

**INVITATION TO BID
TANKER TRUCK FABRICATION
BID NO. 2019-D**

Please be advised that Columbia County desires to accept bids on the above referenced item. Bids will be accepted until 2:00 P.m. on April 17, 2019 in the office of the Board of County Commissioners located at 135 NE Hernando Ave. Room 203, Lake City, Florida 32055.

Specifications and bid forms may be downloaded at the County web site:

<http://www.columbiacountyfla.com/PurchasingBids.asp>

Columbia County reserves the right to reject any and/or all bids and to accept the bid in the County's best interest.

**Columbia County, Florida
Purchasing Department
General Instructions to Bidders**

These instructions will bind bidders and conditions herein set forth, except as specifically qualified in special bid and contract terms issued with any individual bid.

1. The following criteria are used in determining low responsible bidder:

- A. The ability, capacity and skill of bidder to perform required service.
- B. Whether the bidder can perform service promptly or within specified time.
- C. The character, integrity, reputation, judgment, experience and efficiency of bidder.
- D. The performance of previous contracts with Columbia County.
- E. The suitability of equipment or material for county use.
- F. The ability of bidder to provide future maintenance.

2. Payment Terms are net (30) unless otherwise specified. Favorable terms, discounts, may be offered and will be considered in determining low bids if they are deemed by Purchasing Department to be advantageous to the County.

3. All bids should be tabulated, totaled and checked for accuracy. Unit price will prevail in case of errors.

4. All requested information shall be included in the envelope. All desired information must be included for your bid to receive full consideration.

5. If anything on the bid request is not clear, you should contact the Purchasing Director immediately.

6. A bidders list is available at the Purchasing Office.

7. Quote all prices F.O.B. our warehouse or as specified in bid documents.

8. Each proposal shall be clearly marked on the outside of the envelope including Fed Ex, UPS or other delivery service envelopes, as a sealed bid. The name of the item being bid shall be shown on the outside in full.

9. No responsibility shall attach to any County representative or employee for the premature opening of bids not properly addressed or identified.

10. If only one (1) bid is received, the bid may be rejected and re-advertised or excepted if determined to be in the counties best interest.

11. Bids received late will not be accepted, and the County will not be responsible for late mail delivery.

12. Telephone and facsimile bids will not be acceptable in formal bid openings (sealed bids). Should a bid be misplaced by the County and found later, it may be considered. Any bidder may request and shall receive a receipt showing the day and time any bid is delivered to the appropriate office of the County from the personnel thereof.

13. Bids requiring bid bonds will not be accepted if bond is not enclosed. Cash or certified check will be accepted in lieu of bond except on construction projects where cost exceeds \$40,000.
14. All bidders must be recognized dealers in the materials or equipment specified and is qualified to advise in their application or use. A bidder at any time requested must satisfy the Purchasing Office and the County Manager that he has the requisite organization, capital, plant, stock ability and experience to satisfactorily execute the contract in accordance with the provisions of the contract in which he is interested.
15. Any alterations, erasures, additions, or admissions of required information or any changes to specifications or bidding schedule are done at the risk of the bidder. Any bid will be rejected that has a substantial variation, that is; a variation that affects price, quantity, and quality or delivery date (when delivery is required by a specific time).
16. When requested, samples will be furnished to the County free of expense, properly marked for identification and accompanied by a list where there is more than one (1) sample. The County reserves the right to mutilate or destroy any sample submitted whenever it may be to the best interest of the County to do so for the purpose of testing.
17. The County will reject any material, supplies or equipment that did not meet the specifications, even though the bidder lists the trade names or names of such material on the bid or price quotation form.
18. The unauthorized use of patented articles is done entirely at the risk of the successful bidder.
19. The ESTIMATED QUANTITY given in the specifications or advertisements is for the purpose of bidding only. The County may purchase more or less than the estimated quantity and the vendor must not assume that such estimated quantity is part of the contract.
20. Only the latest model equipment as evidenced by the manufacture's current published literature will be considered. Obsolete models of equipment not in production will not be acceptable. The equipment shall be composed of new parts and materials. Any unit containing used parts or having seen any service other than the necessary tests will be rejected. In addition to the equipment specifically called for in the specification, all equipment catalogued by the manufacturer as standard or required by the State of Florida shall be furnished with the equipment. Where required by the State of Florida Motor Vehicle Code, vehicles shall be inspected and bear the latest inspection sticker of the Florida Department of Revenue.
21. The successful bidder on motor vehicle equipment shall be required to furnish with delivery of vehicle, certificate of origin and any other appropriate documentation as required by the Florida Motor Vehicle Department.
22. Prospective bidders are required to examine the location of the proposed work or delivery and determine, in their own way, the difficulties, which are likely to be encountered in the prosecution of the same.
23. All materials, equipment and supplies shall be subject to rigid inspection, under the immediate supervision of the Purchasing Department, its designee and /or the department to which they are delivered. If defective material, equipment, or supplies are discovered, the contractor, upon being instructed by the Purchasing Department or designee, shall remove, or make good such material, equipment, or supplies without extra compensation. It is expressly understood and agreed that the inspection of materials by the County will in no way lessen the responsibility of the Contractor release him from his obligation to perform and deliver to the

County Sound and satisfactory materials, equipment, or supplies. The Contractor agrees to pay the costs of all tests upon defective material, equipment, or supplies or allow the costs to be deducted from any monies due him from the County.

24. Unless otherwise specified by the Purchasing Department all materials, supplies, or equipment quoted herein must be delivered within thirty (30) days from the day of notification or exceptions noted on bid sheets.

25. A contract will not be awarded to any corporation, firm, or individual who is, from any cause, in arrears to the County or who has failed in former contracts with the County to perform work satisfactorily, either to the character of the work, the fulfillment or guarantee, or the time consumed in completing the work.

26. Reasonable grounds for supposing that any bidder is interested in more than one proposal for the same item will be considered sufficient cause for rejection of all proposals in which he is interested.

27. Submitting a proposal when the bidder intends to sublet the contract may be a cause for rejection of bids or cancellation of the contract by the County Manager.

28. Unless otherwise specified the County reserves the right to award each items separately or on a lump sum basis whichever is in the best interest of the County.

29. The County reserves the right to reject any and/or all quotations, to waive any minor discrepancies in the bids for all bidders equally, quotations, or specifications, when deemed to be in the best interest of the County and also to purchase any part, all or none of the materials, supplies, or equipment specified.

30. Failure of the bidder to sign the bid or have the signature of an authorized representative or agent on the bid proposal in the space provided will be cause for rejection of the bid. Signature must be written in ink. Typewritten or printed signatures will not be acceptable.

31. Any bidder may withdraw his bid at any time before the time set for the opening of the bids. No bid may be withdrawn in the thirty- (30) day period after bids are opened.

32. It is mutually understood and agreed that if at any time the Purchasing Department or designee shall be of the opinion that the contract or any part thereof is unnecessarily delayed or that the rate of progress or delivery is unsatisfactory, or that the contractor is willfully violating any of the conditions or covenants of the agreement, or executing the same in bad faith, the Purchasing Department or his designee shall have the power to notify the aforesaid contractor of the nature of the complaint. Notification shall constitute delivery of notice, or letter to address given in the proposal. If after three (3) working days of notification the conditions are not corrected to the satisfaction of the Purchasing Director, he shall thereupon have the power to take whatever action he may deem necessary to complete the work or delivery herein described, or any part thereof, and the expense thereof, so charged, shall be deducted from any paid by the County out of such monies as may become due to the said contractor, under and by virtue of this agreement. In case such expense shall exceed the last said sum, then and in that event, the bondsman or the contractor, his executors, administrators, successors, or assigns, shall pay the amounts of such excess to the County on notice made by the Purchasing Department or his designee of the excess due.

33. If the bidder proposes to furnish any item of foreign make or product, he shall write "foreign" together with the name of the originating country opposite such item on a proposal.

34. Any complaint from bidders relative to the invitation to bid or attached specifications shall be made prior to the time of opening bids; other wise, the bidder waives any such complaint.

35. Contracts may be cancelled by the County with or without cause on thirty- (30) days advance written notice.

36. All contractors submitting bids for road projects in excess of \$150,000 must be pre-qualified with the Florida Department of Transportation and shall provide proof of such qualification upon request.

37. Any bidder affected adversely by an intended decision with respect to the award of any bid, shall file with the Purchasing Department for Columbia County, a written notice of intent to file a protest not later than seventy-two (72) hours (excluding Saturdays, Sundays and legal holidays), after the posting of the bid tabulation. Protest procedures may be obtained in the Purchasing Department.

38. A person or affiliate who has been placed on the convicted vendor's list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to Columbia County, may not submit a bid on a contract with Columbia County for the construction or repair of a public building or public work, may not submit bids on leases of real property to Columbia County, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with Columbia County, and may not transact business with Columbia County for a period of 36 months from the date of being placed on the convicted vendor list.

39. Vendor/Contractor shall utilize the U.S. Department of Homeland Security's E-Verify system, in accordance with the terms governing use of the system, to confirm the employment eligibility of;

A. all persons employed by the Vendor/Contractor during the term of the Contract to perform employment duties within Florida; and

B. all persons, including subcontractors, assigned by the Vendor/Contractor to perform work pursuant to the contract with the County.

SPECIFICATIONS

PROPRIETARY PARTS

It is the intention of the purchaser for all bidders to furnish the apparatus with major parts commonly used by the heavy-duty truck manufacturers and open market vendors whereas replacement parts are more readily available and at reduced cost. The use of proprietary parts may not be acceptable to the purchaser.

MANUFACTURER'S DISCRETION

Materials, parts, or procedures used are subject to change at manufacturer's discretion at any time to provide equal or better products.

PRODUCT QUALITY AND WORKMANSHIP

The components provided and workmanship performed shall be of the highest quality available for this application. Special consideration shall be given to the following areas:

- A). Accessibility to various components that require periodic maintenance or lubrication checks.
- B). Ease of vehicle and pump operation.
- C). Features beneficial to the intended operation of the apparatus.

Construction of the complete apparatus shall be designed to carry the loads intended to meet the road and terrain conditions and speed requirements desired when specified by the purchaser.

Welding shall not be employed in the assembly of the apparatus in a manner that will prevent the removal of any major component part for service and/or repair.

FUEL TANK FILLED AT DELIVERY

The fuel tank and DEF tank (if applicable) shall be filled upon final delivery at the factory.

PLUMBING WARRANTY, TEN YEAR

A Stainless Steel Plumbing/Piping warranty shall be provided by the apparatus manufacturer for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of ten (10) years effective upon final payment in full by the Purchaser, and pick up or delivery of the completed apparatus to the Purchaser. Any unauthorized alterations or modifications to the plumbing shall void this warranty.

PAINT WARRANTY, FIVE YEAR

The finish paint as used on the proposed apparatus shall be warranted against defects in materials and workmanship for a prorated period of five (5) years, effective upon final payment in full by the Purchaser, and pick up or delivery of the completed apparatus to the Purchaser. Any unauthorized alterations or modifications to the apparatus shall void this warranty.

TANK WARRANTY, LIFETIME

For normal fire department applications, the tank shall have a limited Lifetime warranty that provides warranty service for the life of the fire apparatus in which the tank is installed. Warranties are transferable if the apparatus ownership changes by requesting the transfer from UPF. In applications where the tank will be subject to severe conditions, the tank may have a warranty unique to the application that is clearly defined for each such application.

APPARATUS ELECTRICAL WARRANTY, TWO YEAR

The apparatus electrical system as detailed herein shall have a electrical warranty against defects in materials and workmanship for a period of two (2) years, effective upon final payment in full by the Purchaser, and pick up or delivery of the completed apparatus to the Purchaser. Any unauthorized alterations or modifications to the electrical system shall void this warranty.

APPARATUS DIMENSIONS

These are standard truck dimensions. Changes in configuration or additional options may affect these dimensions. The contract specification shall contain the exact dimensions.

OVERALL HEIGHT

The overall height shall be 9' 6".

OVERALL LENGTH

The overall length shall be no longer than 32 feet.

OVERALL WIDTH

The overall width of the body shall be no more than 96.00" inches wide. The chassis mirrors will extend out past this width, but no more than 110.00".

OVERALL WHEELBASE

No overall wheelbase restriction has been specified for this apparatus.

PUMP MODULE WIDTH

No pump module width restriction has been specified for this apparatus.

ANGLE OF APPROACH

The angle of approach for the apparatus shall not be less than eight (8) degrees as specified by the current edition of NFPA 1901/ 1906.

ANGLE OF DEPARTURE

The angle of departure for the apparatus shall not be less than eight (8) degrees as specified by the current edition of NFPA 1901/ 1906.

NFPA COMPLIANCE

The National Fire Protection Association standard #1901 (most recent edition) is hereby adopted and made a part of these specifications, the same as if they were written out in full detail, insofar as they apply with the exception of any sections dealing with "Equipment Recommended for Various Types of Apparatus". Bidders are to provide only the equipment requested herein and the Department will supply the rest before the apparatus is put into service. The unit shall comply with all federal, state, ICC, and DOT motor vehicle regulations, standards, and laws relating to commercial vehicles as well as to fire apparatus on the date of the bid.

ROAD TEST CERTIFICATION

A road test shall be conducted with the finished apparatus fully loaded. During this time, the apparatus shall not show loss of power and/or overheating. The transmission driveshaft or shafts and rear axle shall run free from abnormal vibration or noise throughout the operating range of the apparatus. The apparatus, when loaded, shall have not less than 25% or more than 45% of the weight on the front axle and not less than 55% or more than 75% on the rear axle.

- A). The apparatus must be capable of accelerating to 35 mph from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed RPM of the engine.
- B). The apparatus must be capable of accelerating from a steady speed of 15 mph to a true speed of 35 mph within 30 seconds. This shall be accomplished without moving the gear selector.
- C). The fully loaded apparatus shall be capable of obtaining a speed of 50 to 55 mph on a level concrete highway.

- D). The manufacturer shall furnish copies of the engine installation approvals signed by the appropriate engine company upon delivery of the chassis to the Fire Department.
- E). The manufacturer shall furnish copies of the transmission approval signed by the transmission manufacturer upon delivery of the chassis to the Fire Department.
- F). The manufacturer shall furnish copies of the front and rear axle approvals upon delivery of the apparatus to the Fire Department.

ROAD TEST FAILURE

In the event the apparatus fails to meet the test requirements of these specifications on the first trials, second trials may be made at the option of the manufacturer within thirty (30) days of the first trials. Such trials shall be final and conclusive and failure to comply with changes, as the purchaser may consider necessary to conform to any clause of the specifications within thirty (30) days after notice is given to the manufacturer of such changes, shall be cause for rejection of the apparatus. Permission to keep or store the apparatus in any building owned or occupied by the purchaser, or its use by the purchaser during the above-specified period with permission of the manufacturer, shall not constitute acceptance.

VEHICLE TOP SPEED

The rear axle shall be geared for a top speed of 60 mph at engine governed RPM.

NFPA TOP SPEED STATEMENT

NFPA-1901, 2009 Edition - 4.15.2. The maximum top speed of fire apparatus with a GVWR over 26,000 lbs. shall not exceed either 68 MPH or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

NFPA-1901, 2009 Edition - 4.15.3. If the combined water tank and foam agent tank capacities on the fire apparatus exceed 1250 gallons, or the GVWR of the vehicle is over 50,000 lbs., the maximum top speed of the apparatus shall not exceed either 60 MPH or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

CAB SAFETY SIGNS

The following safety signs shall be provided in the cab:

- A label displaying the maximum number of personnel the vehicle is designed to carry shall be visible to the driver.
- "Occupants shall be seated and belted when apparatus is in motion" signs shall be visible from each seat.

- “Do Not Move Apparatus When Light Is On” sign adjacent to the warning light indicating a hazard if the apparatus is moved (as described in subsequent section).
- A label displaying the height, length, and GVWR of the vehicle shall be visible to driver.

CHASSIS DATA LABELS

The following information shall be on labels affixed to the vehicle:

Fluid Data:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid
- Pump primer fluid (if applicable)
- Drive axle(s) lubrication fluid
- Air conditioning refrigerant
- Air conditioning lubrication
- Power steering fluid
- Cab tilt mechanism fluid (if applicable)
- Transfer case fluid
- Equipment rack fluid (if applicable)
- Air compressor system lubricant
- Generator system lubricant (if applicable)

Chassis Data:

- Chassis Manufacturer
- Production Number
- Year Built
- Month Manufactured
- Vehicle Identification Number

Location shall be in the driver's compartment of the chassis cab.

"NO RIDE" LABEL

A label shall be located on the vehicle at the rear step areas, and at any cross walkways, if they exist. The label(s) shall warn personnel that riding in or on these areas while the vehicle is in motion is prohibited.

DO NOT WEAR HELMET LABEL

One (1) label shall be provided stating "DO NOT WEAR HELMET WHILE SEATED", and shall be visible from each seated position.

COMMERCIAL CHASSIS SPECIFICATION

CHASSIS PROVIDER

The chassis, as detailed in these specifications, shall be ordered and supplied by the apparatus manufacturer.

MAKE: Kenworth
MODEL: T300 Series
CAB: Conventional
YEAR: 2019
APPLICATION: Fire Truck Service

CAB

Two Door Curved Glass Conventional

Cab Includes aluminum & fiberglass fully hucked cab w/ all aluminum bulkhead doors & continuous stainless steel piano-style door hinges. Single electric horn standard. Incandescent exterior lights include diagnosable bulb detection and warning. Trailer cable on tractors includes integrity detection. Standard features include multiplex wiring for interior lights, automated pre-trip inspection, short and open check diagnostics. Warning alarm will sound when lights are left on.

CAB EQUIPMENT

Single-piece Windshield

Hood: Sloped aerodynamic hood includes grill and separate bumper.

Dash mounted air cleaner restriction gauge

Instrument package (speedometer, tachometer, fuel gauge, DEF level gauge, engine coolant temperature gauge, engine oil pressure, voltmeter.)

Self-canceling turn signals with head light dimmer.

Left Hand & Right Hand NFPA compliant grab handles

Daylite doors, includes right hand peeper window.

Four position ignition switch, keyless. (NFPA)

Electric windshield wipers, 2-speed plus intermittent

Electric windshield washers

Solid rear wall. Deletes rear cab window

Glove box door with locking latch
Dash mounted cruise control
Turn signal switch with column mounted dimmer
Inside sun visor, LH/RH
Dome lamp over driver door.

Under-dash center console with two (2) cup holders, one (1) ashtray, one (1) lighter, one (1) 12V outlet, and a storage compartment.

NFPA compliance kit (seat sensors, seatbelt switches, VDR harness)

Cab heater: with integral defrosters and A/C 45,000 btu cab heater. Includes a 5 mode rotary control.
Adjustable telescoping tilt steering column.

DRIVER'S SEAT

The driver's seat shall be a Kenworth air cushion plus High Back vinyl with dual arm rests. It shall have a RED NFPA compliant seat belt, and a pressure sensor for the seat belt monitor.

PASSENGER'S SEAT

The passenger's seat shall be a High Back vinyl with dual armrests. It shall have a RED NFPA compliant seat belt, and a pressure sensor for the seat belt monitor.
An accessible tool box shall be located below the seat.

RADIO

Kenworth radio with AM/FM, Weatherband with USB and Bluetooth

MIRRORS

Dual Kenworth aerodynamic heated motorized 7 in. x 13 in. mirror w/ chrome shell. LH/RH convex mirrors 5 in. x 7 in. heated. Mirror brackets set for 8 1/2 ft. load width. The switch shall be located on the door pad.

SUNVISOR

Aerodynamic sun visor with integral marker lights

FRAME & EQUIPMENT

Frame rails 10-5/8 x 3-1/2 x 5/16in steel
120,000 psi yield
Heat treated

FUEL TANK & EQUIPMENT

The chassis shall have a fifty six (56) gallon fuel tank. It shall be constructed of aluminum. It shall be attached to the chassis using polished stainless steel mounting straps.

The fuel tank shall have a polished finish.

DIESEL EXHAUST FLUID TANK

A polyethylene tank for Diesel Exhaust Fluid (DEF) shall be installed. The tank shall have a capacity of eleven (11) gallons of useable volume. The tank will be located just rearward of the fuel tank. Required capacity is calculated by fuel capacity of the vehicle and is a minimum of 6% by volume. This capacity will accommodate two (2) diesel re-fillings for every DEF re-filling.

BUMPER

Aerodynamic Chrome

DIESEL ENGINE

The chassis shall be powered by a Paccar (Cummins) diesel engine as described below:

MODEL:	PX-9EV (ISL9)
NUMBER OF CYLINDERS:	Six
BORE AND STROKE:	4.49 in (114 mm) x 5.71 in (145mm)
DISPLACEMENT:	8.9L
RATED BHP:	380 hp @ 2000 RPM
TORQUE:	1150 lb-ft @ 1400 RPM
GOVERNED RPM:	2200

Emergency Vehicle includes turbo exhaust brake, no code is used. Diagnostic Plug for data link, Oil Cooler, Aluminum Flywheel Housing.

Air compressor: Cummins 18.7 CFM

Air Cleaner: Dry-type firewall mounted w/filter restriction indicator.

Air inlet ember separator NFPA compliant for fire applications.

Cooling module: 1000 square inches

Fleetguard filter/Water separator FS1003 w/WIF (water in fuel) sensor. For PACCAR PX-8 or Cummins ISL engines.

Bendix 6S/6M ABS w/ATC and Electronic Stability Control

Engine idle shutdown timer disabled

ENGINE WARRANTY

The engine shall come with a **five (5) year** or **100,000 mile** warranty provided by the engine manufacturer.

EXHAUST BRAKE

Paccar turbo exhaust brake with switch on dash.

EXHAUST

RH under cab SCR for PX-9 w/ single horizontal tailpipe.

ALTERNATOR

320 amp Delco 40Si brushless alternator w/ battery voltage sensor.

BATTERY SYSTEM

A single starting battery system shall be provided consisting of three (3) 12 volt, PACCAR GP31, threaded post, 700 CCA, dual purpose, maintenance-free batteries. The battery system shall have a total of 2100 CCA (cold cranking amps).

BATTERY BOX

Steel parallel under cab with aluminum diamond plate cover w/ step w/ aluminum step brackets.

Block heater: 1000 watt, 120V for PX-9 or ISL9 engines.

AUTOMATIC TRANSMISSION

The automatic transmission shall be an Allison 5-speed, model EVS 3000 with electronic controls.

The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

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
Rev	5.03:1

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

TRANSMISSION WARRANTY

The transmission shall have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty to be provided by Allison Transmission and not apparatus builder.

FRONT AXLE

The front axle shall be a Meritor Easy Steer Non drive front axle, model number MFS-14, with a ground rating capacity of 14,600 lb.

FRONT SUSPENSION

- Taperleaf
- Capacity at Ground: 14,600 lb

Shock absorbers shall be provided on the front axle.

STEERING

Steering shall consist of a single 14.6k power steering gear.

REAR AXLE & EQUIPMENT

The rear axle shall be a tandem Meritor MT40-14x4 Hypoid rear axle with a ground rating capacity of 40,000 pounds, with heavy-wall housing.

Spring Brake: 3036 dual 30 square inches; 36 square inches spring chamber.

Interaxle driveline 1 SPL170XL.

Gear Ratio: 5.29

REAR SUSPENSION

Tandem Hendrickson RT403 40K. 52" axle spacing. 7.19" saddle height w/ barpin bushing. Unladen Height: 10.7" Laden Height: 9.7".

ANTI-LOCK BRAKE SYSTEM

The vehicle shall be equipped with an anti-lock braking system. The **ABS** shall provide anti-lock braking control on both the front and rear wheels. It is to be a digitally controlled system that utilizes microprocessor technology to control the anti-lock braking system. Each wheel is to be monitored by the system. When any particular wheel begins to lockup, a signal is to be sent to the control unit. This control unit then shall reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system shall eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

ELECTRONIC STABILITY PROGRAM

A Bendix 6S/6M anti lock brake system (ABS) with air traction control (ATC) and electronic stability program (ESP) shall be provided.

PARKING BRAKE

The parking brake shall be spring set and located on the rear axle service brake.

FRONT BRAKES

The front brakes shall be Bendix 16-1/2" x 5" cast drums, aluminum 10-bolt hub pilot LMS hubs, hubcaps, oil seals, and automatic slack adjusters.

REAR BRAKES

Dual 46K Air Brake package includes 16-1/2" x 7" brakes, cast drums, aluminum 10-bolt hub pilot hubs, slack adjusters and oil seal.

FRONT TIRES

The front tires shall be Goodyear 12R-22.5 16PR "H" tubeless radial G661 HSA mixed service tread.

The rear tire stamped load capacity shall be 27,120 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

REAR TIRES

The rear tires shall be Goodyear 11R-22.5 16PR "H" tubeless radial G182 RSD all-weather tread.

The rear tire stamped load capacity shall be 24,020 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

FRONT WHEELS

Kenworth 7-spoke 88768 22.5x8.25 aluminum with Lvl One [TM] finish, hub pilot mount. 7300lb. maximum rating. Level 1 finish.

REAR WHEELS

Kenworth 7-spoke 88768 22.5x8.25 aluminum with Lvl One [TM] finish, hub pilot mount. 7300lb. maximum rating. Level 1 finish.

CHASSIS PAINT COLOR

The cab shall be painted a single color.

Color: Red

Paint Number: TBD

AIR HORNS

Two (2) Grover chrome plated air horns shall be installed at the front of the vehicle. The air horns shall be mounted in full compliance of NFPA. The supply lines shall be dual 1/4" lines with equal distance from each horn.

Each air horn shall be mounted, one (1) each side, on the side of the hood.

Both air horns shall be controlled by the horn on the KW steering wheel.

ELECTRIC TRAFFIC HORN AND AIR HORN SELECTOR SWITCH

One (1) selector switch shall be provided on the cab's dash that will allow the chassis steering wheel horn button to activate either the electric traffic horn or air horn system.

CAB STEPS

The cab steps shall be left as it comes from the chassis OEM, NO modifications shall be made by the apparatus manufacturer.

HELMET STORAGE, PROVIDED BY PURCHASER

NFPA 1901, 2009 edition, section 14.1.8.4.1 requires a location for helmet storage be provided.

There is no helmet storage on the apparatus as manufactured. The Purchaser shall provide a location for storage of helmets.

TIRE PRESSURE MONITORING

The apparatus shall be provided with tire pressure indicating valve stem caps. The indicators shall be installed on each tire and be a heavy duty design manufactured specifically for trucks. When tire is properly inflated, the indicator inside the cap shall be green, and when the tire is underinflated by 10%, the indicator inside the cap shall be red.

HUB COVERS (front)

Stainless steel hub covers shall be provided on the front axle.

HUB COVERS (rear)

A pair of stainless steel high hat hub covers shall be provided on each of the rear axle hubs.

COVERS, LUG NUT, CHROME

Chrome lug nut covers shall be supplied on front and rear wheels.

EXHAUST SYSTEM

The chassis exhaust system shall be left as it comes from the chassis OEM, NO modifications shall be made by the apparatus manufacturer.

CHASSIS TOW HOOKS

The front tow hooks shall be supplied by the chassis manufacturer.

REAR TOW PLATES

Two (2) rear tow plates with 1-1/2" I.D. holes, constructed with 1" steel plate shall be provided on the apparatus. These shall be located below the apparatus body and fastened to the rear chassis frame rails.

FRONT MUD FLAPS

A pair of black rubber mud flaps shall be provided and installed behind the front wheels by the chassis manufacturer.

REAR MUD FLAPS

A pair of black rubber mud flaps, with the Manufacturer's logo, shall be provided and installed behind the rear wheels.

VEHICLE DATA RECORDER

The apparatus shall be equipped with a Class1 "Vehicle Data Recorder and Seat Belt Warning System" (VDR/SBW) that is connected to the power train CAN (Controller Area Network) bus consisting of transmission (TCM), engine control (ECM) and antilock brake (ABS) modules mounted on the apparatus. The VDR/SBW will function per NFPA 1901-2009 sections 4.11 (Vehicle Data

Recorder) utilizing the power train's J1939 data and 14.1.3.10 (Seat Belt Warning) using the Class1 "Seat Belt Input Module" for seat occupied and belt status information.

The VDR data shall be downloadable by USB cable to a computer using either Microsoft™ or Apple™ Operating Systems using Class 1/ O.E.M. supplied reporting software.

SEAT BELT WARNING SYSTEM

There shall be a seat belt indicator system supplied in the cab. The indicator system shall indicate seat belt use for each individual seating position when the seat is occupied, the seat belt remains unfastened and the parking brake is released.

A display panel shall be supplied in the dash area. The panel shall have an audible indicators and a red light display to indicate that a seat belt has not been fastened.

VEHICLE DATA RECORDER DOWNLOAD HARNESS

A Class1 model #629-00025 USB VDR download harness shall be supplied with the system to allow the data to be downloaded to a computer.

CENTER CONSOLE

A center console shall be furnished and shall be located between the driver and officer's seats. The top face of the console shall be designed as the switch panel for all emergency light switches.

KEYLESS IGNITION SWITCH

One (1) non-removable, keyless style ignition switch shall be provided with the chassis.

MASTER BATTERY SWITCH (Chassis Provided)

A master battery switch shall be provided as detailed in the chassis specifications.

BACK-UP ALARM

One (1) 97 DB back up alarm shall be provided and installed at the rear of the unit. It shall be wired to activate when the transmission is placed in reverse.

PUMP, MODULE, AND RELATED ITEMS

NFPA 1901 COMPLIANT PUMP

The fire pump and related plumbing on the specified apparatus shall be installed in accordance with applicable NFPA 1901 guidelines at the time the contract was placed.

DARLEY HM SERIES PTO PUMP OR ITS EQUIVALENT

A Darley model HM single stage fire pump or its equivalent shall be provided and installed. Power to drive the pump shall be provided by the same engine used to propel the apparatus. The pump shall be midship mounted and designed to operate through a hot-shift transmission PTO. The pump is to be placed in gear from the chassis cab with a pump shift mechanism.

Pump casing shall be a fine grain cast iron, with a minimum tensile strength of 30,000 PSI. Pump shall contain a cored heating jacket feature that, if selected, can be connected into the vehicle coolant system to protect the pump from freezing in cold climates, and to help reject engine heat from engine coolant, providing longer life for the engine.

PUMP SHAFT

The pump shaft shall be splined to receive broached impeller hubs, for greater resistance to wear, torsional vibration, and torque imposed by engine, as well as ease of maintenance and repair.

Bearings provided shall be heavy duty, deep groove, radial-type ball bearings. Sleeve bearings on any portion of the pump or transmission shall be prohibited due to wear, deflection, and alignment concerns. The bearings shall be protected at all openings from road dirt and water splash with oil seals and water slingers.

IMPELLER

The impeller shall be a high strength bronze alloy, splined to the pump shaft for precision fit, durability, and ease of maintenance.

Impeller shaft oil seals shall be constructed to be free from steel components except for the internal lip spring. The impeller shaft oil seals shall carry a lifetime warranty against damage from corrosion from water and other firefighting fluids.

PUMP TRANSMISSION

The pump transmission case shall be heavy-duty cast iron with adequate oil reserve capacity to maintain low operating temperature. Pump ratio to be selected by the manufacturers engineering department. Gears shall be helical in design and precision ground for quiet operation and extended life. Gears to be cut from high strength alloy steel, ground, and carburized. Chain drive and/or design requiring extra lubricating pump is not acceptable.

Pump drive shaft shall be precision ground, heat-treated alloy steel, with a 1-3/8 spline. Gears shall be helical design, and shall be precision ground for quiet operation and extended life.

The pump transmission shall require no further lubrication beyond that provided by the intrinsic action of the gears, to reduce the likelihood of failure due to loss of auxiliary lubrication.

SIX YEAR FIRE PUMP WARRANTY

A six (6) year warranty for the fire pump shall be provided.

MIDSHIP FIRE PUMP DRIVESHAFTS AND INSTALLATION

The midship PTO fire pump shall be installed and shall include installation of the fire pump, modification and/or fabrication of new drivelines and all pump-mounting brackets.

DARLEY MECHANICAL SEAL

The fire pump shall be furnished with a Darley maintenance free mechanical seal; manufactured using the material silicon carbide or its equivalent. The mechanical seal shall be a non-contacting, non-wearing dual seal design. The lip seal shall eliminate leakage on a wet pump while parked on standby. The second seal shall allow a drip rate for cooling and lubrication while pumping.

500 GPM FIRE PUMP SPECIFICATIONS

The centrifugal type fire pump shall be a Darley model HM midship mounted or its equivalent with a rated capacity of 500 GPM. The pump shall meet NFPA 1901 requirements.

The pump shall be certified to meet the following deliveries:

500 gpm (1892 L/M) @ 150 psi (10.3 bar)
350 gpm (1324 L/M) @ 200 psi (13.8 bar)
250 gpm (946 L/M) @ 250 psi (17.2 bar)

LEFT SIDE INLET - 4.00"

One (1) 4.00" suction steamer inlet with male NH threads shall be provided, on the left side pump panel. The inlet shall have a removable screen.

INTAKE TRIM RING WITH WARNING LABEL - BURGUNDY

An Innovative Controls chrome plated molded plastic trim ring shall be installed for the pump intake. A warning label shall be installed on the bezel that states the following: "WARNING: Do not supply inlet with a pressurized source when valve is closed. Serious injury or death can result."

INLET CAP

One (1) 4.00" chrome plated cap with long handle NST threads shall be provided.

The cap shall be the vented type design to automatically relieve stored pressure in the line when disconnected.

RIGHT SIDE INLET - 4.00"

One (1) 4.00" suction steamer inlet with male NH threads shall be provided, on the right side pump panel. The inlet shall have a removable screen.

INTAKE TRIM RING WITH WARNING LABEL - BURGUNDY

An Innovative Controls chrome plated molded plastic trim ring shall be installed for the pump intake. A warning label shall be installed on the bezel that states the following: "WARNING: Do not supply inlet with a pressurized source when valve is closed. Serious injury or death can result."

INLET CAP

One (1) 4.00" chrome plated cap with long handle NST threads shall be provided.

The cap shall be the vented type design to automatically relieve stored pressure in the line when disconnected.

PUMP SHIFT - PTO - STATIONARY PUMPING

One (1) PTO shall be installed to drive the fire pump. An electrically activated switch shall be installed in the cab to engage the fire pump. Safety interlocks shall be provided to ensure the pump drive system components are properly engaged to safely operate the pump. Pump shifting instructions shall be provided at the pump shifting location.

The following indicator lights shall be provided and installed:

A green indicator light labeled "**PUMP ENGAGED**" shall be located in cab and indicate that the pump shift has successfully been completed.

A green indicator light labeled "**OK TO PUMP**" shall be located in the cab, and indicate that the pump is engaged, the chassis transmission is in neutral, and the parking brake is engaged.

PLUMBING SYSTEM

The plumbing system shall consist stainless steel hard piping, or flexible high pressure hose, as deemed necessary for the application. Upon completion, the entire system shall be fully pressure tested.

Each gated intake shall be equipped with a 0.75" bleeder valve located in close proximity to the intake. All intakes shall be provided with suitable closures (valves or caps) capable of withstanding 500 PSI.

When any 3.00" or larger intake or discharge is gated (except tank to pump valve), the valve shall have a mechanism to allow the valve to fully open or fully close no faster than 3 seconds.

Any 2.50" or larger discharge outlet, mounted 42.00" or higher from ground, which hose is to be connected, and which is not in a hose storage area, shall be supplied with a sweep elbow of at least 30 degrees.

Each gated 1.50" or larger inlet and discharge shall have a quarter turn drain valve installed. The drain valves shall be located along the bottom on each pump panel. Inlets & discharges shall be plumbed to each drain at the lowest point. Each drain shall be plumbed with low-pressure hose to drain below bottom of the apparatus and be directed away from the pump operator. Each drain valve shall have a color-coded function label.

Small lines within the pump enclosure shall be constructed from Synflex hose. Uses include, but are not limited to such lines as priming control, gauge lines, drain lines, air control valves, pump shift, supplemental cooling, foam flush and air bleeder valves.

PLUMBING SYSTEM

The plumbing system shall be left unpainted by the apparatus manufacturer.

HOSE THREADS- NST

All hose threads shall be National Standard Thread (NST) on all base threads on the apparatus intake and discharges, unless otherwise specified.

PUMP CERTIFICATION

The fire pump shall be tested to meet the flow requirements of the pump. A written certification shall be provided with the completed vehicle.

INTAKE RELIEF VALVE

One (1) Task Force Tips model #A1821 pressure relief valve shall be provided. The valve shall have an easy to read adjustment range from 50 to 200 PSI in 25 PSI increments. For corrosion resistance the cast aluminum valve shall be hardcoat anodized with a powder coat interior and exterior finish. The valve shall be configured for a Darley pump, and have a 2" male NPT threaded discharge outlet. The unit shall be covered by a five-year warranty.

ELECTRIC PRIMER (FLUIDLESS)

The fire pump priming system shall consist of one (1) 12V positive displacement type rotary vane primer of a fluidless design. A single, push-pull control shall be located on the pump operator's panel with a "Pull to Prime - Push To Close" label. The primer shall not require a lubrication tank. The priming pump shall be constructed of heat treated aluminum and hard coat anodized.

PRIMER FUSE

The primer shall be protected with a 250 amp fusible link that is designed to protect the apparatus 12 volt electrical system if the primer motor malfunctions.

U.L. TEST POINTS

Two (2) U.L. test plugs shall be mounted on the pump panel for testing of the vacuum and pressures.

MASTER PUMP DRAIN

A rotary type, 12 port master drain valve shall be provided and controlled at the lower portion of the side pump panel. The valve shall be located in pump compartment lower than the main body and connected in such a manner as to allow complete water drainage of the pump body and all required accessories. Water shall be drained below the apparatus body and away from the pump operator.

PRESSURE GOVERNOR and ENGINE MONITORING DISPLAY

Fire Research Pump Boss series PBA401 pressure governor and monitoring display kit or its equivalent shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 6.75" high by 4.625" wide by 1.50" deep. The control knob shall be 2.00" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1.75" from the front of the control module. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring. Inputs to the control module from the pump discharge and intake pressure sensors shall be electrical.

The following continuous displays shall be provided:

- Engine RPM; shown with four daylight bright LED digits more than 0.50" high
- Check engine and stop engine warning LEDs
- Oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display

- Pressure and RPM operating mode LEDs
- Pressure / RPM setting; shown on a dot matrix message display
- Throttle ready LED.

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

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

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

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

The governor shall operate in two (2) control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

AUXILARY INTAKE- 2.50" - LEFT SIDE

One (1) 2.50" suction shall be installed on the left pump panel with the valve body mounted behind the pump panel.

A 2.50", Darley bronze valve shall be provided for the LH auxiliary intake. It shall be a quarter turn ball type, self-locking, fixed pivot design and have a high polished stainless steel ball. The valve inlet shall be a 2.50" female NST hose thread adapter with a wire screen inlet strainer and a polished chrome swivel.

The intake valve shall be manually operated with a swing-type manual control located adjacent the intake.

One (1) 2.50 chrome plated plug shall be provided. The threads shall be NST and the plug shall be equipped rocker lugs and chain.

There shall be an Innovative Controls 0.75" quarter turn drain valve included. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

TANK TO PUMP LINE

One (1) 4.00" tank to pump line shall be provided for connection between the water tank and the fire pump.

The valve shall be a 4.00" butterfly type with 4.00" piping, flex hose and stainless steel hose clamps.

The valve shall be controlled electrically with a momentary switch at the pump panel. The control shall have one (1) amber and one (1) green light to show the position of the electric valve.

TANK FILL

One (1) 2.00" gated full flow pump to tank refill line shall be provided. Tank fill plumbing shall utilize 2.00" high pressure hose for tank connection to accommodate flexing between components.

An Elkhart Brass Unibody, model EB20, 2.00" valve shall be provided between the pump discharge manifold and the water tank. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

The quarter turn valve shall be manually operated with a locking push/pull "T" handle located on the left hand side pump operator's panel.

LEFT SIDE FRONT DISCHARGE - 2.50"

One (1) 2.50" discharge outlet shall be supplied at the left hand side pump panel.

The valve shall be a 2.50" Darley bronze valve or its equivalent. It shall be a quarter turn ball type, self-locking, fixed pivot design and have a high polished stainless steel ball.

The quarter turn valve shall be manually operated with a lever control from the left hand side pump operator's panel.

One (1) 2.50" Noshok discharge pressure gauge (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters.

There shall be an Innovative Controls 0.75" quarter turn drain valve included. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

One (1) 2.50" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped rocker lugs and chain.

RIGHT SIDE FRONT DISCHARGE - 2.50"

One (1) 2.50" discharge outlet shall be supplied at the right hand side pump panel.

The valve shall be a 2.50" Darley bronze valve or its equivalent. It shall be a quarter turn ball type, self-locking, fixed pivot design and have a high polished stainless steel ball.

The quarter turn valve shall be remotely operated with a lever control from the left hand side pump operator's panel.

One (1) 2.50" Noshok discharge pressure gauge (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters.

There shall be an Innovative Controls 0.75" quarter turn drain valve included. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

One (1) 2.50" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped rocker lugs and chain.

CROSSLAY PRE-CONNECT #1

One (1) 1.75" crosslay pre-connect shall be installed in the pump module above the pump.

The crosslay shall be plumbed using 2.00" stainless steel pipe, and/or flexible piping.

The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay discharge shall terminate below the hose bed floor with a 1.50" NST male chicksan swivel adapter.

A 2.00" Elkhart Brass Unibody model EB20 valve shall be provided for the crosslay #1 discharge. The valve shall have an all brass valve body and stainless steel ball.

The quarter turn valve shall be manually operated with a locking push/pull "T" handle located on the left hand side pump operator's panel.

One (1) 2.50" Noshok discharge pressure gauge (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters.

There shall be an Innovative Controls 0.75" quarter turn drain valve included. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

Crosslay discharge #1 shall have the capacity to hold 200 feet of 1.75" fire hose and nozzle.

CROSSLAY PRE-CONNECT #2

One (1) 1.75" crosslay pre-connect shall be installed in the pump module above the pump.

The crosslay shall be plumbed using 2.00" stainless steel pipe, and/or flexible piping.

The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay discharge shall terminate below the hose bed floor with a 1.50" NST male chicksan swivel adapter.

A 2.00" Elkhart Brass Unibody model EB20 valve shall be provided for the crosslay #2 discharge. The valve shall have an all brass valve body and stainless steel ball.

The quarter turn valve shall be manually operated with a locking push/pull "T" handle located on the left hand side pump operator's panel.

One (1) 2.50" Noshok discharge pressure gauge (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters.

There shall be an Innovative Controls 0.75" quarter turn drain valve included. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color coded bezel shall be included.

Crosslay discharge #2 shall have the capacity to hold 200 feet of 1.75" fire hose and nozzle.

CROSSLAY #3, 2.50" HOSEBED ("DEADLAY")

One (1) deadlay hosebed, without plumbing, shall be installed above the pump compartment.

The deadlay shall have the capacity to hold 250 feet of 2.50" fire hose and nozzle.

CROSSLAY HOSEBED

The crosslays shall be arranged on top of the pump module with the #1 crosslay toward the front of the pump house and the #2 crosslay immediately behind the first, and the #3 crosslay at the rear of the module.

VINYL CROSSLAY COVER

The crosslays shall be equipped with a heavy duty 18 oz. vinyl cover with side flaps. The top portion will be fastened to the pump house with Velcro and the side flaps will be held in place with a hook and bungee system.

The vinyl cover shall be red in color.

PRESSURE GAUGES

Each line pressure gauge shall be mounted immediately near the control for the corresponding valve. The individual line pressure gauges for the discharges shall be 2.50" in diameter with white dial face gauges with black lettering and markings. The gauges shall be a compound style gauge with a vacuum/pressure range of 0 to +400 psi.

The gauges shall be fluid filled with pulse and vibration dampening Interlube to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation to -40° F. The cases shall be temperature compensated with an internal breathing diaphragm to permit fully filled cases and to allow a rigid lens with a distortion free viewing area. The gauge accuracy for the gauge shall be plus or minus 2% mid-scale, plus or minus 3% balance, per ANSI B40.1, Grade 1A. To prevent internal freezing and to keep contaminants from entering the gauge, the stem and bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage.

MASTER DISCHARGE AND INTAKE GAUGES

Two (2) 4.00" diameter Noshok discharge pressure and intake gauges shall be provided. The face of the gauge shall be a white dial with black letters. The gauges will be located on the pump instrument panel.

The master vacuum gauge shall be a compound style gauge with a vacuum/pressure range of -30" - 0 - 400 psig with the dial face of the gauge labeled in black "PUMP INTAKE".

The master pressure gauge shall be provided with a range of 0-400 psig and the dial face of the gauge labeled in black "PUMP DISCHARGE".

The master gauges shall have clear scratch resistant molded crystals with captive O-ring seals shall be used to ensure distortion free viewing and to seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40° F to $+160^{\circ}$ F. Each gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of $\pm 1.5\%$ full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy. A polished chrome plated brass bezel shall be provided to prevent corrosion and protect the lens and gauge case.

LED WATER LEVEL GAUGE (PUMP PANEL)

One (1) Innovative Controls SL-PLUS model #3030730-02-37, Ultra-Bright LED water level monitor shall be provided on the left hand side pump operator's control panel. The gauge shall feature a 180 degree highly visible wide view ultra-brite LED display showing the level of the booster tank.

The gauge shall use a pressure transducer #3030376-01 installed near the bottom of the water tank to determine the correct volume in the tank.

CAB MOUNTED WATER TANK INDICATOR

One (1) Innovative Controls SL-PLUS model #3030698-37, Ultra-Bright LED water level monitor shall be provided in the cab. The level gauge shall contain four (4) high intensity LED's on the display in a vertical pattern allowing the full, 3/4, 1/4, and refill levels to be easily distinguished at a glance.

SIDE DESIGN PUMP OPERATOR'S PANEL & MODULE

SIDE PANEL MODULE

A pump operator's side panel pump module shall be provided. It shall be assembled and mounted independently from both the chassis and the body, to allow sufficient flexing and prevent component fatigue. The module shall be constructed using square steel tubing. The welded ends of the tubing shall be chamfered prior to welding and shall be ground smooth prior to finishing. The exterior module shall be sanded, prepped, and primed using paint manufacturer's recommendations. The module structure shall be finish painted to match the body and chassis cab. A heavy duty rubber isolation material shall be provided between dissimilar metals during the mounting process. The substructure and extrusions shall be painted and undercoated before bolting to the chassis frame.

SIDE PANELS - BLACK VINYL

The pump compartment module shall have left and right side pump panels constructed of black vinyl clad aluminum sheets.

GAUGE PANEL

The pump operator's upper gauge panel shall be located on the left hand side of the pump module above the main control panel. It shall be vertically hinged and shall have two (2) latches.

LEFT SIDE PUMP PANEL

The pump panel installed on the left hand side of the pump enclosure shall be fastened to the pump enclosure with stainless steel bolts.

RIGHT SIDE PUMP PANEL

The pump panel installed on the on the right hand side of the pump enclosure shall be fully removable without the use of hand tools.

PUMP PANEL/ ENCLOSURE LIGHTS

PUMP PANEL LIGHT SHIELD LEFT

One (1) extruded aluminum light shield assembly shall be provided above the left side pump panel area.

One (1) waterproof strip light with 72 LEDs shall be installed within the shield. The light(s) shall be 23.80" in length, have a clear acrylic lens, aluminum housing, and have a minimum effective output of 950 lumens.

PUMP PANEL LIGHT SHIELD RIGHT

One (1) extruded aluminum light shield assembly shall be provided above the right side pump panel area.

One (1) waterproof strip light with 72 LEDs shall be installed within the shield. The light(s) shall be 23.80" in length, have a clear acrylic lens, aluminum housing, and have a minimum effective output of 950 lumens.

A weather resistant switch, located on the pump operator's panel shall be provided to activate the lights.

PUMP COMPARTMENT LIGHTS

Two (2) LED lights shall be provided inside the pump compartment area. The dimensions of the lights shall be 1.00" x 3.00". Each light shall operate at 12 volts DC, generate 120 lumens, and shall be mounted on an adjustable bail mount bracket.

The lights shall function with the switch for pump operator's gauge panel lights.

LEFT SIDE RUNNING BOARD

The left pump panel shall be equipped with a side running board. The running board shall be constructed of 0.125" embossed fire apparatus bright aluminum tread plate. It shall be a minimum of approximately 11" deep x the width of the side panel module. The running board shall have an upward bend on the inside edge to act as a kick plate. The running board shall be attached to a frame mounted outrigger support structure. The running board shall have a 3" downward bend on the front and side faces with a 1" underside return for superior strength.

RIGHT SIDE RUNNING BOARD

The right pump panel shall be equipped with a side running board. The running board shall be constructed of 0.125" embossed fire apparatus bright aluminum tread plate. It shall be a minimum of approximately 11" deep x the width of the side panel module. The running board shall have an upward bend on the inside edge to act as a kick plate. The running board shall be attached to a frame mounted outrigger support structure. The running board shall have a 3" downward bend on the front and side faces with a 1" underside return for superior strength.

FRONT PUMP HOUSE ENCLOSURE

The front of the pump enclosure shall be enclosed with .08" bright aluminum tread plate.

WARNING - PUMP OPERATOR

A warning plate shall be installed on the pump operator's panel, that states the following: WARNING: Death or serious injury might occur if proper operating procedures are not followed. The pump operator as well as individuals connecting supply or discharge hoses to the apparatus must be familiar with water hydraulics hazards and component limitations.

PUMP PANEL ID PLATE

An identification plate shall be installed on the pump operator control panel to identify the fire pump serial number, model number, and performance.

COLOR CODED PUMP PANEL LABELING AND NAMEPLATES

Discharge and intake valve controls shall be color coded in compliance to guidelines of applicable sections of NFPA standards. Innovative Controls permanent type nameplates and instruction panels shall be installed on the pump panel for safe operation of the pumping equipment and controls.

PUMP PANEL COLOR TRIM PANELS

Innovative Controls intake and discharge trim rings shall be installed to the apparatus with mounting bolts. These bezel assemblies will be used to identify intake and discharge ports with color and verbiage. These trim rings are designed and manufactured to withstand the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The specified assemblies feature a chrome-plated panel-mount bezel with durable UV resistant polycarbonate inserts. These UV resistant polycarbonate graphic inserts shall be sub-surface screen printed to eliminate the possibility of wear and protect the inks from fading. All insert labels shall be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards.

WATER TANK AND RELATED COMPONENTS

3000 GALLON POLY TANK

Tank capacity shall be 3000 US gallons / 2498 Imperial gallons / 11356 Liters.

The tank shall be constructed of PT3 polypropylene material.

TANK MATERIAL

This material shall be a non-corrosive stress relieved thermoplastic and UV stabilized for maximum protection. Tank shell thickness may vary depending on the application and may range from 0.50" to 1.00" as required. Internal baffles are generally 0.375" in thickness.

ISO CERTIFICATION

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

CONSTRUCTION

The booster and/or foam tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include PolyProSeal™ technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the

event of a weld compromise. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 0.375" PT3™ polypropylene.

All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design™. Tolerances in design allow for a maximum variation of 0.125" on all dimensions.

The tank cover shall be constructed of 0.50" thick PT3 polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 0.375" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2.00" minimum polypropylene dowels spaced a maximum of 40.00" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two (2) lifting dowels shall accommodate the necessary lifting hardware.

OUTLETS

There will be two (2) standard tank outlets: one (1) for the tank-to-pump suction line, which shall be sized to provide adequate water flow to the pump; and, one (1) for tank fill line, which shall be sized according to the NFPA minimum size chart for booster tanks. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates of up to 1000 G.P.M. The addition of rear suction fittings, nurse valve fittings, dump valve fittings, and through-the-tank sleeves to accommodate rear discharge piping must be specified. All auxiliary outlets and inlets must meet all NFPA guidelines in effect at the time of manufacture.

CAPACITY CERTIFICATION

All water and foam tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale. Each tank shall be weighed empty and full to provide precise fluid capacity. Each Poly-Tank® III is delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. Engineering estimates for capacity calculations shall not be permitted for capacity certification.

CENTER OF GRAVITY

A center of gravity calculation shall be determined for each tank and provided as requested in order to provide the apparatus manufacturer with the necessary data to design and certify the apparatus

with respect to the NFPA requirements regarding rollover stability. This information may be used by the apparatus manufacturer to assist in the calculation of the apparatus's ability to meet the tilt table static rollover threshold or calculated Center of Gravity requirements per NFPA. A center of gravity and weight calculation for both empty and full conditions shall be required with each tank.

TANKNOLOGY™ TAG

A tag shall be installed on the apparatus in a convenient location and contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag shall include the capacity of the water and foam (s), the maximum fill and pressure rates, the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information. The QR code will allow the user to connect with the tank manufacturer for additional information and assistance.

WATER FILL TOWER AND COVER

The tank shall have a combination vent and manual anti-surge fill tower. The fill tower shall be constructed of 0.50" PT3 polypropylene and shall be a minimum dimension of 10.00" x 10.00" outer perimeter. The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall have a 0.25" thick removable polypropylene screen and a PT3 polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid.

The fill tower shall have an anti-surge provision. It shall be designed to prevent water splashing up through the top of the fill tower when the water tank is full and the apparatus comes to an immediate stop. (NO EXCEPTION)

FILL TOWER LOCATION

The fill tower shall be located in the left front area of the tank.

Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of 6.00" that is designed to run through the tank, and shall be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction.

SUMP, 4.00"

There shall be one (1) sump standard per tank. The sump shall be constructed of a minimum of 0.50" PT3 polypropylene and be located in the left front quarter of the tank, unless specified otherwise. On all tanks that require a front suction, a 3.00" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. All tanks shall have an anti-swirl plate located approximately 3.00" above the inside floor.

WATER TANK CLEAN-OUT PLUG

The tank shall have a 4.00" N.P.T. threaded outlet on the bottom for a cleanout/ drain plug per NFPA. The cleanout/ drain plug shall be installed in the bottom of the water tank using an 8-Bolt flange with a 4.00" N.P.T. threaded outlet to create easy access to the plug. (NO EXCPECTION)

MOUNTING BLOCKS

There will be four (4) mounting blocks, two (2) on each side for mounting equipment such as ladder brackets.

A 1.00" mounting block shall cover the whole rear of tank for mounting work lights, folding steps, grab rails, accessories and emergency lighting.

HOSE BED

There shall be a hose bed area constructed of polypropylene on the top of the water tank consisting of two (2) side walls and one (1) front panel. The hose bed shall be welded to the outside perimeter of the tank cover, and shall be approximately 9.00" tall by the length and width of the water tank.

The hose bed shall be free from all projections, which may interfere with the unloading of hose.

HOSEBED FLOOR

The floor of the hose bed shall be grooved by the tank manufacturer to provide an integral planking designed to allow the loaded hose to drain and allow airflow for ventilation.

VINYL HOSEBED COVER

The apparatus shall be equipped with an 18 oz. vinyl Hose bed cover with a rear flap and a hook and bungee fastening system at front and sides. The rear flap shall be fastened with three (3) 2.00" side release plastic buckle assemblies. The vinyl material shall be treated for protection against UV rays and mildew.

The vinyl cover shall be red in color.

REAR DUMP VALVE

One (1) NEWTON 10" Model 1050-34 Stainless Steel dump valve shall be installed. It shall be located at the rear center of the apparatus.

One (1) manual operated lever control shall be used to open and close the dump valve, the lever shall be located on the top of the valve.

DIRECT TANK FILL, LEFT HAND SIDE

There shall be a one (1) 2.50" direct tank fill located on the left-rear of the apparatus.

The valve shall be an Elkhart Unibody swing out valve. This valve shall be operated using a direct manual actuator handle. The manual actuator shall require only 90° travel and be quickly adjustable to one of eight positions. Valve inlet shall be a 2.50" female NST and feature a 30 degree droop with a wire screen inlet strainer and a polished chrome swivel. The inlet shall be able to be controlled from the rear of the apparatus while standing at ground level.

One (1) 2.50" chrome plated plug shall be provided. The threads shall be NST and the plug shall be equipped rocker lugs and chain.

DIRECT TANK FILL, RIGHT HAND SIDE

There shall be a one (1) 2.50" direct tank fill located on the right-rear of the apparatus.

The valve shall be an Elkhart Unibody swing out valve. This valve shall be operated using a direct manual actuator handle. The manual actuator shall require only 90° travel and be quickly adjustable to one of eight positions. Valve inlet shall be a 2.50" female NST and feature a 30 degree droop with a wire screen inlet strainer and a polished chrome swivel. The inlet shall be able to be controlled from the rear of the apparatus while standing at ground level.

One (1) 2.50" chrome plated plug shall be provided. The threads shall be NST and the plug shall be equipped rocker lugs and chain.

SUBFRAME

The sub frame shall be constructed from structural steel channel and plate, welded together and bolted to the chassis frame. The main support shall be a 0.3125" thick steel plate under the tank floor with a 2.50" angle steel around the perimeter of the tank. Two (2) sub frame long sills constructed of 3.00" X 7.00" steel tubing with 0.1875" walls shall run the full length of the sub frame and be mounted to truck frame using 0.1875" angle clips and a minimum of ten (10) grade 8 bolts. The tank sub frame and attachments shall be in strict compliance with UPF poly-tanks engineering specifications.

MOUNTING

The tank shall rest on the sub frame as to not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches the sub frame shall be designed to allow for not more than 400 square inches of unsupported area.

The tank shall be supported to prevent itself from shifting during vehicle operation.

A non-corrosive protective liner shall be installed in between the tank and the sub frame.

The tank shall be mounted to sub frame with three (3) stainless steel gussets per UPF specifications.

The tank and sub frame must be installed by a UPF Authorized installer (NO EXCEPTIONS).

BODY CONSTRUCTION

The body shall be fabricated of steel tubing, angle, smooth aluminum sheet and aluminum tread plate.

The tubing shall be designed as structural-framing members with the smooth aluminum and tread plate fabricated to form compartments, floors and fender panels

The side compartments shall be modular in design and shall be capable of being replaced if damaged. Each shall be supported by the steel frame and attached to the sub frame with grade 8 bolts.

The compartments shall have a minimum of one (1) set of louvers stamped into the rear wall to provide the proper airflow inside the compartment and to prevent water from dripping into the compartment. These louvers shall be formed into the metal and not added to the compartment as a separate plate.

The side compartments shall be constructed of formed 1/8" aluminum.

COMPARTMENT FLOORS

The side compartment floors shall be constructed of 3/16" smooth aluminum.

The side compartment floors shall have a sweep out design for easy cleaning.

BODY WIDTH

The width of the apparatus body from the outside face of the left compartments to the outside face of the right compartments shall be 96.00" wide.

FENDER PANELS

The side fender panels above the rear wheels shall be constructed of 0.125" bright aluminum diamond plate.

The rear wheel wells shall be angled cut with an integral fenderette for a streamlined appearance.

The compartments and fenders, together forming the body, shall remain unpainted. All seams on the frame side of the body shall be welded or caulked to prevent moisture from entering the compartments.

LEFT SIDE COMPARTMENT IN FRONT OF REAR WHEELS, L-1

One (1) compartment shall be supplied on the left hand side of the truck in front of the rear wheels. The compartment shall be equipped with a low double hinged doors. Compartment dimensions shall be approx. 60.00" wide by 26.00" deep by 27.00" high.

COMPARTMENT LIGHT(S)

One (1) surface mount LED light(s) shall be installed in the compartment. The light(s) shall have a clear lens and shall a minimum effective output of 810 lumens.

The lights shall function independently of other compartments by an automatic "On-Off" switch located on each compartment door.

RIGHT SIDE COMPARTMENT IN FRONT OF REAR WHEELS, R-1

One (1) compartment shall be supplied on the right hand side of the truck in front of the rear wheels. The compartment shall be equipped with a low double hinged doors. Compartment dimensions shall be approx. 60.00" wide by 26.00" deep by 27.00" high.

COMPARTMENT LIGHT(S)

One (1) surface mount LED light(s) shall be installed in the compartment. The light(s) shall have a clear lens and shall a minimum effective output of 810 lumens.

The lights shall function independently of other compartments by an automatic "On-Off" switch located on each compartment door.

LOWER COMPARTMENT DOORS, DOUBLE

Double door compartments shall have two (2) vertically hinged doors, with no center posts closing to the center of each front compartment.

The compartment doors shall be lap style, and shall be constructed of .125" aluminum diamond plate . A heavy duty automotive extruded rubber molding shall be installed around the door perimeter. Each door shall be attached to the compartment with a full length piano style continuous hinge.

The door handle shall be a 6.00" stainless steel D-Ring.

LOWER COMPARTMENT DOORS, SINGLE

Single door compartments shall have one (1) vertically hinged door closing towards the rear of the apparatus.

The door on the compartments shall be shall be constructed of .125" aluminum tread plate a gas shock to hold it in the open position . A heavy duty automotive extruded rubber molding shall be installed around the door perimeter to insure a weather proof seal. The door shall be attached to the compartment with a full length piano style continuous hinge.

The door handle shall be 6.00" stainless steel D-Ring.

DROP TANK STORAGE- RH SIDE

There shall be room to store an appropriate size dump tank under the right hand side "T" portion of the tank. The area shall have a mechanical means to lock the dump tank in place while the apparatus is in motion.

The tank shall slide in horizontally into the hold from the right side of the body.

The storage shall have the capacity for one (1) 3000 US Gallon portable tank with an aluminum frame.

PORTABLE TANK SOURCE

One (1) new portable drop tank shall be provided by the manufacturer and shall be detailed later in this specification.

HARD SUCTION STORAGE- LH SIDE

There shall be a hard suction storage tray located under the left hand side of the "T" portion of the tank. The hard suction hose storage shall be accessed from the ground at the rear of the unit.

In order to provide a comfortable and safe level of access to the hoses, there shall be no exception allowed to this feature.

Two (2) troughs shall be provided in the storage area for the hose to slide on and be held in position when stored. Appropriate stops shall be provided.

The suction storage shall have capacity for two (2) 10' sections of hard suction hose.

SUCTION HOSE SOURCE

New suction hose shall be provided by the manufacturer and shall be detailed later in this specification.

REAR TAILBOARD

A rear beavertail tailboard shall be provided and installed at the rear of the apparatus. The tailboard shall consist of two (2) separate stepping/ standing surfaces made of aluminum grip-strut material.

The top step shall be 7.00" deep and the bottom shall be 9.50" deep. The rear tailboard shall be full width of the tanker body between the side compartments.

The outside edges of the rear tailboard shall be trimmed with bright diamond plate aluminum.

The tailboard shall meet recommended requirements for non-slip surfaces. This area is to be used as a step, but is not designed to carry personnel and should never be used to transport firemen.

STEPS

All steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of at least 500 pounds.

REAR FOLDING STEPS

Three (3) large, heavy duty chrome folding steps shall be furnished and located, at the rear of the apparatus. The exact number of steps provided may vary depending upon body configuration and options.

FRONT OF BODY FOLDING STEPS- RIGHT

Four (4) large, heavy duty chrome folding steps shall be furnished and located, at the right hand front of the body. The exact number of steps provided may vary depending upon body configuration and options.

EXTERIOR GRAB RAILS

Each grab rail shall be non-slip, 1.25" diameter extruded polished aluminum grab rails with rubber inserts designed to provide maximum gripping ability, strength, and durability. All railing escutcheons and brackets shall be chrome plated, and shall be bolted to the body with stainless steel bolts.

The rails shall comply with NFPA 1901.

HANDRAILS - REAR STEP

Two (2) extruded aluminum non-slip handrails, approximately 30.00" in length, shall be provided and vertically mounted on the rear of the apparatus, one (1) on each side of the body.

HANDRAIL, RH FRONT

One (1) extruded aluminum non-slip handrail shall be provided and horizontally mounted on the front, upper, right hand side of the body.

12 VOLT ELECTRICAL SECTION

NFPA 1901 CERTIFIED 12 VOLT ELECTRICAL SYSTEM

The 12-volt apparatus body electrical system shall be provided and shall be in compliance with NFPA 1901 testing and certification procedures as follows:

NFPA MINIMUM ELECTRICAL LOAD DEFINITION

The NFPA 1901 defined minimum electrical load shall consist of the total amperage required to simultaneously operate the following in a stationary mode:

1. Propulsion engine and transmission.
2. The clearance and marker lights.
3. Communication equipment. 5 amp default.
4. Illumination of all walking surfaces, the ground at all egress points, control and instrumentation panels and 50% of total compartment lighting.
5. Minimum warning lights required for "blocking right of way" mode.
6. The current to simultaneously operate and fire pump and all specified electrical devices.
7. Anything defined by the purchaser, in the advertised specifications, to be critical to the mission of the apparatus.

RESERVE CAPACITY TEST

The first electrical test to be performed will be the Reserve Capacity Test. All items listed in NFPA Minimum Load Definition shall be activated with the engine shut off. After 10 minutes of operation, the items 1-7 shall be deactivated. After deactivation, the battery system shall have ample reserve to start the engine.

ALTERNATOR PERFORMANCE TEST AT IDLE

The second electrical test to be performed shall be Alternator Performance Test at Full Load. All electrical loads shall be activated with the engine running up to the governed rpm for two hours. During the test, the system voltage shall not drop below 11.7 volts or have excessive battery discharge for more than 120 seconds. Any loads not defined in the NFPA Minimum Electrical Load may be load managed to pass test.

TEST CONDITIONS

All electrical testing shall be performed with the engine compartment at approximately 200 degrees.

12 VOLT ELECTRICAL SYSTEM

The truck shall have a 12-Volt electrical system.

All wiring will be run in convoluted high temperature plastic loom. Wiring shall be color and function coded and will be of adequate size to handle the assigned load. All solenoids, relays, and terminal blocks will be located in an easily accessible area.

All circuits provided shall have properly rated low voltage over current protective devices.

All wiring shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for the protected circuit. Voltage drops in all wiring from the power source to the using device shall not exceed 10 percent. The wiring and wiring harness and insulation shall be in conformance to applicable SAE and NFPA standards. The wiring harness shall conform to SAE J-1128 with GXL temperature properties. All exposed wiring shall be protected in a loom with a minimum 289 degree Fahrenheit rating. All wiring looms shall be properly supported and attached to body members. The electrical conductors shall be constructed in accordance with applicable SAE standards, except when good engineering practice requires special construction.

All under side terminal junctions shall be fully enclosed in sealed plastic weather proof boxes.

Electromagnetic interference suppression shall be provided as required to satisfy the radiation limits specified in SAE J551/1.

CLASS1 ES-KEY SYSTEM

The electrical system shall utilize Class1 Inc. **ES-Key** technology where applicable.

The apparatus shall be equipped with a Class 1 ES-Key Management System for controlling electrical system devices. This management system shall be capable of performing load management functions, system switching, monitoring and reporting, and be fully programmable for a standardized electrical system utilizing the ES-Key Professional software program.

SUPERNODE II

The apparatus shall be equipped with a Class1 ES-Key system with a Supernode II high density input output node. The Supernode II shall have (24) inputs, (24) outputs, a Universal System Manager, a data logger, and programmable special utilities.

The Supernode II shall have an integrated USB port to allow for direct connection to the ES-Key system without additional interface devices.

LOAD MANAGER

The Supernode II shall have an integrated Load Manager. The Load Manager Sequencer shall

assure that loads are applied and removed gradually, thus eliminating the possibility of inducing failures in the vehicle's equipment.

LOW VOLTAGE MONITOR

A voltage monitor shall be built into the ES-Key electrical system. It shall activate a warning when the alternator output voltage falls below any desired voltage (usually 11.5 volts).

1TOUCH SWITCH PANEL, 8 POSITION

The apparatus shall be equipped with an eight (8) position 1Touch switch panel module for enhanced device activation. Individual switches shall be backlit with multiple colored and textured switch caps and printable labels. Switch panels shall be sealed to IP67 and have dual LED indicators.

SWITCH PANEL LOCATION

The switch panel shall be located on the center console.

CHASSIS GROUND LIGHTS

LED ground lights with outward facing angle brackets shall be installed, one (1) under each chassis door.

FRONT OF BODY GROUND LIGHTS

Two (2) LED ground lights with outward facing angle brackets shall be installed under the front of the body. One (1) light shall be located on the left hand side and one (1) light located on the right hand side of the apparatus.

REAR STEP GROUND LIGHTS

Two (2) LED ground lights with outward facing angle brackets shall be installed under the rear step of the apparatus, one (1) each side.

GROUND LIGHT SWITCHING

The cab and body ground lights shall activate by engaging the parking brake.

HAZARD LIGHT

A Whelen model 0SR00FCR flashing red LED light, located in the driving compartment, shall be illuminated automatically whenever any compartment door is ajar.

The hazard light shall be marked with a sign that reads "Do Not Move Apparatus When Light is On".

The warning light shall be interlocked to the parking brake and shall only alert the driver when the parking brake is released. The light shall also be used to signal that other ancillary equipment such as racks light towers etc. are not in their "ready for transport" position.

LICENSE PLATE LIGHT

A license plate bracket with LED light shall be provided and installed on the rear of the body. It shall be wired to come on with the headlights.

REAR ROAD LIGHTING

Two (2) sets of 4.00" LED stop, turn and back-up lights shall be provided, one (1) set on each side of the rear of the truck.

MIDSHIP TURN SIGNAL

There shall be a midship turn signal mounted on each side of the apparatus.

MARKER LIGHTS

LED marker lights shall be installed on the vehicle in conformance to the Department of Transportation requirements. The side and rear of the body will be provided with reflectors. All marker lights shall be incorporated into the headlight circuit of the cab/chassis

UPPER REAR SCENE LIGHTS

One (1) pair of Whelen model 90E000ZR halogen scene lights shall be installed, one (1) each side on the upper rear of the apparatus body.

The light(s) shall be installed within a Cast Aluminum Bezel.

UPPER RIGHT SCENE LIGHTS

One (1) pair of Whelen model 90E000ZR halogen scene lights shall be installed, one (1) each side on the upper right hand side of the apparatus body.

The light(s) shall be installed within a Cast Aluminum Bezel.

UPPER LEFT SCENE LIGHTS

One (1) pair of Whelen model 90E000ZR halogen scene lights shall be installed, one (1) each side on the upper left hand side of the apparatus body.

The light(s) shall be installed within a Cast Aluminum Bezel.

SCENE LIGHT ACTIVATION

The scene lights shall be activated by a switch located in the cab. Each side shall be activated separately.

REAR SCENE LIGHTS - ADDITIONAL ACTIVATION

In addition to the cab mounted switch for the rear scene lights, the rear scene lights shall illuminate when the transmission is placed in reverse gear.

NFPA AUDIBLE AND LIGHTING WARNING PACKAGE

The following warning light package shall include all of the minimum warning light and actuation requirements for the current revision of the NFPA 1901-2009. The lighting as specified shall meet the requirements for both "Clearing Right of Way" and "Blocking Right of Way" which includes disabling all white warning lights when the apparatus is in "Blocking Right of Way" mode.

WARNING LIGHT FLASH PATTERN

All of the perimeter warning lights shall be set to the default NFPA flash pattern as provided by the warning light manufacturer.

WARNING PACKAGE ACTUATION CONTROLS

The entire warning light package shall be actuated with a single warning light switch located on the cab switch panel. The wiring for the warning light package shall engage all of the lights required for "Clearing Right of Way" mode when the vehicle parking brake is not engaged. An automatic control system shall be provided to switch the warning lights to the "Blocking Right of Way" mode when the vehicle parking brake is engaged.

LIGHTBAR

One (1) WHELEN model JE2NFPA 56.00" LED lightbar shall be supplied and mounted. The lightbar shall have clear lenses and contain the following modules:

- Four (4) RED LIN6 LED modules, two (2) on each corner.

- Four (4) RED CON3 LED modules, across the front

- Two (2) WHITE CON3 LED modules, on the front

The forward facing white lights shall be automatically disabled for the "Blocking Right of Way" mode.

LIGHT BAR SWITCH

The lightbar shall be controlled through the master warning switch.

UPPER REAR WARNING LIGHTS

One (1) pair of Whelen model 90RR5FRR Super LED warning lights shall be installed, one (1) each side on the upper rear of the apparatus body.

The lights shall be red in color with red lens.

The light(s) shall be installed within a Cast Aluminum Bezel.

UPPER LEFTSIDE WARNING LIGHTS

One (1) pair of Whelen model 90RR5FRR Super LED warning lights with shall be installed, one (1) each side on the upper left side of the apparatus body.

The lights shall be red in color with red lens.

The light(s) shall be installed within a Cast Aluminum Bezel.

UPPER RIGHT SIDE WARNING LIGHTS

One (1) pair of Whelen model 90RR5FRR Super LED warning lights shall be installed, one (1) each side on the upper right side of the apparatus body.

The lights shall be red in color with red lens.

The light(s) shall be installed within a Cast Aluminum Bezel.

LOWER FRONT WARNING LIGHTS

One (1) pair of Whelen model 60R02FRR Super LED warning lights shall be installed, one (1) each side on the front of the chassis cab.

The lights shall be red in color with red lens.

The light(s) shall be supplied and installed with a chrome bezel.

INTERSECTION WARNING LIGHTS

One (1) pair of Whelen model 60R02FRR Super LED warning lights shall be installed, one (1) each side of the chassis bumper.

The lights shall be red in color with red lens.

The light(s) shall be supplied and installed with a chrome bezel.

LOWER MID-BODY WARNING LIGHTS

One (1) pair of Whelen model 60R02FRR Super LED warning lights shall be installed, one (1) each side of the apparatus, mid-body.

The lights shall be red in color with red lens.

The light(s) shall be supplied and installed with a chrome bezel.

LOWER REAR WARNING LIGHTS

One (1) pair of Whelen model 60R02FRR Super LED warning lights shall be installed, one (1) each side on the lower rear of the apparatus body.

The lights shall be red in color with red lens.

The light(s) shall be supplied and installed with a chrome bezel.

REAR BEACONS

Two (2) Whelen model L31 LED beacons shall be provided and installed at the upper rear corners of the apparatus.

The beacon on the left hand side shall be red in color with a red lens.

The beacon on the right hand side shall be red in color with a red lens.

BEACON LIGHT MOUNTING

The rear beacons shall be mounted on a smooth aluminum bracket and attached to the apparatus body, one (1) on each side.

ELECTRIC SIREN AND CONTROL

One (1) Whelen model #295SLSA1 electronic siren shall be mounted in the cab. This unit shall feature an electronic air horn, wail, yelp, hi-lo and shall have a hard wired PA microphone.

ELECTRONIC SIREN SPEAKER

One (1) Federal Signal model ES100 Dynamax 100 watt speaker shall be flush mounted as far forward and as low as possible on the front of the vehicle. A polished model ESFMT with "Electric F"

grille shall be provided on the outside of the speaker to prevent road debris from entering the speaker.

The speaker shall produce a minimum sound output of 120 dB at 10 feet to meet current NFPA 1901 requirements.

The speaker shall be located on the right hand side of the bumper.

PAINT, STRIPING, AND LETTERING SECTION

PAINT PROCESS

The wetside tank shall be painted with a PPG Delfleet Evolution Paint System.

All products and technicians shall be certified by PPG every two (2) years.

The wetside tank shall be totally removed from the chassis during the painting process to insure the entire unit is covered.

All seams shall be caulked both inside and along the exterior edges with a urethane automotive sealant to prevent moisture from entering.

The water tank and all parts shall be thoroughly washed with a grease cutting solvent prior to any sanding. After the wetside tank has been sanded, the wetside tank shall be washed again with a grease cutting solvent to remove any contaminants on the surface.

TANK PAINT COLOR

The tank shall be painted to match the chassis. The tank's paint color shall be "cross referenced" from the chassis paint, and shall be painted to match the main chassis color as close as possible.

PRIMING

Two (2) medium wet coats of adhesion promoter for plastics shall be applied to all surfaces to be painted.

All surfaces to be painted shall be primed with Primer Filler.

Two (2) applications of primer shall be applied. The first application shall be four (4) coats and the second application shall be three (3) coats.

A final application of sealer shall be applied using Primer Filler.

COMPARTMENT INTERIORS

The side compartment interiors shall be unpainted and in their natural finish.

WHEEL RIMS

The chassis wheels shall be as furnished by the chassis OEM. No additional finishes shall be provided by apparatus manufacturer.

LETTERING

Reflective lettering shall be applied to the cab doors at the direction of the purchaser. Photos or drawings of the lettering and striping layout shall be provided by the purchaser prior to construction.

REFLECTIVE STRIPE

There shall be a reflective Scotch lite band located on the apparatus cab and body. The band shall be per the purchasers size, design and color specifications.

The reflective band shall be in compliance with current NFPA requirements.

Photos or drawings of the layout shall be provided by the purchaser prior to construction.

CHEVRON STRIPING

At least 50% of the rear of the unit shall be covered with Red and Fluorescent Yellow-Green alternating 6.00" stripe in an inverted Chevron pattern.

A 0.50" Gold reflective stripe shall outline the sides of the wetside tank.

FOLDING TANK

One (1) 3,000 gallon Aluminum collapsible frame folding portable tank shall be supplied. The tank liner shall have 22 oz vinyl sides and a 28 oz vinyl floor that shall be Red in color. Grab handles shall be placed on the floor of the liner to help the firefighter pick up the liner when folding.

SUCTION HOSE

Two (2) 4" X 10' section(s) of KOCHEK, PVC type hard, suction hose shall be provided on the apparatus. The hose(s) shall be light weight type with Pyrolite, Long Handle Female x Rocker Lug Male, NST threads. The hose shall be black in color.

**BID FORM
2019-D
TANKER TRUCK FABRICATION
COLUMBIA COUNTY BOARD OF COUNTY COMMISSIONERS**

Bids must be received in the Office of the Board of County Commissioners, Columbia County, 135 NE Hernando Avenue, Room 203, Lake City, FL, 32055 no later than 2:00 P.M., on April 17, 2019. Columbia County reserves the right to reject any and/or all bids and to accept the bid in the county's best interest, bid F.O.B., Columbia County, Florida.

Lump Sum \$ _____

I certify that this bid meets or exceeds the County specifications and that the undersigned bidder declares that I have carefully examined the specifications, term and conditions of this bid and I am thoroughly familiar with its provisions. The undersigned bidder further declares that he/she has not divulged, discussed or compared his bid with any other bidders and has not colluded with any other bidders or parties to a bid whatsoever for any fraudulent purpose.

COMPANY: _____

ADDRESS: _____

PHONE NO: _____

EMAIL: _____

SIGNATURE: _____

PRINT NAME/TITLE: _____

DATE: _____