WAKE COUNTY FIRE COMMISSION

APPARATUS COMMITTEE

FY-2017-18

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WAKE COUNTY TANKER SPECIFICATION

WAKE COUNTY FIRE DEPARTMENTS:

APEX FIRE DEPARTMENT	GARNER	SWIFT CREEK
BAYLEAF FIRE DEPARTMENT	HOLLY SPRINGS	WAKE FOREST
DURHAM HIGHWAY	HOPKINS	WAKE NEW HOPE
EASTERN WAKE	MORRISVILLE	WENDELL
FAIRVIEW	ROLESVILLE	WESTERN WAKE
FUQUAY-VARINA	STONY HILL	ZEBULON

WAKE COUNTY
NORTH CAROLINA

INTENT OF SPECIFICATION

It shall be the intent of this specification to cover the furnishing and delivery of a complete apparatus equipped as hereinafter specified. These specifications cover only the general requirements as to the type of construction and test to which the apparatus shall conform, together with certain details as to finish, equipment and appliances with which the successful bidder shall conform. Minor details of construction and materials, which are not otherwise specified, are left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features. Apparatus proposed by the bidder shall meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Loose equipment shall be provided only as stated in the following pages.

Bids shall only be considered from manufacturers that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of 20 years at the time of Bid. Further, bidder shall maintain dedicated service facilities for the repair and service of products. Evidence of such a facility shall be included in bidder proposal. The bidder shall provide mobile field service capability within 100 miles of Wake County.

Each bidder shall furnish satisfactory evidence of their ability to construct the apparatus specified and shall state the location of the factory where the apparatus is to be built. The bidder shall also show that the company is in position to render prompt service and to furnish replacement parts for said apparatus.

Each bid shall be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract shall conform. These specifications shall indicate size, type, model and make of all component parts and equipment.

QUALITY AND WORKMANSHIP

The design of the apparatus shall embody the latest approved automotive engineering practices. The workmanship shall be of the highest quality in its respective field. Special consideration shall be given to the following points: Accessibility of the various units which require periodic maintenance, ease of operation (including both pumping and driving) and symmetrical proportions. Construction shall be rugged and ample safety factors shall be provided to carry the loads specified and to meet both on and off road requirements and speed conditions as set forth under "Performance Tests and Requirements". Welding shall not be employed in the assembly of the apparatus in a manner that shall prevent the ready removal of any component part for service or repair. All steel welding shall follow American Welding Society D1.1-96 recommendations for structural steel welding. All aluminum welding shall be done to American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum. Flux core arc welding shall use alloy rods, type 7000, American Welding

Society standards A5.20-E70T1. The manufacturer is required to have an American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

DELIVERY

Apparatus, to insure proper break in of all components while still under warranty, **shall be delivered under its own power to the receiving Department**- rail or truck freight shall not be acceptable. A qualified delivery engineer representing the contractor shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in the proper operation, care and maintenance of the equipment delivered.

IN SERVICE TRAINING

In service training **shall** be provided by the vendor to accommodate three training sessions per department for all shifts and Volunteers within 20 days of delivery.

INFORMATION REQUIRED

The manufacturer shall supply at time of delivery, complete operation and maintenance manuals covering the completed apparatus as delivered. A permanent plate shall be mounted in the driver's compartment which specifies the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle, overall height.

During the construction phase the vendor **shall provide** weekly progress photos (electronically) for review by the Department once construction begins on each unit. **NO EXCEPTIONS**

PERFORMANCE TESTS AND REQUIREMENTS

A road test shall be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. Vehicle shall adhere to the following parameters:

The apparatus, when fully equipped and loaded, shall have not less than 25% or more than 50% of the weight on the front axle, and not less than 50% nor more than 75% on the rear axle.

The apparatus shall 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.

The service brakes shall be capable of stopping a fully loaded vehicle in 35 feet at 20 mph on

a level concrete highway. The air brake system shall conform to Federal Motor Vehicle Safety Standards (FMVSS) 121.

The apparatus, fully loaded, shall be capable of obtaining a speed of 50 mph on a level concrete highway with the engine not exceeding its governed rpm (full load).

FAILURE TO MEET TEST

In the event the apparatus fails to meet the test requirements of these specifications on the first trial, second trials may be made at the option of the bidder within 30 days of the date of the first trial. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes to conform to any clause of the specifications, within 30 days after notice is given to the bidder of such changes, shall also 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 the permission of the bidder shall not constitute acceptance.

TILT TABLE TEST

Vendor will provide the proper documentation to show that the tilt table test was conducted in accordance with NFPA 1901, and the results of said test.

FAILURE TO MEET TEST

In the event the apparatus fails to meet the test requirements of NFPA 1901 on the first trial, second trials may be made. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection.

LIABILITY

The successful bidder shall defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.

SPECIFICATION BID REQUIREMENTS

Bidders shall also indicate if their bid complies on each (PARAGRAPH) specified. Also, bidders shall submit a detailed proposal. A letter only, even though written on a company letterhead, shall not be sufficient. Bid proposals shall be submitted in the same sequence as specifications for ease of evaluation, comparison and checking of compliance.

EXCEPTIONS

All exceptions shall be stated no matter how seemingly minor.

Any exceptions not taken shall be assumed by the purchaser to be included in the proposal, regardless of the cost to the Vendor.

Proposals taking total exception to specifications shall not be acceptable.

GENERAL CONSTRUCTION

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association.

COMMERCIAL GENERAL LIABILITY INSURANCE

The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:

Products/Completed Operations Aggregate $2,000,000 Personal and Advertising Injury $1,000,000
Each Occurrence $1,000,000

Coverage shall be written on a Commercial General Liability form. The policy shall be written on an occurrence form and shall include Contractual Liability coverage subject to the terms and conditions of the policy. The policy shall include owner as an additional insured as their interest may appear.

COMMERCIAL AUTOMOBILE INSURANCE

The successful bidder shall, during the performance of the contract keep in force at least the following minimum limits of commercial automobile insurance:

Each Accident: $1,000,000

Coverage shall be written on a Commercial Automobile form.

UMBRELLA/EXCESS LIABILITY INSURANCE

The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Aggregate: $10,000,000
Each Occurrence: $10,000,000

The umbrella policy shall be written on an occurrence basis and at a minimum provide excess to the Bidder's General Liability, Automobile Liability and Employer's Liability policies.

Owner shall be included as an additional insured on the General Liability policy as their interest may appear.
The required limits can be provided by one or more policies provided all other insurance requirements are met.

Coverage shall be provided by a carrier(s) rated A- or better by A.M. Bests.
Bidder agrees to furnish Wake County with a current Certificate of Insurance with the coverages listed above prior to and as a condition of award; and within five (5) calendar days of request... The certificate shall be made out to the purchaser. The Certificate of Insurance shall endeavor to provide that owner be given 30 days advance notice of cancellation or nonrenewal change in coverage.

ISO COMPLIANCE

The manufacturer shall operate a Quality Management System under the requirements of ISO 9001. These standards sponsored by the "International Organization for Standardization (ISO)" specify the quality systems that shall be established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance shall be included with the bid.

APPROVAL DRAWING

A drawing of the proposed apparatus shall be provided with the Bid proposal (**NO EXCEPTIONS)**. The sales representative shall also have a copy of the same drawing. The finalized and approved drawing shall become part of the contract documents. This drawing shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc. The final drawing shall be done within sixty (60) days of contract signing.

A "revised" approval drawing of the apparatus shall be prepared and submitted by the manufacturer to the purchaser showing any changes made to the approval drawing, signed by the vendor and the Department.

WARRANTY

Each piece of new fire apparatus shall be warranted to be free from defects in materials or workmanship under normal use and service. Each manufacturer shall supply, as a part of their bid package, a copy of the warranty or warranties that they propose to provide, and in no case shall it be less than one (1) year on the entire apparatus.

All other warranties, as outlined in these specifications shall be provided in writing as a part of the bid package.
Failure to provide the warranties as outlined throughout these specifications shall be cause for rejection of the bid package.

CONTRACT AWARD

Because of the time-span covered by this bid, no contract extensions are anticipated. Due to the intent to purchase three (3) vehicles during the FY 17 and FY 18 timeframe, no increase in price will be considered. Bidder must identify pricing for the units purchased. However, Wake County may elect to purchase additional units, if any additional units are purchased between July 2016 and December 31, 2017, bidder must extend the same pricing shown for the units purchased during FY 17.

TIMELINES FOR ORDERS

1. A follow up to the vendor will be released at a later date

BOND

NOT REQUIRED

PERFORMANCE BOND, NOT REQUESTED

A performance bond shall not be included. If requested at a later date, one shall be provided for an additional cost.

TITLE PAPER WORK

All title and MCO's are required to be delivered with completed Title Application, MSO, and Invoice at the time the apparatus is delivered. Payment will be made within 30 days. The vendor will have a N.C. State Vehicle Inspection completed prior to delivery to the designated location, there are no exceptions to this.

Apparatus will be titled to:

County of Wake
401 Capital Boulevard
Raleigh, NC 27603

VEHICLES TO BE PURCHASED ARE AS FOLLOWS:

For the Fiscal Year 2017	**For the Fiscal Year 2018**
1-Fuquay Varina	1- Fuquay Varina
1-Wake Forest	

The successful bidder shall provide an electronic copy of the final accepted bid, upon notice of award to: Grant.Vick@wakegov.com CC: jjones@fuquay-varina.org

During the construction phase the vendor **shall provide** weekly progress photos (electronically) for review by the Department once construction begins on each unit. ***No Exceptions.***

LIABILITY

The successful bidder shall defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.

PUMP TEST

The pump shall be tested, approved, and certified by Underwriter's Laboratory at the manufacturer's expense. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the manufacturer's record of pump construction details shall be forwarded to the Fire Department.

GENERAL CONSTRUCTION

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association.

COMMERCIAL GENERAL LIABILITY INSURANCE

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Products/Completed Operations Aggregate	$2,000,000
Personal and Advertising Injury	$1,000,000
Each Occurrence	$1,000,000

Coverage shall be written on a Commercial General Liability form. The policy shall be written on an occurrence form and shall include Contractual Liability coverage subject to the terms and conditions of the policy. The policy shall include owner as an additional insured as their interest may appear.

COMMERCIAL AUTOMOBILE INSURANCE

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Aggregate:
$10,000,
000 Each Occurrence:
$10,000,
000

The umbrella policy shall be written on an occurrence basis and at a minimum provide excess to the Bidder's General Liability, Automobile Liability and Employer's Liability policies. Owner shall be included as an additional insured on the General Liability policy as their interest may appear.
The required limits can be provided by one or more policies provided all other insurance requirements are met.
Coverage shall be provided by a carrier(s) rated A- or better by A.M. Bests.

Bidder agrees to furnish owner with a current Certificate of Insurance with the coverages listed above prior to and as a condition of award; and within five (5) calendar days of request... The certificate shall be made out to the purchaser. The Certificate of Insurance shall endeavor to provide that owner be given 30 days advance notice of cancellation or nonrenewal change in coverage.

ISO COMPLIANCE

The manufacturer shall operate a Quality Management System under the requirements of ISO 9001. These standards sponsored by the "International Organization for Standardization (ISO)" specify the quality systems that shall be established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance shall be included with the bid. An equivalent internal documentation procedure will be accepted in lieu of ISO Certification.

SINGLE SOURCE MAINTENANCE

The successful bidder **SHALL** provide Mobile Field service for fire apparatus and accessories, technicians **SHALL** be at a minimum EVT certified. No exceptions to this requirement are acceptable.

The vendor will provide road service within 100 miles of Wake County, and will show a picture of said vehicle utilized for service. The successful bidder shall also provide twenty-four (24) hour emergency service for first out apparatus only.

CAB CUSTOM STYLE WET SIDE WATER TENDER

The cab shall be a custom 2 man cab over engine style, with the driver and officer positions ahead of the engine and front axle. The cab shall be specifically designed and manufactured for the fire service industry.

The cab shall be designed and assembled by the apparatus manufacturer in a facility located on the manufacturer's premises.

The cab shall be of a totally enclosed full tilt design, with the interior area completely open to improve visibility and verbal communication between the occupants. The cab shall be capable of tilting 45-degrees, allowing the chassis engine to be removed, if required, without tilting the cab beyond 45-degrees.

The cab shall be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.

The cab super-structure shall be designed with high strength 6061-T6 aluminum extrusions and 3/16" 5052-H32 aluminum plate. This shall include the “A”, “B”, “C” and “D” extruded pillars, triple wall front end reinforced by 3/16" thick x 2"x3" extrusion tubes, 3/16" side walls and rear wall. This shall offer superior occupant protection in the event of vehicle impact.

The "A" pillar shall be of a closed section, one-piece extrusion extending from the cab header to the bottom of the cab. This design shall ensure strength and superior resistance to buckling in the event of a frontal impact.

The outside cab width shall measure a minimum of 99” across. The interior cab shall have a width minimum of 93".

The cab length shall measure approximately 77.3” from the center of the front axle to the front cab skin and approximately 33” from center of the front axle to the back of the cab, for a total cab length of a minimum of 110.3”.

The cab shall also feature ample driver and officer foot room, of a minimum of 3.7 square feet for the driver and 4.45 square feet of floor space at the officer’s feet. (No exceptions)

The leading edge of the cab floor from the steps shall meet NFPA 13-7.3 slip resistance requirements, by using bi-directional, knurled trim piece on the front cab doors.

The cab shall incorporate a two-step design at each door, with a first step height of approximately 22” from the ground. The leading edge of the first step shall be 5" further outboard than the second step to provide a staircase design for safer egress.

The front cab first step shall measure a minimum of 32" wide x 9-1/2" deep. The front cab intermediate step shall measure a minimum 33" wide x 8-1/2" deep.

There shall be an aluminum wall on the interior of the cab located behind the driver and officer seat. The wall shall divide the forward portion of the cab from the rear transverse compartment.

The cab shall meet or exceed cab impact test (SAE J-2420, cab rollover test (SAE J2422), and cab seating requirements (FMVSS 210, and FMVSS 208).

ROOF STYLE - FLAT

The roof of the cab shall incorporate a flat roof style. The cab roof design shall incorporate an angled front roof, transitioning into a rolled extrusion for a swept back design.

The roof of the cab shall feature dual .25" thick interlocked structural member extrusions running the entire width of the cab defending against buckling in the event of a rollover.

The interior cab height based on the flat roof style shall measure a minimum of 55-1/2".

The forward cab roof section shall include a combination of 1/8" 6061-T6 extruded tube reinforcements and a hat-section structure 1/8" thick 5052-H32 aluminum bracing. The bracing shall wrap the entire perimeter of the cab forward roof, and the condenser support structure.

The condenser support structure shall include 1/8" triple sections, supporting the outer perimeter and center of the condenser mounting pad.

A drip rail shall be provided along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side.

REAR COMPARTMENT

The rear portion of the cab shall have a transverse compartment. The compartment shall start at the center line of the front axle and continue to the rear wall of the cab. The compartment shall be a minimum of 35.00 inches wide by 50.00 inches high and 92.50 inches across. There shall be an opening on both the driver and officer side of the cab. The compartment shall have a clear door opening minimum of 28.50 inches wide by 46.50 inches high.

REAR COMPARTMENT INTERIOR FINISH

The interior of the driver side compartment shall be finished in a high performance polyurethane coating. The color shall be gray in color.

REAR COMPARTMENT – Exterior Hinged Doors

The rear compartment shall feature:

A hinged box pan style exterior compartment door.

A hidden, piano style stainless steel door hinge which shall be mounted inside the panel of the door prohibiting dirt and debris from becoming trapped in the hinge

REAR COMPARTMNET HANDLE

The rear compartment handle shall be a die cast steel, chrome plated handle.

CAB DOORS

The cab shall include a total of two (2) forward doors.

The forward cab doors shall be a minimum of 45" wide to provide enhanced entry and egress of the cab.

The two (2) forward doors shall offer a clear door opening measurement of a minimum of 42" wide, measured from door seal to door seal.

A full length, hidden piano style 10 gauge stainless steel door hinge with a 1/4" pin, which shall be mounted inside the panel of the door prohibiting dirt and debris from becoming trapped in the hinge

An integrated one-piece inner door assembly that includes a glass track, mounting provisions for window regulator, door handle and door panel shall be utilized. The inner door assembly shall be easily removed with nut inserts. Self-tapping screws shall not be acceptable.

CAB STEPS

The cab steps shall meet NFPA 13-7.3 in size and slip resistance requirements.

The cab shall incorporate a two-step design at each door, with a first step height of approximately 22” from the ground. The leading edge of the first step shall be 5" further outboard than the second step to provide a staircase design for safer egress.

The front cab first step shall measure a minimum of 32" wide x 9-1/2" deep. The front cab intermediate step shall measure a minimum 33" wide x 8-1/2" deep.

CAB STEP TRIM

The cab steps shall include a 12 gauge 304 Grip Strut stainless steel construction on the first step, the step closest to the ground. The stainless steel finish shall be a number 7 mirror. The step shall include a frame which is integral with the construction of the cab for rigidity and strength. The Grip Strut shall allow water and other debris to flow through rather than becoming packed under the step. The middle step shall be integral with the cab in construction and shall be trimmed in 3003-H22 embossed aluminum tread plate which is 0.084" thick.

FULL HEIGHT DOORS

All doors shall be full height from the roof of the cab extending down to cover and protect the entrance step areas.

DOOR HANDLES

The exterior door handles shall be constructed of die-cast steel and chrome plated for a pleasing appearance. They shall feature a vertically oriented heavy duty pull style handles which are extended out and suitable for easy grasping with a gloved hand.

The interior door handle shall be a chrome plated paddle style latch. The paddle shall be hinged towards the front of the cab and shall include a manual door lock unless otherwise specified.

Each door latch shall feature a military grade aligning dove tail guide striker assembly for precision door closure which prevents sagging throughout the life of the vehicle. No exceptions.

CAB DOOR LOCKS

All cab doors shall include manual door locks with keys. The door lock shall include a toggle and shall be an integral part of the interior door handle which is red in color. The exterior door lock is integral with the door latch. The cab doors may be unlocked from the exterior with a key or through a thumb turn from inside the cab.

INTERIOR CAB DOORS

All cab doors shall consist of a one-piece formed and stamped aluminum interior panel. The panel shall include a formed collar around the interior door latch. ABS material shall not be acceptable.

INTERIOR CAB DOOR FINISH

All cab doors shall be finished with a coating for durability. The finish shall be black in color.

INTERIOR FRONT DOOR PULL

The interior driver and officer cab doors shall each include one (1) customized cast aluminum single piece door grab pulls designed specifically for the fire service.

The door pull shall feature secure mounting in three separate locations of the pull utilizing stainless steel fasteners with nut inserts in each location. Self-taping screws or other mounting techniques shall not be allowed for interior door pulls or grab handles.

Each handle shall be constructed of A356 aluminum casting or equivalent and shall feature a black powder coated finish.

WINDSHIELD

A one (1)-piece, safety glass full width windshield with approximately 3,228 square inches of clear viewing area will be provided.

The windshield shall feature:

A completely uninterrupted view from both the driver and officer positions

The windshield will consist of three (3) layers; the outer layer, the middle safety laminate, and the inner layer. The .114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage.

Economical replacement readily available from auto glass supplier

Easily removable for replacement using standard automotive techniques

A band will be provided along with an outer trim seal on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPER SYSTEM

A single windshield wiper system shall be incorporated in conformance with FMVSS and SAE requirements. Two (2) 22" windshield wiper arms shall be mounted below the windshield. Each arm shall include a 26" long wiper to provide optimum windshield clearing.

The windshield wiper fluid reservoir can be filled without raising the cab.

WINDSHIELD WIPER ACTIVATION

The windshield wipers shall be activated through a switch on the driver's panel, with intermittent control.

ELECTRIC WINDOW CONTROLS

Each cab entry door shall be equipped with an electrically operated tempered glass window. A window control shall located on the door panel within easy reach of the respective occupant. Each switch shall allow intermittent or auto down operation for ease of use. The driver control panel shall contain a control switch for each cab door's window. The window switches shall be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.

WINDOW -DRIVER'S DOOR

The driver's door shall include a window which measures a minimum of 25.5" wide x 21" high with a minimum clear viewing area of 694 square inches. The glass shall include a standard automotive tint and shall roll completely into the door housing.

The window shall be trimmed in a black anodized aluminum ring and rubber seal to keep water from entering the cab when closed.

WINDOW- OFFICER'S DOOR

The officer's door shall include a window which measures a minimum of 25.5" wide x 21" high with a minimum clear viewing area of 694 square inches. The glass shall include a standard automotive tint and shall roll completely into the door housing.

The window shall be trimmed in a black anodized aluminum ring and rubber seal to keep water from entering the cab when closed.

CAB INSULATION

The cab shall be completely insulated from road and vehicle resonance, exterior sound and thermal intrusion.

The cab insulation system shall be comprised of three separate components each designed to assure optimal thermal and acoustic properties are achieved. Two layers of insulation material shall be utilized in conjunction with a .2" air barrier.

The cab shall utilize at a minimum 10 mils of flexible extensional visco elastic vibration damping insulation offering excellent acoustic reduction properties.

A minimum of .8" of SC bond Polyurethane Foam insulation shall be applied as an additional insulation between the cab skin and all interior ceiling and wall surfaces. The insulation shall have a density of 10lb/ft3 +/-.5 providing better thermal properties and acoustic reduction properties.

The interior cab insulation system shall ensure that no seated position within the cab exceeds 72dB as certified by the manufacture. This decibel rating shall be measured with the apparatus traveling 45 mph with climate control settings off.

All insulation used in the construction of the cab shall be marine grade featuring longevity and resistance to degradation.

Use of open cell material as the primary insulation will not be acceptable.

The interior of the cab including the rear wall and ceiling panels shall be insulated.

Use of open cell material as the primary insulation will not be acceptable.

ENGINE TUNNEL INSULATION

The engine tunnel shall include an insulated barrier from noise on the underside of each tunnel surface.

The insulation barrier shall provide an acceptable decibel level within the cab meeting or exceeding the recommendations of NFPA 1901.

The thickness of the engine tunnel insulation shall be 1" thick. The insulating material shall be open cell polyether based foam with a textured surface, specifically designed for acoustic absorption.

Use of aluminized faced material on the engine tunnel shall not be acceptable.

The engine tunnel insulation shall be precisely cut and sealed to fit each segment on the underside of the tunnel surface. The insulation shall then be affixed by a pressure sensitive adhesive.

The insulation shall meet or exceed FMVSS 302 flammability testing.

DAMPING INSULATION

The entire cab, including the ceiling and walls shall include additional insulation reducing structure borne noise from vibration, impact and resonance within the cab.

INTERIOR TRIM MATERIAL

The interior trim shall feature a 31 oz. marine grade vinyl which features a tensile strength of ASTM D751 of excellent, tear strength meeting the Federal standard 191-5134 of excellent and shall be oil resistant passing the CID-A-A-2950A requirement for no permeation.

The soft trim vinyl shall feature mildew resistance passing ASTM G21-90 and shall be rated to -25 degrees Fahrenheit.

The vinyl shall be flame retardant meeting California Fire Code 117, UFAC Class 1, and BIFMA Class 1 and shall have a high resistance to abrasion.

The interior of the cab and ceiling panels shall feature this soft trim and shall be gray in color.

INTERIOR TRIM MATERIAL

The rear wall of the forward cab shall be covered in gray 31 oz. marine grade vinyl for a more pleasing appearance.

FLOOR MAT

The interior flooring of the cab shall be covered with an advanced gray multi-layer acoustic dampening mat. The floor matting shall be an open/closed cell, flexible polyurethane polyamide material with frictional dampening and dissipation properties. The mat shall be a fire and skid resistant non-wicking material.

SUN VISORS

The driver and officer seats shall feature a sun visor mounted in the header over each seating position. The sun visors shall be gray tinted plastic.

CAB DASH

The cab dash shall offer heavy duty, durable construction and shall be constructed of a single contoured piece.

This construction shall allow for a clean, seamless dash area that shall reduce unnecessary joining of cab dash components.

Optimal heating and cooling of cab occupants, HVAC louvers shall be integrated into the gauge panel with a total of six (6) louvers; three louvers pointing at the driver and three louvers pointing at the officer.

For improved safety cab switches and controls shall be ergonomically located within easy reach of the driver when in the seated position with seatbelts fastened. This design will reduce driver distraction and increase safety by putting frequently accessed driver controls within easy reach to allow the driver more time to focus on the road.

The officer side cab dash shall have a painted surface grade panel that shall house the three HVAC louvers on the officer side. This panel will also provide ergonomically located switches and controls for the officer. All controls shall be within easy reach while in the seated position with seatbelts fastened.

Access panels on the top of the dash for both the driver and officer sides easing maintenance access to controls, components and gauge assemblies

The driver side dash shall include gauges for primary air pressure, secondary air pressure, a Pacific Insight instrumentation gauge panel and the DEF gauge as standard

The driver side dash shall also include two (2) lower panels to the left and right of the steering column for FMVSS switches such as the Off/Ignition and start switches and the park brake assembly

.The driver dash shall include a panel for inclusion of an optional Weldon Vista screen and seven (7) additional switches or the HVAC controls and additional switching to the right of the Driver

The officer dash shall include a recessed area for a glove box, map compartment or clip board

ENGINE TUNNEL

The engine tunnel shall be constructed of aluminum offering superior durability in addition to thermal and acoustic resistance. Covering the engine tunnel shall be a layer of formed composite material for a contoured transition into the dash and offering a pleasing appearance.

The tunnel shall feature a coating which shall match the dash and header in texture and color for a consistent appearance and robust finish with a thickness of approximately .28".

The engine tunnel shall feature:

The engine tunnel at the driver's position shall be a tapered design, featuring 24" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 25.5" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 33".

The engine tunnel at the officer's position shall be a tapered design, featuring 22-1/2" clear width at floor level, first taper shall start 16" from floor level and taper inward for a clear width of 24" and the final taper shall start at 20.5" from floor level and taper inward for a clear width of 31-1/2".

The design shall offer a minimum of 26" for the driver and 24" for the officer as measured from the inside door pan to the top edge of the tunnel. The dimension measured at the "H" (hip) point, with the seat in the lowest position, shall be a minimum of 28-1/2" for the driver and 27" for the officer.

There shall be no components such as HVAC systems mounted to or above the tunnel as this would reduce visibility and inhibit communications within the cab

CAB DASH & ENGINE TUNNEL

The cab dash and the engine tunnel of the cab shall be coated with polyurethane coating for a durable finish. The color shall be black.

MODULAR CENTER DASH CONSOLE

The dash and front portion of the tunnel shall include an angled modular console centered between the driver and officer positions.

The console shall feature:

A heavy duty housing constructed from 14 gauge steel which is powder coated with a durable semi-gloss textured black finish to provide glare and corrosion resistance

The console top constructed of black anodized aluminum extruded rails which allow for mounting brackets, plates, and other console options

Integral nut tracks which allow mounting of equipment to the sides of the console by way of sliding 1/4"-20 hex nuts

A hinged lid constructed from 16 gauge steel also powder coated for corrosion resistance

The availability of pre wiring for specific components

A modular design for ease of changes and future additions such as changing out brands of radio, types of sirens or adding accessory space

The console shall offer an available eight (8) zones configured with mounting plates for optional components as shown below:

CONSOLE MOUNTED SIREN

One (1) black mounting plate(s) containing mounting for a siren shall be provided and incorporated in the modular dash console.

Mounting shall be per the Fire Department discretion.

INSTRUMENTATION PANEL

The instrumentation panel inlay shall be painted job color.

CAB HEADER

The cab header shall offer heavy duty, durable construction and military type strength.

The cab header shall offer a finish of a polyurethane coating for a rugged design and finish.

The cab header shall also be purpose built for integration of Fire components and ease of maintenance with panels above both the driver and officer positions measuring 8" wide x 15"long for mounting radios, aerial controls and switches.

HVAC HEATING AND COOLING SYSTEMS

The interior cab climate control shall be comprised of a triple system that shall include a defroster, a cab and crew heater and air conditioner for a complete HVAC system. The air

conditioning system shall be comprised of compressor, condenser, and a minimum of three (3) evaporators to provide consistent temperature control throughout the entire cab.

The system shall be rated as an Emergency Vehicle grade for the use in Fire and Rescue style vehicles and shall provide environmental air treatment in accordance with published SAE standards.

The HVAC system shall be tested and certified by the component manufacturer and a third party independent certified testing laboratory, including all three systems. Documentation of test results shall be provided with the bid. No Exceptions.

The HVAC system shall be a total and complete system, and shall provide sufficient defrosting, heating and cooling to the entire cab. The HVAC system shall meet or exceed all specified items without the use of auxiliary heating and cooling systems.

DEFROSTING SYSTEM

The defrosting system shall feature:

Maximum defrost and heating performance, a 30,000 BTU heater-defroster unit with 780 CFM of air flow will be provided inside the cab.

The defroster unit will be strategically located under the center forward portion of the instrument panel. For easy access, a removable cover will be installed over the defroster unit.

Mounting under the dash with fresh air intake providing excellent defrost.

Six (6) vents shall be located in the top forward portion of the dash for superior defrosting properties across the entire windshield.

The system shall be capable of clearing 90 percent or more of the windshield in fifteen (15) minutes or less after a three (3) hour cold soak at 0 degrees Fahrenheit (-17.78 degrees Celsius).

The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the one (1) piece windshield.

HEATING SYSTEM

The heating system shall feature:

Delivery of a minimum of 82,000 BTU/hour of heat to the entire cab.

Heat and air circulation shall be provided to the driver and officer foot area of the cab as standard through ducting in the foot well area of both positions. No Exception.

Substantial air movement and heating provided to the driver and officer's position, with six (6) adjustable louvers, located in the dash, three (3) adjustable louvers directed at the driver and three (3) adjustable louvers directed at the officer

A minimum of 880 CFM of air flow measured at the front seated positions.

The heater shall be plumbed with a shut off valve at the engine, so that the coolant bypasses the heaters.

The heater hoses used will be silicone high heat heater hose.

AIR CONDITIONING

The air conditioning system shall feature:

A minimum of 96,000 BTU/hour of cooling capacity to the entire cab.

One (1) evaporator shall be located under the center dash and allowing for more interior mounting of accessories.

A gravity condensation drain system shall be utilized. These drains shall remove all condensation from the evaporator units and direct it to the exterior of the chassis cab for optimal performance. Systems utilizing pumps to remove condensation, or gravity systems with poles or other obstructions located within the cab to route drains through shall not be acceptable.

Substantial air movement for optimum cooling shall be provided to the driver and officer positions, with six (6) adjustable louvers, located in the dash, three (3) adjustable louvers shall be directed at the driver and three (3) adjustable louvers shall be directed at the officer

The air condition system shall be capable of cooling the cab from 110 degrees Fahrenheit (43.33 degrees Celsius) to 70 degrees Fahrenheit (21.11 degrees Celsius) at 60% humidity in less than 30 minutes with an engine RPM of 1400; and cool the cab from 100 degrees Fahrenheit to 73 degrees Fahrenheit at 80% humidity, after a three (3) hour heat soak. A certification document from the testing facility shall be available upon request.

Proposals offering ceiling mounted evaporator units in the center of the cab above or on the engine tunnel shall not be accepted as this is a safety consideration due to the lack of visibility and communication within the cab.

CAB PAINT AIR CONDITIONING CONDENSER

The air conditioning condenser shall be painted to match the roof color.

CONDENSOR

The cab air conditioning system shall include one (1) low profile HE-condenser which shall be centered on the roof of the cab.

HEATING AND COOLING CONTROLS

The HVAC system shall be controlled from the Driver dash through turn style knobs for the temperature control, the fan control and for the mode.

CAB SAFETY SYSTEM (No deletion of this item allowed per Wake County)

The cab shall be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and shall include the following:

A supplemental restraint system (SRS) sensor shall be installed on a structural cab member behind the instrument panel. The SRS sensor shall perform real time diagnostics of all critical subsystems and shall record sensory inputs immediately before and during a side roll or

- A fault-indicating light shall be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag shall be mounted in the steering wheel and shall be designed to protect the head and upper torso of the occupant, when used in combination with the three (3)-point seat belt.
- A passenger side knee bolster air bag shall be mounted in the modesty panel below the dash panel and shall be designed to protect the legs of the occupant, when used in combination with the three (3)-point seat belt.
- Air curtains shall be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats shall be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.
- Seat belts shall be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

FRONTAL IMPACT PROTECTION (No deletion of this item allowed)

The SRS system shall provide protection during a frontal or oblique impact event. The system shall activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis shall have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system.
The sensor shall activate the pyrotechnic devices when the correct crash algorithm,

wave form, is detected. (No exception).

The SRS system shall deploy the following components in the event of a frontal or oblique impact event:

- Driver side front air bag.
- Passenger side knee bolster air bag.
- Air curtains mounted in the outboard bolster of outboard seat backs.
- Suspension seats shall be retracted to the lowest travel position.
- Seat belts shall be pre-tensioned to firmly hold the occupant in place.

SIDE ROLL PROTECTION (No deletion of this item allowed)

The SRS system shall provide protection during a fast or slow 90-degree roll to the side, in which the vehicle comes to rest on its side. The system shall analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

The SRS system shall deploy the following components in the event of a side roll:

- Air curtains mounted in the outboard bolster of outboard seat backs.
- Suspension seats shall be retracted to the lowest travel position.
- Seat belts shall be pre-tensioned to firmly hold the occupant in place.

SEAT AND SEAT BELT COLOR

The seats in the cab shall be black in color with a red seat belt.

SEAT MATERIAL

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester.

A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids.

DRIVER SEAT-Safety System

The driver's seat shall be a H. O. Bostrom Sierra Electric 8-Way, high back ABTS bucket seat. The seat shall have contoured, high-density cushions with lumbar support. The seat cushion shall be supported with a serpentine spring suspension. The seat shall have eight-inch fore and aft adjustment, 2 inch height adjustment, front of seat tilt, rear of seat tilt, reclining seat back and occupancy sensor in the seat cushion. All seat adjustments will be electric and will be adjusted with a switch mounted under the front of the seat cushion. The seat control switch bracket will have a slotted mounting to allow up to 1” of rearward adjustment to accommodate user preference.

The seat shall be equipped with a red, integrated 3-point shoulder harness and lap belt and an emergency locking retractor. The seat belt shall include a buckle latched switch. The seat belt shall include a rotating bezel guide at the upper shoulder point and shall be routed through the seat frame and covering to protect webbing.

SEAT BACK

The seat back shall incorporate a standard style headrest.

SEAT MOUNTING DRIVER

The driver's seat shall be installed in an ergonomic position in relation to the cab dash.

DRIVER SEAT BOX STORAGE COMPARTMENT

There shall be a storage area under the driver's seat. The compartment shall be 21.25 inches wide, 22.50 inches long, and 6.25 inches high. The access opening shall be 12.00 inches wide and 4.50 inches high.

ALUMINUM ACCESS DOOR

There shall be an aluminum door cover provided for the driver and officer seat compartment. The door shall be coated to match the interior of the cab, and it shall be equipped with a piano style hinge and a manual latch.

OFFICER SEAT-Safety System

The seat shall be an HO Bostrom Tanker 450 series seat. The seat shall include an SCBA storage area with one piece flip-up headrest with spring return. The seat shall include two part bolster padding with removable insert to accommodate SCBA's with rigid waist belts.

The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt and an emergency locking retractor. The seat belt shall include a buckle latched switch. The seat belt shall include a rotating bezel guide at the upper shoulder point and shall be routed through the seat frame and covering to protect webbing.

SEAT BACK

A SecureAll™ SCBA locking system which shall be one bracket model and store all U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically

A center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions

The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

SEAT MATERIAL

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester.

A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids.

OFFICER'S SEAT BOX STORAGE COMPATMENT

There shall be a storage area under the officer's seat. The compartment shall be 19.75 inches wide, 17.50 inches long, and 6.25 inches high. The access opening shall be 9.00 inches wide and 4.50 inches high.

HELMET STORAGE MODEL

Two (2) Ziamatic model UHH-1 helmet storage brackets shall be provided in the cab. The location of the helmet bracket shall be decided prior to construction of the cab.

EXTERIOR GRAB HANDLES

One (1) 18" anti-slip exterior assist handle shall be mounted behind each of the cab doors. The grab handle shall be constructed of aluminum and be 1.25" diameter with a knurled finish enabling non-slip assistance with a gloved hand and mounted on stanchions.

CAB FASCIA

The cab fascia shall offer a traditional, yet aggressive appearance, in its design and shall be constructed of work-hardened 5052-H32 aluminum, and shall include the following.

Traditional style headlight bezels with 4 x 6 high intensity headlights which shall add a classic look to the fascia while improving visibility

The turn signal lights shall be located in the lower outboard portion of the head lamp bezel and a warning light in the lower inboard position

FLUID FILLS & CHECK

For ease of maintenance and access, the following fluid checks shall be located behind the tiltable and/or removable mesh panel:

Engine Oil dipstick

Engine Coolant Sight Glass

Power Steering Fluid dipstick

Windshield Washer Fluid

The following fluid fill shall be located behind the tiltable and/or removable mesh panel:

Engine Oil for the ISL and ISX12 Engines only

Power Steering

Windshield Washer

Proposals including access to fluid checks through the tunnel or by raising the cab shall not be considered.

HEADLIGHTS

A quadruple headlight assembly shall be provided in the fascia to enhance the look. The top two (2) bezels shall include head lamps while the lower bezels shall house a turn signal in the outboard position and a warning light in the inboard position.

FRONT TURN SIGNALS

Two (2) Whelen Series 600 LED square, front turn signal assemblies shall be included on the front fascia directly below the headlights, one each side of the cab grille. Each turn signal shall be mounted in an attractive façade style bezel which is an integral part of the fascia.

SIDE MARKER LIGHTS

Two (2) Weldon amber LED round, side marker light assemblies shall be mounted on the side of the cab ahead of the driver door, adjacent to the front head lamp bezel.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The head light and marker lights shall be activated through a switch on the driver's panel.

FRONT MARKER LAMPS

The cab front shall include five (5) LED amber marker lamps above the windshield in accordance with the Department of Transportation requirements.

CAB FENDERS

The cab wheel wells shall include full width, 14 gauge 304 polished, stainless steel cab fenders to resist corrosion and enable easier cleaning maintenance. The inner liner, measuring 18" wide shall be constructed of plastic with an outer fenderette measuring 2.5" wide.

FRONT MUD FLAPS

The cab and chassis shall be provided with rubber front mud flaps.

CAB TILT SYSTEM

The cab shall be a full tilt style. A hydraulic cab lift system shall be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

CAB TILT LIMIT SWITCH

A cab tilt limit switch shall be included with the cab tilt system. The switch shall effectively limit cab's travel to 35 degrees when being tilted.

There shall be a safety bar to hold the cab at 35 degrees for additional safety.

CAB TILT LOCK DOWN INDICATOR

The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.

In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar and the parking brake is released.

REARVIEW MIRRORS

Velvac model 2025 bus style mirrors shall be provided. The mirror heads shall have a chrome finish and shall measure 8.00" wide x 13.75" high. The mirrors shall be mounted one (1) on the driver door and one (1) Officer's Side mirror to be mounted on frontal portion of the cab. The mirrors shall have an integrated Signal Arrow in the flat glass and clearance light on the mirror arm.

The mirrors shall feature an upper heated remote controlled flat glass and a lower heated remote convex glass. The mirror control switches shall be located within easy reach of the driver. The mirrors shall be manufactured using the finest quality non-glare glass and shall feature a rigid mounted, reducing vibration. The mirrors shall be corrosion free under all weather conditions.

MIRROR REMOTE ACTIVATION

The driver's panel shall include activation for the mirrors remote function. The driver panel shall also include a switch activating the mirrors to be heated.

CAB TWO TONE PAINT

The cab shall be painted with the White over Red colors designated by the customer with a minimum thickness of 2.00 mils of finished paint, followed by a clear top coat not to exceed 2.00 mils.

CAB UNDERCOAT

The cab shall have an undercoat applied prior to the cab being set on the running gear. The under coat shall be a waterborne, one-component, air dry undercoat formulated to prevent chipping, cracking and marring of painted or unpainted surfaces after exposure to high impact sand, gravel or other abrasive materials. It shall also have high corrosion resistance.

PAINT SPRAY OUT

The customer shall be supplied with a paint spray out for customer approval prior to the cab being painted.

FRONT AXLE

A Meritor MFS Easy Steer 20,000 pound non-drive axle shall be incorporated as the front axle for the chassis. The axle shall feature:

A 3.74" drop and a 71" king pin intersection (KPI)

A conventional style hub with a standard knuckle

FRONT WHEEL BEARING LUBRICATION

The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.

FRONT SUSPENSION

The front suspension shall include a Hendrickson leaf spring suspension. The suspension shall feature:

- Capacity rating of 20,000 pounds
- 9 Leafs
- A Grease fitting
- Double wrapped front eye

FRONT SHOCK ABSORBERS

Two (2) Bilstein inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system. The shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.

The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and "road sensing" shock designs and shall contribute to the durability and long life of the Bilstein shock absorbers.

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 85 or equivalent and shall include the following:

A balanced, hydraulic, positive displacement, sliding vane power steering pump which is gear driven from the engine

One-piece, 2" diameter drag link for maintaining consistent wheel alignment resulting in less maintenance.

CHASSIS ALIGNMENT

The chassis frame rails shall be measured to insure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser

aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer.

Alignment documentation shall be delivered with chassis.

FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 46 degrees to the left and right.

The manufacturer shall provide third party verification of cramp angle upon request from the fire department.

FRONT TIRES

The front tires shall be Goodyear 385/65R 22.5 G296 MSA "J" tubeless radial.

The front tires shall feature:

- A stamped load capacity of 18,740 pounds per axle with a speed capacity of 65 miles per hour when properly inflated to 120 pounds per square inch
- Deep 23/32" tread helps put more wearable rubber on the road for enhanced mileage.
- Severe service compound helps resist cuts, chips and tears and offers enhanced mileage.
- Deep, wide circumferential grooves with more than 500 biting edges help promote all-season traction on wet, snowy and dry roads.
- Optimized tread design helps reduce road noise for a quiet ride.

FRONT WHEELS

The front wheels shall be Accuride hub piloted, 22.50 inch X 12.25 inch polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and a polished finish that lasts.

FRONT BRAKES

The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17" vented rotors. The disc brakes shall be provided with visual wear indicators.

The front brakes shall include brake chambers supplied by Meritor and shall be approved per application.

STEERING WHEEL AND COLUMN

The vehicle shall include an 18" tilt/telescopic steering column which shall offer up to seven (7) tilt positions. The steering column shall include a self-canceling turn signal lever, a four-way hazard switch and headlamp dimmer switch.

The steering wheel shall be a four (4) spoke VIP steering wheel which shall be finished in a vinyl covering over foam padding and shall include a center horn button.

The chassis shall have a 12-volt electric horn with a minimum 110 decibels.

REAR AXLE

A single Meritor RS-25-160 driving axle shall be incorporated as the rear axle for the chassis. The axle shall feature:

- Rated capacity of 27,000 pounds
- Heavy duty Hypoid gearing for longer life, increased strength and quieter operation
- Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage
- Rigid differential case for high axle strength and reduced maintenance
- Rugged Dependability
- Rectangular shaped, hot formed housing with a standard wall thickness at spring seat of .63” for extra strength and rigidity
- Precision forged, single differential gearing

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR SUSPENSION

The single rear axle shall feature a Reyco 79KB vari-rate, self-leveling captive slipper type conventional multi-leaf spring suspension, with 57.50 inch X 3.00 inch springs. One (1) adjustable and one (1) fixed torque rod shall be provided.

The rear suspension capacity shall be rated at 27,000 pounds based on the capacity of the brakes and rear tires.

REAR BRAKES

The rear brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors. The disc brakes shall be provided with visual wear indicators.

The rear brakes shall include brake chambers supplied by Meritor and shall be approved per application.

REAR SHOCK ABSORBERS

Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.

REAR TIRES

The rear tires shall be Goodyear 12R 22.5 16PR "H" tubeless radial G622 RSD. The rear tires shall feature:

- A stamped load capacity of 27,120 pounds per axle with a speed capacity of 68 miles per hour when properly inflated to 120 pounds per square inch

REAR WHEEL

The rear wheels shall be Accuride hub piloted, heavy duty, 22.50 inch x 8.25 inch aluminum wheels. Each outer wheel shall have a polished aluminum finish on the exterior surface and each inner wheel shall have a machine finish. The wheels shall be forged from a single piece of aluminum which shall be corrosion resistant, engineered to be lightweight and provide exceptional performance. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

VEHICLE TOP SPEED

The top speed of the vehicle shall be programmed at approximately 68 MPH +/-2 MPH at governed engine RPM, to comply with NFPA classifications.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system with a minimum of 4152 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. The system shall include an anti-compounding feature. All air reservoirs provided on the chassis shall be labeled for identification.

The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.

A four (4) sensor, four (4) modulator anti-lock braking system (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the single rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

The Electronic Stability Control (ESC) unit is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle's motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle's lateral acceleration. The Controller Area Network (CAN) bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

The Meritor Wabco ABS and ESC system shall come with a three (3) year/300,000 mile parts and labor warranty.

AIR TANK BRACKETS

The air tank shall be mounted to the frame rail with brackets that are hot dipped galvanized thereby creating a barrier and cathodic protection from corrosion, and eliminating the requirement for finish paint and the subsequent requirements for touch up paint and/or total

repaint after a period of time due to nicks, chips and corrosion. Powder coated or painted air tank brackets shall not be accepted.

Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

Park brake system shall include an anti-compounding feature.

PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color.

The parking brake actuation valve shall be mounted on the driver's side dash to the right of the steering column within easy reach of the driver.

AIR DRYER

The brake system shall include a Wabco System Saver 1200 plus air dryer with an integral 100 watt heater with a Metri-Pack sealed connector. The system shall have an integrated purge volume and integrated governor.

The system shall have the following features:
Premium desiccant provides greater water adsorption

Replaceable spin on cartridge for simple maintenance

Compact light weight design

Pressure relief safety valve

Turbo cut-off valve for boosted compressor applications

Service components are external for easy replacement

Common service components proven for reliability and quality

Integrated with the air governor.

AUXILIARY AIR TANK

An auxiliary air reservoir shall offer a 1200 cubic inch reservoir, isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

MOISTURE EJECTORS

Manual pet-cock type drain valves shall be installed on all reservoirs of the air supply system.

AIR SUPPLY LINES

A dual air system plumbed with color coded reinforced nylon tubing air lines shall be installed on the chassis. The primary (rear) brake line shall be green, the secondary (front) brake line orange, the parking brake line yellow and the auxiliary (outlet) will be black; in accordance with SAE standards.

Brass push-lock type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

AIR HORN RESERVOIR

One (1) air tank, with a 1200 cubic inch reservoir, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

FRAME

The chassis frame shall consist of two (2) “C” style parallel rails, constructed of high strength low alloy and shall feature the following:

A 10.19” high by 3.63” deep cold rolled steel frame.

Inner channel with a minimum measurement of 9.31" high x 3.25" deep x .25" thick

The 10.19” frame height shall be maintained throughout the entire length of the frame to allow for maximum storage capacity for the entire apparatus.

If frame rails that are larger than those specified are to be utilized, the maximum height of each frame rail shall not exceed 10.25” at any point on the frame rail. This will ensure the lowest possible vehicle center of gravity allowing maximum stability as well as providing the lowest body height possible.

Frame rail shall have a consistent frame web throughout the entire length.

Grade 8 Yellow zinc coated fasteners, huck bolts shall not be acceptable

Manufacturer's lifetime warranty

The frame ratings shall be as follows:

110,000 PSI minimum yield strength high strength low alloy steel

Minimum Resisting Bending Moment (RBM) of 2,810,000 inch pounds per rail.
(NO EXCEPTIONS)

To avoid frame cracking and failure over time, the top flange of the frame adjacent to the engine installation shall have a tapered design. Notches for engine components shall not be accepted due to fatigue and the potential for cracking.

UNDER FRAME REINFORCEMENT

An under slung frame reinforcement shall be installed below the frame rails in the transmission area to increase the vertical rigidity of the frame.

CROSS MEMBERS

There shall be a minimum of seven (7) steel plate cross members installed on the apparatus.

50,000 psi minimum yield strength steel plate cross members

Manufacturer's lifetime warranty to match frame warranty.

Installed with one-piece cross member gusset to maximize vertical strength and minimize cross member flex

Crossmembers can be inverted when required to allow for PTO drive line installation without the need for notching or modifying the cross members in anyway.

FRONT FRAME EXTENSION

A single piece 80,000 PSI steel extension shall be installed on the front of the frame rails.

Allows radiator to be removed through the bottom of the frame extension without tilting the chassis cab

Minimizes damage to the chassis cab in the event of frontal impact accident

Maintains structural integrity of the chassis frame rails while attaching bumper extensions of varying lengths

Splayed or notched frame rails and/or extensions shall not be accepted

Provides foundational strength and stability of the cab tilt system which provides superior access to engine and cooling components

FRAME FINISH

The frame shall be powder coated to resist weather, dirt and other corrosive material.

ENGINE

The chassis shall be powered by an electronically controlled engine as described below:

Make: Cummins

Model: ISL9

Power: 400 HP at 2100 rpm

Torque: 1250 ft-lb at 1400 rpm

Governed Speed: 2200 rpm

Emissions Level: Current EPA Requirements

Fuel: Diesel

Cylinders: Six (6)

Displacement: 543 cubic inches (8.9L)

Starter: Delco 39MT

Fuel Filters: Spin-on style primary filter with water separator and water-in-fuel sensor. Secondary spin-on style filter.

Coolant Filter: Spin-on style with shut off valves on the supply and return line.

The engine shall include On-board diagnostics (OBD), which provides self-diagnostic and reporting. The system shall give the owner or repair technician access to state of health information for various vehicle sub systems. The system shall monitor vehicle systems, engine and after treatment. The system shall illuminate a malfunction indicator light on the dash console if a problem is detected.

HIGH IDLE

A high idle switch shall be provided, inside the cab, on the instrument panel, that shall automatically maintain a preset engine rpm. A switch shall be installed, at the cab instrument panel, for activation/deactivation.

The high idle shall be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light shall be provided, adjacent to the switch. The light shall illuminate when the above conditions are met. The light shall be labeled "OK to Engage High Idle."

ENGINE PLACEMENT

The engine placement shall provide optimal weight distribution to the front axle to enhance vehicle handling.

The engine shall be mounted in a position that provides for the lowest possible height of the interior engine tunnel. An engine tunnel height from the floor of the chassis cab shall be no more

than 21" high inside the cab.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be integrated in the air dryer assembly.

ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled, one (1) piece eleven (9) blade Horton clutched type fan drive, and shroud.

When the clutched fan is disengaged it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail safe so that if the clutch drive fails, the fan shall engage to prevent engine overheating due to the fan clutch failure.

The clutch fan shall automatically engage in pump mode (when applicable).

AUXILIARY ENGINE BRAKE

A Cummins engine compression brake, for the six (6) cylinder engine, shall be provided. The engine compression brake shall:

Activate upon 0% accelerator when in operation mode and activate the vehicle's brake lights.

TRANSMISSION PRE-SELECT

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed. The transmission shall assist the secondary braking system, thereby slowing the vehicle.

AUXILIARY ENGINE BRAKE CONTROL

An auxiliary engine brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected:

A valid gear ratio is detected.

The driver has requested or enabled engine compression brake operation.

The throttle is at a minimum engine speed position.

The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift.

The auxiliary brake shall be controlled through an on/off switch and individual low/medium/high selector switches on the Driver's panel.

ENGINE PROGRAMMING HIGH IDLE SPEED

The Engine high idle will be set at 1250 RPM. The high idle will be operational only when the parking brake is set and the truck transmission is in neutral.

ENGINE AIR INTAKE

The engine air intake system shall include an ember separator air intake filter which shall be located behind the fascia.

The intake shall also feature a cyclone style water separator to remove unwanted moisture from incoming air.

The engine shall include an air intake filter which shall be bolted to the frame and located under the front of the cab. This dry type filter shall ensure dust and debris is safely contained inside the disposable housing, eliminating the chance of contaminating the air intake system during air filter service via a leak-tight seal.

The filter must have a capacity of no less than 1350 cubic feet of air per minute. The filter paper media must be of a flame retardant treated material. An electric air filter restriction indicator shall also be included with the system.

ENGINE EXHAUST SYSTEM

The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction catalyst (SCR) to meet current EPA standards.
The selective catalytic reduction catalyst shall utilize a diesel exhaust fluid solution consisting of urea and purified water to convert nitrogen oxide into nitrogen, water, and trace amounts of

carbon dioxide. The solution shall be injected into the system through the decomposition tube between the DPF and SCR.

The system shall utilize 0.065 inch thick stainless steel exhaust tubing between the engine turbo and the DPF.

The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall all be connected with zero leak gasketed clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires with an exhaust gas diffuser.

The diffuser shall lower exhaust gas temperatures during the regeneration cycle.

DIESEL EXHAUST FLUID TANK

There shall be a molded cross linked polyethylene tank for the Diesel Exhaust Fluid (DEF). The tank shall have a capacity of not less than five (5) usable gallons and shall be mounted on the left hand side of the chassis frame in front of the batteries below the frame.

The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.

DIESEL EXHAUST FLUID TANK

Access to the DEF tank, shall be accessible for any maintenance requirements.

ENGINE EXHAUST ACCESSORIES

An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.

ENGINE EXHAUST WRAP

The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.

DIESEL PARTICULATE FILTER CONTROLS

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit. Each switch shall be located in a covered location.

ENGINE COOLING SYSTEM

The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system requirements.

The system shall include and feature the following:

A vertically stacked charge air cooler providing the maximum cooling capacity for the engine. Proposals offering horizontally stacked charge air cooler shall not be acceptable. No Exceptions

The charge air cooler and radiator shall measure not less than 1382 square inches

A surge tank with a low coolant probe and capable of removing entrained air from the cooling system

Radiator re-circulation shields to prevent heated air from re-entering the cooling system and affecting performance

Engine placement shall provide a minimum of 8" between the engine fan and radiator to maximize the airflow and cooling of the engine.

A Spin on Element water filter with corrosion inhibitor shall be provided for the cooling system. No Exception.

Shut off valves by the coolant filter shall be supplied. No Exception.

COOLANT HOSES

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include stainless steel constant torque band clamps.

ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees F.

Supplemental coolant additives (SCA) are not required as this is part of the extended life coolant makeup.

ENGINE PUMP HEAT EXCHANGER

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. This pump heat exchanger shall circulate water from the fire pump to the heat

exchanger thereby reducing the temperature of the coolant for the engine. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant.

TRANSMISSION

The drive train shall include an Allison model EVS 3000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters and Allison approved transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

The transmission gear ratios shall be:

1st 3.49:1
2nd 1.86:1
3rd 1.41:1
4th 1.00:1
5th 0.75:1
6th 0.65:1 (if applicable)
Rev 5.03:1

TRANSMISSION COOLING SYSTEM

The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.

TRANSMISSION DRAIN PLUG

The transmission shall include an original equipment manufacturer installed magnetic oil drain plug.

AUTOMATIC NEUTRAL

The transmission shall be provided with an automatic neutral. When the parking brake is applied the transmission automatically returns to neutral.

TRANSMISSION FLUID

The transmission shall include two (2) internal oil filters and Allison approved synthetic transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located on the tunnel to the right of the driver.

The shift selector shall provide an indicator on the digital display and shall alert the driver/operator when a specific maintenance function is required.

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1710 series universal joints.

The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®.

Any carrier bearing brackets that are utilized on the apparatus shall be hot dipped galvanized as to provide a superior barrier and cathodic protection from corrosion. Proposals offering powder coated or painted brackets shall not be accepted.

FUEL SYSTEM

The fuel tank shall have a capacity of fifty (50) gallons, the tank shall offer:

A vent port which will facilitate venting to the top of the fill neck for rapid filling without any “blow-back”

Two (2) 2” NPT fill ports for left and right hand fill with a .5” NPT drain plug centered side to side 9" from the front of the tank

A roll over ball check vent for temperature related fuel expansion and draw

A design including dual draw tubes and sender flanges

A baffled design and shall be constructed of steel

A black Powder Coated exterior to ensure corrosion resistance

The fuel tank shall be mounted below the frame, behind the rear axle. There shall be two (2) three-piece strap hanger assemblies with "U" straps bolted midway on the fuel tank, allowing the tank to be easily lowered and removed for service purposes.

The strap hanger material shall be stainless steel. No Exceptions.

For isolation of vibration and movement, rubber isolating pads shall be provided between the tank and the hanger strap assemblies. The tank straps shall be attached to rubber coated cross members which help isolate the tank from frame flex.

Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

All fuel lines shall be connected with steel fittings with all fittings pointed towards the right side (curbside) of the chassis.

The chassis fuel lines shall feature an additional 4' of length provided so the tank can be easily lowered and removed for service purposes which shall be coiled and secured at the top of the tank.

FUEL FILTER/WATER SEPARATOR

The fuel system shall incorporate a heated Racor 3150R-1210, 10 micron fuel filter/water separator as a primary filter. The fuel filter shall have a sight bowl to allow visual inspection of fuel and a drain valve to remove visible contaminants.

A water-in-fuel sensor probe shall be installed in the filter bowl and wired to the water in fuel (WIF) indicator lamp and audible alarm on the cab dash.

A secondary fuel filter shall be included as approved by the engine manufacturer.

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black aramid braided lines with a fiber outer braid. The fuel lines shall connected with reusable steel fittings. Fuel line is compatible with bio-fuel blends.

FUEL SHUTOFF VALVE

Two (2) fuel shutoff valves shall be installed at the fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

FUEL COOLER

The cross flow air to fuel cooler shall be all aluminum and shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the battery box, under the frame.

The fuel cooler shall incorporate a fan for improved heat transfer.

The fuel cooler shall be mounted to the frame using hot dipped galvanized brackets. Powder coated or painted brackets shall not be acceptable. No exception.

ALTERNATOR

A Reyco or equivalent 320 AMP alternator will be provided.

ELECTRICAL SYSTEM

There shall be a 12 volt direct current single starting electrical system providing power to all components for the cab and chassis. The system shall feature:

300 degree Fahrenheit high temperature, flame retardant loom

All SAE wiring color coded and labeled as to its function

Wiring which is cross link with 311 degree Fahrenheit insulation

A suppressed system in accordance with SAE J551

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload.

General protection circuit breakers will be a combination of automatic and manual reset breakers. This will provide a durability and capacity maximization of the electrical system. When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

EMI/RFI PROTECTION

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10 KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10 KHz-1GHz to 100 Volts/Meter requirements. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself.

EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL HARNESSING INSTALLATION

To ensure rugged dependability, all wiring harnesses installed by the apparatus manufacturer will conform to the following specifications:

SAE J1128 - Low tension primary cable

SAE J1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring

SAE J163 - Low tension wiring and cable terminals and splice clips

SAE J2202 - Heavy duty wiring systems for on-highway trucks

NFPA 1901 - Standard for automotive fire apparatus

FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses

SAE J1939 - Serial communications protocol
SAE J2030 - Heavy-duty electrical connector performance standard
SAE J2223 - Connections for on board vehicle electrical wiring harnesses NEC - National Electrical Code
SAE J561 - Electrical terminals - Eyelet and spade type
SAE J928 - Electrical terminals - Pin and receptacle type A

All electrical terminals in exposed areas will have protective Coating applied completely over the metal portion of the terminal.

Rubber coated metal clamps will be used to support wire harnessing and battery cables routed along the chassis frame rails.

Heat shields will be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust will be protected by a heat shield.

Cab and crew cab harnessing will not be routed through enclosed metal tubing. Dedicated wire routing channels will be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab will allow for easy routing of additional wiring and easy access to existing wiring.

All braided wire harnesses will have a permanent label attached for easy identification of the harness part number and fabrication date.

All standard wiring entering or exiting the cab will be routed through sealed bulkhead connectors to protect against water intrusion into the cab.

BATTERY CABLE INSTALLATION

All 12-volt battery cables and battery cable harnessing installed by the apparatus manufacturer will conform to the following requirements:

SAE J1127 - Battery Cable
SAE J561 - Electrical terminals, eyelets and spade type
SAE J562 - Nonmetallic loom
SAE J836A - Automotive metallurgical joining
SAE J1292 - Automotive truck, truck-tractor, trailer and motor coach wiring
NFPA 1901 - Standard for automotive fire apparatus
Battery cables and battery cable harnessing will be installed utilizing the following guidelines:

All battery cables and battery harnesses will have a permanent label attached for easy identification of the harness part number.

Splices will not be allowed on battery cables or battery cable harnesses.

For ease of identification and simplified use, battery cables will be color coded. All positive battery cables will be red in color or wrapped in red loom the entire length of the cable. All negative battery cables will be black in color.

For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus will be coated to prevent corrosion.

ELECTRICAL COMPONENT INSTALLATION

All lighting used on the apparatus will be, at a minimum, a two (2) wire light grounded through a wired connection to the battery system. Lights using an apparatus metal structure for grounding will not be allowed.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests will be recorded and provided to the purchaser at time of delivery.

DRIVER SWITCH PANEL

The driver panel to the right of the Driver's position shall include the following:

In the upper most row it shall have the HVAC Controls, which shall include three (3) controls, the fan speed, comfort and defrost control, and temperature control. In the far right position shall be the seat belt indicator.

In the middle section there shall be eight (8) backlit switches, the switch on the far right side shall be a high idle switch.

In the bottom row there shall be six (6) switches. These switches shall be configured in the following order starting with the switch closest to the driver, headlight switch, dimmer switch, wiper control, engine brake on/off switch, with 2 blank switches on the far right side for customer application.

MASTER WARNING SWITCH

A master switch shall be included in the main rocker switch panel. The switch shall be a rocker type, red in color and labeled "Master" for identification. The switch shall feature control over all devices wired through it. Any warning device switch left in the "ON" position shall automatically power up when the master switch is activated.

CAB INSTRUMENTATION

The instrumentation panel within the cab shall feature a Pacific Insight gauge panel which shall include three (3) 5"diameter information centers, telltale indicator lamps, control switches, alarms, and a LCD diagnostic panel.

The gauges shall be easy to read including red backlighting.

The instrument panel shall contain the following gauges and indictors:

The middle information center shall include:
A programmable speedometer to read either 0 to 140 MPH or 0 to 140 KM/H
An amber telltale lamp indicating the Check Engine
An amber telltale lamp indicating MIL Engine Emissions System Malfunction
A red telltale lamp indicating Stop Engine
A tachometer gauge with 0-3,000 RPM

The right hand side information center shall include:
A gauge to display the engine oil pressure with high and low level indicators and stop engine alarm
A fuel level gauge with a low fuel indicator and alarm
An LED bar displaying 4 stages of the level for the Diesel Exhaust Fluid (DEF) with a refill indicator
A voltage gauge with low voltage indicator
A water temperature gauge with high water temp indicator and alarm

The left hand side information center shall include:
A primary air PSI gauge including low air and high air warning displays
A secondary air PSI gauge with low and high air warning indication

An LCD diagnostic display, located in the left hand side information center shall include digital readouts for the following:

Odometer

Transmission oil temp

Engine oil temp

Speedometer

Engine hours

Engine and transmission code

Exhaust temp

Engine coolant temp

Engine oil PSI

Turbo boost PSI

Primary air pressure

Secondary air pressure

Engine load %

Engine torque

Battery volts

Fuel level %

Vehicle speed

RPM

DEF level

Instant fuel economy

Average fuel economy

Engine hours

Capable to record four trips, each shall be include:

· Trip distance

· Fuel economy

· Fuel used

· Idle fuel used

The LCD screen shall also provide diagnostic capability

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located below the middle information center. The indicator lamps will be "dead-front"

design that is only visible when active. The colored indicator lights will have descriptive text or symbols. The following indicator lamps shall be located on the Telltale panel:

BLUE Indicator Lights

- High Beam Headlight

GREEN Indicator Lights

- Right Turn Indicator
- Left Turn Indicator
- Battery On (Always On)

YELLOW Indicator Lights

- Particle Filter Regeneration (DPF)
- Regeneration Inhibit (Switch Engaged)
- Check Transmission
- Air Intake Restriction
- High Exhaust System Temperature (HEST)
- Wait to Start
- ATC (Automatic Traction Control) (when applicable)
- Water in Fuel

RED Indicator Lights

- Low Engine Coolant Level
- Air Bag Warning (when applicable)
- High Transmission Temperature
- ABS
- Parking Brake

ALARMS

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Alarm silence: Any active audible alarm will be able to be silenced with a button on the right side of the LCD screen.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

DIAGNOSTIC PANEL

A diagnostic panel shall be accessible while standing on the ground and located inside the driver's side door, left of the steering column. The diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved trouble shooting providing a lower cost of ownership. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist.

The diagnostic panel shall include the following:

Engine diagnostic port

Transmission diagnostic port

ABS diagnostic port

SRS diagnostic port (when applicable)

V-Mux USB diagnostic port (when applicable)

Engine diagnostic switch (blink codes flashed on check engine telltale indicator)

Diesel particulate filter regeneration switch (when applicable)

Diesel particulate filter regeneration inhibit switch (when applicable)

BACKLIGHTING COLOR

The instrumentation gauges and the switch panel legends shall be backlit using LED backlighting.

VEHICLE DATA RECORDER

Apparatus shall be equipped with a Class1 "Vehicle Data Recorder (VDR) that is connected to the power train CAN (Controller Area Network) bus consisting of transmission (TCM), engine control (ECM) and anti-lock brake (ABS) modules mounted on the apparatus. The VDR will function per NFPA 1901-2009 sections 4.11 (Vehicle Data Recorder) utilizing the power train s J1939 data.

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. The latest version of the software shall be available by contacting Class 1.

The apparatus shall be equipped with a Class1 Seat Belt Warning System" (SBW) that is connected to the power train CAN (Controller Area Network) bus consisting of transmission (TCM), engine control (ECM) and anti-lock brake (ABS) modules mounted on the apparatus. The SBW will function per NFPA 1901-2009 14.1.3.10 (Seat Belt Warning) using the Class1 "Seat Belt Input Module" for seat occupied and belt status information.

The SBW system shall have the ability to use either normally open (NO) or normally closed (NC) switches (user selectable by “dip switches” at ground potential) for operation.

BATTERIES

The single start electrical system shall include six (6) group 31 1070 CCA batteries. **(NO EXCEPTION)**

The batteries shall feature:
A 210 minute reserve capacity
4/0 dual path starter cables per SAE J541
Heat shrink and sealant encapsulated ends on the cables
Maintenance free

BATTERY COMPARTMENTS

A well ventilated battery storage compartment shall house the batteries on the officer and driver side of the chassis and shall be located so as to offer easy access to the batteries when the cab is tilted.

The each battery compartment shall feature:

3/16" steel construction with powder coated finish

A complete floor of heavy duty, industrial grade, recycled Turtle Tile brand interlocking matting

A double hinged powder coated steel cover with two (2) push button latches shall be utilized providing easy access to the batteries, while also being capable of supporting a 250 lb. load. No tools shall be required to gain access to the batteries.

When in the open position, the double hinged door shall be flush with the bottom of the battery compartment, allowing for a sweep out style floor and removal of the batteries when necessary, without the inference of a lower lip. No Exceptions.

BATTERY CABLES

The cables shall be in a loom to help keep out dirt, dust and debris.

BATTERY JUMPER STUD

The starting system shall include battery jumper studs.

These studs shall be located in the forward most portion of the driver's side lower step.

The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

IGNITION

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a Land & Sea brand two position switch, of which shall be mounted on the left side of the steering wheel adjacent to the driver's knee.

A push button type starter button shall be provided on the driver dash to the left of the steering wheel.

The starter button shall only operate when both the master battery and ignition switches are in the “ON” position.

POWER & GROUND STUD

An electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud. (Location per Department)

GROUND LIGHTS

Each door shall include a Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the cab step below each door.

Each light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.

GROUND LIGHT ACTIVATION

The ground lights shall activate when the park brake is engaged.

CAB STEP LIGHTING

One (1) LED light shall be mounted to the riser of the middle cab step, a total of eight (8) step lights for the cab, in accordance with NFPA.

Each light shall include a polycarbonate lens and shall be contained in a housing which is vibration welded with a bulb which shall be shock mounted. Each step light shall not be any larger than 3" in diameter.

STEP LIGHT ACTIVATION

The step lighting shall be activated by opening any of the cab doors on the respective side.

ENGINE COMPARTMENT LIGHTING

Two (2) LED lights shall be mounted to the engine compartment in such a fashion as to provide as much light as possible to the engine compartment area. The engine compartment lighting shall activate with the tilting of the cab.

INTERIOR OVERHEAD CAB LED LIGHTING

Each cab door shall include a dual red and white LED lamp. There shall be one (1) light centered over each of the Driver and Officer's seat and one centered over each crew door.

The clear lamp shall illuminate with the opening of each respective door with both the red and clear portions of the lamp activated by individual lighted switches on each lamp.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include a flashing red Whelen round LED light with a red lens clearly labeled "Do Not Move Apparatus".

The flashing red light shall be 3.00 inches in diameter and shall be located centered left to right for greatest visibility.

The light shall be interlocked for activation when either a cab door is not firmly closed or an apparatus compartment door is not closed, and the parking brake is released.

BACK-UP ALARM

A backup alarm shall be installed at the rear of the chassis with an output level of A MINIMUM OF 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

BATTERY CHARGER AND AIR COMPRESSOR

One (1) Kussmaul Pump Plus 1200 model #091-187-12-R-B1 battery charger and air compressor system shall be installed. The 120 volt compressor system shall be designed to maintain the air pressure in the chassis brake system whenever the pressure drops below a predetermined level.

The battery charger shall be supplied from the 120 volt shore power receptacle and be a fully automatic high output charging system. The unit shall be mounted in a clean dry area and will be accessible for service and/or maintenance.

Automatic Shoreline - 20 Amp (Location Per Department)

There shall be a yellow, 20-amp super auto eject cover supplied.

"LED" BODY MARKER LIGHTS AND REFLECTORS

LED clearance, **LED** marker, and license plate lights, along with reflectors will be mounted along the length of the body and at the rear of the body and will be wired in accordance with federal regulations.

The rear mounted, lower **LED** marker lights and reflectors will be recess mounted in the vertical surface of the rear step for protection from breakage.

An upper rear **LED** marker light will be furnished at each side, outermost practical mounting location at the top of the body.

A secondary **LED** turn signal / clearance light will be provided below each side of the body, in the area forward of the rear axle.

"LED" STOP, "LED" TURN AND BACK-UP LIGHTS

Two (2) Whelen # **60R00XRR**, 6" x 4" size, red **LED** combination tail and stop lights, will be mounted one each side at the rear of the body with a #6EFLANGEchrome mounting flange.

Two (2) Whelen # **60A00TAR**, 6" x 4" size, amber arrow **LED** turn signals, will be mounted in a vertical plane with the tail/stop lights with a #6EFLANGEchrome mounting flange.

Two (2) Whelen # **60J000CR**, 6" x 4" size, clear halogen backup lights, will be mounted with a #6EFLANGE chrome mounting flange, one each side on a vertical plane with the turn/tail/stop signals. These lights will activate when the transmission is placed in reverse gear.

GROUND LIGHTS

One (1) flange mounted LED type ground light will be provided under each side cab running board, for a total of two (2). The ground lights will turn on automatically when the parking brake is activated.

Each light will illuminate an area at a minimum 30" outward from the edge of the vehicle. The ground lights will be positioned at the front of the running board facing rearward to provide illumination for the entire length of the running board as well as lighting for the pump panel and the front of the body-work areas.

SCENE LIGHTS - UPPER REAR

Two (2) Whelen M9 Series Model # M9LZC scene light shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology. The M9LZC configuration shall consist of 24 clear Super-LEDs and a clear gradien optic polycarbonate lens.

The scene light shall have specialized TIR optics for ideal scene illumination. The M9LZC shall have a rugged powder coat heat sink and a waterproof wire entry grommet. The M9LZC shall meet KKK 1822F and AMD024 specifications. mounted on the upper rear of the apparatus

The lens/reflector assembly shall be sealed and resistant to water, moisture, dust, and other environmental conditions. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The light engine shall be installed at the rear of the unit and be vacuum tested to ensure proper sealing. The PC board shall be conformal coated for additional protection. The M9LZC shall have 6,500 useable lumens.

The M9LZC shall be furnished with 12"unterminated pigtails. The scene light shall include a chrome trim ring, a rubber gasket, screws, and screw grommets for installation. The M9LZC shall have the ability to be installed as a surface mount scene light.

All scene lights will be controlled by a single "Scene Light" rocker switch in the master warning light switch console. In addition, all scene lights will illuminate when the transmission is placed in “REVERSE” gear and the apparatus is operating as an emergency vehicle (Primary Warning switch is on)

SCENE LIGHTS – REAR UPPER SIDES

Two (2) Whelen M9 Series Model # M9LZC scene light shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology. The M9LZC configuration shall consist of 24 clear Super-LEDs and a clear gradien optic polycarbonate lens. The scene light shall have specialized TIR optics for ideal scene illumination. The M9LZC shall have a rugged powder coat heat sink and a waterproof wire entry grommet. The M9LZC shall meet KKK 1822F and AMD024 specifications. mounted on the upper rear of the apparatus

The lens/reflector assembly shall be sealed and resistant to water, moisture, dust, and other environmental conditions. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The light engine shall be installed at the rear of the unit and be vacuum tested to ensure proper sealing. The PC board shall be conformal coated for additional protection. The M9LZC shall have 6,500 useable lumens.

The M9LZC shall be furnished with 12"unterminated pigtails. The scene light shall include a chrome trim ring, a rubber gasket, screws, and screw grommets for installation. The M9LZC shall have the ability to be installed as a surface mount scene light.

SCENE LIGHTS - FRONT UPPER SIDES

Two (2) Whelen M9 Series Model # M9LZC scene light shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology. The M9LZC

configuration shall consist of 24 clear Super-LEDs and a clear gradien optic polycarbonate lens. The scene light shall have specialized TIR optics for ideal scene illumination. The M9LZC shall have a rugged powder coat heat sink and a waterproof wire entry grommet. The M9LZC shall meet KKK 1822F and AMD024 specifications. mounted on the upper front side of the apparatus

The lens/reflector assembly shall be sealed and resistant to water, moisture, dust, and other environmental conditions. The hard coated lens shall provide extended life/luster protection against UV and chemical stresses. The light engine shall be installed at the rear of the unit and be vacuum tested to ensure proper sealing. The PC board shall be conformal coated for additional protection. The M9LZC shall have 6,500 useable lumens.

The M9LZC shall be furnished with 12"unterminated pigtails. The scene light shall include a chrome trim ring, a rubber gasket, screws, and screw grommets for installation. The M9LZC shall have the ability to be installed as a surface mount scene light.

All scene lights will be controlled by a single "Scene Light" rocker switch in the master warning light switch console. In addition, all scene lights will illuminate when the transmission is placed in “REVERSE” gear and the apparatus is operating as an emergency vehicle (Primary Warning switch is on)

WORK LIGHT - CROSSLAY AREA

One (1) Whelen M9 Series Model # M9LZC scene light shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology. The M9LZC configuration shall consist of 24 clear Super-LEDs and a clear gradien optic polycarbonate lens. The scene light shall have specialized TIR optics for ideal scene illumination. The M9LZC shall have a rugged powder coat heat sink and a waterproof wire entry grommet. The M9LZC shall meet KKK 1822F and AMD024 specifications. mounted on the crosslay area of the apparatus.

Light will be switched from the PRIMARY pump panel area.

ANTENNA INSTALLATION

The antenna(s) will be mounted on the cab roof and will be located as noted on the final approval drawing. The antenna(s) will be furnished to the manufacturer. The attached antenna wire will be run to the center console area, unless otherwise specified.

"LED" STEP LIGHTS

Whelen #T0CACCCR 2" round LED step lights will be provided and controlled with marker light actuation. Step lights will be provided with #TFLANGEC chrome plated plastic mounting

bezels. Step lights will be located to properly illuminate all body and chassis access steps and walkway areas.

PUMP ENCLOSURE WORK LIGHT

One (1) LED work light will be mounted inside the pump enclosure. The light will be individually switched.

ENGINE COMPARTMENT WORK LIGHT

One (1) LED work light will be mounted inside the engine enclosure. The light will be individually switched.

COMPARTMENT LIGHTS

Each exterior compartment lights shall be flush mounted LED strip lighting minimum of 2 per compartment, and shall illuminate when each door is in the open position.

ALARM - "DO NOT MOVE APPARATUS" WARNING LIGHT WITH AUDIBLE

A red flashing warning light **with an integral audible alarm**, will be functionally located in the cab to signal when an unsafe condition is present such as an open cab door or body compartment door, an extended ladder rack, which is opened, extended or deployed which may cause damage to the apparatus if it is moved. This light will be activated through the parking brake switch to signal only when the parking brake is released. This light will be labeled "DO NOT MOVE APPARATUS WHEN LIGHT IS ON".

WARNING DEVICES:

NFPA LIGHTING PACKAGE

The following warning light package includes all of the minimum warning light and actuation requirements for the current revision of the NFPA 1901 Fire Apparatus Standard as noted in the “General Requirements” section of these specifications.

The following lighting as specified will meet the requirements for both "Clearing Right of Way" and "Blocking Right of Way" as noted.

LIGHT PACKAGE ACTUATION CONTROLS

The entire warning light package will be actuated with a single warning light switch in the cab switch panel. The wiring for the warning light package will engage all of the lights required for "Clearing Right of Way" mode when the vehicle parking brake is not engaged. An automatic

control system will be provided to switch the warning lights to the "Blocking Right of Way" mode when the vehicle parking brake is engaged.

ZONE A (FRONT - UPPER) - CAB ROOF LIGHT BAR

A 58” cab roof warning light bar will be furnished and rigidly mounted on top of the cab roof. The light bar will be configured with twelve (12) LED flashers total two (2) forward corner red flashers, two (2) side facing red LED flashers, two (2) forward facing outboard mounted red LED flashers and two (2) inboard forward facing clear LED flashers. Four (4) rear facing Red Flashers.

The light bar lens color will be clear.

The center two clear LED flashers may be wired through a load management system, and disabled during the blocking mode.

ZONE A (FRONT - LOWER) - HEAD LIGHT BEZEL MOUNTED WARNING LIGHTS

Two (2) Whelen M6 Linear Super-LED flush mounted lights will be provided and mounted one at each side in each side head lamp module. Both LEDs must be RED.

ZONE C (REAR - UPPER) - REAR STANCHION WARNING LIGHTS

Two (2) Whelen M9 Linear Super-LED light heads shall be provided. Each light head shall be equipped with a red lens and chrome plated mounting flange. One (1) on each side at the upper rear of the apparatus mounted in the fabricated rear light stanchion with the specified scene light.

Two (2) Whelen M6 Linear Super-LED flush mounted lights will be provided and mounted directly below the rear body taillights. Both LEDs must be RED.

The lighting requirement for this area is covered by the LEDX2158 light bar as noted in Zone “A” Upper.

ZONE B & D (SIDE REAR - UPPER)

Two (2) Whelen M9 Linear Super-LED light heads shall be provided. Each light head shall be equipped with a red lens and chrome plated mounting flange. One (1) on each side at the upper rear sides of the apparatus mounted in the fabricated light stanchion with the required scene light.

ZONE B & D (SIDE FRONT - LOWER) - SIDE INTERSECTION WARNING LIGHTS

Two (2) Whelen M6 Linear Super-LED lights with chrome plated plastic bezels will be furnished and mounted one (1) each side of the front bumper extension or on the side of the cab hood, facing to each side of the unit. Both LEDs must be RED.

ZONE B & D (SIDE CENTER - LOWER) - SIDE CENTER WARNING LIGHTS

Two (2) Whelen M6 Linear Super-LED lights with chrome plated plastic bezels will be furnished and mounted one (1) each side of the center of the unit, facing to each side of the unit. Both LEDs must be AMBER.

ZONE B & D (SIDE REAR - LOWER) - SIDE REAR WARNING LIGHTS

Two (2) Whelen M6 Linear Super-LED lights with chrome plated plastic bezels will be furnished and mounted one (1) each side of the rear body fender as close as possible to the rear of the vehicle. The lights will face to each side of the unit. Both LEDs must be RED.

REAR DIRECTIONAL LIGHT BAR

AWhelen “Narrow Stik” Model #NA3539, 41” rear directional light shall be provided and recessed into the center area of the transverse rear light stanchion box.

It shall be controlled from the cab by way of a controller mounted as directed by the department. It shall be wired through the load management system of the unit to only operate when the PRIMARY WARNING switch is in the “ON” position.

REAR LIGHT STANCHION

The rear light stanchion will be designed to accommodate the rear (Zones “B”, “C”, & “D”) upper level warning lights, the rear scene / work area lighting, and the rear directional light bar in a single mount.

WARNING LIGHT SYSTEM CERTIFICATION

The warning light system specified will not exceed a total amperage draw of 45 AMPS with all lights activated in either the "Clearing Right of Way" or the "Blocking Right of Way" mode.

This warning light system will be certified by the light system manufacturer, to meet all of the requirements in the current revision of the NFPA 1901 Fire Apparatus Standard as noted in the “General Requirements” section of these specifications.

ALARM - BACK-UP

A solid state 107 db. back-up alarm will be provided and installed at the rear of the apparatus under the tailboard. The back-up alarm will activate automatically when the transmission is placed in reverse gear and the ignition is "on".

AIR HORNS - GROVER EMERGENCY TYPE

Two (2) Grover Stuttertone, 24" long chrome plated air horns will be recessed into the bumper installed, one each side of the chassis bumper.

The air horns will be controlled by a foot switch on the officer's side and the steering horn button on driver's side.

A low air pressure protection valve will be provided in the supply piping to prevent use of the horns when the air pressure drops below 80 psi.

SIREN - ELECTRONIC SIREN AND SPEAKER

One (1) Whelen 295SL100 electronic siren will be provided featuring: electronic air horn, wail, yelp and hi-lo siren tones along with public address and radio rebroadcast.

A hardwired microphone will be provided for the public address feature.

One (1) Whelen chrome plated siren speaker will be provided, recessed in the front bumper and wired to the electronic siren.

The electronic siren and speaker will meet the NFPA required SAE certification to ensure compatibility between the siren and speaker.

SIREN - FEDERAL Q2B MECHANICAL

One (1) Federal Model #Q2B siren with chrome plated grille shall be provided to deliver audible warning. It shall be wired through the load management system to prevent excessive amperage draw. The Q2B siren shall be semi-recessed into the bumper centered. It shall be recessed so the front grille portion of the siren is exposed and protruding beyond the bumper.

Two (2) foot switches will be provided in the cab along with a push button siren brake switch on the cab dash near the drivers seating position.

Siren will only be powered when the Emergency Warning Light circuit is active and the Emergency Brake is disengaged.

The siren will be provided in addition to the required minimum NFPA audible warning requirements.

PUMP AND PLUMBING SYSTEM:

PUMP TYPE

- HALE AP-50

- 500 GPM

- SINGLE STAGE

PUMP CONSTRUCTION

The pump will be driven by a transmission PTO and have the capability of producing over 200 GPM at 150 PSI; from booster tank operation. The pump will be capable of being driven by either engine rotation or opposite engine rotation PTO's.

PUMP BODY

The volute will be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 pounds per square inch. The entire pump will be hydrodynamically tested to 500 PSI.

The pump body will have the capability of being rotated for various discharge positions.

PUMP IMPELLER

The pump impeller will be hard, fine grain bronze of the mixed flow design: accurately machined, hand ground and individually balanced. The vanes of the impeller intake eye will be hand ground. The impeller will be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower. Impeller will be keyed to pump shaft and locked in place with a stainless steel lock nut.

Shaft seal to be effected by a spring loaded, carbon ring on a ceramic faced, brass seat mechanical seal, which automatically adjust for wear.

PUMP SHAFT

The pump shaft will be rigidly supported by two deep groove ball bearings for minimum deflection. The pump shaft will be heat-treated, electric furnace, corrosion resistant, stainless steel.

The pump shaft and drive shaft must be sealed with a double lip oil seal to retain lubrication and keep road dirt and water out of the drive unit.

PUMP DRIVE UNIT

The drive unit, as well as the entire pump, will be completely manufactured at the pump manufacturer's factory. The drive unit bearings will be heavy duty and precision ground to size.

The drive unit will be of sufficient size to withstand the full torque of the pumping operation. The drive unit will have ample capacity for lubrication reserve and maintaining the proper operating temperature.

All gears will be of highest quality steel alloys. They will have case hardened teeth, to give long life, smooth, quiet running and higher load carrying capability. An accurately cut spur design will be provided to eliminate all possible end thrust.

The pump ratio will be selected by the apparatus manufacturer to give maximum performance within the limits of the engine, transmission and PTO selected.

POWER TAKE-OFF (PTO)

A Chelsea, hot shift Power Take-Off will be provided to drive the AP-50 pump. The PTO will be controlled by an electric hot shift lighted rocker switch on the cab dash.

PRESSURE CONTROL MECHANISM

The pump will be equipped with an automatic pressure control device. A single bronze, variable pressure setting relief valve will be provided and be of ample capacity to prevent an undue pressure rise as per NFPA Standards. The relief valve will be normally closed and will be open against pump pressure, with a control light to signal when open. In event of relief valve control failure, the pump is to remain operable for the complete range of the pump's rated capacity, without requiring the closing of any emergency or "in case of failure" (on/off) valves. (No exceptions)

INLET RELIEF VALVE

An **Akron Model 59** intake relief valve system will be plumbed on the suction side of the pump to comply fully with NFPA-1901 requirements. Excess pressures will be discharged to the right side running board area with a 2 1/2" NST adapter to route discharged water away from the pump operator's station.

PRIMING PUMP

The priming pump will be a **model ESP Oil-Less,** positive displacement vane type, electrically driven. One priming control will open the priming valve and start the priming motor. The primer will be capable of priming without the use of primer oil.

ENGINE COOLER

An auxiliary cooler or heat exchanger will be installed in the engine compartment between the engine and the chassis radiator. The cooler will permit the use of water from the pump for cooling system. The cooling will be done without mixing engine and pump water.

PUMP MOUNTS

Extra heavy-duty pump mounting brackets will be furnished. These will be bolted to the frame rails in such a position to perfectly align the pump so that the angular velocity of the drive line joints will be the same on each end of the drive shaft. This will assure full capacity performance with a minimum of vibration. Mounting hardware will utilize Grade 8 bolts.

PUMP MODULE

The pump module will be a self-support structure mounted independently from the body and chassis cab.

The design must allow normal frame deflection without imposing stress on the pump module structure or side running boards.

Rubber flex joint gasket material will be installed between the self-supported pump module structure and the fire body.

The pump module will be a welded frame work utilizing structural steel components properly braced to withstand the rigors of chassis frame flex.

The pump module will be bolted to the frame rails at four (4) points.

APPARATUS VALVES

All 2" or larger in-line suction and discharge valves will be full flow, drop-out style, to simplify servicing.

Valves will be Akron Brass series #8800 chrome brass ball series with "Tork-Lok" feature.

All 3" or larger suction or discharge valves will be **Akron** valves equipped with a **"Slow Cloz"** option which decelerates the opening and closing of the valve to comply with NFPA -1901 requirements (Unless otherwise specified).

PIPING (STAINLESS STEEL)

All piping will be heavy duty, Schedule 40, Type 304, stainless steel pipe with N.P.T. thread or victaulic groove connections. Also, in order to minimize friction loss, only sweep type elbows will be used. Where vibration or chassis flexing may damage or loosen piping, all plumbing exiting the pump enclosure area will be equipped with victaulic or rubber couplings as necessary.

All flexible hoses 1" and larger will be high pressure hydraulic type hoses.

All flexible hoses less than 1" will be high pressure synflex type hose with reusable brass fittings.

Wherever threaded joints are used, the sealing compound will be of the non-hardening type to insure ease of removal for repair or replacement of couplings.

The unit will be hydrostatically tested in accordance with NFPA-1901.

ENGINE COOLER

An auxiliary cooler or heat exchanger will be installed in the engine compartment between the engine and the chassis radiator. The cooler will permit the use of water from the pump for cooling system. The cooling will be done without mixing engine and pump water.

PUMP MOUNTS

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The pump module will be a self-support structure mounted independently from the body and chassis cab.

The design must allow normal frame deflection without imposing stress on the pump module structure or side running boards.

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Wherever threaded joints are used, the sealing compound will be of the non-hardening type to insure ease of removal for repair or replacement of couplings.

The unit will be hydrostatically tested in accordance with NFPA-1901.

MASTER DRAIN VALVE

A rotary type, 12 port master drain valve will be provided and controlled at the lower portion of the side pump panel. The valve will 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 will be drained below the apparatus body and away from the pump operator.

INDIVIDUAL BLEEDERS AND DRAINS

All lines will drain through either the master drain valve or will be equipped with individual drain valves, easily accessible and labeled.

One (1) individual quarter turn drain valve will be furnished for each 1-1/2" or larger discharge port and each 2-1/2" or larger gated auxiliary suction.

Drain/bleeder valves will be located at the bottom of the side pump module panels.

All drains and bleeders will discharge below the running boards.

INLETS:

INLETS - PRIMARY

Two (2) 4" N.S.T. suction inlets will be provided, one on the left pump panel and one on the right pump panel.

A removable strainer and a Trident brand chrome plated long handle vented cap will be installed on each.

INLETS - 2-1/2" AUXILIARY SIDE

All 2-1/2" auxiliary suction valves will have a removable strainer, chrome plated, 2-1/2" NST female swivel, with a chrome plated plug and retaining chain.

All side 2-1/2" gated inlet valves will be recess mounted behind the side pump panels or body panels.

2-1/2" auxiliary suctions will be located as follows:

- One (1) DRIVER side pump panel, to the rear of the main inlet and controlled at the pump operator's panel.

TANK TO PUMP

One (1) 3" tank to pump line will be plumbed directly into the rear of the pump suction manifold for maximum efficiency.

A 3" full flow in-line ball valve and a check valve will be provided to prevent accidental pressurization of the water tank through the pump connection. Connection from the valve to the tank will be made by using a non-collapsible flexible rubber hose.

A control handle will be located on the operator's panel with function plate.

DISCHARGES – PRIMARY

Two and one-half (2 1/2) inch or larger discharge outlets will be provided to discharge the rated capacity of the pump in accordance with NFPA -1901.

Each discharge will be controlled from the operator's panel.

The main pump side discharges will be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

The valves will be equipped with integral, 30 degree, chrome plated "droop snoot" male outlets.

All discharges will have Trident brand chrome plated vented caps and retaining chains.

All discharges will terminate with NST male thread in accordance with NFPA -1901.

Main pump discharges will be provided as follows:

- One (1) 2-1/2" at the DRIVER side pump panel
- One (1) 2-1/2" at the PASSENGER side pump panel.

PRECONNECTS - HORIZONTAL CROSSLAYS

The cross lay hose bed will be transverse, in two (2) sections and will be located above the pump enclosure for quick attack deployment.

The cross lay hose bed flooring will be removable, brushed finish, perforated aluminum material with a stainless steel scuff plate provided horizontally on each end.

- One (1) of the pre-connected hose storage areas will have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose. It will be plumbed with 2" piping and equipped with a 2" valve and a 1-1/2" NST bronze hose swivel in the floor area.

- One (1) of the pre-connected hose storage areas will have a minimum total capacity of 4.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 2-1/2" fire hose. It will be plumbed with 2-1/2" piping and equipped with a 2-1/2" ball valve and a 2-1/2" NST bronze hose swivel in the floor area.

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

An individual control and gauge will be provided at the operator's panel for each pre-connected hose storage area.

BOOSTER REEL DISCHARGE

A 1 1/2" booster reel discharge will be plumbed from the pump to the booster reel. The booster reel will be plumped to the rear center compartment area. The booster reel discharge will be plumbed from the valve to the hose reel utilizing 1" high pressure hose. The end of the hose connected to the hose reel will be equipped with a swivel end for ease in hose replacement.

A 1 1/2" Akron Brass series #8800 chrome brass ball series with "Tork-Lok" feature will be provided for the booster reel discharge. The booster reel discharge valve will be controlled by a push/pull handle located on the driver side operator's panel.

A pressure gauge is not required for the booster line.

BOOSTER REEL

One (1) Hannay, aluminum, Super Booster, electric rewind booster reel shall be furnished. The reel shall be equipped with a water lubricated; self-flushing, bronze swivel joint and an adjustable brake for freewheeling, drag or full lock operation.

The hose reel will have an in-board underside mounted motor for minimizing the overall width of the area needed for mounting of the hose reel. (SBSF SERIES)

The booster reel shall be equipped with 200' of 3/4" booster hose in 100' sections. Each length shall be fitted with NST couplings.

BOOSTER REEL REWIND CONTROL

Booster reel rewind shall be controlled by a pump panel mounted push button on the driver's side panel.

The booster reel circuit shall be equipped with a shielded toggle switch to act as a booster reel disconnect to avoid accidental actuation of the booster reel rewind button.

BOOSTER REEL ROLLERS

Two (2) horizontal hose rollers of polished stainless steel and guide spools shall be placed one (1) on each side dunnage wall panel.

The DRIVER side rollers will be located on the low profile DRIVER side wall for ease of reloading & spooling hose on and off of the reel.

TANK FILL / PUMP RECIRCULATION LINE

One (1) 2" gated full flow pump to tank refill line controlled at the pump panel will be provided.

A deflector shield inside the tank will be furnished.

Tank fill plumbing will utilize 2" wire braided hose for tank connection to accommodate flexing between components.

PUMP PANEL:

CONTROL PANEL

The pump operator's control panel will be located on the DRIVER side of the apparatus. Both side panels will be completely removable and designed for easy access and servicing.

VALVE CONTROLS

All 1" or larger In-line valves will be controlled by chrome plated locking "T" handles, connected to swiveling type ends with 1/2" stainless steel threaded ends welded to 3/4" tubing reinforced control rods.

Rods will be designed to permit easy operation and minimal distortion when opening or closing a valve.

PUMP PANEL MATERIAL

The left side operator's panel, gauge panel, right side pump panel and right side access door will be fabricated from 14-gauge 304L stainless steel with a #4 standard brush finish.

HINGED GAUGE PANEL

A full width hinged gauge access panel will be provided at the operator's position.

Chrome plated positive locks will be provided along with chain holders to prevent the front of the gauge panel from coming in contact with other panels when open.

PUMP ACCESS DOOR - HINGED

A 16" high by a minimum of 26" wide pump enclosure access door will be provided above the PASSENGER side pump panel. This door will have a "D" ring, two-point latch mechanism and two (2) gas shock stay arms for ease of access.

PORTA-TANK TROUGH

Provide a Zico electrically powered porta- tank rack with a polished stainless steel enclosure on the outboard side. Control point to be located adjacent to the rack for full viewing when operating. Control to include both audible and illuminating alarms.

Port-a-tank ____L x _____W x ____H.

STAINLESS STEEL PANEL FASTENERS

Stainless steel machine screws and lock washers will be used to hold these pump panels in position unless otherwise noted. The panels will be easily removable to provide complete access to the pump for major service.

PRIMARY OPERATOR'S PANEL LIGHTING

Using a minimum of three (3) clear lens whelen LED lights under a polished stainless steel light shield will illuminate the operator's panel. The shield will be full width of control panel, and will be positioned to cover the lights and prevent glare.

The center light under the operator's panel light shield will be actuated when fire pump is engaged in addition to the pump engaged light.

PASSENGER SIDE PANEL LIGHTING

Two (2) Whelen LED step lights mounted on the side panel and activated with the pump panel lights will illuminate the PASSENGER side pump panel and running board.

IDENTIFICATION PLATES – COLOR CODED

Identification plates will be provided for all gauges, controls, connections, switches, inlets and outlets. Plates will be engraved and color coded polymer material for durability and accurate identification of controls.

PUMP OPERATOR'S PANEL

The pump operator's panel will accommodate the following:

- Water tank fill valve
- Auxiliary suction valve control
- All discharge valve controls
- Auxiliary engine cooler controls
- Water tank suction control valve
- Pump primer valve

- Discharge Pressure Relief Controls
- Individual discharge gauges
- Pump shift engaged indicator light
- Water tank water level indicator
- Engine tachometer (Included in pressure governor control device)
- Engine oil pressure gauge with audible alarm (Included in pressure control device)
- Engine water temperature gauge with audible alarm (Included in engine monitor system)
- Pump panel light switch
- Vacuum & pressure test plugs (Underwriters)
- Pump performance plate (Underwriters)
- Pump serial No. plate
- Master pump drain valve
- Individual drains
- Voltmeter with low voltage warning light and alarm (Included in pressure control device)
- Air inlet/outlet at lower left hand panel
- Transmission temperature gauge
- Push button type air horn switch

PRESSURE GAUGES

Individual gauges will be fluid filled No Shok gauges. The fluid fill shall be an environmentally friendly synthetic anti-freeze type agent, acting as a lubricant and shock absorber.

The gauge accuracy will comply with ANSA B40.1 Grade a requirements.

Temperature operating range will be 40 degrees F to +160 degrees F.

Gauge will be constructed of heavy duty brass on the case for increased shock protection.

The lens crystal will be a molded plexiglass with captive "O-Ring" and secured with a rolled type 304 highly polished stainless steel bezel.

The individual gauges will be 2-1/2" in diameter and shall be compound style with a vacuum/pressure range of 30"-0-400 psi.

Gauges shall have white faces with black markings and shall include an orange tip pointer for easy readability.

The individual pressure gauge shall be installed as close to the outlet control as practical.

The pressure gauges shall come with a five (5) year warranty on accuracy, performance, discoloration, defects, and workmanship provided by Innovative Controls, Inc.

The pressure gauge shall come with a ten (10) year warranty against fluid leakage.

WATER LEVEL GAUGE DISPLAY - PUMP PANEL

A Class 1, Model # ITL 40 Tank Level Gauge for indicating water level will be provided on the DRIVER'S side pump panel.

The Tank Level Gauge shall indicate the liquid level or volume on an easy to read LED display and show increments of 1/8 of a tank.

Each tank level gauge system shall include:

- A pressure transducer that is mounted on the outside of the tank in an easily accessible area.
- A super bright LED display viewable from 180 degrees with a visual indication at nine accurate levels.
- A set of weather resistant connectors to connect to the digital display, to the pressure transducer and to the apparatus power.

WATER LEVEL GAUGE DISPLAY - IN-CAB

A Class 1 Remote Dash Indicator tank level gauge will be provided inside the cab on the dash area visible to the driver. This display shall receive its signal directly from the Master Tank Level Display.

WATER TANK LEVEL GAUGE - REAR OF BODY

A Class 1, Model # ITL 40 Tank Level Gauge for indicating water or foam level will be provided on the REAR of the tank at a height and location as determined by the department.

The Tank Level Gauge shall indicate the liquid level or volume on an easy to read LED display and show increments of 1/8 of a tank.

Each tank level gauge system shall include:

- A pressure transducer that is mounted on the outside of the tank in an easily accessible area.
- A super bright LED display viewable from 180 degrees with a visual indication at nine accurate levels.
- A set of weather resistant connectors to connect to the digital display, to the pressure transducer and to the apparatus power.

WATER TANK – WET SIDE:

WATER TANK CAPACITY

The tank will have a capacity of 2000 U.S. gallons minimum.

WATER TANK CONSTRUCTION

The tank and its integral support structure will be manufactured from a PT2E copolymer ultra-high impact polypropylene with physical properties equal to or greater than Amocos AccTuf 3045 resin. The fabrication will be of a welded construction utilizing a nitrogen shielding gas for optimum weld consistency and purity. Exterior seams are to be extrusion welded for maximum strength and integrity.

The tank will be self-supporting in design. The integral and internal supports must not contain any non-polymer material in their construction. The barrel will be constructed with 3/8" sheet in a series of prefabricated sections utilizing one piece cell modules containing 3/4" and 1/2" thick partitions to form the tank. Each cell module will contain one longitudinal and one transverse partition creating an NFPA compliant compartment type baffling system.

The Closed-Curve compartment type baffling system will include primary transverse partitions and end walls that will extend down to the bottom of the support sills. Channel shaped longitudinal sill supports will be externally welded to the underside of the barrel and to the tank end walls as well as to the primary transverse partitions. This longitudinal sill will be constructed from 3/4" PT2E polypropylene and will be fully extrusion welded. Drain holes will be provided at the ends of each section.

Provisions are to be incorporated for air and water to adequately pass through the Closed-Curve baffles to facilitate filling and evacuation requirements and will be staggered in an efficient design to reduce water turbulence while in motion.

WATER TANK FILL TOWER

A fill tower will be located in the center of the tank and will have a minimum 6” vent/overflow pipe which is to be internal to the tank and will terminate behind the vehicles rear most axle. The tower will have an open area of no less than 500 square inches and must be at least 8” in height from the highest point on the barrel.

The fill tower lid will be of a hinged type design and will be hinged towards the front of the tank. The tank lid will be retained using a rubber pull latch. It should be able to self-vent during dumping operations. A tether will be provided to hold the tank lid in the open position.

WATER TANK SUMP AND CONNECTION

A sump will be provided at the front underside of the tank along the tanks longitudinal centerline. This sump will be fabricated from 1/2" PT2E copolymer polypropylene with a 3/4" PT2E floor. Provisions for a 3" NPTF clean-out port will be provided in the floor of the sump. An anti-swirl device in the form of a horizontal plate will be provided internally to avoid cavitation over the sump during rapid evacuation. A 4" NPTF tank-to-pump suction connection will be provided in the forward wall of the sump.

A discharge sump will be incorporated at the rear of the tank, which will provide a mounting surface for a dump valve(s). This sump will be fabricated from 3/4" PT2E polypropylene. The dump surface will allow multiple round/square dump valves to bolt to the tank. The bottom of the sump will be at least 6" lower than the bottom of the elliptical tank floor.

WATER TANK OUTLETS

There will be two (2) standard tank outlets; one for tank-to-pump suction line which will be a minimum of 4" coupling and one for a tank fill line which will be a minimum of a 2" N.P.T. coupling. All tank fill couplings will be backed with flow deflectors to break up the stream of water entering the tank.

WATER TANK MOUNTING

The tank will be mounted to the truck chassis utilizing a structural tubular steel sub-frame, which will provide a properly cushioned mounting surface for the tank. Captive mounting brackets adequately sized for the tank will be provided to attach the tank to the sub-frame utilizing a cushioned isolator for positive and negative vertical retention. The sub-frame will be bolted to brackets fastened to the side of the truck chassis. The front mounts are to be spring-loaded to allow for chassis flexing under extreme road conditions. There will be a 1" polypropylene strip attached to the underside of the sub-frame to isolate the sub-frame from the chassis. The forward section of the strip will have a double-tapered relief to eliminate point loading the frame rail.

DIRECT TANK FILLS - TWO (2)

Two (2) Fireman Friendly 2-1/2" direct rear tank fills will be provided and mounted on the lower rear of the water tank with one (1) to each side of the rear dump valve. Each will

terminate with a 30 degree elbow and 2-1/2" NST threads will be provided and located on the rear of the water tank as low as possible. The direct fills will be controlled by the use of (2) 2 ½" Fireman's Friend valves.

HOSEBED

There shall be a hosebed area constructed of polypropylene on the top of the tank consisting of two side walls and one front panel. The hosebed shall be welded to the outside perimeter of the tank cover. Hosebed depth shall be determined by distance from top of tank to top of cab. Height of hosebed shall be equal in height of cab.

VINYL HOSEBED COVER

The apparatus shall be equipped with a vinyl hosebed cover.

The cover, approximately 74" wide, shall be secured utilizing a velcro fastening system at the front and sides of the hosebed body.

The vinyl cover shall be red in color.

REAR DUMP - 10" PNEUMATICALLY CONTROLLED WITH EXTENSION

A pneumatically controlled 10" diameter square dump chute/valve will be installed on the rear body panel and tank area.

The dump valve will be an air operated 10" butterfly valve with attachment to the rear of the water tank.

The extendable dump chute will be constructed of 304 Stainless Steel materials with a minimum extension length of 14".

The dump chute/valve will be controlled by a two switch operation in which one switch extends the dump chute and the second switch opens the Ultra Flow water valve.

The dump valve actuator must fully open, when the apparatus air system is fully pressurized, within 10 seconds of activating the dump valve.

Controls for the dump valve will be installed on both the DRIVER side and PASSENGER side rear body panel in a Cast Products aluminum housing enclosure with hinged lid.

DUMP – 10" PNEUMATICALLY CONTROLLED WITH EXTENSION - DRIVER SIDE

A pneumatically controlled 10" diameter dump chute/valve will be installed in the DRIVER side rear fender panel.

The dump valve will be an air operated 10" butterfly valve with attachment to the lower sides of the water tank.

The extendable dump chute will be constructed of 304 Stainless Steel materials with a minimum extension of 14” from the body side panel.

The dump chute/valve will be controlled by a two switch operation in which one switch extends the dump and the second switch opens the Ultra Flow water valve.

The dump valve actuator must fully open, when the apparatus air system is fully pressurized, within 10 seconds of activating the dump valve.

Primary controls for the dump valve will be installed on the DRIVER side rear body panel in a Cast Products aluminum housing enclosure with hinged lid.

DUMP - 10" PNEUMATICALLY CONTROLLED WITH EXTENSION - PASSENGER SIDE

A pneumatically controlled 10” diameter dump chute/valve will be installed in the PASSENGER side rear fender panel.

The dump valve will be an air operated 10" butterfly valve with attachment to the lower sides of the water tank.

The extendable dump chute will be constructed of 304 Stainless Steel materials with a minimum extension of 14” from the body side panel.

The dump chute/valve will be controlled by a two switch operation in which one switch extends the dump and the second switch opens the Ultra Flow water valve.

The dump valve actuator must fully open, when the apparatus air system is fully pressurized, within 10 seconds of activating the dump valve.

Primary controls for the dump valve will be installed on the PASSENGER side rear body panel in a Cast Products aluminum housing enclosure with hinged lid.

DUMP CONTROL SWITCHES - IN CAB

There will be additional dump control switches provided inside of the cab per the following:

One (1) "Dump Enable" switch will be provided that will serve as the master power switch to all interior and all other dump switches. Switch to have an accompanying indicator light to indicate when the switch is powered.

One (1) control switch to extend the dump chute for the DRIVER side rear dump and one (1) control switch to open the Ultra Flow water valve on the DRIVER side rear dump. Switches to have an accompanying indicator light to indicate anytime the valve is open or the extension chute is extended.

One (1) control switch to extend the dump chute for the PASSENGER side rear dump and one (1) control switch to open the Ultra Flow water valve on the PASSENGER side rear dump. Switches to have an accompanying indicator light to indicate anytime the valve is open or the extension chute is extended.

One (1) control switch to extend the dump chute for the REAR side rear dump and one (1) control switch to open the Ultra Flow water valve on the REAR side rear dump. Switches to have an accompanying indicator light to indicate anytime the valve is open or the extension chute is extended.

APPARATUS BODY:

WET SIDE TANKER BODY

The apparatus design will incorporate the vehicle requirements as specified in the latest revision of NFPA 1901 as required for a "Mobile Water Supply" type apparatus.

The body and side compartment assemblies will be designed and assembled to provide maximum strength and durability under all operating conditions. Each compartment provided will have a minimum load capacity of 500 pounds, providing a total of at least 1000 pounds of storage space.

Special attention will be taken to minimize rust on all fabricated parts and structural members of the body. All bolt on panels will be provided with a dissimilar metals isolation barrier to prevent electric corrosion.

BODY FABRICATION 3/16" ALUMINUM PAINTED

The body/fender will be fabricated of 3/16" aluminum painted (5052-H32). The panel fabrication will be both plug welded and stitch welded to ensure proper weld penetration on all panels while avoiding the possible warping caused by a full seam weld. The body/fender will be welded on a fixture to ensure true body dimensions and squareness of all panels.

The body/fender will incorporate a flat top design to allow for accessory mounting as required. The body/fender panel, as well as all compartmentation will be mounted directly to the chassis frame with saddle style brackets.

BODY SUPER STRUCTURE - ALUMINUM

The body super structure will be an all welded configuration utilizing a minimum of 3" x 1-1/2" x 3/16" rectangular aluminum structural tubing (6061-T6).

This structure will be designed to totally support the full length and width of the body and will be welded to the body side compartments by use of reinforcement plates to incorporate the compartments into an integral part of the body weldment.

All cross tubes of the structure will be capped and butt welded at their point of termination to prevent water from lying inside the super structure.

BODY MOUNTING

The super structure will be held on the chassis frame by "U" bolts. The "U" bolts will be bolted through a "J" shaped bracket that fits over the bottom flange of the chassis frame rails. In addition, a 1/2" thick bracket will be bolted to the chassis frame rails on an angle behind the rear axle to prevent the body from shifting fore and aft on the chassis frame rails.

CERTIFICATION - STEPPING, STANDING, & WALKING SURFACES

All stepping, standing, and walking surfaces on the body will meet NFPA #1901 anti-slip standards. Aluminum tread plate utilized for stepping, standing, and walking surfaces will be Alcoa No Slip type. This material will be certified to meet the NFPA #1901 standard. Upon request by the Purchaser, manufacturer will supply proof of compliance with this requirement. All vertical surfaces on the body, which incorporate aluminum tread plate material, will utilize the same material pattern to provide a consistent overall appearance.

COMPARTMENT SIZE AND LOCATION

One compartment will be provided on each side of the vehicle forward of the rear axles. The compartment will be constructed of 3/16" thickness brushed finish aluminum. The compartment will be directly attached to the chassis frame with saddle mounting brackets.

Each compartment will have the following dimensions:

- Interior Dimensions: Approximately 59-5/8" Wide x 32" High x 26" Deep
- Door Opening Dimensions: Approximately 54" Wide x 30" High

In addition, each compartment floor shall have Turtle Tile installed.

REAR BUMPER

The unit will be equipped with a full width rear bumper. The bumper will be constructed from aluminum tread plate with tapered corners and will extend a minimum of 18" beyond the rear of the water tank to protect rear mounted accessories.

REAR STEP COMPARTMENT

One (1) rear step compartment shall be provided between the frame rails. The compartment shall be Approximately 13" high x 30-3/4" wide x 22" deep with a door opening of 11" high x 28" wide.

The compartment shall have a hinged tread plate door with a D-ring handle automotive latch.

RUNNING BOARDS

The side running boards will be fabricated of 3/16" thickness polished aluminum tread plate.

The outside edge on each step will be fabricated with a double break, return flange.
Each step will be rigidly reinforced with a heavy duty support structure.

Running boards will not form any part of the compartment design, and will be bolted into place with a minimum 1/2" clearance gap between body, pump and cab to facilitate water runoff.

FOLDING STEPS

Two (2) large folding steps will be installed, one (1) on each side of the body, located on the front surface of the side compartments.

HANDRAILS

All hand rails will be 1-1/4" outer diameter, polished aluminum, rubber insert type tubing, designed to meet NFPA 1901 requirements.

Molded gaskets will be installed between the handrail stanchion castings and body surfaces to prevent electrolytic reaction between dissimilar metals and to protect paint.

HANDRAIL LOCATIONS

- Two (2) vertical rails will be mounted on the rear edge of the body, one (1) each side.

- Two (2) horizontal 18” anodized aluminum serrated grab handles will be mounted on the top of both ends of the manually hinged porta-tank rack.

REAR TOW EYES

Two (2) rear tow eyes will be provided, and bolted directly to chassis frame protruding below the fire body at the rearmost portion of the frame.

MUD FLAPS

Heavy duty, black rubber mud flaps will be provided behind the Front and rear wheels.

COMPARTMENT DOORS - ROLL-UP STYLE

The body compartments as listed will have ROM Roll-O-Matic shutter style roll-up doors or equivalent.

The doors will consist of anodized aluminum interlocking slats with an inner seal between each slat to prevent noise from vibration and helps to inhibit water and dust penetration. The slats will be double wall construction for strength, durability and to resist deflection. Interlocking end shoes on the slats allows the door to operate as one unit, eliminating side to side movement. The side tracks will be one piece aluminum with a custom mounting flange to allow the shutter to slide up and down without any obstructions and will include a finishing flange to eliminate the gap between the shutter bodies. A proprietary designed drip rail across the top along with side and bottom seals will be provided to help prevent moisture and dirt from entering the compartment. A spring-loaded, counter balance assembly will be provided in the roller to assist in door actuation.

The door will be equipped with a continuous one-piece lift bar style latch mechanism which allows one-hand operation along the entire length of the door. Door catches will be provided at the bottom of the door to engage each end of the lift bar. A magnetic switch will be provided in one of the door catches, designed to activate a "Door Ajar" warning light in the cab and will activate the compartment light.

Doors will be provided with a natural anodized aluminum finish.

SWEEP-OUT COMPARTMENT FLOORS

Compartment floors will be welded to the compartment walls and have a sweep out design for easy cleaning.

Compartments with hinged doors will have the door opening flanges bend down to produce the sweep-out design.

Compartments with roll-up style doors will have the external floor flange stepped down, 1/2" high x 2" deep, to produce a sealing surface for the roll-up doors below the compartment floor. The sweep out design will also permit easy cleaning.

Compartments set on running boards, which could cause additional corrosion potential

COMPARTMENT HEIGHT

Both compartments shall be a minimum of 33" high.

LEFT FRONT COMPARTMENT

There shall one (1) low compartment located ahead of the rear wheels. The compartment shall be equipped with a low single natural finish roll up door.

There shall be two (2) aluminum adjustable tracks, vertically mounted, that are bolted in place for adjustable shelving and equipment mounting.

The floor area shall be fitted with removable vinyl Turtle Tile matting.

One (1) ROM vertically mounted roll-up compartment LED V3 door light and shall be installed on one side of the door opening. The light shall be integrated into the roll-up door track with the light acutuation with the door opening.

The compartment light will be controlled by a magnetic "On-Off" switch located on each compartment door.

RIGHT FRONT COMPARTMENT

There shall one (1) low compartment located ahead of the rear wheels. The compartment shall be equipped with a low single natural finish roll up door.

There shall be two (2) aluminum adjustable tracks, vertically mounted, that are bolted in place for adjustable shelving and equipment mounting.

The floor area shall be fitted with removable vinyl Turtle Tile matting.

One (1) ROM vertically mounted roll-up compartment LED V3 door light and shall be installed on one side of the door opening. The light shall be integrated into the roll-up door track with the light acutuation with the door opening.

The compartment light will be controlled by a magnetic "On-Off" switch located on each compartment door.

COMPARTMENT TOPS

Compartment tops will be covered with polished aluminum tread plate. The compartment tops will have a 90 degree flange downward over the top of compartments.

DRIP MOLDING

Compartment tops over all side compartments will have a 45 degree flange formed out to provide protection against water runoff.

All exterior fasteners used for holding panels or tread plate will be stainless steel. In no case will pop rivets or self-tapping screws be used.

LOUVERS

Machine stamped ventilating louvers will be furnished in each compartment, and so located that water cannot normally enter the compartment.

A metal hat section will be fastened in place on the inside body wall to further prevent moisture from entering through the louver.

ACCESS PANELS

Removable access panels will be provided in all lower compartments to access spring pins, fuel tank sender, electrical junction compartment and rear body mounts.

Protective panels will be located in the rear compartments providing access to the lights and associated wiring. The covers will also serve as protective covers to prevent inadvertent damage to lights or wiring from tools or equipment located in the compartment.

RUSTPROOFING

The entire unit will be thoroughly rust proofed utilizing rustproof and sound deadening materials applied in all of the manufacturer recommended application procedures. Our rust proofing will be applied during the assembly process and upon completion to insure proper coverage in all critical areas.

HOSE TRAY REAR

There shall be a floating hose tray mounted and recessed into the rear tailboard for hose storage.

PIKE POLE MOUNTING BRACKET

Two (2) brackets shall be provided for pike pole mounting. The tube shall have a 2" interior diameter and shall be mounted on the outside of the apparatus per the Department discretion.

FRONT BODY PROTECTION PANELS

Aluminum tread plate overlays and panels shall be installed on the front of the body compartment from the lower edge to the top of the body compartment from the lower edge to the top of the compartment doors.

REAR BODY PROTECTION PANELS

The rear body panels of the body shall be a smooth material, this will allow for the proper application and installation of the Chevron stripe on the rear.

FOLDING STEPS LEFT REAR

Four (4) folding steps serrated non-skid step traction area and also offer an oversized non-slip grasp hand-hold.

HANDRAIL REAR STEP

Two (2) extruded aluminum non-slip handrails, approximately 48" in length, shall be provided and horizontally mounted on the rear of the apparatus, one (1) on each side of the body.

HANDRAIL BELOW HOSEBED

One (1) extruded aluminum non-slip handrail approximately 48" in length, shall be provided and horizontally mounted below the hosebed on the rear of the apparatus.

EXTRUDED ALUMINUM RUB RAILS

Full body length polished aluminum rub rails shall be bolted in place on the lower right and left body sides. The side rub rails shall be heavy extruded aluminum "C" channel.

WHEEL WELL PROVISIONS

There shall be an air bottle compartment located in the rear wheel well left front to house two-(2) spare SCBA cylinders. The bottom of the tubes shall be supported to eliminate breakage. The tubes are vented to facilitate moisture drainage. The compartment door shall be a stainless steel with a positive mechanical latch.

WHEEL WELL EXTINGUISHER COMPARTMENT, RIGHT REAR

There shall be an extinguisher compartment located in the rear wheel well right

rear to house two-(2) extinguishers (2-1/2" water or 20-pound ABC). The compartment shall be fabricated of the same type of material as the body. The compartment shall be supported at the opening by seam welding the tube to the wheel well. The bottom of the tube is also to be supported to eliminate breakage. The tube is vented to facilitate moisture drainage. The compartment door shall be stainless steel and have a positive Mechanical latch. The bottom of the compartment shall be lined with a material to protect the extinguisher bottles finish.

HARD SUCTION MOUNTING

One (1) horizontally mounted aluminum hard suction hose tray with velcro straps shall be provided and mounted per the Departments discretion.

LETTERING AND STRIPING

A maximum of sixty (60) three (3) inch vinyl letters will be provided to coincide with the Fire Department's existing lettering.

SCOTCHLITE STRIPE

A minimum of a four (4) inch high white "Scotchlite" stripe shall be provided. The stripe will be applied to at least 50 percent of the cab and body length on each side, at least 50 percent of the width of the rear, and at least 25 percent of the width of the front of the apparatus shall have the reflective material affixed to it. There will be a $2,500.00 allowance for graphics additionally.

CHEVRON STRIPPING

A Reflective Chevron striping will be applied to the rear of the apparatus in a V-Shape pattern.

Striping will be 6” wide red/fluorescent yellow green reflective. It will be applied in accordance with NFPA 1901 2009 Edition.

MISCELLANEOUS EQUIPMENT:

SUCTION HOSE – FLEXIBLE PVC

Two (2) 10 foot sections of six (4) inch (PVC) suction hose with lightweight hard coat couplings will be furnished. Couplings will include a long handle, female swivel on one end and a rocker lug male on the other end. All threads will be six (4) inch N.S.T.

SUCTION HOSE TROUGHS

A polished aluminum hose trough in an enclosed compartment will be provided to accommodate the two (2) suction hoses.

The troughs will be mounted on the DRIVER body side panels with the opening to the rear of the apparatus.

(The hose troughs will "not" be painted to reduce paint chipping problems).

WHEEL CHOCKS

Two (2) wheel chocks will be mounted per the Department.

HANDLIGHTS

Provide, mount and wire two (2) 12 volt Streamlight “Vulcan” rechargeable halogen type handlights as determined by the department.

EQUIPMENT CARRYING CAPACITY

The equipment storage capacity of this unit will meet NFPA 1901 requirement of 1000 lbs. This allowance does not include fixed mounted items like generators, reels, ladders and suctions hose.

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