for superior stain resistance and ease of cleaning. In addition, the interior of the compartment must be free from interference caused by the body frame or other structural supports used in the manufacture of the body. The compartments must be completely open on the interior except for door hardware and items used to support trays, shelving, and other equipment storage.

UPPER BODY COMPARTMENTS

There shall be two (2) compartments parallel to the sides of the body, one (1) on each side. Each of these compartments shall have inside dimensions of approximately 120"L x 27"W x 12"H. The compartments shall be constructed from smooth plate aluminum painted body color, and will be bolted to stiffeners on the top of the water tank. Each compartment shall be accessed from the center walkway at the top of the water tank.

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

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

Each compartment shall have a minimum of four (4) drains installed on the compartment floor to allow moisture to drain out of the compartment and onto the top of the water tank.

Each compartment shall have a horizontally mounted OnScene Solutions LED Night Stik on the underside of the door that will be automatically activated when the door is opened and wired to the NFPA required hazard warning light provided in cab.

TANK SIDE PROTECTION

The upper part of the tank sides and rear shall be clad with smooth plate aluminum. The sheets shall be attached to the side and rear of the tank via mounting blocks incorporated into the construction of the tank. The panels shall extend the full length and rear of the tank and shall function to protect the tank against impact from brush and branches and protect the tank material from radiant heat. The panels shall be painted the lower cab color.

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Build Specification

ROOF ACCESS LADDER

The top of the body shall be accessible from the ground by an OnScene Solutions ladder with 6-ring main ladder section and 2-rung fold down landing section. The ladder shall store parallel to the body and release with locking latches to allow the ladder to pull out to a comfortable climbing angle. The ladder shall automatically lock into the open position and will not retract until the scissor lock is raised.

Each cast aluminum step shall be 4-1/2" deep x 11 3/4" wide. Hand railing shall be 1-1/4" x 2-1/4" heavy walled extruded aluminum tubing for a firm gripping surface. The ladder shall be wired to the door ajar warning light in cab to warn the driver that the ladder is in the down position. Ladder shall be mounted to body with stainless steel bolts. Ladder shall be located on rear streetside of the body.

ROOF ACCESS HANDRAIL

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

ROOF ACCESS WALKWAY

A walkway shall be provided in the center area of the top of the water tank. The walkway shall be constructed of NFPA compliant 3/16" aluminum tread plate secured to the water tank.

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Build Specification

STREETSIDE COMPARTMENT - (S1)

One (1) side compartment shall be provided on the driver side of the apparatus, recessed into the lower water tank area.

The interior useable compartment width shall be approximately 124.0" wide.

The interior useable compartment depth shall be approximately 18.0" deep.

The interior useable compartment height shall be approximately 24.0" high.

The compartment shall have two (2) door openings, one (1) approximately 34" wide, and one (1) approximately 80" wide.

This compartment shall have horizontally hinged box pan style doors fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

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

The hinged door(s) shall have a pneumatic cylinder to hold door in the open and closed positions. Each door shall be capable of being closed without unlatching. Door checks shall be bolted to the side compartment sills and the box pan of the door.

- Three (3) nylon straps shall be provided to assist in closing the doors, one (1) per door.

COMPARTMENT COMPONENTS

- Three (3) horizontally mounted OnScene Solutions LED Nightstiks, one (1) above each door opening.
- The compartment shall be separated by stationary vertical partitions located behind each door sill.

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STREETSIDE COMPARTMENT – BEHIND REAR WHEELS (S2)

One (1) compartment located on the aft of the rear axles shall be provided for the purpose of storing fuels such as drip torches.

The interior useable compartment width shall be approximately 20.0" wide.

The interior useable compartment depth shall be approximately 24.0" deep.

The interior useable compartment height shall be approximately 22.0" high.

This compartment shall have vertically hinged box pan style doors fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

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

The hinged door(s) shall have a pneumatic cylinder to hold door in the open and closed positions. Each door shall be capable of being closed without unlatching. Door checks shall be bolted to the upper compartment door header and the box pan of the door.

COMPARTMENT COMPONENTS

- Two (2) 6" x 5" stainless steel louvered vents shall be provided in the lower compartment door.
- One (1) horizontally mounted OnScene Solutions LED Nightstik, located above the door opening.

Maui County Fire Department

2000 Gallon Extreme Duty Wildland Engine (Tatra 6x6 Tanker)

Build Specification

CURBSIDE COMPARTMENT - (C1)

One (1) side compartment shall be provided on the passenger side of the apparatus, below the level of the water tank and forward of the rear wheels.

The interior useable compartment width shall be approximately 19.0" wide.

The interior useable compartment depth shall be approximately 20.0" deep.

The interior useable compartment height shall be approximately 20.0" high.

This compartment shall have vertically hinged box pan style doors fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

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

The hinged door(s) shall have a pneumatic cylinder to hold door in the open and closed positions. Each door shall be capable of being closed without unlatching. Door checks shall be bolted to the upper compartment door header and the box pan of the door.

COMPARTMENT COMPONENTS

- One (1) horizontally mounted OnScene Solutions LED Nightstik, located above the door opening.

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2000 Gallon Extreme Duty Wildland Engine (Tatra 6x6 Tanker)

Build Specification

CURBSIDE COMPARTMENT - (C2)

One (1) side compartment shall be provided on the passenger side of the apparatus, recessed into the lower water tank area.

The interior useable compartment width shall be approximately 124.0" wide.

The interior useable compartment depth shall be approximately 18.0" deep.

The interior useable compartment height shall be approximately 24.0" high.

The compartment shall have two (2) door openings, one (1) approximately 34" wide, and one (1) approximately 80" wide.

This compartment shall have horizontally hinged box pan style doors fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

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

The hinged door(s) shall have a pneumatic cylinder to hold door in the open and closed positions. Each door shall be capable of being closed without unlatching. Door checks shall be bolted to the side compartment sills and the box pan of the door.

- Three (3) nylon straps shall be provided to assist in closing the doors, one (1) per door.

COMPARTMENT COMPONENTS

- Three (3) horizontally mounted OnScene Solutions LED Nightstiks, one (1) above each door opening.
- The compartment shall be separated by stationary vertical partitions located behind each door sill.

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2000 Gallon Extreme Duty Wildland Engine (Tatra 6x6 Tanker)

Build Specification

CURBSIDE COMPARTMENT – BEHIND REAR WHEELS (C3)

One (1) compartment located on the aft of the rear axles shall be provided for the purpose of storing fuels such as drip torches.

The interior useable compartment width shall be approximately 20.0" wide.

The interior useable compartment depth shall be approximately 24.0" deep.

The interior useable compartment height shall be approximately 22.0" high.

This compartment shall have vertically hinged box pan style doors fabricated of 1/8" thick smooth aluminum. The inner liner of the door shall be 1/8" thick smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

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

The hinged door(s) shall have a pneumatic cylinder to hold door in the open and closed positions. Each door shall be capable of being closed without unlatching. Door checks shall be bolted to the upper compartment door header and the box pan of the door.

COMPARTMENT COMPONENTS

- Two (2) 6" x 5" stainless steel louvered vents shall be provided in the lower compartment door.
- One (1) horizontally mounted OnScene Solutions LED Nightstik, located above the door opening.

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Build Specification

REAR COMPARTMENT - CENTER (RC1)

One (1) hard suction hose / long handled tool compartment shall be constructed underneath the body frame between the frame rails.

The interior useable compartment width shall be approximately 30.0" wide.

The interior useable compartment depth shall be approximately 80.0" deep.

The interior useable compartment height shall be approximately 7.0" high.

This compartment shall have a horizontally hinged single pan overlap style door fabricated of 1/8" thick smooth aluminum, hinged to open towards the ground. The inner side of the door shall be smooth aluminum with an unpainted finish. The door exterior shall be painted job color.

The hinged door shall have two (2) push-button style locking stainless steel latches. The door shall overlap the edges of the equipment box and shall include a gasket around the perimeter to minimize exposure to the environment.

COMPARTMENT COMPONENTS

- One (1) horizontally mounted OnScene Solutions LED Nightstik, located above the door opening.

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Build Specification

PLASTIC FLOOR AND SHELF TILE

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

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

COMPARTMENT COMPONENTS DESCRIPTIONS

All interior compartment components shall be fabricated as follows:

COMPARTMENT LIGHTING

Each enclosed equipment compartment greater than 4 ft³ (0.1 m³) in volume and having an opening greater than 144 in.² (92,900 mm²) shall have sufficient compartment lighting to provide a minimum of 2 fc (20 lx) at any location on the floor of the compartment without any shelves, dividers, or equipment in the compartment.

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

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

- Side Body Compartments, 36" Section (24 LED's)
- Under Tank Compartments, 9" Section (6 LED's)

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

STEP / GROUND LIGHTS

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

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

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Build Specification

LOW VOLTAGE ELECTRICAL SYSTEM- 12 VDC

General

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

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

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

Wiring

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

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

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

Wiring and Wire Harness Construction

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

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

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

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

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

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

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

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

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

Power Supply

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

Minimum Continuous Electrical Load

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

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

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

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

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

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

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

Electromagnetic Interference

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

Wiring Diagram

A complete electrical wiring schematic of actual system shall be provided with finished apparatus.

MULTIPLEXED SOLID STATE ELECTRICAL SYSTEM

A single battery system shall be installed consisting of matching batteries furnished by the chassis manufacturer and a master switch single "on" position switch supplied by the body builder. This switch shall mount separately or as a part of the master console. When in the off position, all electrical power to the apparatus shall be off.

There shall be a green pilot light visible to the driver which illuminates when the master switch is activated. The batteries shall be installed in an accessible location.

The electrical system shall be fabricated in modules as is the apparatus. The body and chassis shall be individually wired as independent modules and connected as a completed unit at the final assembly via waterproof electrical connectors located in the electrical compartment. Seals shall be provided on each individual wire and the assembly as a whole. All GXL/SXL wiring for the apparatus body shall be within a temperature resistant harness rated at a minimum of 280 degrees. All wires in each harness must be color and function coded. Wiring shall be run along structural rails and tied in a neat and orderly manner.

The electrical junction box for all apparatus multiplex modules, circuit breakers, etc., will be located in the forward face of rear driver and passenger side compartments. It shall be of stainless steel construction with a stainless steel hinged door that opens out and is retained in the closed position with a push-button style spring loaded latch. It must be recessed into the wall of the cabinet and be designed so as not to protrude out into cabinet storage area when in the closed position. It must be sealed and weatherproof. All components in the compartment must have identification tags. The apparatus circuits requiring breaker protection shall utilize solid state electronic circuit protection or automatic reset circuit breakers. Fuses shall not be accepted. The main power lead to the body shall include manual reset circuit breakers.

The vehicle's electrical system shall be equipped with a **Weldon VMUX multiplexed solid state system**.

The system shall be capable of performing load management functions, system monitoring and reporting, and be fully programmable.

The completed body shall be grounded to the chassis with a minimum "0" gauge wire with crimped and soldered lugs. The lug shall be bolted to the chassis after the removal of all paints, rust, etc. Additionally a minimum 3/4" braided ground strap shall be furnished between the body and chassis. The ground strap shall have soldered tabs on each end and attached to the chassis as above except that stainless steel star washers shall be used between the ground strap tab and bolt. After attachment, all ground connection points shall be sprayed (soaked) with no hardening battery terminal sealer. A ground strap will also be installed from the pump engine to the apparatus body.

The electrical system will contain two (2) spare 20 amp circuits (no switches) with circuit breakers and relays. One spare leads shall be wired for the cab and one for the body.

A low voltage alarm shall be provided in the cab and at the pump panel. It shall provide an audible and visual indication when the truck 24 volt electrical system voltage drops below 23.6 volts.

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CAB CONSOLE

A cab console shall be provided in the front center cab area to provide a mounting area for the electronic components and pump controls. Console shall be as large as possible, fabricated of 1/8" smooth aluminum and slope down towards the windshield to reduce the driver's viewing obstruction. A textured powder coat paint finish shall be provided for durability and finished appearance. The final design of console shall be determined by the Maui County Fire Department at the pre-construction meeting.

MULTIPLEXED DASH MOUNTED SWITCH CONSOLE

All accessory and emergency lighting will be controlled at a master electrical dash mounted panel in the cab. The panel shall include a multiplex switch module of six (6) double throw lighted momentary rocker switches, three (3) indicator lights, and one (1) Innovative Controls five light mini tank level indicator. The electrical panel shall have back lighted identification plates on a non-glare panel face illuminated when the Master Switch and the dash light switch are "on". The function and layout of the six (6) double throw switches, three (3) indicator lights, and tank level indicator are as follows (from streetside to curbside):

Switch 1 Upper: Emergency Master: Activates all emergency or hazard lights.

Switch 1 Lower: Horn/Siren: Illuminates in siren mode. Allows the horn button to activate siren control head.

Switch 2 Upper: Upper Emergency Cancel: Cancel the upper level warning lights.

Switch 2 Lower: Lower Emergency Cancel: Cancels the lower level warning lights.

Switch 3 Lower: Rear Flood: Activates the rear panel flood lights.

Switch 3 Upper: Rear Spots: Activates the rear swivel spot lights.

Switch 4 Upper: Left Flood: Activates the left side swivel flood light.

Switch 4 Lower: Right Flood: Activates the right side swivel flood light.

Switch 5 Upper: Off-road/Driving Lights: (With off-road light option)

Switch 5 Lower: Unused

Switch 6 Upper: Step Lights

Switch 6 Lower: Compartment Light Master.

Battery On: Green indicator light. Illuminates when the master battery switch is on.

Pump Running: Amber indicator light. Illuminates when the pump engine is running.

Volt Alarm: Red indicator light. Activates when voltage drops below 11.8 volts.

Tank Level Indicator: 10 segment LED bar graph display. Indicates water tank level.

BATTERY SYSTEM

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

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

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

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

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

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

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

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

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

BATTERY SWITCH

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

BATTERY SOLENOID

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

BATTERY CONDITIONER

One (1) Kussmaul model 091-90-24 "Euro Charger 1" single battery charger with 120 VAC input and 24 VDC, 6 amp output shall be provided. This system shall monitor the condition of battery(s) and provide an electrical current at variable rates to overcome battery failure. A Kussmaul bar graph type indicator panel shall be provided near the Driver door area for showing status of battery conditioner.

SHORE POWER INLET

One (1) Kussmaul 120 VAC, 20 amp shore power inlet with weather resistant snap cover shall be provided. The protective ground from the shoreline inlet shall be bonded to the vehicle frame.

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

AIR COMPRESSOR

One (1) Kussmaul model 091-9B-1 "Auto Pump 120 Volt" air compressor shall be provided. The air pump shall be plumbed into the vehicle air system to maintain the system pressure during long periods of idle. The pump shall automatically start when the air system pressure drops below 70 psi and stop when 90 psi is attained.

ENGINE COMPARTMENT LIGHT

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

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CAB HAZARD WARNING LIGHT

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

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

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

- The volume is less than or equal to 4 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.

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.

BACKUP ALARM

One (1) backup alarm shall be installed and have a minimum of 87 dB rating. It shall be energized automatically when the chassis is placed into reverse gear.

TAIL LIGHTS / BACKUP LIGHTS

The tail light assemblies shall be as supplied by the chassis manufacturer, and shall be mounted to the rear body structure at the rear of the apparatus. Each tail light cluster shall consist of a red brake / tail light, a clear backup light, an amber turn light, and a red reflector.

MIDSHIP MARKER/TURN SIGNAL

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

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MARKER LIGHTS AND REFLECTORS

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

Nine (9) ICC clearance lights shall be mounted around the apparatus. Five (5) shall be mounted across the upper rear and shall be red in color. Two (2) shall be mounted on each side. The one at the front of the body shall be amber in color, and the one at the rear of the body shall be red in color. The clearance lights shall be LED lights with polished trim ring attached with button head stainless steel screws. The clearance lights shall be located according to ICC regulations.

Four (4) reflectors shall be mounted around the perimeter of the body as well. Two (2) shall be mounted on each side with the forward reflector being amber in color, and the aft reflector being red in color. In addition, the taillight assemblies described elsewhere in these specifications shall incorporate a red reflector which faces towards the rear. All reflectors shall be no higher than 60 inches above the ground.

STEP LIGHTS / GROUND LIGHTS

There shall be five (5) OnScene Solutions 9" LED Nightstik light(s) installed on the apparatus capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the vehicle in areas designed for personnel to climb onto or descend from the vehicle to the ground level.

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

LICENSE PLATE LIGHT

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

WORK LIGHTING

One (1) OnScene Solutions 9" LED Nightstik light shall be mounted on the pump platform to illuminate the walkup area. This light shall be mounted in an aluminum guard to protect it from impact. In addition, an additional OnScene Solutions 9" LED Nightstik light shall be mounted under the pump platform to illuminate the ground under the platform. These lights shall be activated with the switch on the pump panel. The ground light shall be positioned to protect it from brush during off-road use.

WHELEN MODEL 295SLSA1 SIREN CONTROL HEAD

There shall be one (1) Whelen model 295SLSA1 electronic siren control with standard hard wired microphone and user programmable siren tones. The siren head shall be installed in the headliner of the cab, adjacent to the EF Johnson radio justified towards the Driver.

WHELEN 100 WATT SPEAKER BEHIND BUMPER

There shall be one (1) Whelen 100 watt siren speaker mounted behind the bumper and connected to the siren head. The speaker shall be mounted in a shielded location to protect it from damage due to branches or brush.

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SIDE SCENE LIGHTS

There shall be four (4) Weldon 2010 series (7" x 8") 50W surface mounted halogen lights (2010-0390-30) provided on the sides of the upper equipment storage boxes. Each light shall be installed in a Cast Products aluminum bezel that angles the light beam towards the ground. They shall be equally divided between the curbside and streetside.

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

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

REAR SCENE LIGHTS

There shall be two (2) Weldon 2010 series (7" x 8") 50W surface mounted halogen lights (2010-0390-30) provided on the rear of the upper body area. Each light shall be installed in a Cast Products aluminum bezel that angles the light beam towards the ground.

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

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

WARNING LIGHT PACKAGE

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

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

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

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

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

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

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

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.

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UPPER LEVEL OPTICAL WARNING DEVICES

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

ZONE A - FRONT WARNING LIGHTS

There shall be two (2) Whelen Mini-Freedom LED 28" lightbar(s) permanently mounted to the cab roof front corners.

The lightbar configuration (streetside to curbside) shall be:

<u>STREETSIDE LIGHTBAR</u>			<u>CURBSIDE LIGHTBAR</u>		
<u>SECTION</u>	<u>INTERNAL COMPONENTS</u>	<u>LENS COLOR</u>	<u>SECTION</u>	<u>INTERNAL COMPONENTS</u>	<u>LENS COLOR</u>
1	Red Linear LED - Side Facing	Clear	1	Red Corner LED	Clear
2	Red Corner LED	Clear	2	Clear Linear LED	Clear
3	Clear Linear LED	Clear	3	Red Corner LED	Clear
4	Red Corner LED	Clear	4	Red Linear LED - Side Facing	Clear

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

The lightbar(s) shall be switched at the multiplex control panel in the cab.

ZONES B AND D - SIDE WARNING LIGHTS

UPPER REAR CORNER WARNING LIGHTS

There shall be two (2) Whelen 700 series (7" x 3") red Linear Super-LED lights (70R02FRR) provided, one (1) each side. Each light have a red lens and chrome flange.

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

UPPER FORWARD CORNER WARNING LIGHTS

There shall be two (2) Whelen 700 series (7" x 3") red Linear Super-LED lights (70R02FRR) provided, one (1) each side. Each light have a red lens and chrome flange.

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

ZONE C - REAR WARNING LIGHTS

There shall be two (2) Whelen 700 series (7" x 3") red Linear Super-LED lights (70R02FRR) provided, one (1) each side. Each light have a red lens and chrome flange.

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

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LOWER LEVEL OPTICAL WARNING DEVICES

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

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

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

ZONE A - FRONT WARNING LIGHTS

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

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

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

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

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

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

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

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

ZONE C - REAR WARNING LIGHTS (LOWER REAR CORNERS)

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

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

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WATER SYSTEM

The following equipment shall be furnished and installed to supply water to the emergency scene:

WATEROUS 500-150-P PTO DRIVEN COMPRESSED AIR FOAM SYSTEM

A compressed air foam system shall be provided as described herein. It shall be designed and constructed to discharge water, foam solution or compressed air foam from all discharge ports. In addition, the consistency of the compressed air foam (expansion ratio) from each discharge shall be individually adjustable.

The integrated water pump / air compressor unit shall be mounted under the apparatus body and driven via transmission power take-off.

PERFORMANCE

The compressed air foam system shall be capable of developing a minimum of 300 gallons per minute of water at 125 PSI and 150 cubic feet of air at 125 PSI simultaneously (NFPA rating). The unit shall also be capable of pumping water or air independently. The following water pump performance ratings shall be achievable:

- 500 GPM @ 150 PSI
- 350 GPM @ 200 PSI
- 250 GPM @ 250 PSI

AIR COMPRESSOR TRANSMISSION

The air compressor shall be driven by a dry Poly Chain from the pump transmission. The drive system shall utilize 8mm pitch sprockets and belt, sized to handle the speed and horsepower requirements of the air compressor. The power transmission shall be capable of operating in ambient temperatures of -65 degrees F to +185 degrees F.

The transmission shall have sufficient power handling capacity to allow extended operations at full load while maintaining acceptable operating temperatures and component life. A Poly Chain drive enclosure shall be provided around all moving parts to reduce noise levels and provide added safety.

WATER PUMP

A Waterous CLVK water pump shall be utilized. It shall utilize a high tensile gray iron case, balanced bronze impeller, ball bearings, wrap-around wear rings, mechanical seal, 4" Victaulic male suction inlet and 3" tapped flange discharge outlet. The water pump shall be driven via transmission power take-off.

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AIR COMPRESSOR SYSTEM

The air compressor shall be an oil flooded rotary screw type, sized to supply a minimum of 150 SCFM of useable compressed air in the installed configuration. The system shall be designed to produce the compressor's rated output when the water pump is developing 120 to 130 PSI in a "no flow" state. The air compressor shall be capable of maintaining prolonged pressures from 100 to 175 lbs. per square inch throughout the service life of the compressed air foam system.

The compressor shall be controlled by a pneumatic modulating inlet valve mounted on the air end inlet. This controller shall sense air pressure and control the air delivery of the air end while maintaining constant pressure. An automatic balancing system shall be provided to maintain the air pressure within plus or minus 5% of the water pump pressure, throughout the pressure range. An Auto Sync dual mode controller shall be provided on the pump operator's panel with the following settings:

AUTOMATIC: Air pressure matched to water pressure.

FIXED: Air pressure defaults to manual setting on compressor mounted control valve (for operation of air tools).

UNLOAD: Air pressure reduced to 40PSI for standby or water/solution only pumping operations.

All compressor system oil shall be routed in wire braid reinforced hose conforming to SAE 100R1 standards for hydraulic hose. Air control hoses shall be SAE J844 push-on type, color-coded to simplify troubleshooting.

The compressor system sump/pressure vessel shall be constructed entirely of stainless steel; built in compliance with ASME standards. The sump shall have a sight window installed for oil level monitoring, 1.5" threaded brass oil fill cap and a drain valve located in the lowest point. The air compressor system shall incorporate a spin-on, full-flow hydraulic oil filter module with readily available replacement cartridge.

A modular air/oil separator unit with spin-on element shall be provided and installed within close proximity to the sump/pressure vessel. Replacement elements shall be readily available.

The air compressor shall be cooled by water from the fire pump, utilizing a shell and tube heat exchanger constructed of copper and brass. Water shall flow through the heat exchanger whenever the pump is operating. An in-line wye strainer shall be installed in the water inlet side of the heat exchanger to prevent clogging. The air compressor cooling system shall be capable of maintaining recommended operating temperatures throughout the full operational range in ambient temperatures up to 115 degrees Fahrenheit.

A dry cartridge type air intake filter shall be provided on the compressor air inlet, mounted on top of the CAFS module. Replacement air filters shall be readily available.

COMPRESSOR SYSTEM PROTECTION

A warning system shall be provided to alert the operator to high temperature conditions. A red warning light and an audible alarm shall be mounted on the pump operator's panel.

INSTRUMENTS AND CONTROLS

The following CAFS controls and instruments shall be provided on the pump operator's panel, arranged in a logical and operator friendly manner:

- Air compressor PTO engagement switch
- Auto Sync compressor controls (Auto/Fixed/Unload) with engraved instruction plate
- Air compressor oil temperature gauge with warning light and audible alarm
- CAF system air pressure gauge
- An air valve for each CAF discharge; handles to be adjacent to and color coded with water valves.

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SYSTEM TESTING

The completed unit shall undergo a manufacturer's run-in test prior to delivery. The pump and air compressor shall be operated at full load for a minimum period of two (2) hours, during which time the operator shall monitor the functions of each system component and record the test results at 15 minute intervals. This testing is to be performed to ensure proper systems operation and performance prior to shipment.

MANUALS

Two (2) copies of operation and maintenance manuals shall be provided to the purchaser with the unit. Manuals shall include detailed instructions in the operation and maintenance of the overall unit, water pump and air compressor system.

OILLESS PRIMING SYSTEM

A 24-volt electric, rotary-vane priming system shall be utilized. The primer is capable of priming the water pump through 20 feet of hard suction hose with a 10 foot lift. Primer controls and an instruction plate shall be mounted on the operator's panel. To prevent environmental contamination, the primer shall use no oil or other fluid to achieve the prime.

SUCTION INLETS

- The suction piping shall be stainless steel with a 3" electric-operated tank-to-pump valve controlled from the operator's panel.
- Two (2) 4" diameter non-gated suction inlets are to be provided, one (1) each side of the pump panel. The suction will have 4" plumbing with an Elkhart 4 inch female NPT X 4 inch male NHT chrome adapter, a removable strainer, and Elkhart high polished chrome long handle cap.
- A 3" pump inlet shall be provided on driver side rear of apparatus. (*Termination to be in pump module with Victaulic connection, location per OEM.*)

PUMP DISCHARGES

All discharge valves will be Elkhart locking, push/pull, T-handle type controllers for the water and quarter-turn controllers for air injection points.

- One (1) 1-1/2" discharge with Elkhart valve shall be located on the left side (driver's side) panel. The panel discharge shall terminate with a 1-1/2" male NHT adapter with cap and chain. This discharge shall be CAFS capable.
- One (1) 1-1/2" discharge with Elkhart valve shall be plumbed to the left side (driver's side) hose reel. This discharge shall be controlled at the operator's panel and plumbed with 1-1/2" hose from the discharge valve to the hose reel by the body builder. This discharge shall be CAFS capable.
- One (1) 1-1/2" discharge with Elkhart valve shall be positioned at the rear (passenger side) of the apparatus. This discharge shall be controlled at the termination point with a swing handle. It shall terminate with a 1-1/2" male NHT adapter with cap and chain. This discharge shall be CAFS capable.
- One (1) 1-1/2" discharge with Elkhart valve shall be positioned at the right side (passenger side) of the apparatus. This discharge shall not be CAFS capable.
- One (1) 1-1/2" discharge with Elkhart valve shall be plumbed to the right side (passenger side) hose reel. This discharge shall be controlled at the operator's panel and plumbed with 1-1/2" hose from the discharge valve to the hose reel by the body builder. This discharge shall be CAFS capable.

Each line shall include an air injection point with a Class 1 valve used to regulate the air injection rate. The air for these discharges shall be supplied from the main air manifold at the pump panel.

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FRONT TFT TURRET FOR CAFS

One (1) TFT Tornado Y2C-52 Combination 500GPM Turret with the following features shall be installed at the front of the apparatus.

- Electric B-TO-ERP 1-1/2" 10-125GPM nozzle
- Smooth Tips (CAFS)
- Joystick control for electric valve w/ Oscillation & Stow
- 7820 2" electric valve
- Quick Disconnect
- 24 Volt

The turret shall be plumbed from a Victaulic termination on the foam manifold to the front of the apparatus with an Elkhart 2" electric valve and high pressure flexible or stainless steel plumbing. It shall have a manual valve in the front plumbing so the turret maybe removed without disabling continued pump operations.

A 2-1/2" pressure gauge, electronic over mechanical hand throttle, air valve control and pump engine stop switch shall be installed in the front center cab console on the passenger side.

The turret shall be protected with a custom made removable front brush guard that will not impede the vehicles angle of approach.

PUMP MODULE DECK GUN TFT TURRET FOR CAFS

One (1) TFT Tornado Y2C-51 Combination 500GPM Turret with the following features shall be installed above pump module of the apparatus.

- Electric MDERP18A 2-1/2" 100-500GPM nozzle
- Stacked Tips (CAFS)
- Panel control for electric valve w/ Oscillation & Stow
- 7820 2" electric valve
- Quick Disconnect
- 24 Volt

The turret shall be plumbed from a threaded termination on the foam manifold to the top of the pump module with an Elkhart 2" electric valve and stainless steel plumbing. It shall have a manual valve in the front plumbing so the turret maybe removed without disabling continued pump operations. The deck gun riser shall be offset to the driver side.

A 2-1/2" pressure gauge, electronic over mechanical hand throttle, air valve control and pump engine stop switch shall be installed in the front center cab console on the passenger side.

EXTENDER FOR DECK GUN

The deck gun plumbing will have an electrically operated 18 inch TFT Extend-a-gun model deck gun extension installed. All plumbing and extension will be properly braced. The Extend-a-gun will have a built in switch which will activate a "Monitor Raised" light in the cab when in the extended position.

The Extend-a-gun will have a panel mounted control for raising and lowering the deck gun from the cab and the pump panel.

TANK FILL AND PUMP COOLING LINE

One (1) 2-1/2" tank fill line with Elkhart valve will be supplied. The valve will be accessible from the operator's position via a T-handle control.

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BYPASS COOLING LINE

No bypass cooling line is necessary as cooling for the pump is integrated into the compressor water cooling circuit which provides sufficient cooling for the pump under all operations while minimizing the pressure loss in the line. This line will be plumbed from the discharge side of the compressor cooler to the tank fill piping at the tank. The line will also include a check valve to prevent water from draining from the tank into the cooler when it is drained.

PRESSURE RELIEF VALVE

A pressure relief valve of bronze construction, built by the pump manufacturer and assembled as an integral part of the pump, is to be furnished and shall have a large hand wheel pressure setting control, complete with indicating lights to alert operator when valve is in an open or closed position.

One (1) suction relief/dump valve shall be supplied. The relief valve features behind the pump panel adjustable pressure setting, stainless steel construction, stainless steel spring, rubber seat to assure positive vacuum seal, and a 2-1/2 inch outlet. The surplus water shall discharge to the atmosphere at a location away from the pump operator's position. The discharge pipe shall terminate with a male NST hose thread fitting that is visible to the pump operator. A permanent label shall be affixed near the outlet that states "Intake Pressure Relief Outlet - Do Not Cap".

2-1/2" DIRECT TANK FILL

One (1) 2-1/2" direct fill line with Elkhart valve will be provided at the rear of the body on the passenger side. The plumbing will terminate with a 2-1/2" female NPT by 2-1/2" male NHT chrome adapter, rocker lug cap, and stainless steel chain.

WATEROUS FOAM SYSTEM

One (1) AQUIS™ 2.5 foam proportioning system with dual Operator Interface Terminals shall be provided.

The Operator Interface Terminal (OIT) shall be mounted on the pump operator's panel and inside the cab which allow the operator to perform the following functions:

- Provide rotary dial control of foam proportioning rates from 0.1% to 1%, in infinite increments
- Calibrate flow rate
- Flashes and then displays a steady "low concentrate" warning when the foam concentrate tank runs low - system shuts off after two minutes
- Flash a "no concentrate" warning when the foam concentrate tank is empty
- Flash an "error" warning with associated code in the event of an electronic malfunction
- Provide a manual back-up mode, controlled by the operator

FLOWMETER

A paddlewheel-type flow meter, installed in the process manifold upstream of the foam injection point, connects to the microcontroller.

A flow meter tee, constructed of stainless steel or brass with Victaulic groove outer connections and threaded NPT inner connections at each end of the tee, is provided for connection to the apparatus plumbing. Flow meter tee shall be as follows:

- Standard - 2" ID (400 GPM / 1500 L/min)

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FOAM PUMP

The 24 volt, electric motor driven, positive displacement triplex plunger foam pump is equipped with an aluminum crankcase, ball bearings, forged brass pump body and manifold, solid ceramic plungers, stainless steel check valves and piston guides, Buna packing and preset thermal and pressure relief valves.

The foam pump is rated at 2.5 GPM @ 150 psi (9.46 l/min @ 10 bar) with operating pressures up to 450 psi (32 bar). Maximum electrical load of 40 amps @ 12 VDC and 21 amps @ 24 VDC.

A pump motor electronic driver, located inside the controller housing, receives signals from the microcontroller and powers the 1/2 hp (.4 kW) electric motor in a variable speed duty cycle to ensure that the correct amount of foam concentrate set by the pump operator is injected into the water stream.

CONTROL CABLES AND CONNECTORS

The cables for interconnection of the control unit, OIT, temperature sensor and flow meter are electrically shielded to prevent radio frequency or electro-mechanical interference.

FOAM INJECT CHECK VALVE

A brass and stainless steel check valve provided in the foam concentrate line at the foam injection point prevents water backflow into the foam supply reservoirs.

FOAM SYSTEM SUPPORT

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

FOAM REFILL SYSTEM

A Waterous FoamFill Foam tank refill system capable of 10 GPM (37.8 L/min) shall be provided and installed that is completely-automated making it easier, safer, cleaner and quicker to top off the foam tank or tanks in your apparatus. The FoamFill foam tank refill can be used with both Class A and B foam and features a 24-volt motorized pump. When turned on, a microcontroller identifies if tanks are low, and automatically fills them without overflowing using a stainless steel wick wand and six feet of reinforced hose. A 3/4" panel mounted connector shall be provided, along with a 5' 3/4" hose and pickup tube.

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CONTROL PANEL (UNIT #734)

A black powder coated aluminum control panel shall be mounted to the module frame on the left side of the apparatus. The panel shall be equipped with a water resistant electrical access door. The following items shall be positioned as low as possible on the module and clearly marked in a logical manner to provide for simple and easy operation.

- Shielded pump panel light cluster and switch with sealed beam type lights
- Innovative Controls LED light water tank level indicator
- Innovative Controls LED light foam tank level indicator
- Master pump pressure gauge, 3-inch, black dial
- Master air pressure gauge, 3-inch, black dial
- Master suction vacuum gauge, 3-inch, black dial
- Foam proportioner controls
- Class 1 ENFO III display
- FoamFill connection and control panel
- Air compressor temperature switch gauge and light
- 97 decibel alarm
- Vernier throttle control
- Two (2) 1.5" driver and officer side pump module discharge valves controlled at the panel
- Two (2) 1.5" driver and officer side booster hose reel discharge valves controlled at the panel
- Primer system control
- Two (2) compressed air discharge controls valves
- Auxiliary compressed air outlet
- Electrically operated tank-to-pump valve control
- Tank refill valve control
- Suction valve control
- NFPA standard ID labels
- Discharge outlet drains, quarter-turn
- Auto Sync compressor control
- Master Drain
- Instruction Placards

PUMP ELECTRICAL SYSTEM

All electrical equipment installed by the manufacturer shall conform to current automotive electrical system standards and the requirements of the applicable NFPA Apparatus Standard. Wiring shall be individually and permanently color and function coded. The installation shall meet SAE Standard J1128 in its latest edition for GXL or SXL temperature rating.

All exposed wiring shall run in loom with a minimum 280-degree rating. All wiring loom shall be properly supported and attached to frame members along the entire run. At any point where wire or looms must pass through metal, rubber grommets shall be installed to protect the wire from abrasion.

The main low-voltage electrical terminal block and circuit breaker panel shall be provided behind the pump operator's panel in allocation providing easy service access.

Electrical connection shall be made using heat shrink and/or weatherproof connectors wherever possible. All electrical circuits shall be protected with automatic reset circuit breakers.

PLUMBING, HOSES, AND LINES

All plumbing shall be of Schedule 10 stainless steel and/or high pressure hydraulic hose with stainless steel fittings. Use of Victaulic fittings is required for flexibility and movement of system components. Check valves are required throughout the system to maintain integrity and shall be placed to prevent the backflow of air, water, foam, and foam solution. The system will be designed to drain completely from one master drain controlled from the operator's panel to prevent freeze damage.

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PUMP MODULE CONSTRUCTION

The frame shall be constructed of aluminum and designed for rigorous use by fire service personnel. The top of the module shall be aluminum NFPA approved diamond-plate tread material, hinged for a complete service access door. The top access door shall use pneumatic gas shocks to maintain the door in the open position. The passenger side shall have a full access door, laser cut for ventilation, for access to the Aquis 2.5. The overall dimensions of the module shall be 32" wide x 37" height x 78" deep. The pump panel light cover shall project an additional 5".

Clarify the specification to show that the pump module shall be constructed to allow the Maui County Fire Department to install two (2) Piston Intake Valves (PIV) on the 4" pump inlet connections, one (1) per side. The PIV's shall be located with the downturn connection positioned towards the rear of the pump panel. The pump panel step shall be notched at the rear of the module to allow for the connection of a large diameter hose to the PIV. To the extent possible, all pump controls, discharge controls, drain controls, and pump indicators shall be kept clear of the area located below and to the rear of the 4" intakes to allow for the PIV connection.

2000 GALLON POLYPROPYLENE TANK W/ 50 GALLON FOAM CELL

The tank shall have a rated capacity of 2050 U.S. gallons. It shall carry 2000 gallons of water and have an internal foam cell to hold 50 gallons of foam concentrate. The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty. The purpose of the notice is to inform department personnel who store, stock, or use the tank that the tank is under warranty. The tank shall be constructed of copolymer sheet stock. This material shall be non-corrosive stress relieved thermo-plastic, black in color, and U.V. stabilized for maximum protection. The tank shall be completely independent of the body and compartments. The top of the tank shall be fitted with removable lifting eyes designed with a 3 to 1 safety factor. The baffles shall be constructed of copolymer material. All partitions shall be equipped with vent and air holes to permit the movement of air and water between compartments. The tank shall have a combination vent and manual fill tower. The vent shall also serve as an overflow and shall have a minimum I.D. of 4". The overflow will discharge excess spillage behind the rear axle by use of internal piping within the tank. The overflow shall have a plastic tab to prevent the entry of a fill hose into the overflow during overhead fill operations. A removable plastic screen shall be located in the fill tower around the overflow. A 14" square fill tower with hinged lid for the water tank shall be located at the forward part of the apparatus body. The entire tank will be mounted on a 1/4 inch 60 Durometer rubber sheet attached to the bottom of the tank between the tank and the tank frame.

Baffling shall be positioned to extend from the bottom of the tank to the top of the tank adjacent to the mounting blocks to provide superior strength within the tank. The water tank is to be equipped with one primary tank floor sump. It shall have internal plumbing from the front of the tank to the bottom of the sump so that no plumbing is necessary below the tank for the tank to pump line. In addition, a 3" threaded fitting with plug shall be installed in the bottom of the sump for use as a cleanout or tank drain. The sump will be equipped with an anti-swirl baffle plate.

The water tank shall have a clear plastic sight lens welded into at the back of the tank to provide a backup for the electronic water level indicator described elsewhere in these specifications.

10" MANUAL ROUND REAR DUMP VALVE

One (1), 10 inch diameter Bray butterfly dump valve with locking manual handle shall be provided at the lower rear center of the water tank.

To be easier to reach from the ground, the handle shall be mounted on the left side of the dump.

The valve shall be installed by the use of a SAE 150# flange fully molded into the interior and exterior of the water tank sump. The valve shall be a butterfly valve for smooth, even operation. This valve shall allow the dumping of the water down to the bottom of the valve opening.

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HOSE REEL MOUNTING AREA

An area at the front of the tank on each side shall be used for the mounting of the hose reels. The reels shall be mounted towards the outside with space between them to allow access to the walkway at the top of the water tank.

DUAL POLISHED ALUMINUM HANNAY HOSE REELS

Two (2) Hannay polished aluminum 24V electric rewind hose reels with outboard upper roller assemblies and 40 amp breakers shall be provided.

The hose reel drum size shall be made as small as possible to carry the intended hose so that the drum will be as low as possible to avoid catching on branches, etc.

The left side (driver's side) discharge shall have a pump panel T-handle controlled Elkhart 1-1/2 inch valve with 1 inch high pressure flexible hose connecting the pump to the hose reel. The right side (passenger side) discharge shall have a locally controlled Elkhart 1-1/2 inch valve with 1 inch high pressure flexible hose. The reel shall be capable of holding 150 feet of 3/4 inch booster style hose (NO nozzle is provided.).

Two (2) hose reel rewind switches shall be located, one (1) per side, in the pump platform area on either side of the body assembly. The switches shall be marine style sealed momentary switches with a chrome button protector ring to aid in the prevention of accidental impact. The enclosures that surround the hose reel button should have drain holes in them to prevent moisture accumulation. Hose reel rewind indicator labels shall be permanently affixed to the body.

HOSE CLIPS FOR BOOSTER HOSE

One (1) pair of hose clips shall be provided on each side below the hose reels. They shall be mounted to hold the hose.

REAR HOSE STORAGE TRAY

A rear hose storage tray shall be provided underneath the passenger side rear discharge. It shall deploy from the rear, have a cover and be capable of holding 25' of 1-1/2" hose. It shall be mounted to the aft side of the fuel storage compartment.

EQUIPMENT

The following equipment shall be furnished with the completed vehicle:

- One (1) container of assorted stainless steel nuts, bolts, screws and washers used in the construction of the apparatus shall be provided with the completed apparatus.
- There shall be two (2) NFPA approved aluminum wheel chocks provided for 44" diameter tires that together will hold the vehicle when loaded to its GVWR or GCWR, on a hard surface with a 20 % grade, with the transmission in neutral, and the parking brake released.
 - The wheel chock(s) shall be mounted between rear wheels, one (1) chock per side between the tandem axles.
- One (1) two ounce (2oz) container with an applicator brush of touch-up paint shall be supplied for each color of the finished apparatus body color paint at the time of delivery or pick up of the apparatus.