

Crimson Fire Pumper/Rescue 2008

GENERAL SPECIFICATIONS

Crimson Fire submits the following detailed proposal is submitted for your consideration:

Unit will be protected by permanent Anti-Freeze for operation between -30 degrees F to +235 degrees F and shall have all fluid levels filled prior to delivery.

Unit will be designed and constructed to follow the requirements of the following:

FMVSS; DOT; ICC; NFPA Pamphlet 1901; SAE; TRA; ULI; TBEA; and State Motor Vehicle regulations (NFPA loose equipment not requested is not included).

Crimson Fire is a subsidiary of Spartan Motors Inc. at 1000 Reynolds Road, Charlotte MI.

Crimson Fire (formerly Luverne Fire Apparatus) has been in operation since 1912. Crimson Fire maintains a complete, on-site parts department, and ships spare parts orders the same day they are received.

The apparatus will be manufactured at 907 7th Avenue North at Brandon, South Dakota.

Spartan Motors Inc. has been in operation since 1975. Spartan Motors Inc. maintains a complete, on-site parts department, and ships spare parts orders the same day they are received.

The chassis will be manufactured at 1000 Reynolds Road, Charlotte, MI.

The apparatus will be designed and assembled completely in the USA.

Unit will be quality control inspected and documented at each step of manufacturing, and will be fully road tested.

Unit will be fully covered by manufacturer's insurance until delivery is made.

Unit will be designed and assembled so that all recommended daily maintenance checks can be performed easily by the operator without the need for hand tools. Apparatus components that interfere with removal or repair of other major components will be attached with fasteners and installed with normal hand tools. These components will not be welded or otherwise permanently secured into place.

A test data plate will be provided at the pump operator's position which gives the rated discharges and pressures, together with the speed of the engine as determined by the manufacturer's test for this unit.

A manufacturer's certification of GVWR and GAWR on a nameplate will be affixed to the completed vehicle.

A permanent plate mounted in the driver's compartment will be supplied. It will specify the quantity and type of the following fluids used in the vehicle: engine oil, engine coolant, chassis transmission fluid, pump transmission lubrication fluid, pump primer fluid (if used), and drive axle

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lubrication fluid.

A permanent plate in the driver's compartment will be installed, specifying the seating capacity of the included cab.

Signs that state "OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION" will be provided. They will be visible from each seated position.

An accident prevention sign will be located at the rear step area of the apparatus. It shall warn personnel that standing on the step while vehicle is in motion is prohibited.

A nameplate indicating the chassis transmission shift selector position to be used for pumping will be provided in the driving compartment and located so that it can be easily read from the driver's position.

The height of the fully loaded vehicle's center of gravity will not exceed the chassis manufacturer's maximum limit.

The front to rear weight distribution of the fully loaded vehicle will be within the limits set by the chassis manufacturer. The front axle loads will not be less than the minimum axle loads specified by the chassis manufacturer, under full load and all other loading conditions.

The difference in weight on the end of each axle, from side to side, when the vehicle is fully loaded and equipped will not exceed 7 per cent.

All manufacturers' operations and maintenance documents supplied with components and equipment installed on, or supplied with the completed vehicle will be provided.

Any special tools that are required to service any component will be provided with the completed apparatus. (When applicable)

The apparatus is designed so that the various parts are readily accessible for lubrication, inspection, adjustment, and repair.

The apparatus when fully loaded will be capable of the following performance on dry, level paved roads in good condition.

- (a) From a standing start the vehicle will attain a true speed of 35 mph within 25 seconds.
- (b) From a steady pace of 15 mph, the vehicle will accelerate to a true speed of 35 mph within 15 seconds. This will be accomplished without moving gear selector.
- (c) The apparatus will be able to maintain a speed of at least 20 mph on any grade up to and including 6 percent.
- (d) The vehicle will attain a minimum speed of 50 mph.

The GAWR and GVWR of the chassis will be adequate to carry the fully equipped apparatus including water and other tanks filled, the specified hose load, unequipped personnel weight,

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ground ladders, and a miscellaneous equipment allowance per NFPA criteria as well as additional equipment and personnel specified by purchaser.

Personnel is calculated at 200 lbs per person.

OVERALL MEASUREMENTS OF THE COMPLETED APPARATUS

Wheelbase: 225.5"

Height: 115"

Length: 420.5"

APPARATUS TEST BY UNDERWRITERS LABORATORIES

The following Apparatus shall comply with all NFPA 1901 applicable regulations in effect as of the contract signing date. There shall be multiple tests performed by Crimson Fire and Underwriter's Laboratories when the apparatus has been completed. Crimson Fire shall furnish the completed Test Certificates to the purchaser at time of delivery.

The tests conducted on the apparatus shall include, but not be limited to:

PUMP & PLUMBING PERFORMANCE TEST

The apparatus pump and plumbing system shall be tested and certified.

12 VOLT ELECTRICAL TEST

The apparatus low voltage electrical system shall be tested and certified.

GENERATOR & 110/220-VOLT UL TESTING

The apparatus generator system shall be tested and UL certified.

FOAM SYSTEM TESTING

The apparatus foam system shall be tested and certified.

SUPPLIED INFORMATION & EXTRAS

There shall be supply two (2) copies of apparatus manuals with all manufactured apparatus. The manuals shall include, but not be limited to: all component warranties, users manuals and information for supplied products, apparatus engineering information including drawings and build prints, and whatever other pertinent information the manufacture can supply to its customer regarding the said apparatus.

Included in the delivery of the unit, Crimson Fire shall also include spare hardware and extra fasteners, paint for touch-up, information regarding washing and care procedures, as well as other recommendations for care and upkeep of the general apparatus.

Crimson Fire shall also supply a manufacturer's record of apparatus construction details,

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including the following information:

Owner name and address;

Apparatus manufacturer, model, and serial number;

Chassis make, model, and serial number;

GAWR of front and rear axles;

Front tire size and total rated capacity in pounds;

Rear tire size and total rated capacity in pounds;

Chassis weight distribution in pounds with water (if applicable) and manufacturer mounted equipment (front and rear);

Engine make, model, serial number, number of cylinders, bore, stroke, displacement and compression ratio, rated horsepower and related speed per SAE J690, Certificate of Maximum Net Horsepower for Motor Trucks and Tractors, and no load governed speed;

Type of fuel and fuel tank capacity;

Electrical system voltage and alternator output in amps;

Battery make and model, capacity in CCA;

Paint numbers;

Company name and signature of responsible company representative;

Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle (with the water tank full (if applicable) but without personnel, equipment, and hose);

Written load analysis and results of the electrical system performance tests;

Transmission make, model, and type;

Pump to drive through the transmission (yes or no);

Engine to pump gear ratio and transmission gear ratio used;

Pump make, model, rated capacity in gallons per minute, serial number, number of stages, and impeller diameter in inches;

Pump manufacturer's certification of suction capability;

Pump manufacturer's certification of hydrostatic test;

Pump manufacturer's certification of inspection and test for the fire pump;

Copy of the apparatus manufacturer's approval for stationary pumping applications;

Pump transmission make, model and serial number;

Priming device type;

Type of pump pressure control system;

The engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum no load governed speed;

Certification of water tank capacity;

ON-LINE CUSTOMER INTERACTION

Crimson Fire shall provide the capability for online access through the manufacturer's web site.

There shall be a dedicated section of the web site for customers to access the status of their apparatus during the construction phases. In this secured area customers will be able view specified digital photos of their apparatus during the construction phases.

The following photos will be provided with this service:

1. Chassis (front, rear, left and right side)

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2. Body, pre-paint (front, rear, left and right side)
3. Body and pump module mounted (front, rear, left and right side)
4. Final (front, rear, left and right side)

GENERAL WARRANTY

We warrant each new fire apparatus manufactured by Crimson Fire for a period of one (1) year from the date of delivery, except for the chassis and certain other components as noted in paragraph three.

Under this warranty we agree to furnish any parts to replace those that have failed due to defective material or workmanship where there is no indication of abuse, neglect, unusual or other than normal service providing that such parts are, at our option, made available for our inspection and at our request, returned to our factory or other location designated by us with transportation prepaid within thirty days after the date of failure or within one year from the date of the delivery of the apparatus to the original purchaser, whichever occurs first, and inspection indicates that the failure was attributed to defective material or workmanship.

The warranty on the chassis, engine, transmission, tires, storage batteries, generators, electrical lamps and other devices subject to deterioration is limited to the warranty of the manufacturer thereof and adjustments for the same are to be made directly with the manufacturer by the customer.

This warranty shall not apply to any fire apparatus, which has been repaired or altered outside our factory in any way, unless prior written authorization has been received from Crimson Fire.

This warranty shall not apply to those items, which are usually considered normal maintenance and upkeep services including, but not limited to, normal lubrication or proper adjustment of minor auxiliary pumps and reels.

This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on our part. We neither assume nor authorize any person to assume for us any liability in connection with the sales of our apparatus unless made in writing by Crimson Fire.

STRUCTURAL WARRANTY

A structural warranty will be provided by the manufacture for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of twenty (20) years.

PAINT WARRANTY

A ten (10) year Paint Warranty will be included with the apparatus.

PUMP WARRANTY

A pump warranty shall be provided by Waterous for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of five (5) years.

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PLUMBING WARRANTY:

The plumbing provided by Crimson Fire shall have a ten (10) year warranty.

TANK WARRANTY

A lifetime tank warranty shall be provided by UPF.

MULTI-PLEXED ELECTRICAL WARRANTY

A multi-plexed electrical warranty will be provided by the apparatus manufacturer under normal use and service, for a period of four (4) years. One (1) year parts and labor remainder three (3) years parts only.

CAB AND CHASSIS

The cab and chassis shall be a Spartan Chassis, Inc. Flat Floor Advantage, model VA41M, medium four door with a 10" raised roof, flat floor, aluminum tilt cab, built specifically for the fire service by a publicly held U.S. parent company, specializing in chassis for all fire service applications.

FLAT FLOOR MFD 10" RAISED ROOF 4DR TILT CAB

The cab shall be a Spartan Chassis, Inc. Flat Floor, MFD (medium four door), 10" raised roof, aluminum tilt cab, capable of seating six (6) firefighters.

The raised roof shall extend from the back of the cab to the center of the front doors to provide additional headroom for the driver and officer.

The cab shall be of the Eurospace interior design allowing for easy communication inside the cab. The cab overall length shall be 128.0" with 54.0" from the centerline of the front axle to the back of the cab.

The rear cab wall shall be 0.090" thick aluminum. The rear floor to the headliner shall be approximately 65.0".

The cab front skin and floor shall be 0.190" thick aluminum. The inside width shall be 88.0" and the front floor to headliner height above the driver and officer shall be approximately 65.0".

All glass used in the cab shall be automotive tint. The windshield shall have a maximum of 2808 square inch area and be of the wraparound design, 52.0" wide and 27.0" high for maximum visibility. The left and right windshield shall use the same interchangeable piece of glass.

A molded rubber 11" grab handle shall be provided on the hinge post inside the cab at the driver and officer door for entering and exiting the cab.

The driver and officer seats shall have an 8" high x 16.25" wide x 18.75" deep compartment in the seat box beneath them. The compartment shall have an opening of 6" high x 14.25" wide.

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Intermittent parallel arm-type electric wipers with separate motors and electric powered "wet arm" type windshield washers shall be provided. Access to the wiper motors shall be through an access panel located on the front cab face.

AIR-CONDITIONING

The cab shall have a combination heater air-conditioning unit mounted on the engine tunnel.

The combination heater/air-conditioning unit has eight (8) adjustable louvers, a temperature control valve and two (2) three speed blowers capable of circulating 550 cubic feet of air per minute. This unit is rated at 42,500 BTU for cooling and 36,000 BTU for heating.

A roof mounted condenser shall be installed:

Centered on cab forward of raised roof against the slope rise.

The air-conditioning compressor will be an engine driven Seltec TM-16 and utilize R-134A refrigerant.

The A/C lines will be a mixture of custom bent zinc coated steel fittings and Goodyear Galaxy flexible hose with ATCO crimp-on fittings.

All heater system hoses, including auxiliary units shall be silicone with stainless steel constant torque clamps approved for use with silicone hose.

A seasonal shut-off valve for the heater will be supplied at the front of the right hand corner of the cab.

CAB DOORS

The cab doors shall be flush, full length type with hidden .375" stainless steel door hinges. All doors shall be equipped with exterior pull handles, suitable for use with firefighter mittens, and keyed alike locks that are designed to prevent accidental lockout.

The interior latches shall be black flush paddle type, which are incorporated into an upper door panel.

The front doors shall measure 43.00" wide x 77.00" high with .13" thick aluminum skins. The steps shall be a two (2) step configuration with the lower step constructed of an open grate material and the intermediate step shall be covered with black flex tread.

The following measurements shall apply:

First step: 11.00" deep x 32.00" wide

Intermediate step: 8.75" deep x 33.00" wide

Ground to first step: approximately 21.00"

First step to intermediate step: 11.00"

Intermediate step to floor: 11.00"

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The rear doors shall measure 34.00" wide x 87.00" high with .13" thick aluminum skins. The rear steps shall be a two (2) step configuration with the lower step constructed of an open grate material and the intermediate step covered with black flex tread.

The following measurements shall apply:

First step: 11.00" deep x 21.50" wide

Intermediate step: 11.50" deep x 23.50" wide

Ground to first step: approximately 21.00"

First step to intermediate step: 12.50"

Intermediate step to floor: 12.50"

DOOR HANDLES EXTERIOR - CHROME

The cab door exterior pull handles (4) shall be extruded aluminum with a polished chrome plated finish.

Each handle shall include an aluminum scuff plate with a polished chrome finish. The scuff plate shall be 6.25" tall x 10.50" wide.

STAINLESS TRIM

A stainless steel trim band, 12" high (equal in height to the front bumper) with upper and lower trim affixed without holes and fasteners, shall be installed on the lower exterior sides of the cab and doors.

FRONT AND REAR ROLL DOWN DOOR WINDOWS

The front doors shall have a full roll down window 27.00" x 26.00" with a total glass area of 702 square inch each.

The rear doors shall have a roll down window 27.50" x 26.00" with a total glass area of 715 square inch each.

FABRIC COVERED SEATS - DURABLE BALLISTIC POLYESTER

The seats shall be covered with a high strength, wear resistant fabric of durable ballistic polyester. A PVC coating is bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids.

GRAY SEAT COLOR

All seats supplied on the chassis shall be gray in color.

SEATBELT WARNING SYSTEM

A seatbelt use warning system shall be installed in the chassis. The system will provide a visual and audible warning when all of the following conditions are met.

1.) Any seat is occupied (sixty pounds minimum).

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- 2.) The corresponding seat belt(s) remains unfastened.
- 3.) The park brake is released.

Once activated, the visual and audible indicators will remain active until all occupied seats have the seat belts fastened.

DRIVER SEAT

The driver's seat shall be a two-way manual adjustment Seats Inc. 911 "Universal" high back seat and shall include a tapered and padded seat cushion and back, with a minimum of 37" from the seat H-point to the headliner.

The seat shall be equipped with an adjustable lumbar support, adjustable titling seat back and "knee rake" bottom cushion adjustment.

The seat shall be equipped with a red three-point shoulder harness with lap belt and an automatic retractor attached to the cab.

Seatbelts only available in outboard to inboard (buckle) orientation.

OFFICER SEAT

The officer's seat shall be a Seats Inc. 911 "Universal" SCBA high back seat and shall include a tapered and padded seat cushion and back.

The seat back shall include a vertically split hinged headrest and ZICO "ULL" bracket with LLS strap. A removable padded cover shall be supplied over the SCBA cavity.

The seat shall be an ABTS (All Belts to Seat) type integrated red three-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The female seat belt clasp shall extend up from the seat base ~ 14" to be within easy reach of the occupant. The ABTS feature is an engineering break through where the passenger restraint harness is built into the seat module and meets the twenty "G" load test.

Standard seatbelt orientation - Integrated shoulder belt shall be oriented from outboard to inboard (buckle).

REAR FACING OUTBOARD SEATS

Two (2) outboard rear facing crew area Seats Inc. 911 "Universal" SCBA high back individual seats shall be installed in the rear of the cab.

Each "Universal" high back seat shall include a tapered and padded seat cushion and back.

Each seat back shall include a vertically split hinged headrest and ZICO "ULL" bracket with LLS strap. A removable padded cover shall be supplied over the SCBA cavity.

The seats shall be an ABTS (All Belts to Seat) type integrated red three-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The female seat belt clasp

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shall extend up from the seat base ~ 14" to be within easy reach of the occupant. The ABTS feature is an engineering break through where the passenger restraint harness is built into the seat module and meets the twenty "G" load test.

Standard seatbelt orientation - Integrated shoulder belt shall be oriented from outboard to inboard (buckle).

FORWARD FACING CENTER SEAT BOX

A seat box 42-3/8" wide x 12" high x 22" deep shall be installed against the center of the rear wall for seat mounting. The seat box shall be made from smooth aluminum and welded to the cab structure for seat mounting integrity. The seat box will be painted the cab interior color.

Both sides of the seat box shall have a hinged door with latch and opening 13-3/4" wide x 10" high to allow access for storage in the seat box.

FORWARD FACING CENTER SEATS

Two (2) center forward facing crew area Seats Inc. 911 "Universal" SCBA high back individual seats shall be installed in the rear of the cab.

Each "Universal" high back seat shall include a tapered and padded seat cushion and back with a spring loaded hinge fold up seat bottom.

Each seat back shall include a vertically split hinged headrest and ZICO "ULL" bracket with LLS strap. A removable padded cover shall be supplied over the SCBA cavity.

The seats shall be an ABTS (All Belts to Seat) type integrated red three-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The female seat belt clasp shall extend up from the seat base ~ 14" to be within easy reach of the occupant. The ABTS feature is an engineering break through where the passenger restraint harness is built into the seat module and meets the twenty "G" load test.

Standard seatbelt orientation - Integrated shoulder belt shall be oriented from outboard to inboard (buckle).

CAB WINDOWS

Fixed cab side windows, 16.0" x 26.0" (416 square inches) shall be installed behind the front cab doors one each side of the cab. Each window shall be the same height as the windshield to provide maximum visibility.

CAB CRASH TEST ECE-29

Spartan Chassis Inc has successfully submitted their extruded flat floor cab to the International crash test ECE-29, Addendum 28, revision 1. As part of the ECE regulation 29 test, the frontal area of the cab is struck by a 3,700 pound pendulum weight. The weight is brought back to a sixty degree angle and then the weight is released and allowed to swing forward, imparting some 32,600 lb.ft. of force to the cab front face. The cab must be so constructed that after the

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test, there will be minimal intrusion of cab structure into the passenger area. Note: After the test the Spartan cab doors remained usable for both entry or exit. Also, as part of the test the cab roof must withstand a static load bearing test. The Spartan cab withstood a weight of over 21,500 pounds without permanent damage or collapse. The above tests were witnessed by and attested to by an independent third party. The test results were recorded on/by cameras, high speed imagers, accelerometers and strain gauges. Notarized copies of the letters verifying the test results and videos of said test are available upon request.

ONE YEAR CHASSIS WARRANTY

The chassis manufacturer shall warrant to the original purchaser the custom fire truck chassis for a period of twelve (12) months with the exception of the actual fire apparatus chassis frame which carries a lifetime warranty. The warranty period shall begin on the date the vehicle is delivered to the original purchaser. The warranty may include conditional items, which shall be listed in the detailed warranty document that shall be provided upon request.

CAB WARRANTY

The cab shall be warranted for a period of ten (10) years. Warranty conditions may apply and shall be listed in the detailed warranty document that shall be provided upon request.

PAINT FRAME AND CHASSIS UNDER CARRIAGE

The chassis under carriage that consists of the axles, driveline running gear, battery boxes, air tanks and other assorted chassis mounted components shall be painted with standard black paint. The frame rails shall be powder coated black. Paint shall be applied before airlines and electrical wiring is installed.

CHASSIS WHEELBASE

The chassis wheelbase shall be 225.5".

FRAME

The frame side rails shall be black powder coated "C" channel type 10.25" x 3.5" x .38" with an inner channel 9.44" x 3.13" x .38" of 110,000 psi minimum yield high strength steel, a RBM of 3,315,214 inch pounds and a section modulus of 30.14 cubic inches.

A minimum of seven (7) fully gusseted bolted assembly crossmembers shall be installed using grade 8 flanged head bolts and flanged lock nuts.

The area between the axle suspension hangers shall be free of any holes or fasteners in the flanges. No welding shall be incorporated in attachment of components. All frame dimensional cutting shall be by a plasma cutter. All relief areas shall be cut in with a minimum 2" radius at intersection points with ground smooth edges to prevent a stress focal point.

The frame and crossmembers shall carry a lifetime warranty to the original purchaser.

FUEL TANK

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The fuel tank shall have a minimum capacity of fifty (50) gallons. The baffled tank shall be made of 14 gauge aluminized steel. The tank exterior is painted with a primer and top coat. This results in a tank which offers the internal and external corrosion resistance and surface characteristics of aluminum with the strength, durability and economy of steel.

The fuel tank shall be mounted under the frame, behind the rear axle with a three-piece strap hanger assembly with a "U" strap bolted midway on the fuel tank front and rear so the tank can be easily lowered and removed for service purposes. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

The tank shall have a vent port to facilitate rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2"NPT fill ports for right or left hand fill. A .5"NPT drain plug shall be centered in the bottom of the tank.

The standard fuel line for ISC and ISL engines will be nylon material rated for diesel fuel. All other engines will be steel wire braid reinforced rubber.

FRONT BUMPER

A one piece, two (2) rib wrap-around style, polished stainless steel front bumper shall be provided. The material shall be 10 gauge 304 stainless steel, 12" high and 99" wide.

The bumper shall be extended 24" ahead of the cab.

AIR HORNS

Dual Grover Stuttertone 24" air horns shall be recessed in the front bumper, one (1) each side on the outboard of the frame rails - at the inner most mounting position. A 3/8" airline "teed" equal distance from each horn shall be installed.

ADDITIONAL AIR RESERVOIR

An additional 1200 cubic inch air reservoir shall be installed and isolated to prevent depletion of the air to the air brake system and to act as a supply tank for operating air equipment. It shall be plumbed with a 90 psi pressure protection valve on the reservoir supply side.

BUMPER APRON

A 3/16" bright embossed aluminum tread plate apron shall be installed between the bumper and the front face of the cab. Stainless steel bolts shall be used to attach the apron to the bumper flange.

FRONT TOW HOOKS

Two (2) painted steel tow hooks shall be bolted to the frame under the front bumper.

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AIR HORN ACTUATION

Air horn actuation shall be accomplished by the steering wheel horn button and a right side officer's mounted Linemaster SP491-S81 foot switch.

FRONT AXLE

The front axle shall be an ArvinMeritor MFS-18 with a 3.74" drop and a 71.00" KPI.

It shall have a capacity of 18,000 pounds GAWR.

Suspension

The springs shall be taper type, four (4) leaf, 54" long and 4" wide with a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counterbore and lubrication land off crossbore with grease fitting. The spring capacity shall meet or exceed the capacity of the front axle.

Steering

The hydraulic power assist steering gear shall be a TRW TAS-85. The steering ratio shall be 23.3:1 and have 6.2 turns stop to stop.

FRONT TIRES

The front tires shall be Goodyear 315/80R 22.5 20PR "L" tubeless radial G291 highway tread with 22.5 x 9.0 ten (10) stud disc wheels. The tires and wheels shall be rated at 18,000 pounds.

FRONT AXLE CRAMP ANGLE

The hub piloted, MFS-18 model front axle cramp angle shall be a minimum of 50 degrees when using the 315/80R 22.5 front tires.

FRONT WHEELS STEEL

The front wheels shall be Accuride hub piloted, 9.00" x 22.5" steel wheels.

FRONT WHEEL BEARINGS OIL LUBRICATED

The front axle wheel bearings shall be oil lubricated and come equipped with an oil level visual inspection window.

FRONT SHOCK ABSORBERS

Two (2) Bilstein monotubular design, nitrogen gas charged shock absorbers shall be part of the front axle suspension. Bilstein shall warranty the shock for a period of five (5) years.

FRONT BRAKES

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The front brakes shall be ArvinMeritor 16.5" x 6" S-cam type with ArvinMeritor automatic slack adjusters.

CHASSIS ALIGNMENT

The chassis frame rails shall be cross checked for length and squareness. Front and rear axles shall be laser aligned. Tires and wheels shall be aligned and toe-in set on the front tires at the chassis manufacturer's facility.

The completed apparatus should be rechecked for proper alignment after the chassis has been fully loaded.

FRONT STAINLESS STEEL WHEEL DRESS UP KIT

A front stainless steel wheel simulator kit shall be provided.

The kit is to include American made RealWheels brand mirror finish, 304L grade, non-corrosive stainless steel Universal front wheel simulators meeting D.O.T certification standards. They shall simulate the look of polished aluminum wheels and come complete with stainless steel hub covers and lug nut covers.

All stainless steel simulators shall carry a lifetime warranty.

STEERING COLUMN AND WHEEL

The Douglas Autotech steering column shall be a seven (7) position tilt and 2.25" telescopic type with an 18" steering wheel. The steering wheel shall be covered with black absorbite padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

REAR AXLE

The rear axle shall be an ArvinMeritor model #RS-25-160 with single reduction gearing and shall have a fire service rated capacity of 27,000 pounds GAWR.

TOP SPEED

The top speed of the vehicle shall be approximately 70 MPH +/-2 MPH at governed engine RPM.

REAR BRAKES

The rear brakes shall be ArvinMeritor 16.5" x 7" S-cam type with ArvinMeritor automatic slack adjusters.

ABS BRAKE SYSTEM

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A Meritor Wabco four sensor four modulator anti-lock braking system shall be installed on the front and rear ArvinMeritor axles for safer vehicle control during braking and reduced stopping distance in skid conditions.

The electronic monitoring system shall incorporate diagonal circuitry to monitor wheel speed during braking through a sensor and tone ring on each wheel.

A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. A momentary test switch shall be installed to test the system for diagnostic codes.

The ABS system shall automatically disengage the auxiliary braking system device when required.

The Meritor Wabco ABS system shall have a three (3) year or 300,000 mile warranty provided by Meritor Wabco Vehicle Control Systems.

REAR TIRES

The rear tires shall be Goodyear Unisteel 12R 22.5 16PR "H" tubeless radial G124 mud and snow tread with 22.5 x 8.25, ten (10) stud disc wheels. Tires and wheels shall be rated at 27,120 pounds.

REAR WHEELS

The single rear axle wheels shall be Accuride hub piloted, 8.25" x 22.5" steel.

PAINTED WHEELS

The wheels on the chassis shall be pretreated in a zinc phosphate bath, and then coated with an acrylic cathodic electro deposited white primer base coat (E-Coat) by the wheel supplier.

OIL LUBRICATED REAR WHEEL BEARINGS

The rear axle shall have oil lubricated wheel bearings.

REAR SUSPENSION

The rear suspension shall be a Reyco 79KB vari-rate, captive slipper type, with 57.5" x 3" springs. One (1) adjustable and one (1) fixed torque rod shall be provided.

The spring capacity must meet or exceed the capacity of the rear axle.

AIR BRAKE SYSTEM - SINGLE AXLE

A rapid build-up air brake system shall be provided. It shall include a two (2) air tank, three (3) reservoir system with a total of 4152 cubic inch of air capacity. The air tanks shall be labeled for each of their functions.

A Meritor-Wabco floor mounted treadle valve shall be mounted in the cab for graduated control

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of applying and releasing brakes.

A Meritor-Wabco inversion valve shall be installed to provide a service brake application with no primary air supply.

A Meritor-Wabco yellow hand control push-pull valve shall operate the parking brake system.

The rear axle spring brakes are to automatically apply in case of air pressure loss below 60 psi with a mechanical means for releasing the spring brake chambers.

PARKING BRAKE ACTUATION VALVE

The parking brake actuation valve shall be mounted on the LH dash within easy reach of the driver.

REAR STAINLESS STEEL WHEEL SIMULATOR KIT

A rear stainless steel wheel simulators shall be provided.

The kit is to include American made RealWheels brand mirror finish, 304L grade, non-corrosive stainless steel Universal rear wheel simulators meeting D.O.T. certification standards. They shall simulate the look of polished aluminum wheels and come complete with stainless steel hub covers and lug nut covers.

All stainless steel simulators shall carry a lifetime warranty.

AIR DRYER

A Meritor Wabco system saver 1200 spin-on desiccant air dryer with a 12-volt, 100-watt automatic heated moisture ejector shall be installed in the air brake system.

The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure.

The Meritor Wabco air dryer shall come with a three (3) year or 300,000 mile warranty provided by Meritor Wabco Vehicle Control Systems.

MANUAL DRAINS ON AIR TANKS

Manual drains shall be installed on all reservoirs of the air brake system.

NYLON AIR LINE TUBING

A dual air system plumbed with color coded reinforced nylon tubing air lines shall be installed. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.

Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall be fiber

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reinforced neoprene covered hoses.

ENGINE

A Cummins 2007 EPA compliant ISC-360 turbocharged, charge air cooled engine shall be provided.

TYPE:

In-Line six (6) cylinder, 4 cycle

HORSEPOWER:

360 @ 2000 rpm (Governed @ 2200 rpm)

TORQUE:

1050 lbs.ft. @ 1400 rpm

DISPLACEMENT:

506 cu.in.

GOVERNOR:

Electronic

A wiring harness shall be supplied with a drop out at the back of the cab. The harness shall include a connector to allow an optional harness for the pump panel to be plugged into it. Circuits shall be provided for tachometer, oil pressure, engine temperature, hand throttle, high idle and PSG system. A circuit for J1939 data link shall also be provided at the drop out.

An engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge shall be part of the engine's lubrication system.

An external mounted transmission cooler shall be part of the engine cooling system.

POWER STEERING PUMP

The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type.

AIR COMPRESSOR

The air compressor on the engine shall be a Wabco capable of producing a minimum of 18.7 cfm at 1250 engine rpm. It shall be gear driven, engine oil pressure lubricated and cooled by the engine cooling system. The air compressor shall have a 5-year warranty.

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

FUEL FILTER - CUMMINS ENGINE

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Two (2) Fleetguard fuel filters shall be provided. A combination primary fuel/water separator shall be remote mounted on the cross member behind the transmission complete with a water-in-fuel (WIF) sensor. If water is present in the fuel the sensor shall activate the WIF light and alarm in the instrument panel.

A secondary filter will be installed on the engine between the fuel pump and the injectors.

AUXILIARY ENGINE BRAKE

The engine's turbo shall be used as an engine brake to serve as a speed retardation device. There shall be an on-off switch located on the instrument panel.

EXHAUST SYSTEM

The single pipe exhaust system shall be installed under the right side frame with the discharge forward of the rear tires.

The exhaust system shall consist of an DPF, 0.065" wall aluminized steel exhaust pipe supported by bolted on frame brackets, stainless steel flex tubing between the engine and DPF and overlapping band clamps for the system joints.

2007 EXHAUST SYSTEM

The exhaust system shall be installed inboard of the frame rail with the discharge to the right side of the vehicle forward of the rear tires.

A DPF and .065 wall aluminized steel exhaust tubing supported by bolted on frame brackets shall be installed.

Stainless steel flex tubing is to be installed between the exhaust pipe and DPF. System joints shall be connected with lapping band clamps.

COOLING SYSTEM

The cooling system shall have sufficient capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the engine and transmission manufacturer and EPA requirements. The complete cooling system shall be mounted in a manner to isolate the system from vibration and stress. The individual cores shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining core(s).

Radiator

The radiator shall be a down-flow design constructed brass/copper with plastic tanks. The radiator shall have a minimum of a 909 sq. in. core and located behind the charge air cooler.

Surge Tank

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The cooling system shall be equipped with a surge tank that is capable of being filled and removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and sight glass to monitor the level of the coolant. The surge tank shall have a cap that meets the engine manufactures pressure requirements as well as the system design requirements.

Coolant

The cooling package shall have Extended Life Coolant (ELC) installed. The use of supplemental coolant additives (SCA) will not be allowed, as this is part of the extended life coolant makeup. The use of ELC provides longer life and change intervals providing improved performance. The coolant shall contain ethylene glycol and deionized water to keep the coolant from freezing to a temperature of -34 degrees F.

Hoses/Clamps - Radiator

All radiator tubes shall be formed from aluminized steel tubing and installed with silicone hoses with stainless steel constant torque clamps.

Recirculation Shields

Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting the performance.

Charge Air Cooler

The charge air cooler shall be a cross-flow design constructed completely of aluminum with welded side tanks. The charge air cooler shall have a minimum of a 710 sq. in. core and be located in front of the radiator.

Hoses/Clamps - Charge Air Cooler

All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel "T" style clamps meeting the engine manufactures requirements.

COOLING SYSTEM FAN

The engine cooling system shall incorporate a heavy-duty composite fan, belt driven on the engine. A shroud and recirculation shield system shall be used to ensure air that has passed through the radiator is not drawn through it again.

COOLANT FILTER

An engine coolant filter with a shut-off valve shall be installed on the engine. The location of the filter shall allow for easy maintenance.

TRANSMISSION

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The transmission shall be an Allison 3000 EVS automatic with electronic controls. The transmission shall have two (2) 10-bolt PTO pads.

The transmission shall be equipped with an air to oil transmission cooler located below the radiator allowing a single depth core and efficient cooling package. The transmission cooler shall be mounted in a manner to allow maximum approach angle by not protruding below the frame more than an inch. The transmission cooler shall be constructed completely of aluminum with welded side tanks. The transmission shall have two (2) internal oil filters.

Fourth gear hold-in range may be accomplished by wiring for a pumping application.

The transmission gear ratios shall be:

1st	3.49:1
2nd	1.86:1
3rd	1.41:1
4th	1.00:1
5th	0.75:1
6th	0.64:1 (if applicable)
Rev	5.03:1

TRANSMISSION COOLING SYSTEM

Transmission Cooler

The transmission cooler shall be a tube bundle type. The tube bundle cooler shall be mounted to the chassis, plumbed into the engine cooling system plumbing.

SYNTHETIC TRANSMISSION FLUID

Castrol "Transynd" or an equivalent synthetic TES 295 transmission fluid shall be utilized to fill the EVS transmission.

TRANSMISSION MODE

The transmission, upon start-up, will select four (4) speed operation. By pressing the "mode" switch on the shift pad (mode on) provides five (5) speed overdrive.

TRANSMISSION WARRANTY

The Allison 3000 EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

ALTERNATOR

A 270 amp Leece Neville 12 volt alternator model #4867JB with integral regulator and #10 screw AC terminals shall be installed.

AIR CLEANER

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The air cleaner shall be Farr #62891-001 dry type with a replaceable element, it shall have an outside air intake with an ember separator filter and an indicator light in the warning light cluster to show when the air cleaner element requires replacement.

HIGH IDLE SWITCH FOR ELECTRONIC ENGINE

A fast idle switch with relay shall be installed in the cab to provide a pre-set elevated engine speed of 1250RPM's. The switch shall be a push-on/push off momentary rocker switch located in the dash. The high idle shall operate only with the park brake set and transmission selector in neutral.

TRANSMISSION TOUCH PAD

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and reach.

DRIVELINES

All drivelines shall be Spicer 1710 heavy duty series with "glide coat" splines on all slip shafts.

ELECTRICAL SYSTEM

A single starting electrical system shall be installed.

The electrical system shall be 12 volt, suppressed per SAE J551 with six (6) Harris CTX31S-9 950 CCA batteries with 210 minute reserve capacity and 3/0 welding type dual path starter cables per SAE J541. The cables shall be sealed and encapsulated in a rubberized compound and held in place with a double nut configuration to prevent loosening.

Wiring shall be appropriate gauge cross link with 311 degree F. insulation. All wires in the chassis shall be circuit numbered and function coded where possible, in addition the SAE wires will be color coded. The wiring shall be protected by 275 degree F. minimum high temperature flame retardant loom.

The following shall be supplied:

One (1) Cole-Hersee #EX26654A ignition switch.

One (1) Cole-Hersee #2484 master battery switch.

One (1) starter button.

Rocker type headlight switch with instrument lamp slide dimmer.

Windshield wiper switch, multiple speed intermittent with integral washer switch.

Self-canceling steering column mounted turn signal switch with integral hazard and headlamp dimmer switch.

Twelve (12) LED backlit rocker switches and legends for accessories.

Master rocker switch (Red), installed below eye level to the right of the instrument panel.

Note: All warning lights shall be activated by the " RED MASTER " warning light switch in the master rocker switch panel.

LOAD MANAGER

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The load management system shall be integral with the Crimson Fire multiplexed electrical system.

BATTERY JUMPER STUDS

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

INSTRUMENTATION

An ergonomically designed instrument panel shall be provided. The gauges shall be backlit with red LED lamps. All gauges shall be driven by stepper motor movements. The instrumentation system shall be multiplexed and shall receive engine and transmission information over the J1587 data bus to reduce the number of redundant sensors.

The instrument panel shall contain the following gauges:

One (1) electronic tachometer with integral digital hour meter. The scale on the tachometer shall read from 0 to 3000 RPM. The hourmeter shall display engine hours of operation.

One (1) electronic speedometer with integral digital odometer/trip odometer. The speedometer shall have a dual scale with miles per hour (MPH) as the dominant scale and kilometers per hour (KPH) on the minor scale. The speedometer scale shall read from 5 to 85 MPH (5 to 140 KPH). The odometer shall display miles.

One (1) three function gauge with primary air pressure, secondary air pressure and fuel level. The scale on the air pressure gauges shall read from 0 to 140 pounds per square inch (PSI). The air pressure scales shall be non-linear to expand the scales in the region of normal operation. The scale on the fuel level gauge shall read from empty to full.

One (1) four function gauge with engine oil pressure, coolant temperature, transmission oil temperature and a voltmeter. The scale on the engine oil pressure gauge shall read from 0 to 140 pounds per square inch (PSI). The engine oil pressure scale shall be non-linear to expand the scale in the region of normal operation. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (F). The scale on the transmission oil temperature gauge shall read from 100 to 300 degrees Fahrenheit (F). The scale on the voltmeter shall read from 8 to 16 volts.

The instrument panel shall contain an Annunciator Module that contains the following indicator lights. All indicator lights shall contain LED lamps.

RED LAMPS

Stop Engine - indicates critical engine fault.

Park Brake - indicates park brake is set.

Low Fuel - indicates low fuel.

Cab Ajar - indicates tilt cab is not locked down. (1)

Volts - indicates high or low system voltage.

Low Oil Press - indicates low engine oil pressure.

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High Coolant Temp - indicates excessive engine coolant temperature.
High Trans Temp - indicates excessive transmission oil temperature.
Low Air - indicates low air pressure in either system one or system two.
Low Coolant Level - indicates low engine coolant level. (1)
Low Oil Level - indicates low engine oil level. (1)
Air Filter - indicates excessive engine air intake restriction.

YELLOW LAMPS

Check Engine - indicates non-critical engine fault.
Check Trans - indicates transmission fault.
Wait to Start - indicates active engine air preheat cycle. (2)
ABS - indicates anti-lock brake system fault.
Water in Fuel - indicates presence of water in fuel filter. (1)
Engine Maint - indicates engine maintenance is required. (1)

GREEN LAMPS

Left and Right turn signal indicators.
Aux Brake Active - indicates secondary braking device is active. (1)
High Idle - indicates engine high idle is active. (1)
Low Trac - indicates low wheel traction for automatic traction control (ATC) equipped vehicles, also indicates mud/snow mode is active for ATC system. (1)

BLUE LAMP

High beam indicator.

The instrumentation system shall provide a constant audible alarm for the following situations:

Low air pressure.
Low engine oil pressure.
High engine coolant temperature.
High transmission oil temperature.
Low coolant level. (1)
High or low system voltage
Critical engine fault (Stop Engine).

The instrumentation system will provide a three second alarm every three minutes for the following situations:

Low fuel.
Water in fuel. (1)

(1) Feature only available when optionally equipped.
(2) Feature only available on engines with preheat capability.

POWER AND GROUND STUDS - BATTERY DIRECT

Power and grounding studs shall be provided and installed behind the electrical center cover with a breaker. The studs shall be #10 and capable of carrying up to a 40 amp battery direct load.

MARKER LAMPS

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Five (5) I.C.C. DOT approved Weldon model #9186-1500-20 Light Emitting Diode (LED) cab marker lamps shall be installed on the face of the cab above the windshield.

BACKUP ALARM

An ECCO #575 backup alarm shall be installed at the rear of the chassis with an output level of not less than 107 dB. The alarm will automatically activate when the transmission is placed in reverse.

WARNING LIGHTS -INBOARD

Two (2) Whelen 4x6 LED red warning lights shall be installed on the cab fascia above the headlamps in the inboard position.

GROUND LIGHTS

The cab shall be equipped with Trucklite model #40003 sealed bulb, incandescent lighting under each cab door. The lights will be activated by each respective door switch and the setting of the park brake.

SCENE LIGHTS

Two (2) Whelen #810 Series clear halogen scene lights shall be installed on the sides of the cab. The lights shall be surface mounted one (1) each side of the cab. The lights shall be controlled by separate switches one (1) for the left side and one (1) for the right side.

HEADLIGHTS

Four (4) rectangular halogen headlamps with a separate high and low beams in bright bezels shall be provided. The headlamps shall be equipped with a "Daytime Running" light feature, which will illuminate the headlights to 80% brilliance when the master switch is in the "On" position and the parking brake is released.

Two (2) incandescent round side turn signal/marker lights shall be provided on the front cab corners.

TURN SIGNALS - AMBER LED

Two (2) Whelen 4x6 amber LED programmable turn signals shall be installed outboard of the warning lights in matching bezels located above the headlamps.

DOOR WARNING - CHEVRON

Four (4) Chevron reflective signs shall be installed on the lowest portion of the inner door panels, one (1) on each door. A stripe of reflective tape shall be installed at the outer edge of each door.

FULL WIDTH CREW CAB DOOR ASSIST RAILS

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Black powder coated cast aluminum assist rails shall be provided and installed on the inside of the rear crew doors the full width of the window glass. The rails shall assist personnel in exiting and entering the cab. The rails shall be located at the retracted door window glass level and will protect the exposed window glass area.

INTERIOR LIGHTING

The cab interior lighting shall consist of the following:

A red/white dome lamp shall be located over each door. The white lamp shall be activated by its respective door when opened and both activated by an individual switch on the light.

A three (3) light module with dual map lights shall be located in the headliner, over the engine tunnel.

FLASHING DOOR AJAR LIGHT

A red flashing door ajar light shall be located in the headliner, centered in the cab. The light shall be 6.00" long x 2.50" wide x 1.75" high and labeled "Do Not Move Apparatus". The light shall be wired to indicate an open door on the cab when the parking brake is released.

ENGINE TUNNEL LIGHT

A Trucklite 4" diameter clear work light shall be provided and installed under the engine tunnel.

DASH AND HEADER TRIM ABS

The cab interior dash trim shall consist of a two (2) piece vacuum formed ABS composite driver, officer panel and center assembly. The center dash shall incorporate the integral rocker switch console and incorporate a latching electrical component access cover to allow complete access to the underside of the switch panel assembly and electrical harness and components.

The "A" pillar and center windshield post trim shall consist of a vacuum formed ABS composite driver, officer and center cover.

The header trim shall consist of a metal frame. Mounted to the header panel shall be two (2) 5.75" x 22.50" vinyl sunvisors.

INNER DOOR PANELS ZOLATONE PAINTED

The inner door panels shall be a Zolatone painted aluminum panel. A "Fireman Friendly" cast steel pull handle shall be included with the front door panel.

PAINT INNER DOOR PANELS

The inner door panel surfaces shall be painted with a Zolatone #20-72 silver gray texture finish.

ENGINE COVER

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The fixed type engine cover shall be a maximum of 23.00" high x 41.50" wide. The cover shall be an integral part of the cab and made of 0.13" thick aluminum.

The interior cab side shall be covered with a multi-layer mat consisting of; .25" thick sound absorbing closed-cell foam, a heavy weight sound barrier, a .06" thick non-slip vinyl wear surface with a pebble grain finish, and held in place by a pressure sensitive adhesive and aluminum cornering trim. All exposed seams are sealed to reduce moisture contamination and debris build up.

The engine side of the cover shall be heavily insulated with multi-layer insulating materials, consisting of foam, a 1.0 lbs per sq ft sound barrier with a facing that resists heat transfer, and held in place by adhesive, aluminum stick pins and retention caps. All exposed insulation seams and edges are sealed to reduce moisture contamination and debris build up.

GLOVE COMPARTMENT - ABS

The cab interior dash trim officer panel shall consist of a vacuum formed ABS composite module, which contains a glove compartment with a hinged locking door. The compartment size shall be 14.50" wide x 4.50" high x 9.50" deep.

PAINT INTERIOR

The interior metal surfaces shall be painted with a Zolatone #20-72 silver gray texture finish.

INTERIOR TRIM COLOR AND FLOOR MAT GRAY/GRAY/GRAY

The cab interior soft vinyl trim surfaces shall be gray in color.

The cab interior vacuum formed ABS composite trim surfaces shall be gray in color.

The cab interior floormat shall be gray in color.

The interior cab floor, engine tunnel sides and front seat risers shall be covered with a multi-layer mat consisting of; .25" thick sound absorbing closed-cell foam, a heavy weight sound barrier, a .06" thick non-slip vinyl wear surface with a pebble grain finish, and held in place by a pressure sensitive adhesive and aluminum cornering trim. All exposed seams are sealed to reduce moisture contamination and debris build up.

HEATER/DEFROSTER

A 57,600 Btu, front overhead heater and defroster shall be provided. The heater shall be located above the windshield between the padded sunvisors and contain the temperature and blower controls.

All heater system hoses, including auxiliary units shall be silicone with stainless steel constant torque clamps approved for use with silicone hose.

WINDSHIELD DEFOGGER FANS

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Two (2) individually switched all metal construction 6" windshield defogger fans shall be installed on overhead heater in center of cab directly in front of the windshield.

CAB TILT ACTUATION

The entire cab shall tilt 45 degrees to allow for easy maintenance of the engine and transmission.

The cab tilt actuation shall be with an electric over hydraulic lift pump with a control box on a pendant for safe visual operation.

The lift system shall have an ignition interlock and red lock down indicator lamp, which shall illuminate when holding "down" switch to indicate safe road operation. It shall be necessary to activate the master battery switch with the park brake set in order to tilt the cab.

Two cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab pivots shall be 1.90" ball and be anchored to frame brackets with 1.25" diameter studs.

Two spring loaded hydraulic hold down hooks outboard of the frame shall be installed for holding the cab securely to the frame.

A steel safety assembly shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety assembly shall fall over the lift cylinder when the cab is in the "up" position. A cable release system shall also be provided to clear the safety assembly from the lift cylinder when lowering the cab.

FRONT GRILLE - ADVANTAGE & METRO STAR

A two (2) piece, hinged stainless steel flat front grille 34.75"W x 29.00"H, with a minimum free air intake of 432.4 square inches shall be installed on the front of the cab. The upper portion of the grille will be hinged and will have two (2) flush push button latches that allow access to the front fluid fills of the cab.

WHEEL WELL LINERS

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. The two-piece liners shall consist of an inner liner 16" wide made of vacuum formed ABS composite and a outer fenderette 3.50" wide made of 14 gauge 304 polished stainless steel.

EXTERIOR CAB ASSIST HANDLES

Four (4) 18" knurled anti-slip one-piece exterior assist handles shall be installed, one (1) behind each cab door. The assist handle shall be made of 14 gauge 304 stainless steel and be 1.25" diameter to enable easy grabbing with the gloved hand.

CAB MIRRORS

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Two (2) motorized Retrac, West Coast style mirrors shall be installed on the front doors of the cab. The remote controlled upper flat mirror head model 1171HL will be 16" high x 7" wide and lower manual convex mirror head model 980-4 will be 8" in diameter. The mirror heads shall be mounted on stainless steel bow swing away type arms, center mounted to produce less vibration. The mirrors shall be remote, heated and lighted by amber clearance lights.

EXTERIOR PAINT

All cab painting must be completed prior to the installation of glass accessories or any other cab trim to assure complete paint coverage and maximum corrosion protection.

The entire cab must be disc ground to remove any surface oxidation or surface debris that may hinder the paint adhesion. After the surface is machine finished a high quality acid etching base primer shall be applied. Upon the application of required body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The entire cab then shall be coated with an intermediate solids or epoxy surfacer that is designed to fill minor surface defects, provide an adhesive bond between the primer and the paint, and improve the color and gloss retention of the color coats.

The cab shall be finish sanded with 360 grit paper, seams sealed with SEM seal sealer and painted with two (2) to four (4) coats of an acrylic urethane type system designed not only for color retention, but to resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene.

The maximum overall film thickness of the top coat shall not exceed five (5) mils.

The PPG FBCH lead free paint shall be warranted for ten (10) years against cracking, checking or peeling and loss of gloss caused by chalking or fading.

Cab underside and doors shall be rustproofed with a ten (10) year or 100,000 mile warranty certificate against perforation issued in the Fire Department's name.

Paint Code and Color:

PPG-FBCH-Lead Free - 71665 Red

HAND SAND AND BUFF FINISH

The base coat clear coat finish shall be power sanded and machine finished to achieve a flat finish on all "A" visual surfaces.

OPERATORS MANUAL AND PARTS LIST

A chassis operator's manual and parts list with wiring and air plumbing diagrams shall be provided. The wiring and plumbing diagrams shall be of the chassis model.

ENGINE AND TRANSMISSION OPERATION MANUAL

One (1) engine operation and maintenance manual and one (1) transmission operation manual

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shall be included in the Spartan operator's manual.

FIRE EXTINGUISHER

A 2.5 pound BC D.O.T approved fire extinguisher shall be shipped loose with the cab.

CAB TILT CONTROL

There shall be a remote cab tilt control located in the cord reel compartment, forward portion.

EXHAUST SYSTEM

The exhaust system shall terminate ahead of the rear wheels at a 45 degree angle. The tailpipe shall be a minimum of 4" lower than the bottom side of the body and flush with the body side.

FULL HEIGHT CAB BACK OVERLAY

The entire exterior back of cab shall be covered full height with polished aluminum diamond plate. All sharp edges shall be DA finished. The diamond plate shall be attached with a high strength epoxy adhesive compound and/or mechanical fasteners.

FUEL FILL DOOR

There shall be an aluminum fuel fill assembly located on the apparatus body accessing the chassis supplied fuel tank. The assembly shall be located in the left rear Smart Storage module behind the rear axle. The fuel fill assembly will have a door that matches the Smart Storage module doors. There shall be a drain in the fuel fill assembly to allow over flow to drain on the back side of the apparatus body. The fuel fill cap to be removable. There shall be a label near the fuel fill door labeled "DIESEL FUEL ONLY". The fuel fill pipe shall have a 3/8" inside diameter vent line installed from the top of the fuel tank to the fill tube.

PERIMETER LIGHTS

There shall be six (6) clear underbody perimeter lights furnished and installed. One (1) under each side of the front of the body, one (1) under the pumphouse each side and two (2) under the rear step to illuminate the ground around the truck.

The ground lights shall activate by the setting of the park brake.

The lights shall be manufactured by Trucklite.

BATTERY & AIR CHARGERS

A battery charger and air pressure leakage compensator shall be furnished and installed. The battery charger shall have a 40 amp output to the batteries. There shall be a bar graph display, to indicate battery condition, mounted near the shoreline.

The air compressor shall be 12 volts and also operate off of the charger, maintaining brake pressure to a minimum 75 psi. The components shall be manufactured by Kussmaul Electronics

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and be model Pump Plus 1200.

There shall be a Kussmaul "Super Auto-Eject" 110 volt, 20 amp shoreline receptacle furnished and installed. When the ignition switch is activated, the electrical current shall be interrupted before the plug is automatically eject to prevent arcing. The plug for the receptacle shall be shipped loose to be installed on the shoreline cord. The cover shall be Yellow.

The shoreline connection(s) shall be installed in the driver's area step well of the chassis cab.

SIREN

One (1) Code 3 electronic siren, model # 3992F shall be furnished and installed. The siren shall be 200 watts and feature wail, yelp, hi-low and manual electronic air horn. The siren and hard wired, noise canceling microphone shall be installed in the upper right quadrant of the center master rocker switch panel.

The siren shall only be live when the "RED" master warning light switch is activated.

SIREN SPEAKERS

There shall be two (2) 100 watt siren speakers furnished and installed. Each speaker shall be a Cast Products model # SH-2015.

There shall be two (2) speakers installed in the front bumper, one (1) mounted on the right side and one (1) mounted on the left side, outboard of the air horns.

MECHANICAL SIREN

There shall be a motor driven, streamlined, rotary siren with chrome plated grill and housing pedestal furnished and installed. The siren shall be properly wired with heavy copper cable for minimum voltage drop.

The siren shall be manufactured by Federal Signal and be model # Q2B.

The siren shall only be live when the "RED" master warning light switch is activated.

A siren brake activated by a rocker switch located in the control panel shall be installed for the mechanical siren on the apparatus .

The siren shall be located on the front bumper on the left side. It shall have the following:

The siren shall be actuated by either foot switch, one (1) on the driver's side and one (1) on the passenger's side of the chassis cab.

CHASSIS REQUIRED LABELING

Signs that state "Occupants must be seated and belted when apparatus is in motion" shall be provided. They shall be visible from each seating position.

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There shall be a lubrication plate mounted inside cab listing the type and grade of lubrication used in the following areas on the apparatus and chassis:

- Engine oil
- Engine Coolant
- Transmission Fluid
- Pump Transmission Lubrication Fluid
- Pump Primer Fluid
- Drive Axle Lubrication Fluid
- Generator Lubrication Fluid (if applicable)
- Tire Pressures

VEHICLE INFORMATION LABEL

There shall be a travel clearance warning label located in the chassis cab. The travel clearance warning label to be located in easy view of the driver. The travel clearance warning label to include the following information:

1. Overall travel clearance height in feet and inches.
2. Overall travel clearance length in feet and inches.
3. Overall travel clearance width in feet and inches.

HOSEWELL

There shall be a hose well provided on the bumper extension. The hose well shall be made of smooth aluminum and shall have the edges flush with the gravel shield. There shall be modular floor tiles located in the bottom and drain holes in the corners.

There shall be a diamond plate cover provided on the bumper compartment. The rear edge of the cover shall be attached with a stainless steel hinge. The cover shall have a D-Ring handle to latch the compartment closed. There shall be a hold open device to hold the door open.

The cover shall be notched on the curbside for the hose to be pre-connected.

The hose well shall be located in the front bumper between the frame rails.

The hosewell shall be designed to hold 100' of 1-3/4" DJ fire hose with a pistol grip nozzle.

MUD FLAPS

Heavy-duty rubber mud flaps shall be provided behind all wheels. The mud flaps shall be black rubber type and be bolted in place.

WHEEL COVERS

The stainless steel wheel covers shall be installed and have Crimson Fire logo's installed.

MIDSHIP PUMP

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The pump shall have a capacity of 1500 gallons per minute, measured in U.S. gallons. The pump shall be a Waterous model CSUC10, single stage midship pump.

Impeller shall be bronze with double suction inlets, accurately balanced (mechanically and hydraulically), of mixed flow design with reverse-flow, labyrinth-type, wear rings that resist water bypass and loss of efficiency due to wear. The impeller shall have flame plated hub to assure maximum pump life and efficiency despite the presence of abrasive particles, such as fine sand, in the water being pumped. The wear rings shall be bronze and easily replaceable to restore original pump efficiency and eliminate the need for replacing the entire pump casing due to wear.

Pump casing shall be close grained gray iron, bronze fitted and horizontally split in two sections for easy removal of entire impeller assembly, including wear rings, without disturbing setting of pump in chassis or pump piping. The pump, for ease and rapid servicing in the future, shall have the separable impeller shaft which allows true separation of transmission or pump without disassembly or disturbing the other component. This shall be accomplished by using a two piece shaft. This feature will allow field service to accomplish in much less time since each component (pump or transmission) can be repaired independently. The impeller shaft shall be stainless steel, accurately ground to size and polished. Shaft shall be supported at each end by ball type oil grease lubricated bearings. Sleeve bearings or bushings will not be acceptable. The bearings shall be protected from water at each end of the impeller shaft.

The discharge manifold shall be cast as an integral part of the pump body assembly and shall provide at least three full 3 1/2" openings for ultimate flexibility in providing various discharge outlets for maximum efficiency, and shall be located as follows: one outlet on the right side of the pump body, one outlet on the left side of the pump body, and one outlet directly on top of the pump discharge manifold.

The entire pump shall be cast, manufactured and tested at the pump manufacturer's factory. The pump transmission housing shall be high tensile gray iron, three pieces and horizontally split. Power transfer to the pump shall be through a Morse Hy-Vo drive chain. Chain shall be pressure lubricated through oil pump. Chain sprockets shall be cut from carbonized, hardened alloy steel. Spur gears will not be acceptable.

The drive shafts shall be 2.35" in diameter, made of hardened and ground alloy steel. All shafts shall be ball bearing supported. Case shall be designed to eliminate the need of water cooling.

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. A certificate documenting this test shall be furnished with the completed apparatus. The pump shall be fully tested at the pump manufacturer's factory to the performance requirements as outlined by the latest NFPA 1901. Pump shall be free from objectionable pulsation and vibration.

The pump shall be the Class "A" type and shall deliver the percentage of rated discharge at pressures indicated below.

100% of rated capacity at 150 PSI net pump pressure.
100% of rated capacity at 165 PSI net pump pressure.
70% or rated capacity at 200 PSI net pump pressure.

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50% of rated capacity at 250 PSI net pump pressure.

MASTER DRAIN VALVE

There shall be a manifold type drain valve installed in the pump compartment. All pump drains shall be connected to the master drain valve. The drain valve shall be controlled on the left side lower pump house sill. The control shall be a hand wheel knob marked "open" and "closed".

PUMP SEALS

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

PUMP SHIFT

The drive unit shall be provided with an air pump shift system. The control valve shall be a spring loaded guard lever that locks in "Road" or "Pump" mode.

To the left of the pump shift control, there shall be two indicator lights to show the position of the pump when the control is moved to "Pump" position. A green light shall be energized when the pump shift has been completed and shall be labeled "PUMP ENGAGED"; a second green light shall be labeled "OK TO PUMP" energized when both the pump shift has been completed and the chassis automatic transmission is engaged.

A third green indicator light shall be installed adjacent to the throttle on the pump operator's panel. This light shall be labeled "Throttle Ready".

PUMP SHIFT MANUAL OVER RIDE

In the event of pump shift failure, the pump can be shifted by a push/pull manual override. The handle shall be located on the lower portion of the driver's side pump panel and shall be labeled accordingly.

REDUNDANT ELECTRONIC TRANSMISSION LOCKUP CIRCUIT

There shall be a redundant electric circuit that upon actuation of the manual pump shift lever will cause the Allison transmission to attempt to attain converter lockup in 4th range after the operator selects drive on the chassis provided transmission selector. This circuit will be independent of all other systems on the apparatus.

PRIMING SYSTEM

The priming system shall include an electrically driven rotary vane priming pump rigidly attached to the pump transmission. The priming pump shall be self lubricating and shall not require an external oil reservoir. The pump, when dry, shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds through 20 feet of suction hose through

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the steamers. Priming pump shall be built by the manufacturer of the fire pump.

PRIMER CONTROLS

There shall be two (2) push button controls to simultaneously actuate the primer control valves and the primer motor.

One (1) control shall be labeled "MAIN PUMP"

One (1) control shall be labeled "REAR SUCTION"

STEAMER INLETS

There shall be two (2) 6" inlets furnished, one on either side of the pump. The inlets shall not protrude less than 2" away from the side panels and shall each have 6" NST threads and a removable strainer

6" CHROME PLATED BRONZE CAPS

There shall be two (2) 6" long handled chrome plated caps furnished. The caps shall be National Standard Thread.

PUMP ANODES

Two (2) anodes shall be included in plumbing system of the apparatus to protect the components that come in contact with the water system from corrosion and deterioration.

STAINLESS STEEL PLUMBING

All auxiliary suction and discharge plumbing related fittings, waterways, and manifolds shall be fabricated with stainless steel pipe, brass or high pressure flexible piping with stainless steel couplings. Galvanized components and/or iron pipe shall not be used to ensure long life of the plumbing system without corrosion or deterioration of the waterway system. Where waterway transitions are critical (elbows, tees, etc), no threaded fittings shall be allowed to promote the smooth transition of water flow to minimize friction loss and turbulence. All piping components and valving shall be non-painted. All piping welds shall be wire brushed and cleaned for inspection and appearance.

The high pressure flexible piping shall be black SBR synthetic rubber hose with 300 PSI working pressure and 1200 PSI burst pressure for flexible piping sizes 1.5" through 4". Sizes 3/4", 1" and 5" are rated at 250 PSI working pressure and 1000 PSI burst pressure. All sizes are rated at 30 in HG vacuum. Reinforcement consists of two plies of high tensile strength tire cord for all sizes and helix wire installed in sizes 1" through 5" for maximum performance in tight bend applications. The material has a temperature rating of --40° F to +210° F.

The stainless steel full flow couplings are precision machined from high tensile strength stainless steel. All female couplings are brass. Mechanical grooved and male 3/4" and 1" couplings are brass. A high tensile strength stainless steel ferrule with serrations on the I. D. is utilized to assure maximum holding power when fastening couplings to hose.

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SPECIAL ATTENTION

All drain lines, gauge lines, foam lines and wiring shall be protected from chafing and hanging loose in the pump house area.

REAR SUCTION

There shall be an auxiliary steamer inlet located on the curbside rear. There shall also be an additional primer valve furnished at the highest point of the line to assist in drafting with the auxiliary inlet.

The suction relief valve with a range of pressure adjustment from 75 to 250 PSI shall be furnished, and installed inside pump compartment piped to the suction side of the pump. The valve shall be preset at 125 PSI suction inlet pressure. The valve shall be installed inside the pump compartment where it will be easily accessible for future adjustment. The excess water shall be plumbed to the atmosphere. For normal pumping operations, the relief valve shall not be capped and there shall be a placard stating "DO NOT CAP" installed.

The suction shall be plumbed with a 5" Akron Brass 7950 electrically actuated wafer valve. The electric valve shall be operated with a control switch located on the pump operators panel. A quarter turn air bleeder valve shall be plumbed to the water supply side of the intake valve (by a 3/4" NPT port) to help evacuate air from the system and avoid cavitation of the pump.

The rear suction shall be plumbed with 5" piping.

The suction shall terminate with a heavily chrome plated brass 6" NST male adapter.

The suction shall be plumbed with two (2) manually operated drains in the following locations:

There shall be a drain control furnished in compartment R3 rearward portion with the drain tube through the floor. The drain control shall be located on the bottom side of the pipe.

There shall be a drain furnished at the forward portion of the rear suction plumbing rearward of the wafer valve. The drain control shall be located on the lower sill on the curbside of the pump house.

The suction shall be located on the right rear of the apparatus, below the suction hose compartment.

2 1/2" STREETSIDE SUCTION

There shall be one (1) 2 1/2" gated suction inlet installed.

The intake valve shall be equipped with a 3/4" bleeder.

The suction shall be plumbed with a 2 1/2" Akron Brass 8000 series ball valve.

The suction shall be controlled from the top operator's panel.

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The side suction shall be plumbed with 2 1/2" piping. The plumbing shall be drained with a quarter-turn drain system. The drain control shall be located on the lower sill on the streetside of the pump house.

The suction shall terminate with a heavily chrome plated brass 2 1/2" NST swivel female adapter with screen. In addition, a 2 1/2" NST male plug shall be included secured by a chromed chain to the inlet termination location.

STREETSIDE DISCHARGE

There shall be one (1) gated discharge installed.

The discharge shall utilize an Akron Brass 2 1/2" 8000 series valve.

The discharge shall be controlled from the top operator's panel.

Each discharge shall be plumbed with 2 1/2" piping. The plumbing shall be drained with a quarter-turn drain system. The drain control shall be located on the lower sill on the streetside of the pump house.

The discharge shall terminate with a 2 1/2" NST adapter and a 2 1/2" NST female by male swivel 45 degree elbow. In addition, a 2 1/2" NST cap shall be included, secured by a chromed chain to the outlet termination location.

A Class 1 2 1/2" gauge shall be supplied for the discharge pressure reading 0-400 psi. The gauge model shall be Class 1 LFP-220.

PUMP COMPARTMENT SPEEDLAYS

Two (2) speedlays shall be provided for up to 200 feet of 1 3/4" hose. Chicksan swivels shall be installed above each speedlay hose bed accessible enough for hose couplings to be tightened on to chicksans and allow the speedlay hose beds to be removable. Chicksan swivels shall swing from left to right to allow attached hose to be deployed from either side.

Each discharge shall utilize an Akron Brass 2" 8000 series valve.

Each discharge shall be controlled from the top operator's panel.

Each discharge shall be plumbed with 2" Class 1 high pressure vapor hose and stainless steel couplings and/or stainless steel piping. The plumbing shall be drained with an auto-drain located at the lowest point of the waterway system.

Each discharge shall terminate with a brass 1 1/2" NST chicksan swivel. This discharge is intended to be pre-connected to hose, so no cap shall be provided.

A Class 1 2 1/2" gauge shall be supplied for each discharge pressure reading 0-400 psi. The gauge model shall be Class 1 LFP-220.

The speedlay's shall be labeled as follows:

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Upper Speedlay with a Yellow label
Middle Speedlay with a Blue label

One (1) speedlay shall be provided for up to 200 feet of 2 1/2" hose. Chicksan swivels shall be installed above each speedlay hose bed accessible enough for hose couplings to be tightened on to chicksans and allow the speedlay hose beds to be removable. Chicksan swivels shall swing from left to right to allow attached hose to be deployed from either side.

The discharge shall utilize an Akron Brass 2 1/2" 8000 series valve.

The discharge shall be controlled from the top operator's panel.

The discharge shall be plumbed with 2 1/2" Class 1 high pressure vapor hose and stainless steel couplings and/or stainless steel piping. The plumbing shall be drained with an auto-drain located at the lowest point of the waterway system.

The discharge shall terminate with a brass 2 1/2" NST chicksan swivel. This discharge is intended to be pre-connected to hose, so no cap shall be provided.

A Class 1 2 1/2" gauge shall be supplied for the discharge pressure reading 0-400 psi. The gauge model shall be Class 1 LFP-220.

The speedlay shall be labeled as follows:

Lower Speedlay with an Orange label

SPEEDLAY TRIM

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

SPEEDLAY COVER

Each speedlay hose bed area shall have a vinyl cover installed on the sides of the speedlay area. Each cover shall be held in place by velcro on all four sides, the velcrow shall also have stainless steel screws installed to hold the velcrow in place. A nylon strap shall be attached to the bottom for fast access with a gloved hand.

The speedlay hose bed covers shall be black.

FRONT BUMPER DISCHARGES

One (1) front bumper discharges shall be provided.

The discharge shall utilize an Akron Brass 2" 8000 series valve.

The discharge shall be controlled from the top operator's panel.

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The discharge shall be plumbed with 2" Class 1 high pressure vapor hose and stainless steel couplings and/or stainless steel piping.

The discharge shall be plumbed with an auto-drain located at the lowest point of the waterway system.

The discharge shall terminate with a polished stainless steel 1 1/2" NST chicksan swivel. This discharge is intended to be pre-connected to hose, so no cap shall be provided.

The front bumper discharge shall be mounted on top of the gravel shield of the front bumper extension. The discharge shall be placed next to the hose well specified to allow hose to be pre-connected and stored in the well. The discharge shall terminate with a chicksan swivel to accommodate deployment of hose in different directions.

A Class 1 2 1/2" gauge shall be supplied for the discharge pressure reading 0-400 psi. The gauge model shall be Class 1 LFP-220.

The discharge shall be labeled as follows:

Front Bumper with a Red label

CURBSIDE DISCHARGE

There shall be one (1) gated discharge installed.

The discharge shall utilize an Akron Brass 2 1/2" 8000 series valve.

The discharge shall be controlled from the top operator's panel.

The discharge shall be plumbed with 2 1/2" piping. The plumbing shall be drained with a quarter-turn drain system. The drain controls shall be located on the lower sill on the curbside of the pump house.

The discharge shall terminate with a 2 1/2" NST adapter and a 2 1/2" NST female by male swivel 45 degree elbow. In addition, a 2 1/2" NST cap shall be included, secured by a chromed chain to the outlet termination location.

A Class 1 2 1/2" gauge shall be supplied for the discharge pressure reading 0-400 psi. The gauge model shall be Class 1 LFP-220.

CURBSIDE MASTER DISCHARGE

There shall be one (1) master discharge installed.

The discharge shall utilize an Akron Brass 3" 8000 series slo-cloz valve.

The discharge shall be controlled from the top operator's panel.

The discharge shall be plumbed with 3" piping. The plumbing shall be drained with a quarter-

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turn drain system. The drain control shall be located on the lower sill on the curbside of the pump house.

The discharge shall terminate with a 3" NST adapter and a 3" NST female swivel by 5" Storz cast aluminum 30 degree elbow. In addition, a 5" Storz cap shall be included, secured by a chain to the outlet termination location.

A Class 1 2 1/2" gauge shall be supplied for the discharge pressure reading 0-400 psi. The gauge model shall be Class 1 LFP-220.

CENTERED REAR DISCHARGE

There shall be one (1) gated discharge installed.

The discharge shall be located between the rear face of body scene lights.

The discharge shall utilize an Akron Brass 2 1/2" 8000 series valve.

The discharge shall be controlled from the top operator's panel.

The discharge shall be plumbed with 2 1/2" Class 1 high pressure vapor hose and stainless steel couplings and/or stainless steel piping. The plumbing shall be drained with a quarter-turn drain system. The drain control shall be located on the lower sill on the curbside of the pump house.

The discharge shall terminate with a 2 1/2" NST adapter and a 2 1/2" NST female by male swivel 45 degree elbow. In addition, a 2 1/2" NST cap shall be included, secured by a chromed chain to the outlet termination location.

A Class 1 2 1/2" gauge shall be supplied for the discharge pressure reading 0-400 psi. The gauge model shall be Class 1 LFP-220.

DELUGE PLUMBING

There shall be one (1) deluge waterway installed.

The discharge shall utilize an Akron Brass 3" 8000 series slo-cloz valve.

The discharge shall be controlled from the top operator's panel.

The deluge shall be plumbed with 3" piping that terminates 5" above the top of the pump compartment. The plumbing shall be drained with an auto-drain located at the lowest point of the waterway system if required.

The monitor pipe will be capped with a stainless steel cap to allow for future installation of deck gun.

A Class 1 2 1/2" gauge shall be supplied for the discharge pressure reading 0-400 psi. The gauge model shall be Class 1 LFP-220.

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The deluge pipe shall be located up through the pump compartment, centered from left to right.

FOAMPRO 1600

There shall be a fully automatic electronic direct injection foam proportioning system furnished and installed on the apparatus. The system shall be capable of Class A foam concentrate. The proportioning operation shall be based on an accurate direct measurement of water flows with no water flow restriction. The foam system shall be installed in accordance with the manufacturers recommendations. The foam system shall have a 12 volt, 1/3 horsepower electric positive displacement foam concentrate pump with a rated capacity of .01 to 1.7 GPM with operating pressures up to 400 psi. The system shall be manufactured by the Hypro Corporation and be model FoamPro 1600.

The system shall be equipped with a control module. The module shall be installed on the pump operator's panel and enable the pump operator to perform the following functions:

Activate the foam system

Change foam concentrate proportioning rates from .1% to 1%

Flash a "low concentrate" warning light when the foam concentrate tank runs low.

In two (2) minutes if foam concentrate is not added to tank, the foam concentrate pump shall be deactivated.

The system shall be supplied by a single foam tank that shall be monitored by the control display. The display shall flash a "low concentrate" warning for two minutes when the foam tank runs low. In the event that no additional concentrate is added to the tank, the foam concentrate pump shall be deactivated.

FOAM TANK

There shall be a 20 gallon foam tank furnished and plumbed with non-corrosive piping to the foam system. There shall be a square fill tower with a hinged lid equipped with a hold down device. The fill tower shall be approximately 10" x 10".

A label that reads "CLASS "A" FOAM" shall be placed on the foam tank fill tower lid.

The foam tank shall be integral with the booster water tank provided.

There shall be a 1" quarter turn drain valve furnished for drainage of the foam tank. The valve shall be installed in the pump house with a drain line extended to the side running board.

The system shall supply three (3) discharges as follows:

The upper and middle speedlays.

Front bumper.

Each discharge shall have a "RED" foam label.

TANK TO PUMP LINE

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The connection between the tank and the pump shall be capable of the flow recommendations as set forth in NFPA Pamphlet 1901, latest revision and shall be tested to those standards when the pump is being certified. One (1) non-collapsible flexible hose and valve shall be incorporated into the tank to pump plumbing to allow movement in the line as the chassis flexes to avoid damage during normal road operation. Schedule 10 stainless steel or schedule 40 Poly-Vinyl Chloride piping may be used to complete the connection from the tank to pump valve to the water tank.

The tank to pump shall utilize an Akron Brass 3" 8000 series valve.

The valve shall be controlled from the top operator's panel.

TANK TO PUMP CHECK VALVE

There shall be a tank to pump check valve, conforming to NFPA standards, which shall be of bronze construction. The check valve shall be mounted as an integral part of the pump suction extension.

TANK FILL LINE

One (1) 2" tank fill/recirculating line shall be installed from the pump directly to the booster tank.

The tank refill shall utilize an Akron Brass 2" 8000 series valve.

The valve shall be controlled from the top operator's panel.

PUMP COMPARTMENT

The complete apparatus pump compartment shall be constructed of a combination of structural tubing and formed sheet metal. The same materials used in the body shall be utilized in the construction of the pump compartment. The structure shall be welded utilizing the same A. S.W. Certified welding procedure as used on the structural body module. These processes shall ensure the quality of structural stability of the pump compartment module.

The pump compartment module shall be separated from the apparatus body with a gap. This gap is necessary to accommodate the flexing of the chassis frame rails that is encountered while the vehicle is in transit so that harmful torsional forces are not transmitted into the structural framework.

SPECIAL ATTENTION

There shall no electrical blocks or buss bars located in the pump house area.

TORSION PUMP MODULE MOUNTING SYSTEM

The entire pump module assembly shall be mounted so that it "floats" above the chassis frame rails with vibration and torsion isolator assemblies. The body substructure shall be mounted above the frame to allow independent flexing to occur between the body and the chassis. Each

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assembly shall be mounted to the chassis frame rails with steel, gusseted mounting brackets. Each bracket shall be powder coated for corrosion resistance. Each body mount bracket shall be mounted to the side chassis frame flange with two 5/8"-UNC Grade 5 HHCS.

Each assembly shall have a two-part rubber vibration isolator. The isolator shall be of a specific durometer to carry the necessary loads of the apparatus body, equipment, tank, water, and hose. The quantity of mounts utilized shall correspond directly to the anticipated weight being supported. Certain assemblies shall also incorporate a torsion spring. Helical coil springs shall be incorporated into specific mounts in tandem with the rubber isolators to minimize the stress absorbed by the body caused from chassis frame rail flexing. There shall be a 1/4" thick UHMW polymer bearing washer between the body structure and each torsion mount. This washer shall provide dissimilar metals contact between the body structure and each mount. The UHMW bearing washer shall also act as a wear pad due to its low wear material properties.

There shall be no welding to the chassis frame rail sides, web or flanges, or drilling of holes in the top or bottom frame flanges between axles. All body to chassis connections shall be bolted so that in the event of an accident, the body shall be easily removable from the truck chassis for repair or replacement.

Because of the constant vibration and twisting action that occurs in chassis frame rails and suspension, the torsion mounting system is required to minimize the possibility of premature body structural failures.

PUMP COMPARTMENT HEATER

A 30,000 BTU hot water type heater shall be furnished and installed inside the pump compartment. The heater shall be connected to the engine cooling system with gate valves located inside the engine compartment. A 12 volt electric fan is to be furnished with an indicator light on the pump operators panel. The activation switch shall be weather proof.

HEAT PAN

There shall be a heat pan enclosure installed under the fire pump gear case. The heat pan assembly shall be fabricated of .125 aluminum. The top portion shall be bolted in place with stainless steel bolts and nuts. The bottom of enclosure shall have a slide rail on each side with a full slide out bottom pan for easy maintenance. The bottom pan shall be held in place with a 1/4 turn spring loaded latch.

The heat pan shall also have two (2) 3" holes cut into the bottom directly under the pump and rear suction relief valves.

OPERATORS PANEL

The operators panel shall be a "top mount", constructed on two incline surfaces. The lower panel shall be used to house all valve controls with the upper panel housing the discharge and other pump monitoring gauges. Valve control levers shall be immediately adjacent and instruments shall be neatly arranged for easy access and visible from the operator's location.

There shall be four (4) Weldon 2025 lights furnished under a light shield for illumination of the

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pump operators panel.

There shall be one (1) directional light located on each side of the pump house to light the running board area. The directional lights shall not be installed on any removable panels.

The pump operator's panel, side panels and step lights shall activate by the setting of park brake.

SPEEDLAY HOSE BEDS

Two (2) 200' 1-3/4" speedlay hose beds shall be provided in the forward portion of the pump compartment module. The speedlay hose beds shall be constructed as an integral part of the pump compartment tubular structure. The speedlay hose beds shall be approximately thirteen and quarter (13-1/4") inches tall and approximately eleven and a half (11.5) inches wide for laying a double stack of each hose size specified. The speedlay hose beds shall span the entire width of the pump compartment module. Slotted smooth aluminum flooring shall be provided for hose area drainage. Stainless steel scuff plates shall be installed at the bottom and at the vertical edges of the speedlay hose bed opening.

One (1) 200' 2-1/2" speedlay hose bed shall be provided in the forward portion of the pump compartment module. The speedlay hose bed shall be constructed as an integral part of the pump compartment tubular structure. The speedlay hose bed shall be approximately seventeen (17") inches tall and approximately eleven and a half (11-1/2) inches wide for laying a double stack of each hose size specified. The speedlay hose bed shall span the entire width of the pump compartment module. Slotted smooth aluminum flooring shall be provided for hose area drainage. Stainless steel scuff plates shall be installed at the bottom and at the vertical edges of the speedlay hose bed opening.

The tubular structure shall be overlaid on each side of the pump compartment underneath the access panels and each shall be made of brushed stainless steel.

PUMP COMPARTMENT SERVICE/SPEEDLAY ACCESS

The front portion of the pump compartment structure shall be overlaid with tread plate. Removable speedlay hose bed trays shall be provided to facilitate hose loading and serviceability of the pump and components. The speedlay hose beds shall be easily removed from the pump compartment tubular structure. The access area from the front for the pump and components will be limited in nature due to the speedlay hose bed feature.

The structural framework of the pump compartment shall be self-supportive and independent of the apparatus body. The pump module shall be approximately 74" in width as measured laterally across the apparatus and approximately 85" in height.

The width of the pump compartment (front to back) shall be 60".

APPARATUS LABELING

The apparatus shall be descriptively tagged with color coded metal labels. The labels shall be applied near Apparatus features that require a user function description. Wherever necessary,

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the labels shall be color coded to differentiate controls and their respective functions to simplify and clarify complex configurations.

STAINLESS STEEL WALKWAY WITH "DIAMONBACK" GRIP STEPS

The walkway shall be located between the cab and pump house where flex joints shall be provided between the walkway and pump compartment as well as between walkway and the chassis cab. These flex joints shall be required to reduce the negative effects that chassis frame rail twist can induce into structural components.

The walkway shall be constructed of structural stainless steel tubing to provide a framework for stepping and standing areas.

Each side of the walkway shall have an intermediate step which facilitates access to the walkway standing surface from the running board level. The surface of the walkway, intermediate steps, and running board areas of the walkway shall be constructed of an aggressive aluminum "Diamondback" grip extrusion. The running board stepping surface shall be flush with the top of the supportive tubular framework. The tubing shall have aggressive grip tape applied to make it a suitable for stepping and standing as well. Each surface shall be 'slip-resistant' compliant with the latest NFPA recommendations for stepping and standing surfaces. The distance between steps shall be approximately 14".

The walkway area immediately in front of the pump compartment shall be 24" in width. This pump operator's area shall be illuminated with two (2) lights mounted on the front face of the pump compartment.

The lights shall be activated by the setting of the park brake.

WALKWAY TOOL COMPARTMENTS

The walkway steps shall be incorporated into 'lift-up' style doors which enclose the integral walkway tool and equipment compartments. The door shall be hinged at the top and open with the assistance of a gas charged cylinder. This cylinder also holds the door in the 'open' and 'closed' positions for ease of operator use by eliminating the need for a latching mechanism.

The walkway step compartments shall be completely caulked at all seams and have two (2) drain holes located at the rearward portion of the compartments, one (1) at the forward portion and one (1) at the rearward portion.

18" HANDRAILS

Two (2) 18" handrails shall be mounted on the pump compartment (one each side) near the walkway steps to facilitate access up to the operator's panel area.

MANSAVER BARS

There shall be two (2) Fire Research "Mansaver" bars located in the walkway, one (1) each side.

BLACK LAMINOL CONTROL PANEL

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The surface of the operator's control and gauge panel shall be manufactured from heavy duty non-glare black "Laminol" aluminum, that is capable of withstanding the effects of extreme weather and temperature.

BRUSHED STAINLESS STEEL SIDE PANELS

There shall be two (2) side pump panels on the left and right sides of the pump compartment, one upper panel and one lower panel. Each upper panel shall be easily removed by a minimum of two (2) chromed quick-release type latches, closing against a door seal. Each lower panel shall be easily removed by a minimum of three (3) chromed quick-release type latches, closing against a door seal, thus providing for a large access area to the pump house for service. All panels shall be manufactured from heavy duty brushed stainless steel, capable of withstanding the effects of extreme weather and temperature.

There shall be access to the foam systems components in the lower removable side panels. There shall be a brushed stainless vertically hinged door provided for the access hole. There shall be access on both side of the pump house if required. Each door shall be labeled "FOAM SYSTEM ACCESS"

RUNNING BOARDS

The running boards shall be made of a structural tubular framework. The tubular frame support all loads by transmitting the loads through the pump compartment structure directly to the chassis frame rails. The running boards shall be independent of the apparatus body and shall be tied only to the pump compartment structure, thereby eliminating any pump compartment to body interference. This is essential in keeping a truly 'modular' configuration. Slip-resistant abrasive shall be applied to the top surface of the running board framework to provide a suitable stepping surface.

GRIP-SURFACE INSERT

The left side running board shall have an aluminum ventilated "Diamondback" grip surface insert installed. The grip surface area shall be as large as possible by extending to the perimeter of the inside of the structural running board framework. This ventilated grip material shall allow debris and water to pass through to eliminate build-up, thereby retaining a suitable stepping surface.

GRIP-SURFACE INSERT

The right side running board shall have an aluminum ventilated "Diamondback" grip surface insert installed. The grip surface area shall be as large as possible by extending to the perimeter of the inside of the structural running board framework. This ventilated grip material shall allow debris and water to pass through to eliminate buildup, thereby retaining a suitable stepping surface.

SPECIAL ATTENTION - PUMP HOUSE LINE PROTECTION

All drain lines for the discharges, suction, ABS discharge gauge lines and any other connections in the pump house area shall have a protective cover provided on the lines in the

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required areas of the lines to prevent the lines from rubbing on any other components in the pump house area.

All drains lines, ABS lines, high pressure discharge lines and electrical wiring in the pump house area shall be properly and neatly routed, wire tied and rubber coated "P" clamped, to keep the items secured.

TESTING PORTS

There shall be a pressure and vacuum test gauge adapter with chrome plated plugs furnished and installed on the pump operators panel.

PRESSURE GOVERNOR

A Class One Captain Pressure Governing System shall be furnished and installed on the pump panel. The PSG allows for pump pressure control and throttle control.

The PSG installation shall be wired specifically for the Cummins electronic engine.

SUCTION RELIEF VALVE

A suction relief valve with a range of pressure adjustment from 75 to 250 PSI shall be furnished, and installed inside pump compartment piped to the suction side of the pump. The valve shall be preset at 125 PSI suction inlet pressure. The valve shall be installed inside the pump compartment where it will be easily accessible for future adjustment. The excess water shall be plumbed to the atmosphere via the unloader pipe and shall dump on the opposite side of the pump operator. The valve shall come with 2 1/2" male NPT threads that can be capped if the relief valve fails in the open position. For normal pumping operations, the relief valve shall not be capped and there shall be a placard stating "DO NOT CAP" installed.

ENGINE INFO CENTER

There shall be a Class 1 ENFO III furnished and installed on the pump panel of the apparatus. The ENFO III provides the pump operator with Engine RPM, Oil Pressure, Engine Temperature, and Electrical System Voltage. This compact unit contains all required engine audible alarms including the low voltage alarm.

HEAT EXCHANGER

There shall be a supplementary heat exchanger cooling system furnished and installed for use of water from the discharge side of the fire pump through the engine compartment, without intermixing, for absorption of excess heat. The heat exchanger shall be adequate in size to maintain the temperature of the coolant in the pump drive engine not in excess of the engine manufacturer's temperature rating under all pumping conditions. Appropriate drains shall be provided to allow draining the heat exchanger to prevent damage from freezing. A manual shut-off valve shall be supplied at the pump operator's position.

AIR HORN BUTTON

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There shall be an air horn activation button furnished and installed on the pump operator's gauge panel. The air horn button shall be weather proof type.

PUMP COMPARTMENT TOP OVERLAY

The top of the pump compartment shall be an approved stepping surface constructed of embossed tread plate approved by the latest NFPA standards for abrasiveness.

Space Frame Body - STAINLESS STEEL

The apparatus body shall be a **Space Frame** design. The entire body structure shall be built as a space frame design with integral structural members forming the entire body structure (compartment frames, sub-frame, and tank support area). The space frame design provides maximum torsion resistance and load capabilities. The entire space frame structure shall be welded together utilizing an A.W.S. Certified welding procedure.

The space frame design shall also be required because it provides energy absorbing impact zones in the structure, thus providing increased safety to the rest of the apparatus and personnel on board. Documented proof of this extra safety shall be required upon request.

The Tri-Max body structure shall consist entirely of closed section members, except where the body is mounted to the chassis. Closed section members (such as square, rectangular, triangular, or round tubes) are required because they provide maximum strength and torsion rigidity. This style of design ultimately reduces fatigue and shall add longevity to the body structure. Body designs that use formed sheet metal compartments with independent sub-frames shall not be acceptable.

Body Structure Members: The space frame body shall have triangular shaped structural members in certain areas of the body. This shape is required to prevent loss of useable compartment space and serve as an attachment member for shelves, trays, or other equipment that requires mounting. Other body structure members shall be square or rectangular. Each structural member will have a nominal outside dimension of 2.5" in at least one direction. The body shall be designed for maximum strength to weight ratio, therefore the gauge of sheet metal and structural members varies from 14 gauge to 11 gauge throughout dependent on the design requirement.

Body Material Type: All body structure and sheet material shall be premium grade Stainless Steel, Type 3CR12.

Compartment Floors: The body compartments shall be enclosed with stainless steel sheet metal as specified above. The compartment floors shall have a 1" lip downward at the door opening side of the compartment. This lip shall integrate with a structural member on the bottom edge and form a "sweep-out" compartment. This design shall also allow for a structural flush fitting door frame and a complete door/weather seal.

Compartment Vents: The body compartments shall be vented through the structural members to below the apparatus body. There shall be mildew resistance filter media with aluminum mesh at the bottom of each structural member that is open for venting.

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Compartment Load Capacity: Each compartment shall have a minimum of one additional structural compartment floor support centered on the underside of the compartment floor. This additional member shall be integral with the rest of the body structure. Each compartment has been designed, and 3rd party analyzed to carry a working load of:

Full depth side compartment: 1,000 lbs per compartment
Half depth side compartment: 750 lbs per compartment
Rear center compartment: 1,500 lbs per compartment

RUB RAILS

The bottom edge of the compartments shall be trimmed with rub rails to absorb minor damage while protecting the body. The rub rails shall be fabricated of brightly anodized aluminum channel. The rub rails shall be bolted in place with stainless steel bolts and locking nuts, and shall be spaced away from the body with 1/2" nylon spacers to help prevent the collection of water and debris. Each rub rail section shall be easily removable and replaced should it become damaged.

RUB RAILS

The rearward edge of the rear step shall be trimmed with rub rails to absorb minor damage while protecting the body. The rub rails shall be fabricated of brightly anodized aluminum channel. The rub rails shall be bolted in place with stainless steel bolts and locking nuts, and shall be spaced away from the body with 1/2" nylon spacers to help prevent the collection of water and debris. Each rub rail section shall be easily removable and replaced should it become damaged.

REAR TAILBOARD

The rear tailboard shall be fabricated of the same tubular materials as used in the apparatus body. The tailboard shall be an independent assembly welded to the rear body structural framing to provide body protection and a solid rear stepping platform. The rear step shall be designed to incorporate "crush zone" technology. This idea incorporates lighter materials in the tailboard than the body structure so the step will "crush" in a collision before the body structure.

The rear of the apparatus body shall be vertical in design - otherwise known as a 'flat-back'. On the rear body surface, a sign shall be attached that states: "DO NOT RIDE ON REAR STEP, DEATH OR SERIOUS INJURY MAY RESULT."

The rear tailboard and body shall be constructed such that the angle of departure shall be no less than 8 degrees at the rear of the apparatus when fully loaded (Per NFPA 1901).

The rear tailboard shall be approximately thirteen and one-half (13.5) inches deep and shall incorporate a ventilated "Diamondback" material stepping surface bolted in place which spans the width of the apparatus. The extruded stepping surface shall be completely enclosed by the supporting structural framework to minimize damage. The ventilated "Diamondback" material shall be capable of being easily replaced if necessary, using only hand tools. The framework shall be covered with an adhesive tape providing an aggressive traction surface. Use of any aluminum diamond plate material on these areas shall not be acceptable.

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FOLDING STEPS

Each surface of the folding step shall have grip material with a minimum of 42 sq. inches in size. Each step shall be capable of sustaining a 500 lb. static load. The steps shall be manufactured by Austin/Thomas Hardware model #PHS100.

The following steps shall be installed:

FOLDING STEPS

Three (3) folding steps shall be installed on the right rear vertical face of the body.

One (1) light shall be mounted to illuminate stepping areas provided. The light shall be a Weldon chrome shielded 12 candle power light. The light shall be directed towards and positioned above the stepping surfaces.

The step light shall activate by the setting of the park brake.

FOLDING STEPS

Three (3) folding steps shall be installed on the left forward wall of the front compartment.

One (1) light shall be mounted to illuminate stepping areas provided. The light shall be a Weldon chrome shielded 12 candle power light. The light shall be directed towards and positioned above the stepping surfaces.

The step light shall activate by the setting of the park brake.

Two (2) 10" handrails shall be mounted. One (1) vertically on the outboard side of the forward corner of the body side wall and one (1) horizontally on top of the pumphouse rearward portion at the outboard edge to assist in climbing the steps according to NFPA 1901.

FOLDING STEPS

Three (3) folding steps shall be installed on the left rear vertical face of the body.

One (1) light shall be mounted to illuminate stepping areas provided. The light shall be a Weldon chrome shielded 12 candle power light. The light shall be directed towards and positioned above the stepping surfaces.

The step light shall activate by the setting of the park brake.

One (1) 10" handrail shall be mounted horizontally on top of the body side wall to assist in climbing the steps according to NFPA 1901.

PAINT SPECIFICATIONS

All bright metal fittings, if unavailable in stainless steel, shall be heavily chrome plated.

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Critical body and sub-frame area which cannot be primed after assembly shall be pre-painted.

All welded metal surfaces shall be ground to a smooth surface prior to a degreasing and high pressure, high temperature phosphatizing process. The entire surface shall then be sprayed with a non-chromate sealing compound to prevent formulation of stains or flash rust on previously phosphatized parts.

The paint applied to the apparatus shall be PPG Industries Delfleet® brand, applied throughout a multi-step process including at least two coats of each color and clear coat finish.

The coating shall be an infra red, baked air dried. The coatings shall provide full gloss finished suitable for application by high-pressure airless or conventional low pressure air atomizing spray.

The coatings shall not contain lead, cadmium or arsenic. The polyisocyanate component shall consist of only aliphatic isocyanates, with no portion being aromatic isocyanate in character. The solvents used in all components and products shall not contain ethylene glycol mono-ethyl ethers or their acetates (commercially recognized as cellosolves), nor shall they contain any chlorinated hydrocarbons. The products shall have no adverse effects on the health or nor present any unusual hazard to personnel when used according to manufacturers recommendations for handling and proper protective safety equipment, and for its intended use.

The coating system, as supplied and recommended for application, shall meet all applicable federal, state and local laws and regulations now in force or at any time during the courses of the bid.

The manufacturer shall supply (upon request) for each product and component of the system, a properly complete OSHA "Material Data Safety Sheet".

The following documents of the issue in effect on the date of the invitation to quote, form a part of this document to the extent specified herein:

Federal Standards: Number 141A and 141B paint, varnish, lacquer and related material: methods of inspection, sampling, and testing.

Military Standard: MIL-C 83486B Coating, Urethane, aliphatic Isocyanate, for Aerospace applications.

Industry Methods and Standards: ASTM Method of Analysis (American Society for testing and Materials). BMS 10-72A (Boeing Material Specifications).

The entire exterior body structure (excluding roll-up doors) shall receive the primer coats and the finish coats. The apparatus body, will be painted in a down draft type paint booth to reduce dust, dirt or impurities in the finish paint. The painted surfaces shall have a finish with no runs, sags, craters, pinholes or other defects.

BODY PAINT COLOR

The apparatus body shall be painted PPG 71665 Red.

ZOLATONE COMPARTMENT FINISH

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The compartment interiors shall be coated with silver gray Zolatone. Zolatone is a polychromatic, modified nitrocellulose coating with a flat background color under accenting fleck colors. Zolatone is VOC Compliant, isocyanate and lead free. This coating system provides an unusual decorative and camouflaging effect that is also durable, flexible and simple to maintain and repair when needed.

Zolatone durable finish requires no special maintenance and can be washed and waxed just like paint. Zolatone resists many common solvents and wear from abrasion, scratching and chipping in normal everyday use.

GENERAL BODY DETAILS

All compartmentation shall be constructed in a sweep out design to be water and dust proof, manufactured to the maximum possible storage capacity.

FASTENERS

All bolts and nuts used in the finish construction of the apparatus shall be coated stainless steel which helps prevent dissimilar metal electrolytic reaction and corrosion. The Manufacturer may be requested to supply evidence of fastener coating and results of salt spray testing when dissimilar metals are used. Any bolt extending into a compartment or into the hose bed area shall have an acorn nut attached or be protected in such manner where sharp edges are avoided.

WHEEL WELLS

Wheel wells shall have semicircular black polymer composite inner liners that are bolted to the wheel well panel and supported inboard by brackets that are connected to the body framework. Each wheel well shall be a continuous piece with no breaks or ledges where road grime or debris may accumulate. This liner shall be removable for access to suspension assembly for repairs. There shall be no exception to the bolted wheel well inner liner requirement.

WHEEL WELL MODULES

The body wheel well area on each side of the body shall be fabricated of smooth stainless steel and finish painted. They shall incorporate smart storage compartments utilize the most space possible.

WHEEL WELL ROLL-OUT TRAY

There shall be a roll-out tray installed above the rear wheel on the left side of the body. The tray shall be 23.5" deep by 59" wide and have a 220 lb. capacity.

WHEEL WELL ROLL-OUT TRAY

There shall be a roll-out tray installed above the rear wheel on the right side of the body. The tray shall be 23.5" deep by 59" wide and have a 220 lb. capacity.

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SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold two (2) 8" diameter x 24.50" long SCBA bottles.

The compartment shall be located in front of the axle on the left side.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold two (2) 8" diameter x 24.50" long SCBA bottles.

The compartment shall be located in front of the axle on the right side.

SCBA COMPARTMENT

There shall be a compartment located in the wheel well to hold two (2) 8" diameter x 24.50" long SCBA bottles.

The compartment shall be located behind the axle on the right side.

FLOOR DRY COMPARTMENT

There shall be a compartment located in the wheel well to floor dry with a drain located at the bottom for dispensing floor dry.

The compartment shall be divided off to prevent the oil dry and dust from entering the roll-out tray and forward wheel chock compartment.

The compartment shall be located behind the axle on the left side.

The smart storage compartment doors shall be painted.

DOOR OPEN WARNING

Each smart storage compartment door shall have a magnetic style switch. If a door is not properly closed, it shall activate the "Door Open" light in the cab to warn crew when a door is open when the transmission is placed into drive or reverse movement mode, with the parking brake released.

TORSION BODY MOUNTING SYSTEM

The entire body module assembly shall be mounted so that it "floats" above the chassis frame rails with vibration and torsion isolator assemblies. The body substructure shall be mounted above the frame to allow independent flexing to occur between the body and the chassis. Each assembly shall be mounted to the chassis frame rails with steel, gusseted mounting brackets. Each bracket shall be powder coated for corrosion resistance. Each body mount bracket shall be mounted to the side chassis frame flange with two 5/8"-UNC Grade 5 HHCS.

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Each assembly shall have a two-part rubber vibration isolator. The isolator shall be of a specific durometer to carry the necessary loads of the apparatus body, equipment, tank, water, and hose. The quantity of mounts utilized shall correspond directly to the anticipated weight being supported. Certain assemblies shall also incorporate a torsion spring. Helical coil springs shall be incorporated into specific mounts in tandem with the rubber isolators to minimize the stress absorbed by the body caused from chassis frame rail flexing. There shall be a ¼" thick UHMW polymer bearing washer between the body structure and each torsion mount. This washer shall provide dissimilar metals contact between the body structure and each mount. The UHMW bearing washer shall also act as a wear pad due to its low wear material properties.

There shall be no welding to the chassis frame rail sides, web or flanges, or drilling of holes in the top or bottom frame flanges between axles. All body to chassis connections shall be bolted so that in the event of an accident, the body shall be easily removable from the truck chassis for repair or replacement.

Because of the constant vibration and twisting action that occurs in chassis frame rails and suspension, the torsion mounting system is required to minimize the possibility of premature body structural failures.

BODY STRUCTURE WIDTH

The width of the apparatus body from the outside of the left compartments to the outside of the right compartments shall be 99" excluding any attached peripherals such as rub rails, fenderettes, grab handles, etc.

COMPARTMENT VENTILATION

To allow for proper air circulation & flow, each compartment shall have a venting route. The compartments shall be vented through the structural members to below the apparatus body into the environment.

COMPARTMENTATION

The following compartments shall be supplied on the apparatus:

Compartment "L1":

There shall be one (1) full height compartment ahead of the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 49" wide by 69" high with a lower depth of 25.5" and an upper depth of 12.5". The door opening shall measure 43.5" wide by 60" high.

The compartment will have approximately 36.25 cubic feet of space.

Compartment "L2":

There shall be one (1) compartment located directly over the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 62" wide by 35" high with a depth of 12.5". The door opening shall measure approximately 59" wide

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by 26" high.

The compartment will have approximately 15.5 cubic feet of space.

Compartment "L3":

There shall be one (1) full height compartment located behind the rear wheels on the left side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 49" wide by 69" high with an upper depth of 12.5" and the lower portion being transverse into the rear compartment. The door opening shall measure approximately 43.5" wide by 60" high.

The compartment will have approximately 36.25 cubic feet of space.

Compartment "R1":

There shall be one (1) full height compartment located ahead of the rear wheels on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 49" wide by 69" high with a lower depth of 25.5" and an upper depth of 12.5". The door opening shall measure approximately 43.5" wide by 60" high.

The compartment shall have approximately 36.25 cubic feet of space.

Compartment "R2":

There shall be one (1) compartment located directly over the rear wheels on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 62" wide by 35" high with a depth of 12.5". The door opening shall measure approximately 59" wide by 26" high.

The compartment will have approximately 15.5 cubic feet of space.

Compartment "R3":

There shall be one (1) full height compartment located behind the rear wheels on the right side of the apparatus. The approximate interior dimensions of this compartment shall be a minimum of 49" wide by 69" high with an upper depth of 12.5" and the lower portion being transverse into the rear compartment. The door opening shall measure approximately 43.5" wide by 60" high.

The compartment shall have approximately 36.25 cubic feet of space.

Compartment "B1":

There shall be one (1) compartment located at the rear of the apparatus, directly below the hose bed access area. The approximate dimensions of this compartment shall be 43" high with a depth of 25.5" with the sides of the lower portion of the compartment being open to the side compartments for maximum storage area.

The compartment will have approximately 28.5 cubic feet of space.

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COMPARTMENT UNISTRUT

Vertically mounted unistrut shall be installed in ALL compartments of the apparatus body to accommodate mounting shelves, trays, and other miscellaneous equipment items.

FULL HEIGHT REAR CENTER COMPARTMENT

The rear center compartment of the apparatus shall be full height, as high as possible as determined by water tank height. The compartment shall have a roll-up door installed.

The door opening shall be approximately 36" wide and 36" high.

ROBINSON BRAND ROLL-UP DOOR

A roll up door shall be Robinson brand. Door slats to be of a double wall box frame extrusion. Exterior surface shall be flat, interior surface shall be concave to prevent loose equipment from jamming the door. Slats will be anodized to prevent oxidation. Slats to have inner-locking end shoes on every slat secured by a Punch-Dimple process. Slats shall have interlocking joints with a folding locking flange. Between each slat is a PVC/Vinyl inner seal to prevent any metal to metal contact.

The track to be a one piece aluminum which has an attaching flange and finishing flange incorporated into its design which facilitates installation and provides a finished look to installation without additional trim or caulking. The track to have a replaceable side seal. Side seal prevents water and dust intrusion into the compartment.

A drip rail will have a built in replaceable wiper seal. The drip rail to be made of aluminum. Roll-up door to have a 4" diameter counterbalance to assist in lifting and to eliminate the risk of accidental closing. The door shall be secured by a full width lift bar, operable by one hand even with heavy gloves. Securing method will be a positive latch device.

If the door is not properly closed, it shall activate the "Door Open" light in the cab to warn crew when a door is open when the transmission is placed into drive or reverse movement mode, with the parking brake released.

The rear center compartment door shall be left a natural satin aluminum finish.

There shall be a protective plate installed under the rear compartment door roll to protect the door in the rolled up position.

DOOR CONSTRUCTION

All doors shall be a minimum of 2" thick with a return flange on the interior of the door to provide a mounting surface for the attachment of a brushed door liner. To prevent corrosion, the liners shall not be attached with metallic fasteners. Each door will have a weep hole to prevent interior moisture build up.

The weep hole on the top of each full height door shall have an ABS type plug installed.

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All door hinges shall be polished 14 gauge 304 stainless steel with a 1/4" diameter stainless steel pin. The hinges shall be mounted to provide easy door adjustment in the future without removing the door liner. The vertically hinged doors shall each have a stainless steel spring loaded door holder. The horizontally top hinged doors shall have a gas charged shock on each side to hold the door in the up position.

Door handles shall be polished stainless steel D-ring style that are spring loaded and bidirectional. They shall be mounted on the doors of compartments with a single door or on the primary door of a compartment with vertical double doors. The latches shall attach to the door assembly without any fasteners penetrating the door skin material, with a rubber gasket provided between the D-ring handle and the door skin. The door latch assembly must be completely enclosed by the door assembly and inner door pan, to prevent damage from shifting equipment carried in the compartment.

The door latches to open the secondary door of a compartment with vertical double doors shall be "lever" style, located on the backside of the door. Once the primary door is opened, the handle shall be easily visible. Full height secondary doors will have the latch at the bottom of the door with all others door heights having the latch at the top of the door.

All hinged doors shall be a "flush" style to provide a flat appearance of the body side. The body shall form a 2" deep frame on all four sides to receive the door, preventing any door overlap. A clip on rubber gasket shall be mounted on the door frame, providing a tight seal to prevent moisture and debris from entering the compartment.

Each nator pin shall have a nut installed on the threaded end. There shall be a 1" hole drilled into the bottom side of the tube directly inline with the nator pin to allow for the retightening of the nator pin if it should become loose. The 1" hole shall have an ABS type plug installed to keep the hole sealed.

All horizontal and vertical side compartment doors shall be fabricated of 5052 aluminum.

DOOR OPEN WARNING

Each flush door compartment shall have a magnetic style reed indicator switch. Each switch shall be hermetically sealed rated to 10,000,000 cycles. The reed shall be potted in the contact housing with polyurethane and the housings shall be molded fire retardant ABS plastic. The contact and magnetic housing shall snap-lock in the body material, one on the body and one in the door.

If a door is not properly closed, it shall activate the "Door Open" light in the cab to warn crew when a door is open when the transmission is placed into drive or reverse movement mode, with the parking brake released.

Brushed stainless steel sill plates shall be installed at the bottom of each body compartment door opening.

HOSE STORAGE

A hose bed shall be provided with a minimum of thirty (30) cubic feet of storage space. The

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hose bed shall have a slotted 1/4" aluminum flooring installed to allow drainage through the tank cavity to the ground below. The aluminum flooring shall be manufactured in discrete sections to allow for easy removal and outstanding stability. The area shall be free of sharp edges to protect the hose when loaded or distributed.

The walls of the hose bed shall be 85" tall, measured from the bottom edge of the compartments to the top flange.

VINYL COATED NYLON HOSE BED COVER

There shall be a hose bed cover furnished that is made of vinyl coated nylon. The cover shall be held in place by extruded aluminum channel on the front and an elastic shock cord sewn into the tarp with brass grommets where the shock cord passes through the hose bed cover on the sides. Hooks shall be provided on the sides to provide a means of attaching the cover to the apparatus. The hooks shall be made of cast aluminum.

The hose bed cover shall extend down from the top of the hose bed body side a minimum of 4".

The cover shall have a flap that extends down over the rear of the hose bed which shall be fastened by an elastic shock cord sewn into the tarp with brass grommets where the shock cord passes through the hose bed cover. Four (4) hooks shall be provided, one (1) at the lower corners and two (2) centered to provide a means of attaching the cover to the apparatus. The hooks shall be made of cast aluminum.

The cover shall extend the full width of the inboard sides of the hose bed.

The hose bed cover shall be black.

HOSE BED AREA

The hose bed area of the apparatus shall be overlaid with brushed material matching the body material type.

HOSE BED AREA TRIMMED W/ BRUSHED SST

The vertical corners at the back hose bed shall be trimmed with brushed stainless steel. The trim shall extend from the hose floor level up to the top edge of the body side.

The hose bed shall accommodate the following hose loads:

<u>Qty</u>	<u>Size</u>
1000'	of 2-1/2" DJ fire hose
1000'	of 5" rubber covered hose

HOSE BED DIVIDERS

There shall be two (2) dividers installed in the hose bed. The dividers shall be fabricated of 1/4" thick aluminum plate with a double sided reinforcement where it is attached to the adjustable

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slide rails. The rear of the dividers shall have a radius to provide a smooth corner and a hand cut out to aid in access to the hose bed area. Hose payout shall be unobstructed by the dividers.

DUNNAGE AREA

A vertical bulkhead shall be installed at the front of the hose bed area, just behind the water tank fill tower, forming a storage area that is separated from the hose bed. The rear face of the bulkhead shall serve as a mounting surface for the hose bed dividers, resulting in the ability to move any hose bed divider across the entire width of the hose bed.

TANK CAPACITY

The tank shall be 1000 gallons in capacity.

TANK LEVEL GAUGE

A Class 1 "Intelli-Tank" tank level gauge shall be mounted on the pump panel. The tank level gauge shall indicate the water level on an easy to read LED display and show increments of 1/8 of a tank. The tank level gauge will utilize a pressure transducer that mounts on the outside of the tank for sensing the water level. No probes shall be installed for the tank. The tank level gauge shall have a super bright LED 4-light display with a visual indication at nine accurate levels. A set of weather resistant connectors to connect to the digital display, to the pressure transducer and to the apparatus power shall be supplied with the tank level gauge. Additional (slave) displays (if requested) are to be easily integrated and will receive data from the same source as the master display. No additional transducers shall be required. The gauge shall be a model ITL.

STAR™ SERIES - POLYPRENE TANK

TANK SHAPE: The water tank shall be designed to utilize cavities that have commonly been wasted space. The water tank shall extend up and over the rear center compartment to just behind the rear body wall. The water tank shall fill the void between the main hose bed floor and the top of the rear center compartment. This tank design shall provide for a lower overall tank height, resulting in a lower overall main hose bed height. In addition, this design shall create a lower center of gravity of the vehicle, for improved vehicle handling.

TANK CONSTRUCTION: The booster tank shall be constructed of 1/2" thick polypropylene sheet stock which is a non-corrosive stress relieved thermoplastic. It shall be designed to be completely independent of the body and compartments. All joints and seams are extrusion welded and/or contain the "Bent Edge" and tested for maximum strength and integrity. The top of the booster tank is fitted with lifting eyes designed with a 3 to 1 safety factor to facilitate tank removal.

COVER: The tank cover shall be constructed of 1/2" thick polypropylene and shall be recessed. A minimum of two lifting dowels shall be drilled and tapped 1/2" x 2" to accommodate the lifting eyes.

BAFFLES: The swash partitions shall be manufactured from 1/2" polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments

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to provide to provide maximum water flow. All swash partitions interlock and are welded to one another as well as to the walls of the tank.

MOUNTING: The tank shall have a reinforced 3/4" floor for added strength and durability. The tank shall be isolated from the body substructure cross members with 1/2" x 2 1/2" rubber strips that are 60 durometer in hardness. The tank shall sit nested inside the center body substructure and shall be completely removable without disturbing the body side panels. Tank stops on all four sides will keep the tank from shifting front to back or side to side.

FILL TOWER: Fill opening shall be approximately 12" x 12". The tower will have a 1/4" thick removable polypropylene screen and a polypropylene hinged type cover that will open if the tank is filled at an excess rate. There shall be a removable 1/4" thick polypropylene screen to prevent debris from falling into the tank. The fill tower shall have a 6" overflow that will discharge underneath the tank, behind the rear wheels. The overflow shall terminate above the tank water level when filled to the rated capacity. A rear secondary tank vent shall be provided to prevent entrapment of air when filling on a decline and will vent next to the overflow.

The fill tower shall be located in the left front hose bed.

SUMP: The sump will be constructed of 1/2" polypropylene and be located inline with the tank suction valve. There shall be a 4" schedule 40 polypropylene tube installed that will run from the suction outlet to the sump location. The tank will have an anti-swirl plate located approximately 2" above the sump.

The sump shall have a 3" plug for use in draining and cleaning out the tank.

OUTLETS: In addition to the tank suction valve outlet located in the sump, there shall be an outlet provided for the tank fill valve. If there are any additional options selected (such as an extra tank suction or direct tank inlets), there shall be additional outlets provided to accommodate these items.

ENCLOSED LADDER STORAGE

The ladders will be mounted in a compartment located beside the booster tank. There shall be a hinged door, matching the rear overlay material, on the rear of the compartment with a minimum of two (2) chromed push button type latches to secure the contents inside.

If the door is not properly closed, it shall activate the "Door Open" light in the cab to warn crew when a door is open when the transmission is placed into drive or reverse movement mode, with the parking brake released.

The compartment shall be located on the streetside of the tank, with the ladders lying on their side.

The compartment shall be fully enclosed through the tank and into the pump compartment.

The compartment shall be large enough for one (1) 10' aluminum attic ladder, one (1) 14' aluminum roof ladder, one (1) 24' two section aluminum ladder. The ladders shall be Duo-Safety brand. The compartment shall also hold two (2) pike poles which shall be stowed in

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individual divided slots, so one item may be removed without disturbing the others. Each slot shall have a plastic angle installed at the top and bottom to guide the ladders. There shall be a stop in the front of each compartment to prevent the items from sliding forward.

SUCTION HOSE STORAGE CARRIER

One (1) hard suction hose carrier shall be provided. The carrier shall be constructed of aluminum and anodized for a durable, long lasting finish. There shall be (2) hold-downs, one (1) at each end, which shall hold the hard suction hose on the tray.

The tray shall be center mounted between the body side scene lights.

One (1) suction hose carrier shall be located on the curbside, mounted to the top of the catwalk.

ENCLOSED SUCTION HOSE STORAGE

The suction hose will be stowed in a compartment located beside the booster tank on the curbside. There shall be a hinged door, matching the rear overlay material, on the rear of the compartment with a chromed push button type latch to secure the contents inside.

If the door is not properly closed, it shall activate the "Door Open" light in the cab to warn crew when a door is open when the transmission is placed into drive or reverse movement mode, with the parking brake released.

The compartment shall accommodate one (1) length of 6' x 12' PVC suction hose with long handles and two (2) pike poles.

SHELVING

The shelves shall be fabricated of 3/16" thick 3003 grade aluminum with four (4) 2" high side flanges.

The shelves shall be as wide as possible and fully adjustable up and down.

The shelves shall be installed in the following compartments:

The shelves shall be 24" deep.

- One (1) L1
- One (1) L3
- One (1) R1
- One (1) R3

ROLL OUT TRAYS

There shall be roll out trays furnished and installed.

The trays shall be fabricated of 3/16" thick 3003 grade aluminum with four (4) 2" high side flanges, corner welded for maximum strength.

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The trays shall be as wide as possible.

Each rollout tray system shall incorporate a pair of cadmium plated, ball bearing roller slides with a pneumatic hold-open and closed device.

The trays shall be installed in the following compartments:

The trays shall be approximately 22' deep.

One (1) L1
One (1) L3
One (1) R1
One (1) R3

One (1) Rear Center compartment

The roll-out tray shall be rated for 220 lbs. and extend to 100% of the slide capacity.

ALUMINUM WALL MOUNTED TOOL BOARD

There shall be six (6) aluminum tool boards installed. Each tool board shall be bolted to the back wall of the compartment spaced 1/2" away with poly spacers.

The toolboards shall be located in the upper portion of compartments L1,L2,L3,R1,R2,R3.

The toolboards located in the full height compartments shall be notched out for the Multi-Plex electrical system nodes and for the load center.

FENDERETTES

Two (2) polished stainless steel fenderettes shall be provided on body rear wheel well openings, one (1) each side. A rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering. A dielectric barrier shall be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion.

OVERLAYS

Overlays shall be brushed stainless steel material coated with 3M sealant and adhesive on the back sides to protect and to put an insulating barrier between dissimilar metals to assist in corrosion resistance.

The following areas shall have brushed stainless steel overlays installed:

The front faces of the apparatus compartments as well as the front header of the hose bed area.

The entire back of the apparatus body including both the side compartment and rear compartment back areas.

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The catwalks shall be approved stepping surfaces constructed of knurled tread plate approved by the latest NFPA standards for abrasiveness.

KNURLED SST HANDRAIL SPECIFICATIONS

All handrails shall be 1 1/4" in diameter, constructed of knurled #3 polished stainless steel tubing. There shall be chrome plated brackets with a rubber gasket installed between the body and the bracket. There shall be a 2" minimum clearance between the bracket and the body.

The following handrails shall be installed.

42" HANDRAIL

One (1) 42" horizontal handrail shall be mounted below the hose bed.

REAR TOW EYE

There shall be a rear tow eye attached to the frame rails. The location of the tow eye shall be below the rear center compartment.

The tow eye shall be manufactured of 1" plate steel that is bolted to the chassis frame rail with a minimum of 6 grade 5 bolts. The plate shall be braced to the opposite frame rail to offset forces placed at an angle to the chassis frame.

LOW-VOLTAGE ELECTRICAL SYSTEM

The apparatus shall be equipped with a Logic Controlled, Low-Voltage (12v) Electrical System compliant with the latest revision of the NFPA 1901 guideline.

The system shall be capable of performing total load management, load management sequencing, and load shedding via continuous monitoring of the low-voltage electrical system. In addition, the system shall be capable of switching loads (like operating as an emergency warning lamp flasher) eliminating the dependency on many archaic electrical components such as conventional flasher modules. The system shall also incorporate provisions for future expansion or modification.

The low-voltage electrical system shall be designed to distribute the placement of electrical system hardware throughout the apparatus thereby enabling a smaller, optimized wire harness. The programmable, logic controlled system shall eliminate redundant electrical hardware such as harnesses, circuit boards, relays, circuit breakers, and separate electrical or interlock subsystems and associated electronics for controlling various electrical loads and inputs.

As-built electrical system drawings and a vehicle-specific reference of I/O shall be furnished in the delivery manuals. These drawings shall show the electrical system broken down into separate functions, or small groups of related functions. Drawings shall depict circuit numbers, electrical components and connectors from beginning to end.

The as built wiring diagrams shall have the brand of lights along with the model numbers on the drawings.

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SPECIAL ATTENTION

The Crimson Fire Multi-Plex Hercules modules and any other electrical components shall be located as follows:

Node #1 shall be located behind the center rocker switch panel.

In the upper portion of the back wall in compartment R1, Node #2, any dill blocks and electrical connections that would be located in the pumphouse area.

There shall be no bulkhead connectors located in the forward wall of compartment R1. All of the wiring shall be run through the upper portion of the forward wall and the hole shall be weather proof sealed. All of the connections shall be connected within the compartment. A protective cover shall be provided to protect the components.

In the upper portion of the back wall in compartment L3, Node #3, any dill blocks and electrical connections that would be located behind the streetside taillight assembly area.

There shall be no bulkhead connectors located in the rearward wall of compartment L4. All of the wiring shall be run through the upper portion of the rearward wall and the hole shall be weather proof sealed. All of the connections shall be connected within the compartment. A protective cover shall be provided to protect the components.

In the upper portion of the back wall in compartment R3, Node #4, any dill blocks and electrical connections that would be located behind the curbside taillight assembly area.

There shall be no bulkhead connectors located in the rearward wall of compartment R3. All of the wiring shall be run through the upper portion of the rearward wall and the hole shall be weather proof sealed. All of the connections shall be connected within the compartment. A protective cover shall be provided to protect the components.

LED DOT LIGHTING

There shall be seven (7) lights located on the rear of the vehicle. Three (3) of the lights shall be (center) mounted as high as possible on the rear face of the body for use as identification lamps. Two (2) lights shall be located on the rear face of the stanchions, one (1) each side and two (2) lights shall be located on the outboard side of the stanchions, one (1) each side, for use as clearance lamps.

All the DOT lights shall be installed horizontally.

There shall also be two (2) amber intermediate turn signals on the sides of the apparatus one (1) each side just forward of the rear axle located in the rub rails. Two (2) amber DOT lights shall be located in the rubrails for the pump house, one (1) each side.

The lights shall be Weldon brand 9186-1500 series LED red and amber markers.

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REAR TAIL LIGHT CLUSTER

There shall be a rear tail light cluster furnished and installed in a polished bezel at the rear of the apparatus, one each side. The cluster shall be manufactured by Whelen and consist of the following:

- 1 - Whelen #60 LED series red brake light
- 1 - Whelen #60 Clear backup light (Halogen)
- 1 - Whelen #60 LED series amber turn signal light populated in the shape of an arrow

Each tail light cluster shall be mounted on a removable panel for easy access to the electrical distribution centers at each rear corner of the apparatus body.

BACKUP LIGHTS

The reverse lights shall not illuminate when the parking brake is engaged.

PUMP COMPARTMENT LIGHTING

There shall be two (2) 12 volt work lights installed in the pump/transverse compartment. Each light shall be activated with a switch located on each light and shall be enclosed in an ABS case. Each light head shall be removable and have a retractable wire that can be extended a minimum of 10 feet to allow maintenance personnel to relocate and direct the light as needed.

The lights shall be located in the upper portion of the pump house compartment on the forward wall, one (1) each side.

COMPARTMENT LIGHTS

There shall be two (2) lights mounted in body each compartment. There shall be one (1) light on the forward wall upper portion and one (1) light on the rearward wall lower. Each light shall be mounted in such a way that it is vertically adjustable with wiring slack to allow for future repositioning. The lights in each compartment shall be on a separate circuit, turning on only those lights that have open compartment doors.

The lights shall be manufactured by Weldon and be model #2030.

The over wheel compartments shall have both lights mounted in the upper portion, one (1) each side.

The rear center compartment shall have the lights mounted in the upper portion of the back wall, one (1) each side.

UPPER LED LIGHTING PACKAGE

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the upper areas of the vehicle.

ZONE A:

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There shall be a 72" light bar furnished and installed with a total of eight (8) LED modules. The bar shall have a total of five sections being clear with one red modules and one white module in two sections facing straight forward and two red modules angled towards the front and the center position being black. The ends colors shall be clear with red modules angled towards the rear. The rear of the bar shall be all clear. The clear lights shall be deactivated when the parking brake is set.

The light bar shall be a Whelen brand Edge Freedom series model # FN72QLED.

ZONES B&D:

The side forward area shall be covered by the Zone A lighting.

ZONE C:

There shall be two (2) halogen beacons furnished and installed in the upper outer corners of the rear of the apparatus.

The beacons shall be Whelen brand model # RB6T.

Both lenses shall be red.

CAST ALUMINUM LIGHT STANCHIONS

Two (2) light stanchions shall be mounted in the upper rear corners of the body sides, one (1) each side. Each shall be large enough to accommodate an upper zone C rotating beacon and a hose bed light if specified. The DOT lights specified shall also be located one (1) on the side and one (1) on the rear of each stanchion.

LOWER LED WARNING LIGHTING

ZONE A:

The warning lights shall be supplied with the custom chassis.

ZONES B&D:

There shall be six (6) LED lights, 4" high x 6" wide, surface mounted along the sides of the apparatus.

The lights shall be Whelen brand model 60 LED.

The lights shall be located one (1) on the front bumper side, one (1) in the pump house area and one (1) on the tailboard.

The lights shall have red lenses.

ZONE C:

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There shall be two (2) LED lights, 4" high x 6" wide, mounted on the rear of the apparatus body specified.

The lights shall be Whelen brand model 60 LED.

Both lenses shall be red.

WARNING LIGHT SWITCH

All warning lights shall be activated by the "RED" master warning light switch in the main rocker switch panel.

LOWER ZONES B&D CAST ALUMINUM LIGHT HOUSING

A cast aluminum light housing shall be used for the rearmost warning light in zones B&D to ensure the light is mounted as far rearward as possible.

12 VOLT SIDE SCENE LIGHTS

There shall be two (2) pair of 12 volt scene lights furnished. The lights shall be mounted on the upper portion of the body sides, one (1) forward and one (1) rearward.

The lights shall be 9" wide x 7" tall and have a built in downward angle.

The scene lights shall activate with the park brake in the on/off position.

The lights shall be manufactured by Whelen and be model 900CA0CR.

The scene lights shall be activated by the switches on the main rocker switch panel.

The left scene light switch shall activate all the left side scene lights on the unit.

The right scene light switch shall activate all the right side scene lights on the unit.

The switches shall be labeled as follows:

One (1) labeled "Left Scene"

One (1) labeled "Right Scene"

12 VOLT REAR SCENE LIGHTS

There shall be one (1) pair of 12 volt scene lights furnished. The lights shall be mounted on the rear face of the apparatus body, one (1) each side above the rear center compartment. The lights shall be 9" wide x 7" tall and have a built in downward angle.

The scene lights shall activate with the park brake in the on/off position.

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The lights shall be manufactured by Whelen and be model 900CA0CR.

The scene lights shall be activated by a switch on the rocker switch panel.

The switch shall be labeled as follows:

"Rear Scene"

REAR SCENE LIGHTS AS BACK-UP ILLUMINATION

The rear scene lights shall illuminate when the apparatus transmission is shifted into reverse to aid in lighting the area behind the apparatus.

HARRISON HYDRAULICALLY DRIVEN GENERATOR

One (1) Harrison Hydraulic Driven Generator model 6.0MAS rated at 6,000 watts, 25/50 amps, 120/240 VAC, 60 Hz, 1-phase.

The system shall be designed and assembled by a company with no less than 10 years experience in the manufacture of hydraulic driven generators. The system shall be tested at the full nameplate load prior to shipping and be accompanied with the test report. The test report will document the generators performance at various loads from no load to full load to ensure reliable power delivery at those loads.

The motor/generator shall be placed in a frame which affords protection to the components and provides a unitized mounting module containing the motor/generator, reservoir, oil cooler, filtration, on/off manifold containing a cross port check valve allowing unit to be started and shut down remotely. The generator shall be a commercial type with a heavy-duty bearing and of brushless design to ensure low maintenance. No brushes or slip rings shall be allowed. The reservoir shall include an oil level sight gauge, oil temperature gauge, fill cap, oil filter, and a venturi boost unit to provide positive pressure to the pump suction port. The generator and motor shall be close coupled and aligned using a Morse taper with a through bolt to secure the motor to the generator. No two (2) bearing generators shall be permitted.

The system must be capable of producing the full nameplate power when driven from the vehicle PTO from idle to maximum engine speed. The generator system must be able to operate on either a Constant Engaged PTO or a Hot Shift PTO. Determination as to which PTO to use will be made by the Fire Department. The generator must be able to be used while vehicle is either stationary or in motion.

The hydraulic motor and pump shall be of axial piston design to provide low internal leakage and a high degree of frequency stability. No gear pumps or motors will be used. The pump shall match the system with the proper orifice, pressure compensator, and load sense settings to provide stable output regardless of engine rpm or electrical load demands.

The system shall be capable of normal operations using a commonly available ATF fluid, such as GM Dexron III or equivalent. All fluid service points shall be in close proximity to the reservoir for ease of scheduled maintenance.

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There shall be a meter containing the volts, amp, frequency and hour meter supplied and installed with the generator and mounted in a location close to the apparatus breaker box.

Activation shall be a weather proof push button switch that shall be lighted and located on the pump operator's panel.

The generator shall be located in the forward portion of the hosebed on the curbside.

HOT SHIFT PTO

A 'hot' shift shall be added to the hydraulic generator installation.

A guarded switch located on the pump operator's panel shall be used to engage / disengage the PTO and energize / de-energize the generator for operation.

The PTO / Generator switch shall be labeled "Generator".

There shall be a light located above the switch that shall activate when the generator is engaged and de-activate when the generator is disengaged.

LOAD CENTER

There shall be a electrical load center furnished and installed in a protected environment. The load center shall have provisions for twelve (12) manual reset type circuit breakers.

The circuit breakers shall be labeled as follows:

- One (1) 15amp Streetside Cab receptacle
- One (1) 15amp Curbside Cab receptacle
- One (1) 15amp Streetside Cab Quartz lights
- One (1) 15amp Curbside Cab Quartz lights
- One (1) 20amp Curbside Cord Reel
- One (1) 20amp (240) Body Quartz lights
- One (1) 20amp spare
- One (1) 20amp spare
- One (1) 15amp spare

The load center shall be located in compartment L1 on the back wall forward portion.

GENERATOR AND SHORELINE POWERED OUTLETS

The following outlets shall be supplied on the apparatus and be live either when the generator is running or when shoreline power is provided;

There shall be two (2) outlets installed. The outlets shall be 120 vac/15 amp (NEMA 5-15), duplex receptacle with a weatherproof cover.

Two (2) outlets shall be located inside the chassis cab. The receptacles shall be located floor mounted, one (1) behind the driver's seat and one (1) behind the officer's seat.

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The receptacles shall be labeled shoreline/generator 15amp.

CAB TRI-POD TELESCOPING LIGHTS

Two (2) light heads shall each be 1000 watts, 110 volt models. Each entire light assembly shall be UL Listed for the fire service. The Focus series lights specified shall be manufactured by Fire Research.

The top of the light heads shall be flush with the top of the cab in the stowed position.

The light heads shall each be equipped with an on/off switch.

There shall be two (2) tripod telescopic lights furnished and installed, allowing use on the vehicle as a telescopic light or detached from the vehicle, supported by the tripod base. The light pole shall be raised from the top and have a friction type lock.

There shall be two (2) outlets installed. The outlets shall be 120 vac/15 amp twist lock (NEMA L5-15), single receptacle with a weatherproof cover.

One (1) outlet shall be located at the left rear cab face.

One (1) outlet shall be located at the right rear cab face.

Two (2) light(s) shall be mounted on the rear face of the custom chassis cab.

BODY PUSH UP TELESCOPING LIGHTS

Two (2) light heads shall each be 1000 watts, 220 volt models. Each entire light assembly shall be UL Listed for the fire service. The Focus series lights specified shall be manufactured by Fire Research.

The top of the light heads shall be flush with the top of the body sides in the stowed position.

240VOLT LIGHTS SWITCHED ON PUMP PANEL

The 240volt lights shall be switched by a 12v weather proof push button switch and relay on the pump panel.

The switch to be labeled as follows:

Body Quartz Lights

Two (2) 48" light poles shall have a friction type lock to hold the pole in the extended position. Each shall be raised using a grip handle located at the bottom of the pole. There shall be a retractile cord at the pole bottom, connected to the circuit breaker panel on the apparatus.

The lights shall have the grab handle feature and SR steady rest. The steady rest shall be installed just above the tail lights.

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Two (2) light(s) shall be mounted on the rear face of the apparatus body.

ELECTRICAL CORD REEL

There shall be one (1) Hannay ECR-1618-17-18 series electric rewind cord reel furnished and installed on the apparatus. A push button weather proof switch to activate the rewind shall be located on the curbside of the pump house side panel (non removable portion of the panel). The reel shall have a four way roller assembly mounted on the reel to guide the cord on and off of the spool. There shall also be a cord stop supplied for the reel. The reel shall come equipped with 200 feet of yellow 10-3 electrical cord.

The cord shall terminate in a NEMA L5-30R receptacle end.

The cord reel shall be located inside the upper portion of the pumphouse on the curbside. There shall be a door fabricated out of the same material as the pumphouse side panels. The door shall be top hinged with two (2) gas shocks and two (2) push button type locking devices.

UNDERCOATING

The under structure of apparatus body shall be completely undercoated.

REFLECTIVE STRIPING

There shall be a 4" inch reflective "Scotch-lite" stripe with a two (2) 1" accent stripes applied to the outside perimeter of the chassis and apparatus.

The reflective striping shall be applied around the perimeter of the front of the apparatus in a straight line. In addition, when the stripe reaches the front area of the body, the stripe shall jog in a 'Z' pattern, then continuing around the rear of the apparatus at a slightly lower level.

The reflective striping shall be white in color.

LICENSE PLATE BRACKET

Provisions for mounting a license plate shall be installed on the apparatus in conjunction with the proper illumination to meet DOT requirements.

EQUIPMENT

The following equipment shall be supplied by Crimson Fire:

ZICO WHEEL CHOCKS

One (1) set of NFPA compliant Ziamatic folding wheel chocks model # SAC-44 shall be supplied with the apparatus

ZICO WHEEL CHOCK MOUNTING BRACKETS

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One (1) set Ziamatic folding wheel chock underbody horizontal mounts model # SAC-44-H shall be furnished and installed on the apparatus under the body in front of the rear wheels.

GROUND LADDERS

one (1) Duo-Safety 24' two (2) section aluminum extension ladder, model 900A

one (1) Duo-Safety 14' aluminum roof ladder with folding hooks, model 775A

one (1) Duo-Safety 10' folding aluminum attic ladder, model 585A

PIKE POLES

one (1) Duo-Safety 10' pike pole with fiberglass handle

one (1) Duo-Safety 8' pike pole with fiberglass handle.

RECHARGEABLE FLASHLIGHTS

There shall be two (2) hand held Streamlite #45107 liteboxes with 12 volt chargers furnished and installed on the apparatus, wired to the batteries.

The two (2) lights shall be vertically mounted in the crew area (centered) on the rearward wall of the doghouse with the lamp head facing upward.