## NFPA 2016 STANDARDS

This unit shall comply with the NFPA standards effective January 1, 2016.

Certification of slip resistance of all stepping, standing and walking surfaces shall be supplied with delivery of the apparatus.

A plate that is highly visible to the driver while seated shall be provided which states the overall height, length, and gross vehicle weight rating.

The manufacturer shall have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company shall designate, in writing, which is qualified to witness and certify test results.

## PAINT WARRANTY FIVE YEAR

The AKZO paint performance guarantee will cover the areas of the vehicle finished with the specified product for a period of FIVE (5) years beginning the day the vehicle is delivered to the purchaser.

The full apparatus chassis, manufactured and painted by Rosenbauer Motors, LLC, shall be covered for the following paint failures as outlined on the guarantee certificate:

- Peeling or delaminating of the topcoat and/or other layers of paint.
- Cracking or checking.
- Loss of gloss caused by cracking, checking, or hazing.
- Any paint failure caused by defective AKZO Fleet Finishes, which are covered by this guarantee.

All guarantee exclusions, limitations, and methods of claims are covered in the full certificate provided to the original purchaser.

Note: Surety bond, if required, will cover the standard one-year warranty period only and will not cover any extended warranties allowed by the seller or other component manufacturers.

## CAB STRUCTURE WARRANTY

The cab structure shall be warranted for a period of ten (10) years with the complete details of the warranty outlined in a document provided upon request.

## TRANSMISSION WARRANTY

The Allison EVS transmission shall be warranted for a period of five (5) years with the complete details of the warranty outlined in a document provided upon request.

## ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever comes first, with the complete details of the warranty outlined in a document provided upon request.

## FRAME WARRANTY

The frame and cross members shall carry a lifetime warranty with the complete details of the warranty outlined in a document provided upon request.

## FRONT AXLE WARRANTY

The front axle shall be warranted by Hendrickson for five (5) years or 500,000 miles, whichever comes first, under the general service application.

## REAR AXLE WARRANTY

The rear axle(s) shall be warranted by Meritor for five (5) years with unlimited miles under the general service application.

## CAB AND CHASSIS WARRANTY

The cab and chassis shall carry a twelve (12) month warranty providing limited parts and labor from the date the complete apparatus is delivered to the end user. The complete details of the warranty shall be outlined in a document provided upon request.

## STATIC LOAD SEAT TEST INFORMATION

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. To reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208.

The materials used in construction of the seat shall also have successfully completed testing regarding the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

## CAB TEST INFORMATION

The cab as built shall have successfully completed the pre-load side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests shall have been witnessed by and attested to by an independent third party. The test results shall have been recorded using cameras, high speed imagers, accelerometers, and strain gauges.

Documentation of the testing shall be provided upon request.

### CAB INTEGRITY CERTIFICATION

The manufacturer shall provide a cab crash test certification with this proposal including SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading for Heavy Trucks and SAE J2420 COE Frontal Strength Evaluation - Dynamic Load for Heavy Trucks.

### CAB TEST INFORMATION

ROOF CRUSH

The cab shall be subjected to a roof crush test of 120,000 pounds exceeding the requirements of ECE 29 criteria. The 120,000-pound requirement is important to ensure the most structurally sound and safe cab in the event of a crash or roll over.

SIDE IMPACT

The cab shall be subjected to dynamic moving barrier slammed into the side of the cab at 7.5 mph, striking with an impact of 15,157-foot pounds of energy. This test will closely represent the forces a cab would incur in a rollover incident.

FRONTAL IMPACT

The cab shall withstand a frontal force produced from a moving barrier slammed into the front of the cab traveling at 10.5 mph, striking with an impact of 42,587-foot pounds of energy.

The same cab shall withstand all tests without any measurable intrusion into the survival space of the occupant area.

## OPERATION AND PARTS LIST MANUALS

Each cab and chassis shall include two (2) electronic copies of the operation manuals and parts listings. The manuals shall include information specific to the components included on the apparatus.

## ENGINE AND TRANSMISSION MANUALS

One (1) paper copy of the specific engine and transmission manuals shall accompany each cab and chassis.

## AS BUILT WIRING DIAGRAMS

Each cab and chassis shall include one (1) digital copy of the wiring schematics and component wiring. The wiring schematics shall be developed on a software program such as VeSys Design or equal that provides continuity in files and diagrams. The software shall allow you to trace through the design schematics to identify cross-referenced items such as in-line connectors and wires. The software shall be interactive which allows you to view one electrical assembly drawing, click on a wire routing and the program will take you to the related circuit assembly or termination point. The software shall also provide a searchable function allowing you to view multiple diagrams using readily available pdf viewers. The digital copy of the wiring schematics shall be compatible with handheld devices such as I-Pads.

## USB STORAGE

For ease of service the chassis will come with an on-board USB flash drive. The flash drive shall have a minimum of 8 GB of storage capacity; and shall be located behind the access panel on the driver side kick panel, next to the data port for the engine.

The following items shall be stored on the Flash Drive. No Exception.

- As built wiring diagrams
- Plumbing diagram
- Chassis, body and aerial manuals

The USB shall be accessible through a 3-foot (3') USB-A to USB-B cable provided by the manufacture with the completed vehicle.

## ROAD SAFETY KIT

- One (1) 2-1/2# ABC DOT Approved fire extinguisher shall be provided. The fire extinguisher shall be shipped loose with the chassis.
- One (1) set of DOT approved hazard triangles shall be supplied with the chassis. They shall be stored in a plastic case and shipped loose with the chassis.
- One (1) first aid kit

**CAB CUSTOM STYLE**

The cab shall be a custom, 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 by manufacturer's engineering to meet the unique, heavy-duty construction specifications. The raw cab will be fabricated to meet the exact demand of the fire industry and shall be manufactured by a company with no less than 50 years of experience in building custom cabs. All aspects of the cab will be quality checked by manufacturers personnel. All cab and chassis customization and assembly will take place 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. No Exceptions.

The cab shall include a four (4)-point rubber isolated cab pivot and mounting system. The rear histic mounts shall be isolated from the chassis frame to reduce the transfer of road vibrations and frame torque into the cab, while providing superior handling characteristics. No solid mounted rear lock downs will be acceptable. No Exceptions.

The front cab pivot assemblies shall be 1/2" A36 steel plate with a .31" thick 2-1/2" diameter tube cross member mechanically attached to the cab and frame. There shall be two (2) greaseable rubber isolated engineered bushings to reduce the transfer of road vibrations into the cab.

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 extrusions shall provide adequate space for routing of wiring and hoses which will provide service accessibility. Routing of harnessing which requires pulling of wires through tubes will not be allowed. No Exceptions.

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 cabs front corners shall be constructed of 5052-H32 stamped aluminum to provide a consistent material composition. The stamping process alleviates the high tendency of fractures through the fusing of dissimilar metal composition as appears with a casting process.

Cast cab components, including cab corners, "A" pillars and front fascia components shall not be acceptable due to the high tendency of fractures. No Exceptions.

Additional cab strength shall be obtained through closed section, dual extrusions in the construction of the "D" pillars.

The front facade shall be constructed with dual wall .19” thick 5052-H32 aluminum plates which make up the front bulkhead, reinforced by .19” thick 6061-T6 aluminum extrusion (box-sections), though-out the inner and outer perimeter of the front end / facade. The reinforcing third wall / barrier is .13” thick 5052-H32 work hardened aluminum facade panels. All panels shall be welded, no adhesive.

The cab side wall of the cab shall be 3/16” thick 5052-H32 aluminum plate. The cab side plate shall wrap the corner of the cab b pillar and slam post. The cab rear wall plates shall be reinforced with a minimum of two (2) 3/16 x 3” aluminum sections; the cab side reinforcements shall be a minimum of 28” apart and span from the cab B pillar and cab C pillar.

The rear wall of the cab shall be 3/16” thick 5052-H32 aluminum plate. The rear cab plate shall wrap the corner of the cab and attach to the cab D pillar and slam post. The cab rear wall plates shall be reinforced with four horizontal and dual vertical support sections; the dual vertical support structure shall consist of 1/8” thick x 2” 6061-T6 aluminum tubes and the horizontal hat sections shall consist of 1/8” thick x 4” 5052-H32 aluminum. The dual vertical support sections shall be 40” a-part, and the cab shall contain a minimum of four (4) 4” hat section horizontal supports.

Additionally, the rear edge of the floor shall include a 3/16” 6061-T6 aluminum tube extrusion (under the floor) and a 7” 5052-H32 aluminum cab floor support section (above the floor).

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

The cab length shall measure 77.3” from the center of the front axle to the front cab skin and 70” from center of the front axle to the back of the cab, for a total cab length of 147.3”.

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

The crew floor shall feature a complete flat floor design, including provisions for a one o'clock PTO inclusion, while still offering an uninterrupted 25 total square feet of space.

The leading edge of the cab floor from the steps shall meet NFPA 15.7.4 slip resistance requirements on both the front and rear cab doors. No Exceptions.

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).

The cab shall include 4 doors. They shall have a front two (2) cab doors shall have a minimum clear opening of 42.5" wide by 81" high measured from the top of the lower cab step to the top of the door opening and the rear two (2) crew doors shall be a minimum clear door opening of 38.5" wide by 91.5" high measured from the top of the lower cab step to the top of the door opening. The length of the door will vary depending on the door type.

ROOF STYLE - 11" RAISED

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

The roof height shall feature an 11" raise starting over the driver and officer positions and continuing back to the roof and rear wall joint. Raised roof designs that do not include a raised portion over the driver and officer positions will not be acceptable. No Exceptions.

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 cab header shall feature dual 6061-T6 aluminum extrusions which shall offer superior rigidity and strength.

The raised roof shall offer a crew head height area of 66-1/2" from the floor to the ceiling in the crew areas for optimum headroom.

The crew roof super structure shall include a reinforcement hat-section structure 1/8" thick 5052-H32 aluminum bracing. The for-aft support braces will be 24" on center apart, the side-to- side support braces will stretch from cab side to cab side and centered between the dual 3/16" extruded and plate reinforced roll-cage section.

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.

Additionally, the entire roof super structure is reinforced by a .25" thick roof edge corner extrusion around the entire cab perimeter.

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.

DRIP RAIL EXTENSION

The cab shall have a drip rail extension in front of the driver and officer doors. The drip rail shall be connected to the rail along the roof and run midway down the “A” pillar to help prevent water from entering the cab when the front doors are opened. The rail shall be painted to match the cab exterior paint and paint break.

LIGHT TOWER PROVISION

The cab roof shall include reinforcement for a light tower. The reinforcement shall consist of (4) aluminum pads mounted to the exterior of the cab roof. The entire reinforcement shall be integral with the roof for rigidity.

## LIGHT TOWER

A Knight 2, manufactured by Command Light, part number KL415D-W2, light tower shall be provided for installation on the apparatus. The location of the light tower and its controls shall be installed according to instructions given by the customer and the requirements of the light tower manufacturer.

The light tower shall extend 87-1/2" above the mounting surface and shall extend to full upright position in less than 15 seconds. The overall size of nested light tower shall be approximately 34" wide x 47" long x 14" high and weigh approximately 165 pounds.

CONSTRUCTION AND DESIGN

The light tower assembly shall be of aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance.

The electrically controlled unit shall not require usage of the vehicle's air supply for operation, thereby eliminating the chance for air leaks in the vehicle braking system. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the specified all electric light tower.

The light tower shall be tested to in wind conditions of 90 mph (150 kph) minimum. Other type floodlights that have not been tested to these conditions are not acceptable.

The light tower shall be capable of overhanging the side or back of the vehicle to provide maximum illumination to the vicinity adjacent to the vehicle for the safety of emergency personnel in high traffic conditions. Any tower that is only capable of rotations at the top of a pole is not an acceptable alternative to the specified tower.

ELECTRICAL SYSTEM

The light tower shall be a two-stage articulating device with a lighting bank on top of the second stage capable of continuous 360 degree rotation. The light shall be elevated by electric linear actuators, one (1) actuator shall elevate the lower stage and one (1) actuator shall adjust the light bank angle from 0 to 110 degrees. Power for the light bank shall be supplied through power collecting rings thus allowing continuous 360 degree rotation in either direction.

The tower base shall have a light that illuminates the envelope of motion during any movement of the light tower mast as required by NFPA1901.

CONTROLS

The light tower shall be controlled with a hand-held 15 foot umbilical line remote control. The storage station for the remote control unit shall be equipped with a button to activate the "Auto-Park" automatic nesting feature.

The controls on the remote box shall be:

- Two (2) switches, one (1) for each light bank.
- One (1) light bank rotation switch.
- One (1) switch for elevating lower and upper stage.
- One (1) indicator light to indicate when light bank is out of roof nest position.
- One (1) indicator light to indicate when light bank is rotated to proper nest position.

FLOODLIGHTS

The Command Light shall be equipped with four (4) Whelen Pioneer Plus PFH2 12 volt lights. Each light shall have 150 watts for a total of 900 watts and 81,044 lumens.

The light heads shall be mounted two (2) on each side of the light tower, giving two (2) vertical lines of two (2) when the lights are in the upright position.

**LIGHT TOWER ENCLOSURE**

A three (3) sided enclosure for the light tower shall be installed. The enclosure shall be constructed from smooth aluminum plate and be designed to protect the components of the light tower from low-lying branches while in transit. The enclosure shall be installed with weather-sealed fasteners.

The enclosure shall be painted to match the upper portion of the cab or body.

**DRIVER SIDE REAR CAB COMPARTMENT**

The driver's side of the vehicle will include a compartment that is located at the rear of the cab behind the driver's side crew door. The compartment shall measure 9"wide x 27" tall x 22" deep and 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
- A clear door opening of 8" wide x27" tall, (the door shall be 37" tall)
- The compartment floor shall be a sweep out design. No Exceptions.

**REAR COMPARTMENTS**

The driver's rear compartment shall stop at the frame rail creating a separate and distinct compartment. Each compartment is ventilated.

**DRIVER EXTERIOR REAR COMPARTMENT HANDLE**

The driver’s exterior rear compartment shall have a chrome plated die cast steel handle.

**REAR CAB COMPARTMENT DOOR LOCKS**

The driver's side rear cab compartment shall include a manual door lock. The door lock shall be an integral part of the compartment handle. The door may be unlocked from the exterior with a key.

**DRIVER REAR COMPARTMENT INTERIOR FINISH**

The interior of the driver side rear compartment shall have a DA sanded finish.

**DRIVER REAR CAB COMPARTMENT LIGHTING**

The driver's side rear compartment shall include one (1) 18"strip of LED lighting that will be located inside the front corner of the compartment near the door

**OFFICER SIDE REAR CAB COMPARTMENT**

The officer's side of the vehicle will include a compartment that is located at the rear of the cab behind the officer's side crew door. Thecompartment shall measure 9"wide x 27" tall x 22" deep and 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
- A clear door opening of 8" wide x 27" tall, (the door shall be 37" tall)
- The compartment shall be of a sweep out design. No Exceptions.

## REAR COMPARTMENTS

The officer's rear compartment shall stop at the frame rail creating a separate and distinct compartment. Each compartment is ventilated.

## OFFICER EXTERIOR REAR COMPARTMENT HANDLE

The officer’s exterior rear compartment shall have a chrome plated die cast steel handle.

## REAR CAB COMPARTMENT DOOR LOCKS

The officer's side rear cab compartment shall include a manual door lock. The door lock shall be an integral part of the compartment handle. The door may be unlocked from the exterior with a key.

## OFFICER REAR COMPARTMENT INTERIOR FINISH

The interior of the officer side rear compartment shall have a DA sanded finish.

## OFFICER REAR CAB COMPARTMENT LIGHTING

The officer's side rear compartment shall include one (1) 18"strip of LED lighting that will be located inside the front corner of the compartment near the door.

## INTERIOR CABINET

There shall be one (1) rear facing cabinet installed behind the engine enclosure. The cabinet shall be constructed of smooth aluminum plate with minimum interior dimensions of 15" high x 36" wide x 18" deep.

### CARGO NETTING

The rear facing engine compartment shall have cargo netting over the opening.

### REAR ENGINE COMPARTMENT LIGHTING

The driver's side EMS compartment shall include one (1) 12" strip of LED lighting and shall be located in the inside front corner of the compartment near the door.

### COMPARTMENT SHELF

One (1) adjustable shelf(ves) shall be installed in the interior cab compartment. The shelf shall be constructed from aluminum.

### COMPARTMENT INTERIOR FINISH

The interior of the rear of engine compartment shall have a DA sanded finish.

## INTERIOR CENTER CEILING CABINET

There shall be a forward facing cabinet installed centered on rear wall of the cab. The cabinet shall be constructed of smooth aluminum plate with minimum interior dimensions of 91.75" wide x 20.25" deep x 11.75" height.

The cabinet shall be finished to match the cab interior finish, both in color and texture.

Four (4) hinged smooth aluminum doors shall be installed on the cabinet. Four (4) push to release latch shall be installed.

The cabinet's exterior finish shall match the interior finish of the chassis cab.

The cabinet's interior shall have an unpainted D/A orbital sander finish.

### CAB COMPARTMENT LIGHTING

The compartment LED light strip shall be 36" long.

## 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 33" wide x 10" deep. The front cab intermediate step shall measure a minimum 31" wide x 8" deep.

The crew cab first step shall measure a minimum of 26" wide x 10" deep. The crew cab intermediate step shall measure a minimum 28" wide x 9" deep.

The top crew step shall incorporate an angle approximately midway from the rear wall to the crew door hinge extending out the flooring under the rear facing outer seat positions, offering foot placement for safety while seated in this position.

### CAB STEP TRIM

The cab steps shall include a .80-gauge 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 round hole pattern 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 0.100" thick.

## CAB DOORS

The cab shall include a total of four (4) doors, two (2) forward and two (2) rear crew doors.

The forward cab doors shall be a minimum of 45" wide and have a cab structure opening of 42.5" wide. The rear crew doors shall be a minimum of 41" wide and a cab structure opening of 38.5" wide to provide enhanced entry and egress of the cab.

Each cab door shall feature:

- Superior strength and rigidity from 3/16" closed section extruded door frames
- Damping inside each door for a solid feel and minimized reverberation when closed
- A rolled rubber bulb seal style gasket shall be utilized around the door ensuring a weather tight fit
- Integrated, mechanical door stop
- A full length, hidden piano style 10-gauge stainless steel door hinge with a 3/8" 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.

### FULL LENGTH DOORS

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

### CAB STEP TRIM KICKPLATE

The vertical section of all cab step risers at each door shall include an aluminum treadplate finish.

### 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 paddle style which shall be chrome in color. The paddle shall be hinged towards the rear of the cab.

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 integrated 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. The door panels shall be attached to the door with nutserts. ABS material shall not be acceptable. No exceptions.

INTERIOR CAB DOOR FINISH

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

INTERIOR CAB DOOR CHEVRON

Reflective striping shall be installed on the interior of each chassis door. The lower portion of the doors shall have scotchlite red and yellow chevron striping applied to it. The striping shall be a minimum of 96 square inches per door. No Exception.

INTERIOR FRONT DOOR PULL

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

The single piece door pull shall have a curved designed in an “L” formation to provide multiple points for grasping with a gloved hand. The horizontal dimension shall be a minimum of 28" and the vertical dimension shall be a minimum of 20". The door pulls shall have an ergonomic curve making them easier to grasp when entering and exiting the cab. No Exceptions.

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-tapping 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 and shall feature a black powder coated finish.

INTERIOR GRAB HANDLE REAR DOOR

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

A black powder coated cast aluminum grab handle shall be provided on the inside of each rear crew door. The handle shall extend horizontally the width of the window just above the windowsill. The handle shall have an ergonomic curve making it easier to grasp assisting with entry and egress from the crew area of the vehicle. No Exceptions.

The door pull shall feature secure mounting with Stainless-steel fasteners with nut inserts in each location. Self-tapping 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 and shall feature a black powder coated finish.

**WINDSHIELD**

A one (1)-piece, safety glass full width windshield with more than 3,228 square inches of area will be provided. No Exceptions.

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 frit 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.

DRIVER WINDOW

The driver's door shall include a window which measures a minimum of 23.5" wide x 29" high, measured from the midpoints left to right and top to bottom. The window shall have a minimum clear viewing area of 681 square inches. The glass shall include a light gray tint and through powered actuation, shall completely roll 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.

**POWER WINDOW SWITCHES**

The Driver shall have switches for each of the cab door windows. The powered windows in the officer door, and each respective crew door, shall be activated by a switch on the respective door itself.

The switches for the driver and officer door windows shall be installed within a customized door grab handle. No Exception

OFFICER WINDOW

The officer's door shall include a window which measures a minimum of 23.5" wide x 29" high, measured from the midpoints left to right and top to bottom. The window shall have a minimum clear viewing area of 681 square inches. The glass shall include a light gray tint allowing approximately 50% of light to pass through and through powered actuation, shall completely roll 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.

REAR DRIVER SIDE WINDOW

The rear driver's side door shall include a window which is 22.5" wide x 27" high, measured from the midpoints left to right and top to bottom. The window shall have a minimum clear viewing area of 607 square inches. The glass shall include a dark gray tint allowing approximately 25% of light to pass through and through powered actuation, shall completely roll into the door housing.

REAR OFFICER SIDE WINDOW

The rear officer's side crew door shall include a window measuring 22.5" wide x 27" high, measured from the midpoints left to right and top to bottom. The window shall have a minimum clear viewing area of 607 square inches. The glass shall include a dark gray tint allowing approximately 25% of light to pass through and through powered actuation, shall completely roll into the door housing.

DRIVER MIDDLE WINDOW

The cab shall include a fixed driver's side window glass which shall be located between the cab front and rear doors. The fritted glass shall have a clear viewing area of 15.5" wide x 21.5" high and shall include a dark gray tint allowing approximately 25% of light to pass through. To eliminate the possibility of corrosion, rubber gasket rings shall not be used in the installation of the window, the window shall be glued in.

OFFICER MIDDLE WINDOW

The cab shall include a fixed officer's side window glass which shall be located between the cab front and rear doors. The fritted glass shall have a clear viewing area of 15.5" wide x 21.5" high and shall include a dark gray tint allowing approximately 25% of light to pass through. To eliminate the possibility of corrosion, rubber gasket rings shall not be used in the installation of the window, the window shall be glued in.

CAB INTERIOR AND TRIM

**CAB INSULATION**

The cab shall be 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.

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

A layer of 1/8” barrier bubble film laminated between two layers of reflective metalized film shall be provided in the roof to minimize the effects of radiant heat. The barrier shall be mold and mildew resistant and have a Class A/Class 1 fire rating. The barrier shall have a minimum of a R-5.6 rating. No Exception

The interior cab insulation system shall meet NFPA 1901 14.1.6 standards and ensure that no seated position within the cab exceeds 90dB. 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.

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

Use of open cell material as the primary insulation will not be acceptable. No exceptions.

ENGINE TUNNEL INSULATION

The engine tunnel shall include an insulated barrier from noise on the underside of each tunnel surface. This barrier shall be engineered for surrounding engines.

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. No exceptions.

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.

CAB UNDERBODY INSULATION

The underside of the cab shall include at a minimum of 1" of a uni-seal Cab-Foam insulation offering reducing vibration noise and thermal effect to the interior of the cab.

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.

Due to the excellent qualities of the marine grade vinyl material, no other type of interior trim shall be acceptable. No Exceptions.

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 including the ceiling panels shall feature this soft trim and shall be gray in color.

## REAR WALL INTERIOR MATERIAL

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

## THROTTLE AND BRAKE PEDALS

The apparatus shall have suspended throttle and brake pedals.

## FLOOR MAT

The interior flooring of the cab shall be covered with an advanced black 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 padded and trimmed in black vinyl.

## ENGINE TUNNEL

The engine tunnel shall be constructed of aluminum offering superior durability in addition to thermal and acoustic resistance.

The engine tunnel shall feature:

- A low-profile design measuring approximately 46.5" wide and 21.5" in height from the crew floor shall offer optimum visibility of the windshield and cab interior from any seated position. No Exception.
- The engine tunnel at the driver's position shall be a tapered design, featuring 24" clear width at floor level, first taper shall start 16.5" from floor level and taper inward for a clear width of 26" and the final taper shall start at 21" 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 23" clear width at floor level, first taper shall start 16.5" from floor level and taper inward for a clear width of 22.5" and the final taper shall start at 21" from floor level and taper inward for a clear width of 31.5".
- The design shall offer a minimum of 30" for the driver and 28.5" 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 28.5" for the driver and 27" for the officer. No Exception.
- Recessed sections for ease of mounting equipment at the rear of the tunnel or for compartments and bases which can be used for installing Fire/EMS equipment and components such as hand-held radios.

CAB DASH

The cab dash shall offer heavy duty, durable construction from formed aluminum. The cab dash shall be finished with an advanced polyurethane coating for a rugged finish.

The polyurethane finish shall provide a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured and skid-resistant surface. The polyurethane finish shall offer durability and scratch resistance even against today's advanced firefighting turnout materials with consistent, even coverage and a uniform texture. The polyurethane coating finish shall resist fading from UV light.

This construction shall allow for a clean, seamless dash area that shall reduce unnecessary joining of cab dash components. This design allows for the following features:

- Optimal heating and cooling of cab occupants, HVAC louvers shall be integrated into the gauge panel with a total of four (4) louvers; two louvers pointing at the driver and two 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 house the two 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 dash shall include a provision for switches to the right of the driver
- The officer dash shall include a flat area for optional mounting cradles or brackets for a laptop computer, mobile data terminal, map compartment or clip board
- The officer dash shall include a provision for switches to the left of the officer

CAB DASH & ENGINE TUNNEL

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

FLAT MOUNTING PLATE

There shall be a flat aluminum mounting plate attached to the top of the engine tunnel which can be utilized for the mounting of equipment. The plate shall utilize .75" spacers allowing for the routing of wires underneath. The plate shall start near the center portion of the tunnel and continue to the rear of the engine tunnel and shall be the width of the flat upper portion of the engine tunnel. The plate shall be coated to match the engine tunnel and dash.

MOBILE DATA TERMINAL PROVISION

The officer dash shall feature a mobile data terminal base which shall support a customer provided docking station for their laptop computer or a tablet and keyboard. This provision shall include a slide out which shall offer easy access and storage.

OFFICER GLOVE COMPARTMENT

The officer side of the cab dash shall include a glove compartment with door and latch. The glove compartment shall be coated to match the dash.

CONSOLE MOUNTED SIREN

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

The location(s) shall be as follows:

CONSOLE MOUNTED TRAFFIC LIGHTBAR CONTROLLER

One (1) black mounting plate(s) containing a plate to mount the traffic advisor lightbar controller shall be provided and incorporated in the modular dash console.

The location(s) shall be as follows:

CONSOLE MOUNTED AM/FM RADIO

One (1) black mounting plate(s) containing a mount for an AM/FM radio shall be provided and incorporated in the modular dash console.

CUP HOLDER

Two (2) cup holders shall be provided. There shall be one (1) mounted each on the driver and officer side in the forward outer portion of the top of dash horizontal surface.

**INSTRUMENTATION PANEL**

The instrumentation panel inlay shall be powder coat black.

## INTERIOR CAB FINISH

The interior cab shall be finished in a high-performance Polyurethane coating including the interior A, B, C and D pillars, all occupant seat frames and any surrounding surfaces extending to the ball seal around each door.

This type of coating shall feature:

- Durability, scratch, chemical and abrasion resistance
- Consistent, even coverage and a uniform texture
- Resistance from fading from exposure to UV light
- Gray in color

Cab Header / Heating and AC

## CAB HEADER

The cab header shall offer heavy-duty, durable construction using resin transfer molding (RTM) technology formed composite material. The composite material shall be .28" thick for improved resistance and military type strength.

RTM is a low pressure, closed molding process which offers a dimensionally accurate and high-quality surface finish composite molding, using liquid thermoset polymers reinforced with various forms of fiber reinforcements. The matrix selection of polymer and reinforcement dictates molding mechanical and surface finish performance.

ABS polymer construction shall not be acceptable. No Exceptions.

The cab header shall offer a finish of a polyurethane coating for a rugged design and finish. No Exceptions.

The polyurethane finish shall provide a tough, flexible, impact-absorbing, chemical & abrasion-resistant, even-textured and skid-resistant surface. The polyurethane finish shall offer durability and scratch resistance even against today's advanced firefighting turnout materials with consistent, even coverage and a uniform texture. The polyurethane coating finish shall resist fading from UV light.

The cab header shall also be purpose built for integration of Fire/EMS 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 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:

- To provide maximum defrost and heating performance, a 30,000 BTU heater-defroster unit 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.
- Six (6) vents shall be located in the top forward portion of the dash for superior defrosting properties across the entire windshield.
- Defrost vents for the driver's and officer's windows.
- 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 system shall exceed flash fogging standards that are set forth in the SAE Heavy-duty cab with sleeper specifications. Documentation from a third-party testing facility shall be available upon request. No Exception.
- 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's and officer's 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's and officer's position, composite dash will have 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 and floor vents at the driver and officer.
- Aluminum dash will have (4) adjustable louvers, located in the dash, two (2) adjustable louvers directed at the driver and two (2) adjustable louvers directed at the officer and floor vents at the driver and officer.
- Dual overhead units, with five (5) adjustable louvers shall be mounted above the rear facing seat positions on the driver and officer side of the cab
- The heater shall be plumbed with a shut off valve at the engine, so that the coolant bypasses the heaters.

## AIR CONDITIONING

The air conditioning system shall feature:

- One (1) evaporator shall be located under the center dash and two (2) crew overhead evaporators located near the B-pillar on each side of the cab allowing for greater frontal visibility for the forward-facing crew seating 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. No Exceptions.
- 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 and floor vents at the driver and officer.
- The air condition system shall be capable of cooling the cab from outside ambient average temp of 104 degrees Fahrenheit (40 degrees Celsius) to an average inside cab temp of 71 degrees Fahrenheit (22 degrees Celsius) at no less than 50% humidity in 30 minutes with an engine RPM of 1250, after a two (2) hour heat soak. A certification document from the testing facility shall be available upon request. No Exception.
- 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 COVER

The air conditioning condenser cover shall be made from aluminum and shall be painted to match the roof color. Plastic condenser covers will not be acceptable. No Exception.

HEATER HOSE

The heater hose inside the cab for the HVAC system shall be a premium silicone hose.

CONDENSER

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

## AUXILIARY COOLANT HEATING SYSTEM

The auxiliary coolant heating system shall include a diesel fired Espar heater rated at 17,000 BTU. The auxiliary heater shall be plumbed into the HVAC and engine coolant system and will include an integrated pump to circulate coolant throughout the cooling system including the engine and heat exchangers.

The heater shall automatically turn on when the coolant temperature is below 170 degrees Fahrenheit and the engine is running. The heater will automatically turn off once the coolant temperature reaches 170 degrees.

The auxiliary coolant heater shall be enclosed in a metal box and shall have a two (2) year parts and labor warranty.

## HEATING AND COOLING CONTROLS

The HVAC system shall be controlled from the driver dash with the use of three (3) turn style knobs. One (1) each for the temperature control, the fan control and for the mode. Fan controls shall also be available to the rear crew area.

## REAR CREW AREA CONTROLS –CENTERED OVERHEAD

The controls for the crew area HVAC system shall be mounted overhead, centered between the rear facing seating position.

Bostrom

**SEAT MATERIAL**

The seats shall include a covering of Durawear Plus, with low seam. Durawear Plus is a 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.

Seat Logo Fire Department (set up fee)

**SEAT BACK LOGO**

The seat back shall include the Fire Department's logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

SEAT AND SEAT BELT COLOR

The seats in the cab shall be gray in color with red seat belts.

DRIVER SEAT

The driver's seat shall be a H.O. Bostrom Sierra, 500 Series Wide, Electric 8-Way, ABTS, LH seat belt, bucket seat. The seat shall have contoured, high-density cushions with lumbar support and an occupancy sensor in the seat cushion. The wide seat cushion shall be supported with a serpentine spring suspension. The seat shall have nine and one half inch fore and aft adjustment, 2-inch height adjustment, front of seat tilt, rear of seat tilt, and reclining seat back. 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.

SEAT BELT SINGLE RETRACTOR

The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt including an emergency locking single retractor built into the seat assembly with the RiteHite™ Seat Belt customized fit adjustment feature. The seat belt shall include a buckle latched switch. The seat belt shall also include a rotating bezel guide at the upper shoulder point that is routed through the seat frame and its covering, protecting the webbing.

SEAT BACK

The seat back shall incorporate a standard style headrest.

SEAT MOUNTING DRIVER

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

The power seat or seats installed in the cab shall be wired directly to battery power.

## 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 15.00 inches wide and 4.50 inches high.

## ALUMINUM ACCESS DOORS

There shall be aluminum doors provided for covering each of the driver and officer seat compartment openings. The doors shall be coated to match the interior of the cab and shall be equipped with piano-style hinges and manual latches.

### OFFICER SEAT

The officer's seat shall be a H.O. Bostrom Sierra, 500 Series Wide, Air-30RX/HD/ABTS LH air suspension, high back bucket. The seat shall have contoured, high-density cushions with lumbar support and an occupancy sensor in the seat cushion . The seat shall have contoured, high-density cushions with lumbar support and Occupancy sensor in the wide seat cushion. The seat shall have a tapered, ergonomic contoured, extended, wide seat cushion with bolster support.

### SEAT BELT SINGLE RETRACTOR

The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt including an emergency locking single retractor built into the seat assembly with the RiteHite™ Seat Belt customized fit adjustment feature. The seat belt shall include a buckle latched switch. The seat belt shall also include a rotating bezel guide at the upper shoulder point that is routed through the seat frame and its covering, protecting the webbing.

### SEAT BACK SMARTDOCK SCBA BRACKET

The seat shall include a SmartDock Gen 2 hands free SCBA bracket that utilizes a locking mechanism that engages during deceleration. The bracket shall hold the cylinder in place while in transit and release using no straps, levers, buttons or switches. This bracket shall be NFPA 1901 compliant.

### HEAVY DUTY SHOCK ABSORBER

A heavy duty shock shall be added to the air ride seat.

## OFFICER'S SEAT BOX STORAGE COMPARTMENT

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.

## REAR FACING OUTER SEAT

{Quantity} rearward facing outer crew seat shall be a H. O. Bostrom Tanker 550 Wide ABTS (All Belts to Seat/Integrated Seat Belts) series with fixed base SCBA seat. The seat shall have contoured, high-density seat cushions with lumbar support and Occupancy sensor in the wide seat cushion. The wide seat cushion shall be supported with a serpentine spring suspension. The seat shall include an SCBA storage area with integral, contoured headrest and tapered side cushions with built in SCBA strap storage hooks.

The seat shall include a Cavity Cover.

SEAT BELT SINGLE RETRACTOR

The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt including an emergency locking single retractor built into the seat assembly with the RiteHite™ Seat Belt customized fit adjustment feature. The seat belt shall include a buckle latched switch. The seat belt shall also include a rotating bezel guide at the upper shoulder point that is routed through the seat frame and its covering, protecting the webbing.

SEAT BACK SMARTDOCK SCBA BRACKET

The seat shall include a SmartDock Gen 2 hands free SCBA bracket that utilizes a locking mechanism that engages during deceleration. The bracket shall hold the cylinder in place while in transit and release using no straps, levers, buttons or switches. This bracket shall be NFPA 1901 compliant.

## REAR FACING OUTER SEAT MOUNTING

Each rear facing outer seat shall be mounted facing the rear of the cab.

## FORWARD FACING CENTER SEAT

{Quantity} forward facing center crew seat shall be a H. O. Bostrom Tanker 500CT Wide ABTS (All Belts to Seat/Integrated Seat Belts) series with Flip/Up cushion. The seat shall have contoured, high-density cushions with lumbar support and occupancy sensor in the wide seat cushion. The seat shall include an SCBA storage area with integral, contoured headrest and tapered side cushions with built in SCBA strap storage hooks.

The seat shall include a Cavity Cover.

SEAT BELT SINGLE RETRACTOR

The seat shall be equipped with a red integrated 3-point shoulder harness and lap belt including an emergency locking single retractor built into the seat assembly with the RiteHite™ Seat Belt customized fit adjustment feature. The seat belt shall include a buckle latched switch. The seat belt shall also include a rotating bezel guide at the upper shoulder point that is routed through the seat frame and its covering, protecting the webbing.

SEAT BACK SMARTDOCK SCBA BRACKET

The seat shall include a SmartDock Gen 2 hands free SCBA bracket that utilizes a locking mechanism that engages during deceleration. The bracket shall hold the cylinder in place while in transit and release using no straps, levers, buttons or switches. This bracket shall be NFPA 1901 compliant.

**SEAT MOUNTING FORWARD FACING CENTER**

The forward-facing center seats shall be installed facing the front of the cab.

**SEAT FRAME FORWARD FACING ENCLOSED**

The forward-facing center seats shall include an enclosed seat box which is located and installed on the rear wall.

The seat box shall be constructed of no less than 5052-H32 .19" thick aluminum plate.

**SEAT FRAME FORWARD FACING ACCESS**

The seat frame shall include a cutout in the center of the wall facing the tunnel for access. The cutout shall be a minimum of 7.5”h x 28”w.

**SEAT COMPARTMENT FINISH**

The seat frame shall be finished to match the interior finish of the cab.

Exterior Grab Handles 18" Aluminum

Exterior Grab Handles Bare Aluminum

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 mounted on stanchions, constructed of aluminum, and be 1.25” in diameter with a knurled finish enabling non-slip assistance with a gloved hand. The handle stanchions shall be mounted to the cab with nutserts. No Exception.

**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. This design shall feature:

- A super structure which is fully welded to the cab, for a seamless and robust integration
- Thermoformed headlamp bezels, constructed of impact resistant, polycarbonate composite which is vacuum metalized to eliminate pealing and bubbling of a chrome type film or plating
- Traditional style headlight bezels with 4 x 6 high intensity headlights which shall add a classic look to the fascia while improving visibility

## FRONT GRILLE

A prominent front grille shall punctuate the aggressive design of the cab with its outboard wing style warning light bezels and heavy framework. The front grille shall feature:

- Fabricated construction for superior strength and durability
- Stainless Steel mirror finish for a distinctive appearance
- Up to six (6) warning light locations along the mid bar for a variety of warning light combinations

## LIGHT BEZEL

The front grille shall include two (2) wing light bezels. The bezels shall be constructed of a stainless material and shall be capable of holding one (1) 4" x 6" warning light in each bezel.

### GRILLE LOGO

The front grille shall include a Rosenbauer logo.

### FRONT GRILLE INLAY

The front grille shall include a honeycomb inlay of steel, painted black, which shall provide air flow to through the grille and provide a sporty, muscular appearance to the front of the apparatus.

The horizontal bars shall be overlaid with polished stainless steel strips.

## FLUID FILLS & CHECK

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

- Engine oil dipstick
- Engine coolant sight glass
- Power steering fluid dipstick
- Windshield washer fluid

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

- Engine oil
- Power steering
- Windshield washer fluid

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

## LED HEADLIGHTS

A set of 4 FireTech 4X6 LED Headlights shall be provided. The kit shall consist of 2 fixtures which operate as SAE VOR "high/low" beams, and 2 fixtures which operate as SAE VO "high-only" beams. All 4 headlights shall have a SAE "P" parking lamp halo surrounding the driving beams, which shall be energized any time the vehicle park brake is set. Optically, on the high/low headlight, an articulated set of elliptical optics must be used to illuminate the foreground while operating in "low" beam mode. The lens of the high/low beam headlight shall be marked "DOT VOR SAE HL P 16." The lens of the high-only beam shall be marked "DOT VO SAE HL P 16." All circuits of the headlights shall be designed to operate from 9-32v DC.

All 4 fixtures must be manufactured such that the internal pressure of the headlight remains constant regardless of operating temperature. The housing shall be equipped with a mechanically fastened GORE PolyVent. Similar functioning vent materials affixed to the housing using adhesive shall not be acceptable for substitution.

The headlights shall be installed, wired, and aimed, in accordance with FMVSS108. The manufacturer of the headlights shall warrant the headlights against defects for the life of the apparatus.

The headlights shall be warranted against failure and condensation accumulation by HiViz for the life of the apparatus.

## DAYTIME RUNNING LIGHTS

The illuminated daytime running light feature shall include the headlights on low beam along with the marker lights.

## HEADLIGHT LOCATION

The headlights shall be located on the front fascia in the upper buckets, on each side of the cab grille.

## FRONT TURN SIGNALS

Two (2) Whelen Series 600 LED square front turn signal assemblies shall be supplied. Each turn signal shall be mounted in an attractive façade style bezel which is an integral part of the fascia.

## TURN SIGNAL LOCATION

The turn signals shall be located on the front fascia directly below the headlights, one on each side of the cab grille.

## 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.

**SIDE MARKER LIGHTS**

Two (2) LED 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 headlight and marker lights shall be activated through a switch on the driver's panel.

**CAB FENDERS**

The cab wheel wells shall have 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. The inner liner shall be installed with 410 stainless-steel hardware that has been coated with black zinc oxide.

**COMMANDER LOGO**

A COMMANDER logo shall be installed on each side of the chassis cab.

**FRONT MUD FLAPS**

The cab and chassis shall be provided with rubber front mud flaps with the Rosenbauer "R" logo.

**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. The cab tilt pump shall be mounted on the right-hand side of the chassis frame in front of the batteries below the frame. The mounting bracket shall be Hot Dipped Galvanized.

The dual lift cylinders shall lift the cab 45 degrees from a horizontal plane facilitating easy engine maintenance. The chassis engine shall be able to be removed if required without tilting the cab beyond 45-degrees.

The center line of the chassis cab tilt shall be a minimum of 76" from the center line of the front axle, providing a large corridor between the cab and front tire for maximum workspace and accessibility to the fan, fan belt, fan drive, air compressor, power steering pump, alternator, and air filter.

The tilt angle shall allow access to the engine and area under the cab without contacting any components mounted to the gravel shield.

The cab shall include a four (4)-point rubber isolated cab pivot and mounting system. The rear histic mounts shall be isolated from the chassis frame to reduce the transfer of road vibrations and frame torque into the cab, while providing superior handling characteristics.

The front cab pivot assemblies shall be a 1/2" A36 steel plate with a .31" thick 2-1/2" diameter tube cross member mechanically attached to the cab and frame. There shall be two (2) greaseable rubber isolated engineered bushings to reduce the transfer of road vibrations into the cab.

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 cylinders shall include blocking valves (velocity fuses) which prevent motion when no control buttons are pushed. In the event of a hydraulic system failure, the valves shall retain the fluid in the cylinders.

A redundant mechanical stay arm shall automatically be engaged once the cab has been fully raised. Before lowering the cab, this device must be disengaged using the stay arm control located on the driver's side rear of the cab, providing the operator protection from high engine exhaust temperatures. The stay arm shall be safety yellow for high visibility so that it is easy to see whether the arm is in place or not. No Exception

All mounting points shall be bolted directly to the frame rail.

The cab lift safety system shall be interlocked with the parking brake. The cab tilt mechanism shall be active only when the parking brake is set, and the battery master switch is in the on position. If the parking brake is release, the cab tilt mechanism shall be disabled.

There shall be a manual pump incorporated in the event of a system failure to the cab tilt system.

A warning light shall illuminate in the cab instrument panel to indicate whenever the cab is not fully latched in the locked down position, and the parking brake is released.

**CAB TILT LIMIT SWITCH**

An adjustable cab tilt limit switch shall be included with the cab tilt system. The switch shall effectively limit cab's travel to avoid impact with bumper mounted items, or station ceiling clearance, while being tilted.

There shall be a safety bar to hold the cab at the new adjusted height 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.

West Coast Style Mirrors

## REARVIEW MIRRORS

Retrac Aerodynamic West Coast style dual vision mirror heads, model 613810, shall be provided and installed on each of the front cab doors.

The mirrors shall measure 8" wide x 19" high and shall include an integral convex mirror installed in the mirror head below the flat glass to provide a wider field of vision. The flat and convex mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The flat and convex mirrors shall be heated for defrosting in severe cold weather conditions.

The mirrors shall be constructed of a vacuum formed chrome plated ABS plastic housing that is corrosion resistant and shall include the finest quality non-glare glass.

## REARVIEW MIRROR REMOTE ACTIVATION

The driver's panel shall include activation for the rearview mirrors remote function. The activation for the mirror heat shall be through the Weldon Vista screen.

## CAB TWO TONE PAINT

The cab surface shall be thoroughly washed with grease cutting solvent (PPG DX330) prior to any sanding. The cab surface shall then be sanded and minor imperfections filled and sanded. The prepared surface shall then be washed again with (PPG DX330) to remove any contaminants from all surfaces to be painted.

The first coating to be applied shall be a pre-treat epoxy primer (.5 to 1.0 dry film build) for maximum adhesion to the body material. The next two to four coats shall be a polyurethane primer resurfacing agent (PPG F4936). The film build shall be 4-6 mils when dry. The primer coat, after appropriate dry time, shall be sanded with 320-600 grit sandpaper to ensure a maximum gloss finish. The last step shall be an application of at least three coats of PPG FDG polyurethane two-component color (single stage). The film build shall be 2-3 mils when dry. The single stage polyurethane shall provide a UV barrier to prevent fading and chalking.

The cab shall then be painted with the specific color 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 PAINT UPPER

The upper or secondary cab color shall be PPG _____ color and _____ number.

## CAB PAINT LOWER

The lower or primary cab color shall be PPG _____ color and _____ number.

**CAB PAINT EXTERIOR BREAKLINE**

The upper and lower paint shall meet on the cab in a special design designated by the Customer.

**CAB PAINT EXTERIOR BREAKLINE**

The side of the cab shall include a black stripe from windshield extending approximately 2" above and below the windows and stopping approximately 3" past the rear crew window.

**PAINT SPRAY OUT**

The customer shall be supplied with a paint spray out of their chosen color(s) for approval prior to the chassis cab exterior being painted.

**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 of their chosen color(s) for approval prior to the chassis cab exterior being painted.

**FRONT AXLE**

A Meritor MFS Easy Steer non-drive axle shall be incorporated as the front axle for the chassis.

The axle shall feature:

- A capacity of 23,000 pounds
- A 3.74” drop and a 71” king pin intersection (KPI)
- A conventional style hub with a standard knuckle
- A reinforced brake spider
- A magnetic plug
- 5-year warranty

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 23,000 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 ride afforded through the use of a gas shock is more consistent and shall not deteriorate with heat, the same way a conventional oil filled hydraulic shock would.

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.

Proposals offering the use of conventional twin tube or "road sensing" designed shocks shall not be considered.

POWER STEERING GEAR WITH ASSIST

The power steering gear shall be a TRW model TAS 85 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.
- The steering gear shall be mounted on a plane that is at a 9-degree angle in relationship to the center plane of the chassis. This mounting technique is designed to reduce the operating angle of input steering shafts. A more direct, responsive, and smoother handling vehicle will result from these unique design characteristics.
- A certified torque and geometry study by TRW shall be available upon request.

CHASSIS ALIGNMENT

The chassis frame rails shall be measured to ensure 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 apparatus manufacturer.

Alignment documentation shall be available upon request.

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.

STEER TIRES

The steer tires shall be Michelin 425 65R 22.5 20PR “L” tubeless radial XZY3 mixed service tread.

The steer tires shall feature:

- A stamped load capacity of 22,800 pounds per axle with a speed capacity of 65 miles per hour when properly inflated to 120 pounds per square inch

TIRE BALANCING

All tires shall contain counter acting balancing beads. Rim mounted weights are unacceptable, no exceptions.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.5-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 shall include Alcoa’s Dura-Bright® finish with XBR technology as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water.

**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 COLUMN AND WHEEL

The cab shall include a Douglas Autotech steering column. The steering column shall feature an 18", four (4) spoke steering wheel located at the driver's position; a five (5) position tilt and 2.25" telescopic adjustment. The steering wheel shall be provided with a black vinyl cover with foam padding and a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

The chassis shall include dual electric 12-volt horn with a minimum of 110 decibels.

## REAR AXLE

A Meritor RS-30-185 driving axle shall be incorporated as the rear axle for the chassis.

The axle shall feature:

- Rated capacity of 33,000 pounds
- Heavy duty Hypoid gearing for longer life, increased strength, and quieter operation
- Industry-standard wheel ends for compatibility with 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 .56" for extra strength and rigidity
- A magnetic plug
- 5-year warranty

### 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 33,000 pounds based on the capacity of the brakes and rear tires.

**REAR BRAKES**

The rear brakes shall be Meritor 16.50" X 8.63" S-cam drum type.

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

**REAR BRAKE SLACK ADJUSTERS**

The rear brakes shall include Meritor automatic slack adjusters installed on the axle which features a simple, durable design offering reduced weight. The automatic slack adjusters shall feature a manual adjusting nut which cannot inadvertently be backed off and threaded grease fittings for easy serviceability.

REAR SHOCK ABSORBERS

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

REAR AXLE DIFFERENTIAL CONTROL

The rear axle shall include a driver controlled differential lock. This shall allow the main differential to be locked and unlocked when encountering poor road or highway conditions, where maximum traction is needed, for use at speeds no greater than 25 MPH.

**REAR AXLE DIFFERENTIAL CONTROL ACTIVATION**

The rear axle driver controlled locking differential control shall be activated through vista screen.

ON-SPOT TIRE CHAINS

"On-Spot" automatic 6 strand tire chains shall be installed on the rear axle of the apparatus. A switch installed on the cab dash shall allow the operator to "Engage" and "Disengage" the tire chains without stopping to enhance traction and braking while in forward or reverse motion. The system shall include a switch (in the Vista on V-Mux trucks), continuous duty solenoid, arm bearings and replaceable chainplates.

REAR TIRES

The rear tires shall be Michelin 315/80R 22.5 20PR “L” tubeless radial XDN2 Grip all weather tread.

The rear tires shall feature:

- A stamped load capacity of 33,080 pounds per axle with a speed capacity of 75 miles per hour when properly inflated to 130 pounds per square inch

TIRE BALANCING

All tires shall contain counter acting balancing beads. Rim mounted weights are unacceptable, no exceptions.

REAR WHEEL

The outer rear wheels shall be Alcoa hub piloted, heavy duty, 22.50-inch X 9.00-inch LvL One™ aluminum wheels with the Alcoa Dura-Bright® wheel treatment with XBR® technology as an integral part of the wheel. The inner rear wheels shall be Alcoa hub piloted, 22.50-inch X 9.00-inch machine finish aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

VALVE STEM EXTENSION - SINGLE AXLE

To allow for easy checking and inflation of the rear inner tire, it shall be equipped with a multi-layer valve stem extension. The layers shall be as follows: starting from the inner to outer layer - a stainless-steel metal core, an air tube, a stainless-steel jacket, a protective cover.

VEHICLE TOP SPEED

The top speed of the vehicle shall be programmed at approximately 75 MPH +/-2 MPH at the governed engine RPM.

**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. A spring brake valve shall be installed to provide a controlled service brake application during an unlikely event including primary air supply loss. 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 activate 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.

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

**AIR TANK BRACKETS & STRAPS**

The air tank(s) 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. No exception.

All of the air tank straps shall be plastic coated stainless-steel cable. No Exception.

**PARK BRAKE**

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.

In addition to the mechanical rear brake engagement, the front service brakes will also engage via air pressure, providing additional braking capability.

**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.

## MOISTURE EJECTORS

A heated, automatic moisture ejector with a manual drain provision shall be installed on the wet tank in the air supply system. Manual pet-cock type drain valves shall be installed on all remaining reservoir tanks in 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. No Exception.

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

## AIR INLET CONNECTION

An air connection for the shoreline air inlet shall be supplied.

## PLUMBING AIR INLET CONNECTION

The air inlet connector shall be plumbed to the air system with a check valve to prevent air from escaping through the inlet connector.

## AIR INLET LOCATION

The air inlet shall be located in the driver's stepwell.

**AIR OUTLET CONNECTION**

A quick release air outlet female connector shall be installed in the cab for the use of auxiliary air tools.

The cab mounted air outlet connection shall be plumbed to the chassis auxiliary air system reservoir(s).

**AIR OUTLET FITTING TYPE**

The air connector supplied shall be a .25" pipe thread provision in a bulk head for the customer installation of quick disconnect air fitting.

**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 Stenx **MODEL 110XF** 10.19” high by 3.63” deep cold rolled steel frame or equivalent.
- .38” thick flange
- Inner channel measuring 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.
- The entire frame rail design shall be manufactured in the United States of America and readily available on the aftermarket.
- Grade 8 Structural fasteners, Huck bolts shall not be acceptable. No Exception.
- The hardware used for the chassis shall be corrosion resistant. The process shall be dip-spin-bake coated with two coats of zinc/aluminum metal flake coating in an inorganic binder. Coating one is to be zinc flake and coating two is to be aluminum flake. The zinc flakes sacrificially corrode to protect the base metal. The aluminum flakes prolong the life of the zinc. Salt fog test life, based on ASTM B117 on unassembled fasteners, is 1000 hours to red rust. The same test on assembled fasteners is 750 hours to red rust. The two-step coating is RoHS compliant as it eliminates the hexavalent chromium used in the passivation of electroplated zinc coatings to create yellow zinc (zinc dichromate). The elimination of the zinc plating also greatly reduces the likelihood that hydrogen embrittlement will occur. Hydrogen embrittlement is a side effect of electroplating that reduces toughness and can lead to fracture. No Exception
- 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

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. No Exceptions

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.

The under-frame reinforcement provides:

- Enhanced handling
- Improved ride quality
- Increase resistance to frame and cross member fatigue
- Enhanced vehicle stability providing improved safety to occupants

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. No Exceptions.
- 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 any way. No Exceptions.

FRONT FRAME EXTENSION

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

- Reduces frame flex which translates into improved vehicle handling and ride quality
- Designs using multiple piece, bolt together extensions will not be acceptable since they are prone to more flexing, possible frame failure and cab cracking
- 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

Prior to assembly, each frame rail section and cross members shall be hot dip galvanized. The galvanizing process will permeate each frame section to prevent rust and corrosion and not be merely an applied coating. The galvanized frame sections shall be provided in the natural finish eliminating the requirement for finish paint and the subsequent requirements for touch up paint and/or total repaint after an amount of time due to nicks, chips, and corrosion.

Galvanizing shall provide a barrier and cathodic protection from corrosion. During the galvanizing process, the complete frame sections and cross members shall be immersed in molten zinc; except for the cross member that contains the engine mounts. Through diffusion, the zinc shall bond to the steel at the molecular level. The resulting zinc coating shall provide a barrier that shields the steel from the environment.

### FRONT FRAME EXTENSION FINISH

The front frame extension shall be hot dipped galvanized to resist weather, dirt and other corrosive material.

Proposals offering powder coated or painted frames shall not be accepted. No Exceptions.

## FRAME GALVANIZING WARRANTY

Rosenbauer Motors, LLC hereby warrants the galvanized frame rails shall be warranted for a period of twenty 20 years and includes the following coverage:

- The galvanized surfaces of the frame rails and cross members shall be free from corrosion caused by dissimilar metals, adhesion, blistering or peeling.
- The galvanized surfaces of the frame rails and cross members shall be free from any corrosion perforation.

Under this warranty Rosenbauer Motors, LLC agrees to repair or refinish any galvanized surface that has been found to have a defect caused by defective manufacturing methods or galvanized material where there is no indication of abuse, neglect, unusual or other than normal service providing that such item or items are, at the option of Rosenbauer Motors, LLC, made available for our inspection at our request, returned to our factory or other location designated by us with transportation prepaid within thirty days after the date of failure or within twenty years from the date of delivery of the apparatus to the original purchaser, whichever occurs first, and inspection indicates the failure was attributed to a defect caused by defective manufacturing methods or galvanized material selection. Written authorization for repair or item replacement must be sought from Rosenbauer Motors, LLC customer service prior to the repair or item replacement occurring.

**Coverage Period**
0 – 10 years = 100%
11 – 15 years = 50%
16 – 20 years = 25%

**This warranty shall not apply to or cover:**

- Normal maintenance services include cleaning and repair of surface corrosion caused by normal road salt/chemicals or debris contacting the frame rails and cross members.
- Damage to the galvanized frame rails caused by exposure to severe environmental or chemical conditions or acidic environment.
- Any item that has been repaired, replaced, or altered by a facility not approved in advance by Rosenbauer Motors, LLC, or in a manner which, at Rosenbauer Motors, LLC discretion, may adversely affect the safe operation or durability of the vehicle or item.
- Special, incidental, or consequential damages including, but not limited to, loss of time, inconvenience, loss of use, lost profits or transportation fees or charges to or from any facility.
- Any malfunction resulting from misuse, negligence, alteration, accident or lack of operational knowledge, lack of normal or required maintenance or adjustments, fire or acts of God.

This warranty is in lieu of all other warranties expressed or implied, and all other obligations or liabilities on our part. This warranty does not supersede the structural warranty We neither assume nor authorize any person to assume for us any liability or make any alteration to this warranty in connection with the sale of our apparatus unless expressly given in writing by Rosenbauer Motors, LLC, 5190 260th St. Wyoming, MN 55092.

**NOTE:** Surety bond, if required, will cover the standard one-year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.

**BUMPER**

The chassis shall feature a heavy duty bumper constructed from ASTM A36, 1/4" thick steel and painted primary job color. The bumper shall be 12" high by 102" wide with two inch (2") flanges and chamfered corners.

Integral heavy duty steel bumper "wings" shall extend from the bumper to the cab.

The bumper shall be mounted to a twenty-four inch (24") long chassis frame extension.

A contoured apron/gravel shield fabricated from NFPA compliant, slip-resistant polished aluminum shall enclose the area between the bumper and the cab.

**LINE-X COATING**

The top edge (lip) of the painted bumper shall be coated with a Line-X material.

**FRONT BUMPER HOSEWELL**

A recessed full width hosewell compartment constructed from smooth aluminum shall be installed in the front bumper extension. The hosewell shall be constructed with "angled" ends.

Water drain holes shall be drilled in the bottom.

## BUMPER COMPARTMENT DOOR

The front bumper compartment shall be equipped with a raised aluminum treadplate door for the full width of the compartment.

COMPARTMENT LIGHT

One (1) vertically mounted LED strip light shall be installed inside the compartment. The light shall have a polycarbonate lens to eliminate breakage from impact and eliminate heat build up and be approximately 30" in length.

MOUNTING

The compartment light shall be mounted in the door jamb to illuminate the compartment interior.

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

## BUMPER COMPARTMENT DOOR SHOCK

A gas shock shall be supplied to hold the front bumper compartment door in the open position.

## BUMPER GUIDE POSTS

Chrome plated bumper guide posts shall be supplied, one each side of the front bumper. The guide posts shall include an amber lighted tip.

Front Suction - Universal Frame

## FRONT BUMPER SUCTION PROVISION

The bumper apron shall include a 5" stainless steel pipe intended for use as a suction intake for the pump. The suction pipe shall be routed from the right hand front bumper area to the area near the back of the cab.

The front of the suction pipe shall be designed to extend approximately 11.5"from front face of the cab behind the bumper face on the right hand side.

The forward end of the suction pipe shall be finished with a 5" National Pipe Thread (NPT). The rear of the suction shall include a Victaulic groove for connecting to the pump plumbing. The suction pipe shall also include a 0.5" NPT port intended as a primer assist connection.

## TOW EYES

Two (2) 3" tow eyes shall be mounted to the bumper extension through the front face of the bumper. The tow eyes shall be steel and shall be painted coated black.

Engine Placement

**ENGINE**

A Cummins X12 12.0-liter diesel fueled; turbo charged engine shall feature the following:

- One of the highest power to weight ratios in its class
- Heavy-duty replaceable wet liners, roller followers, by-pass oil filtration with replaceable spin on cartridge and targeted piston cooling for longer service in tough work environments
- Improved cooled EGR system
- 720 cubic inches of displacement
- High pressure common rail fuel system producing a precise quantity of fuel at ultra-high pressures
- Fully integrated, robust electronic engine controls
- Electric fuel lift pump. No Exceptions.
- Standard drain plug

The engine shall be coupled with a Holset VGT™ (Variable Geometry Turbocharger).

The engine shall be filled with Citgo brand Citgard 500 (or equivalent) SAE 15W40 CJ4 low ash engine oil for proper engine lubrication.

The engine shall be EPA certified to meet the 2021 emissions standards without compromising performance, reliability or durability using cooled exhaust gas recirculation and selective catalytic reduction technology.

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

The engine shall include programming which will govern the top speed of the vehicle.

**ENGINE PLACEMENT**

The engine shall be a maximum of 36" from the center line of the front axle to the front face of the engine block. The engine valve cover shall be a maximum of 23" from the top of the frame.

The engine placement shall provide optimal weight distribution to the front axle to enhance vehicle handling. More weight out in front of the front axle can cause a “fulcrum effect” and cause unsafe “bump steer” conditions.

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 Cummins branded Wabco compressor which shall be capable of producing 25.4 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 increase the system's 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.

Cummins X12 & X15 Surcharge

HORSEPOWER

The engine shall have 500 horsepower at 1800 RPM, with a governed speed of 2000 RPM.

The engine shall have 1695-foot pounds of torque at 1000 RPM.

## ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled Viscous fan clutch drive.

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

## FAN CLUTCH

The clutch fan shall be thermostatically controlled only or with manual fan clutch switch (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 compression brake shall be controlled via an off/low/medium/high virtual switch on the Weldon Vista display. The multiplex system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.

## 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 applied, and the truck transmission is shifted into neutral.

## ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with an automatic high-idle speed control. The high idle shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output and optimize output of the HVAC system.

This device shall operate only when the control switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to engage manually through a virtual switch in the Vista, or automatically re-engage when the brake is set, or when the transmission is placed in neutral. A light on the Vista screen shall indicate the high idle speed control.

## ENGINE AIR INTAKE

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

The filter shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a corrosion resistant steel frame.

This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack, while creating only minimal air flow restriction through the system. Periodic cleaning or replacement of the screen shall be all that is required after installation.

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 of 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 one-piece 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 between the DPF and SCR chambers.

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

The after-treatment 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 (18.92 Liters) and shall be mounted on the left-hand side of the chassis frame in front of the batteries below the frame. The mounting bracket shall be Hot Dipped Galvanized.

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**

There shall be an access door provided in the top rear step of left side crew area for access to the DEF tank.

**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 gases 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**

Provide DPF system status annunciation indicator lights, lights shall be installed on driver dash to alert driver when regeneration is needed and when DPF is in an active re-generation cycle.

Warning systems shall provide DEF low level warning.

Driver's dash shall be provided with two (2) controls for the Diesel particulate filter; one (1) manual regeneration switch to activate a regeneration cycle manually when passive burn is unobtainable due to driving conditions; and one (1) Regen "Inhibit Switch".

Activations will be provided in the service screen of the Driver Display for One LCS trucks.

The switches shall be located in a covered location for V-Mux and P2P trucks.

## 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 producing 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 1214 square inches
- A surge tank with a low coolant probe and capable of removing entrained air from the cooling system, with built in sight glass
- Radiator re-circulation shields to prevent heated air from re-entering the cooling system and affecting performance
- Mounts allowing the entire radiator to drop through the frame for service when needed. No Exceptions
- 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.
- The coolant filter shall be provided with two (2) shut off valves, one (1) one inlet and one (1) outlet. No Exception.
- Cooling system shall be tested and certified by the engine manufacturer

### COOLANT HOSES

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include constant tension spring 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.

## ADDITIONAL COOLANT SHUT OFF VALVE

An additional coolant shut off valve with connection shall be installed in the chassis coolant lines with a connector. This shall allow for the installation of an additional heater such as a pump compartment heater without draining the coolant system.

## 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 fire pump from encountering the engine coolant.

## TRANSMISSION

The drive train shall include an Allison model EVS 4000 torque converting automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing; one (1) in the 8:00 o'clock position and one (1) in the 1:00 o'clock position.

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 Gen V 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 | 3.51:1 |
| 2nd | 1.91:1 |
| 3rd | 1.43:1 |
| 4th | 1.00:1 |
| 5th | 0.74:1 |
| 6th | 0.64:1 (if applicable) |
| Rev | 4.80:1 |

## 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 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 6th GEN 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.

**PTO LOCATION**

The transmission driven power takeoff (PTO) shall be mounted in the 1:00 o'clock position.

**TRANSMISSION MODE PROGRAMMING**

The transmission, upon start-up, will select five (5) speeds of operation. The sixth speed over drive shall be available with the activation of the mode button on the shifting pad.

**TRANSMISSION PROGRAMMING**

The EVS Vocation Package Number 198 for the fire service for this apparatus as a Pumper. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector which requires re-selecting the drive range to shift out of neutral for the override.

This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. The transmission will detect the pump engaged signal and automatically select or deselect fourth gear lock-up. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

A nine (9) pin diagnostic connector will be provided.

The trans module shall contain the following circuits:

| FUNCTION ID | DESCRIPTION | WIRE ASSIGNMNET |
|---|---|---|
| C1 | PTO Drive Interface Output 1 | 142 |
| J | Fire Truck Pump Mode (4th Lockup) | 122/123 |
| G1 | PTO Drive Interface Output 1 | 130 |
| C | Range Indicator | 145 (4th) |

| | |
|---|---|
| Signal Return | 103 |

DRIVELINE

All drivelines shall be heavy duty metal tubes equipped with Spicer 1810 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®.

**FUEL FILTER/WATER SEPARATOR**

The fuel system shall have a Fleetguard FS1065 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.

A water-in-fuel sensor shall be provided and wired to an instrument panel lamp and audible alarm to indicate when water is present in the fuel/water separator.

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

**FUEL SYSTEM**

The fuel tank shall have a capacity of fifty (50) gallons/one hundred eighty-nine (189) liters and shall measure 35.00 inches in width X 15.00 inches in height X 24.00 inches in length.

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 plugs 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 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 are compatible with bio-diesel fuel blends and utilize reusable steel fittings.

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 reward of 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**

The charging system shall include a 320-amp Leece Neville 12-volt alternator. The alternator shall include a self-excited integral regulator.

## V-MUX 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:

- A Weldon Multiplexed system
- 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

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

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 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 10KHz-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 10KHz-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

For increased reliability and harness integrity, harnesses will be routed throughout the cab and chassis in a manner which allows the harnessing to be laid into its mounting location. Routing of harnessing which requires pulling of wires through tubes will not be allowed.

Wiring will be run in loom or conduit where exposed and have grommets or other edge protection where wires pass through metal. Wiring will be colored, function and number coded. Wire colors will be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires using a single wire color for all wires will not be allowed. Function and number codes will be continuously imprinted on all wiring harness conductors at 3.00" intervals. All wiring installed between the cab and into doors will be protected by an expandable rubber boot to protect the wiring. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

- All wire ends not placed into connectors will be sealed with a heat shrink end cap. Wires without a terminating connector or sealed end cap will not be allowed.
- All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
- Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
- For low cost of ownership, electrical components designed to be removed for maintenance will be quickly accessible. For ease of use, a coil of wire will be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.
- A corrosion preventative compound will be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation of the plug.
- Any lights containing non-waterproof sockets in a weather-exposed area will have corrosion preventative compound added to the socket terminal area.
- 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.

SUMMARY OF LOAD MANAGEMENT SYSTEM

In the V-MUX electrical system there will be eight pre-defined Load Manager Trigger points spaced apart in 0.4 Volt increments. Each Output channel can be set for Load Management that will be turned OFF if node voltage falls below a certain level. The trigger points will be configured as shown below.

**Load Manager Trigger Points:**

1: 12.5-V Load Shed Region 1 (12.5 - 12.1 V)
2: 12.1-V Load Shed Region 2 (12.1 - 11.7 V)
3: 11.7-V Load Shed Region 3 (11.7 - 11.3 V)
4: 11.3-V Load Shed Region 4 (11.3 - 10.9 V)
5: 10.9-V Load Shed Region 5 (10.9 - 10.5 V)
6: 10.5-V Load Shed Region 6 (10.5 - 10.1 V)
7: 10.1-V Load Shed Region 7 (10.1 - 9.7 V)
8: 9.7-V

When the voltage of a Load Managed device recovers back above the trigger point, there will be an additional 30 seconds before the Output channel is turned back ON. This buffering time is to ensure that the added load doesn't immediately pull the voltage back below the trigger point.

Below are the standard voltage managed outputs that will be triggered off at 12.1 V.

HVAC FAN MED
HVAC FAN HIGH
HVAC FAN LOW
AUX DEFROST FANS
A/C CONDENSER FANS RLY
A/C COMPRESSOR CLUTCH

AUTO THROTTLE (AUTO HIGH IDLE)

There will be an Automatic High Idle (Auto Throttle) logic that will run in conjunction with the Load Management. The Auto Throttle logic will be ran on the Hercules node under the passenger side kick panel compartment. The standard system design will be triggered on at 12.3 V and triggered off at 12.6 V with a 30 second delay before disengagement. The Auto Throttle function will act to turn the V-MUX High Idle Output ON and OFF. In turn the High Idle sends a signal to the engine ECU. The Auto Throttle Command will be interlocked with **Park Brake** and **Park/Neutral** for safety. A **Service Brake** override interlock will also be configured to immediately return the engine to Low Idle if the vehicle has to move.

12V POWER POINTS

There shall be one (1) 12 volt DC power point and one (1) USB/USB-C power point provided and mounted in the driver's side of the dash. They shall be within easy reach of the driver; and shall be wired directly to the battery

12V POWER POINTS

There shall be one (1) 12 volt DC power point and one (1) USB/USB-C power point provided and mounted in the officer's side of the dash. They shall be within easy reach of the officer; and shall be wired directly to the battery

**IGNITION**

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a marine grade 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.

**PUMP SHIFT**

The pump shift shall be located on a switch panel, adjacent to the driver's left knee.

The driver's side switch panels shall be black.

**MULTIPLEX DISPLAYS - BLACK**

Two (2) Weldon Vista IV displays shall be located one (1) on the driver's side dash and one (1) on the officer's side of the dash.

The Vista IV displays shall feature:

- A full color LCD display screens
- A message bar displaying the time of day, and important messages requiring acknowledgement by the user
- Four (4) push button style controls on either side of the screen for the on-board diagnostics
- Seven (7) push button style controls located below the screen for the on-board diagnostics
- Video ready display screens for back- up cameras, thermal cameras, and DVD
- A DIN type input connector ready for GPS interfacing shall be incorporated into the back of the display
- There shall be a display which indicates any open cab door with a visual display.
- There shall be a text message indication for low washer fluid.

The Vista IV displays shall measure approximately 10.36" wide x 7.63" in height.

**OFFICER SWITCHES**

The officer switch panel to the left of the officer's position shall include two power points in the upper right corner and one (1) row with six (6) backlit rocker switches with laser etched labels located under the Weldon Vista screen.

**DRIVER SWITCHES**

The driver switch panel to the right of the driver's position shall include two power points in the upper left corner and one (1) row with six (6) backlit rocker switches with laser etched labels located under the Weldon Vista screen.

Standard switches shall include:

- Windshield Wiper/Washer Control (except when Smart Wheel is specified)
- Dash panel dimmer switch
- Headlights (except when Smart Wheel is specified)

**V-MUX WARRANTY – 4 YEAR**

A four (4) year limited (V-MUX) multiplex system warranty, of Weldon Technologies, Incorporated; shall be provided by the apparatus manufacturer for parts and labor, while under normal use and service; against mechanical, electrical, and physical defects from the date of manufacture.

The warranty shall exclude sensors, shunt interface modules, serial or USB kits, transceivers, cameras, GPS, and electrical display screens, which shall be limited to a period of one a (1) year repair parts and labor from the date of installation. A copy of the warranty shall be provided with each Bidders proposal for the review and evaluation of the Purchaser.

**ACCESSORY POWER DISTRIBUTION PANEL**

An accessory power distribution panel shall be installed. The panel shall feature twelve (12) blade type fuses, a ground section, and shall be protected by a 40-amp fuse. panel comes with a protection cover and shall be capable of carrying up to a maximum 40- amp battery direct load.

**COMMUNICATION ANTENNA BASE**

A communications antenna base shall be provided and mounted on the cab roof.

**COMMUNICATION ANTENNA CABLE ROUTING**

The cable routing for the communication antenna shall terminate under the dash panel.

**AM/FM RADIO WITH WEATHERBAND**

A radio receiver shall be installed in the headliner. The receiver shall handle vibrations, temperature fluctuations, and humidity with ease. The front panel's protective covering shall keep out any dust and debris.

The receiver's AM and FM tuner shall feature presets for radio stations, and the Weather Band tuner shall include automatic NOAA weather for alerts to any severe weather. A portable player jack shall be available on the front panel.

The receiver shall be Bluetooth-enabled for phone use and stereo control and be iPod/iPhone ready via a front USB port.

The backlit LCD display shall feature easy to read digital readout in all lighting conditions.

**OVERHEAD RADIO MOUNT**

The overhead radio shall be installed on the driver's side.

**SPEAKERS**

Four (4) overhead speakers shall be provided in the cab for the radio.

## DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder system installed. The system shall be designed to meet NFPA 1901. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Service Brake
- Engine Hours
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system. The laptop connection shall be a panel mounted female type A or B USB connection point, remotely mounted in the left side foot well of the cab. The latest software shall be available for download from the Weldon website.

### SEAT BELT WARNING

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall activate an indicator light in the instrument panel, a digital seat position indicator with a seat position legend in the switch panel, and an audible alarm.

The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also be activated when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have their respective seat belts fastened.

Commander Analog Gauge Aluminum Dash Black

**CAB INSTRUMENTATION**

The instrumentation panel within the cab shall feature a 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 three 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)
- Air Intake Restriction
- High Exhaust System Temperature (HEST)
- Wait to Start (when applicable)
- ATC (Automatic Traction Control) (when applicable)
- Water in Fuel

RED Indicator Lights
- Low Engine Coolant Level
- Air Bag Warning (when applicable)
- Check Transmission
- 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 allow diagnostic tools such as computers to connect to various vehicle systems for improved trouble shooting providing a lower cost of ownership. The panel shall be accessible while standing on the ground and located inside the driver's door to the left of the steering column. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist.

The diagnostic panel shall include:

- Engine diagnostic port
- 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)

The enclosed diagnostic panel, accessible through the HVAC access panel shall include:

- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (when applicable)

6 Battery System

**BATTERIES**

The single start electrical system shall include six (6) group 31 1000 CCA batteries.

The batteries shall feature:

- A 200-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, hot dipped galvanized 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.

Each battery compartment shall feature:

- Hot dipped galvanized 3/16" steel construction.
- A complete floor of heavy duty, industrial grade, recycled Turtle Tile brand interlocking matting
- A hinged hot dipped galvanized steel cover with two (2) magnets shall be utilized providing easy access to the batteries. No tools shall be required to gain access to the batteries.
- When in the open position, the hinged door shall rotate past 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 starting system shall include cables which shall be protected by a 275-degree F, minimum high temperature flame retardant loom.

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 installed 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 raised in an emergency in the event of battery failure.

**POWER & GROUND STUD**

An electrical distribution panel shall include two (2) power studs. The studs shall be a minimum of 1/4" 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) 1/4" ground stud.

**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 an LED head that 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 LED head 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.

## STANDARD DOME LIGHT ACTIVATION

White dome light will turn on with open door, white and color dome lights can be manually turned on at the light head at any time or through the multiplex system, if equipped. Same activations shall be used for any added auxiliary dome lights.

## 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 seats, 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.

## ROOF TOP SPOT LIGHT

One (1) GoLight Model 20204 (white) LED spotlight with wired dash-mount remote shall be installed on the officer's side cab roof.

Go-Light Mount Officer Side - 8-11"

## 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. The warning light shall also be attached to folding equipment racks and light towers as specified.

NFPA requires the red light. NFPA 1901.13.11.1

WATER TANK LEVEL LIGHTS

Two (2) Whelen PS-TANK2 vertically mounted LED lights shall be installed one each side of the apparatus to allow for monitoring the water tank level from a distance.
They shall be configured as follows:

- GREEN - Position 1 indicates FULL
- BLUE - Position 2 indicates 3/4
- AMBER - Position 3 indicates 1/2
- RED - Position 4 indicates 1/4

Each light shall remain illuminated until the water level drops below full 3/4, 1/2, or 1/4 levels. When the level drops below 1/4 the RED light will flash to indicate an empty tank. The Whelen PS-TANK water tank level lights shall be controlled with an Innovatic Controls remote driver.

MOUNTING LOCATION

The tank level gauges shall be mounted, one each side of the chassis cab, in the upper rear cab corners.

**AIR HORNS**

Two (2) Hadley brand E-Tone air horns shall be provided. The air horns shall be 6" in diameter and 24" long. Each horn shall feature flared ends offering a pleasing appearance.

AIR HORN LOCATION

The air horns shall be located on the front bumper. One (1) shall be mounted outboard on the driver side and one (1) outboard on the officer side, so as not to interfere with any other components on the bumper.

ELECTRIC TRAFFIC HORN AND AIR HORN SELECTOR SWITCH

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

AIR HORN FOOT SWITCH

A foot switch shall be installed to activate the air horn system on the officer's side of the floor.

**FRONT SCENE LIGHTING**

The following scene lighting shall be located on the front brow of the cab:

**LED SCENE LIGHT**

A Fire Tech FT-MB-27-FT-W brow light shall be provided and installed below the light bar. The light shall produce 14,256 lumens and be powder coated white.

SCENE LIGHT SWITCHING

The one (1) front scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screens.

**LEFT SIDE CAB SCENE LIGHTING**

The following scene lighting shall be located on the left side of the cab:

**SCENE LIGHT**

One (1) Whelen M9 Series Model #M92SLB scene light(s) shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology.

The M92SLB shall be furnished with a black trim ring, a rubber gasket, screws, and screw grommets for installation. The M92SLB shall have the ability to be installed as a surface mount scene light.

SCENE LIGHT SWITCHING

The one (1) left side scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screens.

**RIGHT SIDE CAB SCENE LIGHTING**

The following scene lighting shall be located on the right side of the cab:

**SCENE LIGHT**

One (1) Whelen M9 Series Model #M92SLB scene light(s) shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology.

The M92SLB shall be furnished with a black trim ring, a rubber gasket, screws, and screw grommets for installation. The M92SLB shall have the ability to be installed as a surface mount scene light.

SCENE LIGHT SWITCHING

The one (1) right side scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screens.

## ELECTRIC SIREN AND CONTROL

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

SPEAKER

Two (2) Federal Signal DynaMax 100-watt speaker, model #ES100C, shall be installed. The speaker shall feature a Neodymium driver and a high strength composite housing that is chemical resistant and maintains rigidity at high temperatures.

SPEAKER

Two (2) stainless steel grille shall be installed on the speaker.

SPEAKER LOCATIONS

The siren speakers shall be recessed in the apparatus bumper with one (1) speaker on each side.

## FEDERAL MECHANICAL SIREN

One (1) Federal Signal Q2B mechanical siren, model Q2B-01PSD, shall be pedestal mounted onto the front bumper. The "Q" siren shall feature a highly polished chrome body and grille. The siren's distinctive mechanical wail sound shall produce 123 db at 10'. The siren control switch(es) shall be installed in the cab.

SIREN CONTROL

The mechanical siren shall not be able to activate unless the E-Master switch is activated.

SIREN CONTROL

A foot switch shall be provided on the driver's side of the cab floor to activate the Federal Signal Q2B siren.

SIREN CONTROL

A foot switch shall be provided on the officer's side of the cab floor to activate the Federal Signal Q2B siren.

SIREN BRAKE

Two (2) push button siren brake switches for the Federal Signal Q2B siren shall be provided, one (1) on the driver's side dash and one (1) on the officer's side dash.

## LIGHTBAR

One (1) Whelen Ultra Freedom IV light bar shall be included with the apparatus cab. The light bar shall be a model F4N7QLED and shall be mounted on the roof of the cab, towards the front, above the windshield.

The light bar shall feature:

- A 72" light bar designed for high performance
- Two (2) red Linear Super LED corner modules
- Two (2) red 400 series Linear Super LED endcap lights
- Two (2) red 400 series Linear Super LED lights
- Two (2) white 400 series Linear Super LED lights with clear optic lenses
- Clear hard coated lenses to provide extended life/luster protection against UV & chemical stresses
- Designed in accordance with NFPA Zone A requirements

### LIGHTBAR ACTIVATION

The front upper light bar shall be activated through the master warning switch.

### "WHITE LIGHT" DISABLE SWITCH

There shall be a rocker switch provided in the emergency switch panel labeled "WHITE LIGHT DISABLE". The switch shall break the power circuit to the white Zone "A" traffic clearing lights in the lightbar and grille. This shall minimize the blinding effect to the driver operating the lights in either fog or snow conditions. The switch shall illuminate to indicate that the white lights "are" disabled.

## UPPER WING FRONT WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side one the front of the chassis cab upper wing area. The dimensions of the lights shall be 4-5/16" x 6-3/4".

The driver side warning light shall be a Whelen Model M6DJ red/blue Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M6DJ red/blueSuper-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

**INBOARD WARNING LIGHTS**

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side one the front of the chassis cab, in the inboard warning light position. The dimensions of the lights shall be 4-5/16" x 6-3/4".

The driver side warning light shall be a Whelen Model M6DJ red/blue Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M6DJ red/blueSuper-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

**INNER GRILLE WARNING LIGHTS**

One (1) pair of Whelen model ION LED warning lights shall be installed, one each side on the front of the chassis grille, inboard position. The dimensions of the lights shall be approximately 6" x 2".

The driver side warning light shall be a Whelen Model WIONSMCR red-LED's with clear lens.

The officer side warning light shall be a Whelen Model WIONSMCB blue-LED with clear lens.

Each light shall be mounted with a Whelen chrome flange.

**OUTER GRILLE WARNING LIGHTS**

One (1) pair of Whelen model ION LED warning lights shall be installed, one each side on the front of the chassis grille, outboard position. The dimensions of the lights shall be approximately 6" x 2".

The driver side warning light shall be a Whelen Model WIONSMCB blue-LED with clear lens.

The officer side warning light shall be a Whelen Model WIONSMCR red-LED's with clear lens.

Each light shall be mounted with a Whelen chrome flange.

**INTERSECTION WARNING LIGHTS**

One (1) pair of Whelen model M6 LED warning lights shall be installed one each side of the chassis cab. The dimensions of the lights shall be 4-5/16" x 6-3/4".

The driver side warning light shall be a Whelen Model M6DJ red/blue Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M6DJ red/blueSuper-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

## LOWER MID CHASSIS WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed one each side of the chassis cab, above the chassis wheels. The dimensions of the lights shall be 4-5/16" x 6-3/4".

The driver side warning light shall be a Whelen Model M6DJ red/blue Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M6DJ red/blueSuper-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

## TRAFFIC ARROW LIGHT

One (1) Whelen Model #TAM65 Traffic Advisor shall be installed. The light shall be equipped with six (6) 500 Series TIR6™ Super-LED lights in a low profile flat style lamps measuring 36" (91cm) in length. The unit shall be mounted at the rear of the apparatus body. The Traffic Advisor control head shall be mounted inside the cab and be accessible by the driver and officer.

## TRAFFIC ARROW CONTROL HEAD

A Whelen TACTL5 control head shall be supplied with the traffic arrow.

## BACK-UP ALARM

An ECCO model 575 backup alarm shall be installed under the rear of the vehicle with an output level of 107 db. The alarm shall be wired to the back-up light circuit and will automatically activate when the transmission is placed in reverse.

**HAAS ALERT / HA-5**

R2V (Responder-to-Vehicle) with HAAS ALERT R2R (Responder-to-Responder) Capability HAAS Alert Model Number "HA-5" shall be provided. The device shall: be constructed of high strength, impact resistant, RoHS compliant ASA Plastic; have IP65 ingress protection; include a cellular modem that connects to commercially available cellular networks to transmit and receive data to/from the HAAS Alert Safety Cloud™ and include a cellular network data plan that shall; send vehicle GPS location, speed, course, acceleration, and emergency lights status (e.g., "on" or "off") to the HAAS Alert Safety Cloud every two (2) seconds while the vehicle is moving with e-master activated; send changes in the emergency lights status to the HAAS Alert Safety Cloud; be connected to the E-Master or emergency lights master via a minimum of 22-gauge wire; be connected to the vehicle's main battery via a minimum of 20-gauge wire so that it receives constant power; be connected to the vehicle's ground via a minimum of 20-gauge wire; have a parasitic shut off that turns off the device when the vehicle's battery voltage falls below 12V; be mounted inside the cab on the dashboard, within 10 feet of the officer's seat and with a clear view of the sky. The device shall be up-gradable to other communication technologies such as, at minimum; 5G, 5.9 band, and FirstNet.

The device shall utilize the HAAS Alert Safety Cloud to send digital R2V (Responder-to-Vehicle) alerts to nearby civilian drivers via in-dash infotainment and IVI (In-vehicle Infotainment) units, Waze and other popular consumer navigation applications when the vehicle is en-route with emergency lights engaged; utilize the HAAS Alert Safety Cloud to send digital R2V alerts to nearby civilian drivers via in-dash infotainment and IVI (In-vehicle Infotainment) units, Waze and other popular consumer navigation applications when the vehicle is on-scene with emergency lights engaged; has the ability to utilize the HAAS Alert Safety Cloud to receive digital R2R (Responder-to-Responder) alerts when the vehicle is en-route with emergency lights engaged and other responding emergency vehicles are in close proximity; have a port that connects to a compatible peripheral device to communicate R2R alerts to vehicle passengers. The device shall be able to communicate across all manufacturer brands.

The device shall have a companion, password-protected, web-based dashboard that provides authorized users with a map-based visualization of real-time vehicle location, emergency response status (i.e., "responding", "on-scene", "ready", "offline") with the ability for expanded attribution, vehicle speed and course, vehicle time-to-scene information, and vehicle time-on-scene information.

Dimensions – Length, Width, Height (Inches): 5.4" x 2.7" x 1.3"
Input Voltage - Power: 12.5V to 15V
Input Voltage - Lights Indicator: 12V to 15V
Amperage: 120 mA peak draw
Operating Temperature Range: -40℃ to 85℃
Weight (Ounces): 7 oz.

The HAAS system shall be provided with a 5-year subscription.

Camera System with V-Mux

Camera System - Chrome Side Cameras

## REAR & SIDE FACING CAMERA

A rear facing black box style rearview camera shall be installed on the rear of the vehicle. There shall also be two (2) teardrop style rearview cameras; one (1) mounted to the officer side of the vehicle, and one (1) to the driver side of the vehicle. The rear camera shall be activated when the vehicle transmission is shifted to reverse, and the side tear drop cameras shall be activated with the corresponding turn signal. The images shall be viewed on the driver's and officer's side Vista screens. The side camera housings shall be chrome.

The rear facing camera shall feature automatic heating when the temperature is below 10 degrees Fahrenheit, and 150-degree lens. No Exception.

## BATTERY CHARGER

A Kussmaul Chief series model #091-266-12-60, high output battery charger shall be wired to the 12-volt battery system. The charger unit shall be mounted in a clean dry area and will be accessible for service and/or maintenance.

### CHARGER LOCATION

The battery charger shall be located behind the driver's seat.

## SHORELINE INLET

There shall be a Kussmaul 20-amp super auto eject with a yellow cover and integrated digital display supplied.

## SHORELINE LOCATION

The shoreline shall be located on the driver’s side of the cab behind the front door and above the wheel well.

# Laramie County Fire Authority

# BID SPECIFICATIONS

# FOR

# ROSENBAUER CUSTOM FIRE APPARATUS

**OVERALL HEIGHT**

An overall height restriction has not been specified for this apparatus.

**OVERALL LENGTH**

An overall length restriction has not been specified for this apparatus.

**OVERALL WIDTH**

An overall width restriction has not been specified for this apparatus.

**WHEELBASE**

A wheelbase restriction has not been specified for this apparatus.

**ANGLE OF APPROACH**

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

**ANGLE OF DEPARTURE**

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

## NFPA PUMPER EQUIPMENT ALLOWANCE

In compliance with the current NFPA 1901 guidelines, the apparatus shall be engineered to provide an allow of 2500 pounds of fire department provided loose equipment.

## CONTRACT CHANGE NOTICE

The quoted delivery time is based upon our receipt of the specified materials required to produce the apparatus in a timely manner. "Delivery" means the date company is prepared to make physical possession of vehicle available to the customer.

The Company shall not be responsible nor deemed to be in default on account of delays in performance due to causes which are beyond the Company's control which make the Company's performance impracticable, including but not limited to civil wars, insurrections, strikes, riots, fires, storms, floods, other acts of nature, explosions, earthquakes, accidents, any act of government, delays in transportation, inability to obtain necessary labor supplies or manufacturing facilities, allocation regulations or orders affecting materials, equipment, facilities or completed products, failure to obtain any required license or certificates, acts of God or the public enemy or terrorism, failure of transportation, pandemics, epidemics, quarantine restrictions, failure of vendors (due to causes similar to those within the scope of this clause) to perform their contracts or labor troubles causing cessation, slowdown, or interruption of work.

After execution and acceptance of this Purchase Process, the Buyer may request that the Company incorporate a change to the Products or the Specifications for the Products by delivering a Change Order to the Company; provided, however, that any such Change Order must be in writing and include a description of the proposed change sufficient to permit the Company to evaluate the feasibility of such Change Order. Within seven (7) working days of receipt of a Change Order, the Company will inform the Buyer in writing of the feasibility of the Change Order, the earliest possible implementation date for the Change Order, of any increase or decrease in the Purchase Price resulting from such Change Order, and of any effect on production scheduling or delivery resulting from such Change Order. The Company shall not be liable to the Buyer for any delay in performance or delivery arising from any such Change Order. Purchase Price may be modified only by mutual written agreement of the Parties because of changes to the Apparatus required or requested by the Buyer during the construction process pursuant to Appendix C, Change Order Policy. Any changes in the Purchase Price resulting from changes to the Apparatus required or requested by the Buyer during the construction process shall be stated in the Change Order signed by both parties. Additional Changes: If various state or federal regulatory agencies (e.g., NFPA, DOT, EPA) require changes to the specification and/or the product that result in a cost increase to comply therewith this cost will be added to the Purchase Price to be paid by the customer.

## FINANCIAL STABILITY SPECIFICATIONS

With high-profile instances of fire apparatus manufacturers encountering financial difficulties, it is imperative that fire departments be diligent in evaluating the financial position of the companies they solicit to build on their emergency response vehicles. A contract entered into with a company on shaky ground is a dangerous prospect, since conducting business with a manufacturer in such condition could open the department to monumental problems.

Take, for instance, the growing theme of manufacturers *requiring* as opposed to *offering* pre-payment and progressive payment options with a corresponding discount off the price of a vehicle. Such offers are made with an ulterior motive in mind, as it can be generally inferred that manufacturers requiring pre-payments and progressive payments do so because they need your cash *today* to fund production of other vehicles already in the backlog.

Should problems arise, as has been the case in situations too numerous to mention, your department risks losing any down payments already made or even the entire cost of a piece of equipment should certain pre-pay discount situations go awry.

While pre-payment discounts may be enticing, it is important to know just how stable the manufacturer seeking your funds is before you make that commitment. If you enter into one of these agreements and the manufacturer hits a rough patch, it is you that will be hurting, because your funds may not be recoverable. However, if you enter into a contract with a financially sound manufacturer, you will reap all of the benefits of a well-built truck at a lower cost. You may equally, by taking advantage of the time-value of money, be able to afford more truck than initially thought, because funds saved by leveraging pre-payment options could allow you get some added features that you might not necessarily have been able to afford.

With this in mind, it must be noted that Rosenbauer is a company with rock-solid financial stability. This is a statement not made lightly, as we can prove it to you. We can provide language that you can insert into your bid specifications that stipulates that in order for bids to be accepted by a fire department, the company bidding must meet several fiscal criteria.

The first criteria call for the successful bidder to meet a debt-to-equity ratio not exceeding a 2.0 rating. Rosenbauer presently stands at a 1.51 rating, which is well-below the accepted rating. This low number results from Rosenbauer owning more assets with a marginal debt service. This means we are not using lenders to fund our operations, nor our growth.

The second requirement is that the debt coverage ratio of the successful body builder exceeds a 100 rating. The higher the number, the better able a company is to meet its payment obligations with banks and creditors. Rosenbauer's number is at 279.6, which is nearly three times the required amount. The higher the debt coverage ratio, the easily and more fluidly a company is positioned to pay its monthly obligations and operating costs.

The third criteria require that the equity ratio of the successful bidder must exceed .30 rating. A higher equity ratio indicates that the body builder has increased flexibility to meet its financial obligations which translates into greater financial stability. Rosenbauer currently has an equity ratio of .387 which is well above the accepted rating and an excellent indicator of financial strength.

When exploring and evaluating various manufacturers to consider for building your apparatus, there is little doubt you will find one that stands on as firmly a financial ground as Rosenbauer. While others are experiencing stressful issues that raise doubts as to the company's long-term viability, Rosenbauer continues to demonstrate a strengthening of its financial position in the apparatus manufacturing industry. Because Rosenbauer meets and exceeds all the above-stated financial bid requirements, we are best positioned to ensure customers of a strong relationship with the company, which cannot be claimed by most of our competitors in this volatile market.

The Rosenbauer America Dun and Bradstreet number is 02-447-3584. To acquire a Dun and Bradstreet report, telephone them at 1-800-234-3867 (in Canada 800-463-6362) or visit their web site address at www.dnb.com. Dun and Bradstreet is nationally recognized, independent financial analysis company.

## CENTER OF GRAVITY

The apparatus, prior to acceptance, will be required to meet the vehicle stability of the applicable NFPA Automotive Fire Apparatus Standard.

A calculated center of gravity shall be provided. The calculated or measured center of gravity (CG) shall be no higher that 80-percent of the rear axle track width. If so, a tilt table test at the apparatus body builder's facility or Electronic Stability Control (ESC) must be provided on the chassis meeting the requirement of the NFPA 1901 Guideline.

## ENGINEERING BLUEPRINTS

**ROSENBAUER** has submitted "proposal" blueprints which are "representative" of the vehicle being proposed and these have been generated on computer-aided-design (CAD) equipment.

The blueprints are provided as follows:

Sheet No. 1:

- Left side exterior view
- Right side exterior view
- Rear exterior view
- Front view

**ROSENBAUER** shall provide construction drawings for approval prior to actual construction of the vehicle.

The design of the equipment is in accordance with the best engineering practices. The equipment design and accessory installation shall permit accessibility for use, maintenance and service. All components and assemblies shall be free of hazardous protrusions, sharp edges, cracks or other elements, which might cause injury to personnel or equipment.

All oil, hydraulic, and air tubing lines and electrical wiring shall be located in protective positions properly attached to the frame or body structure and shall have protective loom or grommets at each point where they pass through structural members, except where a through-frame connector is necessary.

Parts and components will be located or positioned for rapid and simple inspection and recognition of excessive wear or potential failure. Whenever functional layout of operating components determines that physical or visual interference between items cannot be avoided, the item predicted to require the most maintenance shall be located for best accessibility.

Contract - Minnesota Division

**PRE-CONSTRUCTION CONFERENCE (AT MANUFACTURER)**

A pre-construction conference shall be conducted at the apparatus manufacturer's factory at which time all final designs and equipment mounting locations will be approved, prior to any sheet metal being cut. A factory employed design engineer shall be present during the pre-construction conference to answer any design, and/or engineering questions relating to the layout of the apparatus. Air travel (for distances over 250 miles), meals, and lodging expenses shall be included. BIDDER SHALL INDICATE INTENTION TO PROVIDE THE REQUIRED PRE-CONSTRUCTION CONFERENCE IN THE PROPOSAL PACKET.

**INSPECTION TRIPS**

Inspection trip(s) for Fire Department personnel shall be made to the facility during the course of construction of the apparatus. Successful bidder shall consult with Fire Department committee chairperson as to the proper timing of the inspection trip(s). Air travel (for distances over 250 miles), meals, and lodging expenses shall be included. BIDDER SHALL INDICATE INTENTION TO PROVIDE THE REQUIRED INSPECTION TRIP(S) IN THE PROPOSAL PACKET.

## DEMONSTRATION

Fire Department personnel shall be properly instructed as to the proper use of the entire apparatus including, but not limited to, chassis, fire pump system, the apparatus and all equipment. The demonstration shall be made by a factory trained Specialist who shall be responsible for complete instruction as to operation and maintenance of the chassis, and the completed vehicle.

The demonstration specialist shall remain at the Fire Department for a sufficient amount of time to provide thorough instructions to all personnel, or as instructed by Chief of the Department. All meals, motel and travel costs shall be the responsibility of the successful bidder.

## LOCAL SALES AND SERVICE VEHICLE SUPPORT

The manufacturer and local sales/service facility shall provide information pertaining to authorized local sales representative of the apparatus. The representative is capable of repairing the apparatus and has a service center located within _____miles of the purchaser. This facility provides complete repair, maintenance and service of the apparatus.

This dealer shall have in their employ, qualified full-time employee(s) who are capable and certified of repairing the apparatus. The local service dealer shall make available their service center for inspection tour at the convenience of the fire officials and or their designates.

**BODY WARRANTY**

We warrant each new motorized fire apparatus manufactured by ROSENBAUER AMERICA, LLC for a period of ONE YEAR from the date of delivery, except for chassis and other components noted herein.

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

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

This warranty will not apply to any fire apparatus that has been repaired or altered outside our factory in any way, which in our opinion might affect its stability or reliability.

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

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

**EXT MODULAR BODY WARRANTY - LIFE-TIME**

Rosenbauer America, LLC warrants to the original purchaser that the all-aluminum body, fabricated by Rosenbauer America, LLC, under normal use and with reasonable maintenance, be structurally sound and will retain structural integrity for the life of the vehicle. Warranty coverage is transferable to second owner, if applicable, with proper notification made to Rosenbauer America, LLC.

This warranty does not apply to the following items that are covered by a separate warranty: paint finish, hardware, moldings, and other accessories attached to this body. In addition, this warranty does not apply to any part or accessory manufactured by others and attached to this body.

ROSENBAUER AMERICA, LLC MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE ALUMINUM BODY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND HEREBY DISCLAIMED.

Rosenbauer America, LLC will replace without charge, repair or make a fair allowance for any defect in material or workmanship demonstrated to its satisfaction to have existed at the time of delivery or not due to misuse, negligence, or accident. If Rosenbauer America, LLC elects to repair this body, the extent of such repair shall be determined solely by Rosenbauer America, LLC, and shall be performed solely at the Rosenbauer America, LLC factory, or at an approved facility. The expense of any transportation to or from such repair facility shall be borne by the purchaser and is not an item covered under this warranty.

Rosenbauer America, LLC will not be liable for damages and under no circumstances will its liability exceed the price for a defective body. The remedies set forth herein are exclusive and in substitution for all other remedies to which the purchaser would otherwise be entitled.

Rosenbauer America, LLC will be given a reasonable opportunity to investigate all claims. The purchaser must commence any action arising out of, based upon or relating to agreement or the breach hereof, within twelve months from the date the cause of the action occurred.

Note: *Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.*

**ALUMINUM SUBFRAME WARRANTY**

Subject to the provisions, limitations and conditions set forth in this warranty, Rosenbauer America, LLC (hereby referred to as "seller"), hereby warrants to each original purchaser that each new aluminum body subframe (exclusive of paint finish and hardware) is structurally sound and free of all structural defects of both material and workmanship and further warrants that it will maintain such structural integrity for the lifetime of the body. Warranty coverage is transferable to second owner, if applicable, with proper notification made to Rosenbauer America, LLC.

This warranty is conditioned upon normal use and reasonable maintenance of such subframe; prompt written notice of all defects to seller or one of the seller's then authorized dealers in the area; no repair or additions there to except by seller or authorized by it; said defect not resulting from misuse, negligence, accident, remount, overloading beyond applicable weight rating by customer or third parties. If any such conditions are not complied with, this warranty shall become void and unenforceable.

Should repairs become necessary under the terms or the warranty, the extent of that repair shall be determined solely by the seller and shall be performed solely at Rosenbauer America, LLC or a repair facility designated by the seller. The expense of any transportation to or from such repair facility shall be that of the purchaser and is not an item covered by this warranty.

Seller reserves the unrestricted right at any time from time to time to make changes in the design of and/or improvements on its products without thereby imposing any obligation on itself to make corresponding changes or improvements in or on its products theretofore manufactured.

EXCLUSIONS AND LIMITATIONS: THIS MANUFACTURER'S WARRANTY IS PROVIDED IN PLACE OF ANY AND ALL OTHER REPRESENTATIONS OR IMPLIED WARRANTIES. NO PERSON IS AUTHORIZED TO MAKE ANY REPRESENTATIONS OR WARRANTY ON BEHALF OF ROSENBAUER AMERICA, LLC OR ANY OF ITS DISTRIBUTORS OTHER THAN SET FORTH IN THIS MANUFACTURER'S WARRANTY. YOUR RIGHT TO SERVICE AND REPLACEMENT OF PARTS ON THE TERMS EXPRESSLY SET FORTH HERIN ARE YOUR EXCLUSIVE REMEDIES AND NEITHER THE MANUFACTURER NOR ANY OF ITS DISTRIBUTORS SHALL BE LIABLE FOR DAMAGES, WHETHER ORDINARY, INCIDENTAL OR CONSEQUENTIAL.

Note: *Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.*

**PAINT WARRANTY TEN YEAR**

The PPG paint performance guarantee will cover the areas of the vehicle finished with the specified product for a period of TEN (10) years beginning the day the vehicle is delivered to the purchaser.

The full apparatus body, manufactured and painted by Rosenbauer America, LLC, shall be covered for the following paint failures as outlined on the guarantee certificate:

- Peeling or delaminating of the topcoat and/or other layers of paint.
- Cracking or checking.
- Loss of gloss caused by cracking, checking, or hazing.
- Any paint failure caused by defective PPG Fleet Finishes, which are covered by this guarantee.

All guarantee exclusions, limitations, and methods of claims are covered in the full certificate provided to the original purchaser.

*Note: Surety bond, if required, will cover standard one year warranty period only and will not cover any extended warranties allowed by seller or other component manufacturers.*

**LETTERING WARRANTY**

Rosenbauer America, LLC warrants to the original purchaser only, that the lettering and striping, installed by Rosenbauer America, LLC, will remain free from defects for a period of one (1) year under normal use.

Rosenbauer America, LLC will replace without charge, repair or make a fair allowance for any defect in material or workmanship demonstrated to its satisfaction to have existed at the time of delivery or not due to misuse, negligence, or accident. If Rosenbauer America, LLC elects to repair this item, the extent of such repair shall be determined solely by Rosenbauer America, LLC, and shall be performed solely at the Rosenbauer America, LLC factory, or at an approved facility. The expense of any transportation to or from such repair facility shall be borne by the purchaser and is not an item covered under this warranty.

**PUMP WARRANTY**

Waterous warrants, to the original buyer only, that products and parts manufactured by Waterous will be free from defects in material and workmanship under normal use and service for a period of seven (7) years from the date the product is first placed in service, or seven and one half 7-1/2 years from the date of shipment by Waterous, whichever period will be the first to expire; provided the buyer notifies Waterous in writing, of the defect in said product within the warranty period, and said product is found by Waterous to be conforming with the aforesaid warranty.

When required in writing by Waterous, defective products must be promptly returned by the buyer to the Waterous Company at Waterous' plant at South St. Paul, Minnesota, or at such other place as may be specified by Waterous with transportation and other charges prepaid. A returned materials authorization (RMA) is required for all products and parts and may be requested by phone, fax or mail. The previously mentioned warranty excludes any responsibility or liability of Waterous for:

- Damages or defects due to accident, abuse, misuse, abnormal operating conditions, negligence, accidental causes or improper maintenance, or attributable to written specifications or instructions furnished by buyer.
- Defects in products manufactured by others and furnished by Waterous hereunder, it being understood and agreed by the parties that the only warranty provided for such products shall be the warranty provided by the manufacturer thereof which, if assignable, Waterous will assign to the buyer, if requested by buyer.
- Any product or part, altered, modified, serviced or repaired other than by Waterous, without its prior written consent.
- The cost of dismantling, removing, transporting, storing, or insuring the defective product or part and the cost of reinstallation.
- Normal wear items (packing, strainers, filters, light bulbs, anodes, intake screens, etc.)
- This warranty is subject to Waterous' conditions of sale (Waterous Company form number F-2190 as currently in effect all of which are herein incorporated and by this reference made a part hereof.

All other warranties are excluded, whether expressed or implied by operation of law or otherwise, including all implied warranties of merchantability or fitness for purpose. Waterous shall not be liable for consequential or incidental damages directly or indirectly arising or resulting from breach of any of the terms of this limited warranty or from the sale, handling, or use of any other product or part. Waterous' liability hereunder, either for breach of warranty or for negligence, is expressly limited at Waterous' option:

- To the replacement at the agreed point of delivery of any product or part, which upon inspection by Waterous or its duly authorized representative, is found not to conform to the limited warranty set forth above, or
- To the repair of such product or part, or
- To the refund or crediting to buyer of the net sales price of the defective product or part.
- Buyer's remedies contained herein are exclusive of any other remedy otherwise available to the buyer.

## STAINLESS STEEL PLUMBING WARRANTY

Subject to the provisions, limitations and conditions set forth in this warranty, Rosenbauer America, LLC (hereby referred to as "seller"), hereby warrants to each original purchaser only that stainless steel plumbing components and ancillary brass fittings used in the construction of the water/foam plumbing system shall be warranted for a period of ten (10) years. This covers structural failures caused by defective design or workmanship, or perforation caused by corrosion, provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original purchaser for a period of ten years from the date of the delivery and shall terminate upon the transfer of possession or ownership by original purchaser.

This warranty is conditioned upon normal use and reasonable maintenance of such plumbing; prompt written notice of all defects to seller or one of the seller's then authorized dealers in the area; no repair or additions there to except by seller or authorized by it; said defect not resulting from misuse, negligence, accident, remount, overloading beyond applicable weight rating by customer or third parties. If any such conditions are not complied with, this warranty shall become void and unenforceable.

Should repairs become necessary under the terms or the warranty, the extent of that repair shall be determined solely by the seller and shall be performed solely at Rosenbauer America, LLC or a repair facility designated by the seller. The expense of any transportation to or from such repair facility shall be that of the purchaser and is not an item covered by this warranty.

Seller reserves the unrestricted right at any time from time to time to make changes in the design of and/or improvements on its products without thereby imposing any obligation on itself to make corresponding changes or improvements in or on its products theretofore manufactured.

EXCLUSIONS AND LIMITATIONS: THIS MANUFACTURER'S WARRANTY IS PROVIDED IN PLACE OF ANY AND ALL OTHER REPRESENTATIONS OR IMPLIED WARRANTIES. NO PERSON IS AUTHORIZED TO MAKE ANY REPRESENTATIONS OR WARRANTY ON BEHALF OF ROSENBAUER AMERICA, LLC OR ANY OF ITS DISTRIBUTORS OTHER THAN SET FORTH IN THIS MANUFACTURER'S WARRANTY. YOUR RIGHT TO SERVICE AND REPLACEMENT OF PARTS ON THE TERMS EXPRESSLY SET FORTH HERIN ARE YOUR EXCLUSIVE REMEDIES AND NEITHER THE MANUFACTURER NOR ANY OF ITS DISTRIBUTORS SHALL BE LIABLE FOR DAMAGES, WHETHER ORDINARY, INCIDENTAL OR CONSEQUENTIAL.

## IN PROCESS PHOTOS

There shall be a series of Fire Ace photos provided as the apparatus progresses through the production process. There will be a minimum of four (4) photos per interval and a total of six intervals, one (1) upon chassis arrival, four (4) during construction and one (1) upon completion.

## ELECTRICAL SYSTEM PRINTED MANUAL (OPTION) AS BUILT

**ROSENBAUER** shall provide with the vehicle upon delivery, one (1) delivery manual for the electrical system. This manual shall be in a notebook type binder, with reference tabs for each section of the vehicle. A digital copy, with all the printed material in an electronic format (Adobe Acrobat PDF) shall be provided.

Within each section shall be:

- Individual component manufacturer instruction and parts manuals
- Warranty forms for the components
- Warranty instructions and format to be used in compliance with warranty obligations
- Wiring diagrams
- Installation instruction and drawings for major parts
- Visual graphics and electronic photos for the installation of major parts
- Necessary normal routine service forms, publications, and components for the installed electrical components
- Technical publications for training and instruction on major components
- Warning and safety related notices for personnel protection

Cab and chassis manuals on parts, service and maintenance shall be provided.

## ROSENBAUER CUSTOM CHASSIS

A Rosenbauer Commander custom fire truck chassis shall be furnished with the following apparatus body and equipment. See the attached specifications for our exact chassis configuration.

## UPPER REAR WARNING LIGHTS

One (1) pair of Whelen model M9 LED warning lights shall be installed, one each side on the upper rear of the apparatus body. The dimensions of the lights shall be 6-1/2" x 10-3/8".

The driver side warning light shall be a Whelen Model M9DJ red/blue Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M9DJ red/blueSuper-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M9FC chrome flange.

## UPPER SIDE FRONT WARNING LIGHTS

One (1) pair of Whelen model M9 LED warning lights shall be installed, on the upper portion of the body side, towards the front. The dimensions of the lights shall be 6-1/2" x 10-3/8".

The driver side warning light shall be a Whelen Model M9DJ red/blue Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M9DJ red/blueSuper-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M9FC chrome flange.

## UPPER SIDE REAR WARNING LIGHTS

One (1) pair of Whelen model M9 LED warning lights shall be installed, one each side on the upper portion of the body side, towards the rear of the body. The dimensions of the lights shall be 6-1/2" x 10-3/8".

The driver side warning light shall be a Whelen Model M9DJ red/blue Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M9DJ red/blueSuper-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M9FC chrome flange.

Lower Cab Warning Provided on Chassis

Front Intersection Lights Provided on Chassis

## LOWER MID-BODY WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed , one each side of the apparatus, mid-body. The dimensions of the lights shall be 4-5/16" x 6-3/4".

The driver side warning light shall be a Whelen Model M6DJ red/blue Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M6DJ red/blueSuper-LED™ with clear lens.

Each light shall be mounted with a Whelen Model M6FC chrome flange.

## LOWER REAR SIDE WARNING LIGHTS

One (1) pair of Whelen model M2 LED warning lights shall be installed , one each side of the apparatus, towards the rear of the body, in the rub rail. The dimensions of the lights shall be 4-1/4" x 2-11/16".

The driver side warning light shall be a Whelen Model M2DJ wide-angle duo red/blue Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M2DJ wide-angle red/blue Super-LED™ with clear lens.

## LOWER REAR WARNING LIGHTS

One (1) pair of Whelen model M6 LED warning lights shall be installed, one each side on the lower rear of the apparatus body. The dimensions of the lights shall be 4-5/16" x 6-3/4".

The driver side warning light shall be a Whelen Model M6DJ red/blue Super-LED™ with clear lens.

The officer side warning light shall be a Whelen Model M6DJ red/blueSuper-LED™ with clear lens.

## LOW VOLTAGE ELECTRICAL SYSTEM SPECIFICATIONS

The following specifications describe the low voltage electrical system on the specified rescue fire apparatus. The electrical system shall include all panels, electrical components, switches and relays, wiring harnesses and other electrical components. The electrical equipment installed by the apparatus manufacturer shall conform to current automotive electrical system standards, the latest Federal DOT standards, and the requirements of the applicable NFPA 1901 standards.

The apparatus shall have a Weldon V-MUX multiplexing system, to provide diagnostic capability. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The electrical system shall be pre-wired for computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics, troubleshooting, or program additions. There shall be a diagnostic display provided in the cab. The multiplexed system shall use twisted-pair shielded wire within the electrical system for noise reduction. The diagnostic display shall allow for fault and condition messages to be displayed. For superior system integrity, the networked system shall meet the following minimum requirement components:

1. Power management center
2. Load shedding power management
3. Solid-state circuitry
4. Switch input capability
5. Responsible for lighting device activation
6. Self-contained diagnostic indicators
7. Power distribution module
8. Diagnostic display for warning message indication
9. High Idle Function

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

The wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection and shall be installed in accordance with the device manufacturer's instructions. Electrical connections shall be with mechanical type fasteners and large rubber grommets where wiring passes through metal panels.

The wiring between the cab and body shall be joined using Deutsche type connectors or in an enclosed terminal junction panel. This system will permit body removal with minimal impact on the apparatus electrical system. All connections shall be crimp-type with insulated shanks to resist moisture and foreign debris such as grease and road grime. Weather-resistant connectors shall be provided throughout to ensure the integrity of the electrical system.

Any electrical junction or terminal boxes shall be weather resistant and located away from direct water spray. In addition, the main body junction panel shall house the automatically reset breakers and relays as required.

There shall be no exposed electrical cabling, harnesses, or terminal connections located in compartments, unless they are enclosed in an electrical junction box or covered with a removable electrical panel. The wiring shall be secured in place and protected against heat, liquid contaminants and damage. Wiring shall be uniquely identified at least every two feet (2') by color coding or permanent marking with a circuit function code and identified on a reference chart or electrical wiring schematic per requirements of the applicable NFPA 1901 standards.

The electrical circuits shall be provided with low voltage over current protective devices. Such devices shall be accessible and located in required terminal connection locations or weather resistant enclosures. The over current protection shall be suitable for electrical equipment and shall be the automatic reset type and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of the maximum current for which the protected circuit. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards.

The electrical system shall include the following:

j) Electrical terminals in weather exposed areas shall have a non-conductive grease or spray applied. A corrosion preventative compound shall be applicable to all terminal plugs located outside of the cab or body.
k) The electrical wiring shall be harnessed or be placed in a protective loom.
l) Holes made in the roof shall be caulked with silicone. Large fender washers shall be used when fastening equipment to the underside of the cab roof.
m) Any electrical component that is installed in an exposed area shall be mounted in a manner that will not allow moisture to accumulate.
n) A coil of wire must be provided behind each electrical appliance to allow them to be pulled away from the mounting area for inspection and service work.
o) All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area.

The warning lights shall be switched in the chassis cab with labeled switches in an accessible location. Individual rocker switches shall be provided only for warning lights added over the minimum requirement level of warning lights in either the stationary or moving modes. All electrical equipment switches shall be mounted on a switch panel mounted in the cab convenient to the operator. Rocker type warning light switches shall be utilized. For ease of nighttime operation, an integral indicator light shall be provided to indicate when the circuit is energized. All switches shall be appropriately identified as to their function.

A single warning light switch shall activate all required warning lights. This switch will allow the vehicle to respond to an emergency and "call for the right of way". When the parking brake is applied, a "blocking right of way" system shall be automatically activated per requirements of the NFPA 1901 standard. All "clear" warning lights shall be automatically turned off upon application of the parking brake.

NFPA REQUIRED TESTING OF ELECTRICAL SYSTEM

The apparatus shall be electrically tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with the delivery documentation per requirements of the NFPA 1901 standard. The following minimum testing shall be completed by the apparatus manufacturer:

1. Reserve capacity test:

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes. All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a failed test.

2. Alternator performance test at idle:

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

3. Alternator performance test at full load:

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system shall be permitted during this test. However, if an alarm sounds due to excessive battery discharge, as detected by the system requirements in the NFPA 1901 standard, or a system voltage of less than 11.7 volts dc for a 12 volt system is present for more than 120 seconds, the test shall be considered a failure.

4. Low voltage alarm test:

Following the completion of the above tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts dc for a 12 volt system shall be considered a test failure. The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

NFPA REQUIRED DOCUMENTATION

The following documentation shall be provided on delivery of the apparatus:

a. Documentation of the electrical system performance tests required above.
b. A written load analysis, including:
    1. The nameplate rating of the alternator.
    2. The alternator rating under the conditions.
    3. Each specified component load.
    4. Individual intermittent loads.

**COMPARTMENT DOOR OPEN SYSTEM ON VISTA SCREEN**

The cab and body main compartment doors shall be wired to illuminate an open door indicator on the Weldon V-MUX Vista screen located in the cab when the parking brake is released. The indicator shall individually specify the door(s) that is(are) open. Accessories on the truck, such as light towers, hydraulic ladder rach, deck gun and small accessory doors shall also be wired to illuminate an indicator on the Vista screen when not stowed or open.

**MASTER ELECTRIC SWITCH**

A battery disconnect switch shall be located conveniently to the driver of the apparatus. The switch shall disconnect the 12 volt power supply from the battery system.

**PUMP ENCLOSURE LIGHTS**

Two (2) LED work light shall be provided in the pump enclosure.

The control switch shall be mounted on the light head.

**BACKUP CAMERA**

A chassis supplied rear camera system shall be mounted on the rear of the vehicle. The camera component and cabling from the camera to the back of the cab shall be installed by the apparatus body manufacturer. All other components shall be installed by the chassis manufacturer.

## INTERCOM SYSTEM

The vehicle shall be equipped with a David Clark 3800 intercom master station. The system shall come standard with headset jacks for two (2) intercom ONLY positions, appropriate for jump seat positions. Additional positions can be added through daisy chaining, including a wireless gateway.

This system can operate with one (1) to four (4) mobile radios. Connection of this system to the mobile radio in not included, unless specified.

One (1) U3800 master station shall be supplied with the system. The U3800 is the heart of the intercom system, providing power to the complete intercom system.

One (1) H3442 Under-The-Helmet Headset shall be supplied for the driver's position. The mic has "ON-OFF" button. When "ON" the mic is always live for intercom communication. This is appropriate for all positions. A U3811 radio interface / headset station shall be supplied with the headset.

One (1) H3442 Under-The-Helmet Headset shall be supplied for the officer's position. The mic has "ON-OFF" button. When "ON" the mic is always live for intercom communication. A U3815 radio interface / head station shall be supplied with the headset.

Four (4) H3442 Under-The-Helmet Headset shall be supplied for the crew members. The mic has "ON-OFF" button. When "ON" the mic is always live for intercom communication.

## INTERCOM PLUG IN MODULE

Four (4) plug-in module for headset at interior positions in the apparatus shall be provided. For intercom communication ONLY. Appropriate for jump seat positions

## MARKER LIGHTS

LED marker lights shall be installed on the vehicle in conformance to the Department of Transportation requirements.

## MARKER LIGHTS

Two (2) Britax P/N L427.203.L12V flex rubber arm style LED Clearance lights shall be mounted on the rear of the body, one each side. These lights are in addition to the lights required by the DOT.

## LICENSE PLATE BRACKET

A Cast Products license plate bracket, model LP0005-1-C shall be provided at the rear of the apparatus. The bracket shall have a polished finish and LED light.

## TAIL LIGHTS

One (1) pair of Whelen M62BTT LED tail/brake lights shall be provided. The rectangular 4"x6" lights shall be red.

**TURN SIGNALS**

One (1) pair of Whelen M62T LED turn signals with populated sequential chevron arrow shall be provided.

**BACKUP LIGHTS**

One (1) pair of Whelen Series M62BU LED backup lights shall be installed on the rear of the apparatus body. The dimensions shall be 4" x 6" and the lens color shall be clear.

**FOUR LIGHT HOUSING**

One (1) pair of chrome plated tail light housings shall be supplied. Each housing shall be designed to hold four (4) Whelen M6 rear lights located at the lower rear corners of the body.

**MID BODY LED TURN SIGNALS**

One (1) pair of mid body LED turn signals shall be provided. The location of the turn lights shall be at mid-body near the rear wheel axle.

**GROUND LIGHTS**

There shall be two (2), one each side, Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the rub rail of the pump house.

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

The ground lighting shall be activated when the parking brake is set.

**GROUND LIGHTS**

There shall be two (2), one each side, Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the rub rail, mid body.

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

The ground lighting shall be activated when the parking brake is set.

**GROUND LIGHTS**

There shall be two (2) Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the rear step.

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

The ground lighting shall be activated when the parking brake is set.

**GROUND LIGHTS**

There shall be two (2) Whelen 3SC0CDCR LED NFPA compliant ground light mounted to the underside of the compartments, behind the rear wheels.

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

The ground lighting shall be activated when the parking brake is set.

The ground lights shall automatically activate when the parking brake is applied.

**STEP LIGHT**

Two (2) LED step light(s) with clear lens shall be installed.

**REAR TAILBOARD LIGHTS**

Two (2) LED step lights with clear lens shall be installed to illuminate the step surfaces at the rear of the apparatus body.

The step/walkway light switch shall be installed and wired to the parking brake.

**LEFT PUMP PANEL SCENE LIGHTING**

The following scene lighting shall be located on the left side of the pump panel:

**RIGH SIDE PUMP PANEL SCENE LIGHTING**

The following scene lighting shall be located on the right side of the pump panel:

**LEFT SIDE BODY SCENE LIGHTING**

The following scene lighting shall be located on the left side of the body:

**SCENE LIGHT**

Two (2) Whelen M9 Series Model #M92SLB scene light(s) shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology.

The M92SLB shall be furnished with a black trim ring, a rubber gasket, screws, and screw grommets for installation. The M92SLB shall have the ability to be installed as a surface mount scene light.

SCENE LIGHT SWITCHING

The two (2) left side scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screens.

## RIGHT SIDE BODY SCENE LIGHTING

The following scene lighting shall be located on the right side of the body:

## SCENE LIGHT

Two (2) Whelen M9 Series Model #M92SLB scene light(s) shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology.

The M92SLB shall be furnished with a black trim ring, a rubber gasket, screws, and screw grommets for installation. The M92SLB shall have the ability to be installed as a surface mount scene light.

SCENE LIGHT SWITCHING

The two (2) right side scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screens.

## REAR BODY SCENE LIGHTING

The following scene lighting shall be located on the rear of the body:

## SCENE LIGHT

Two (2) Whelen M9 Series Model #M92SLB scene light(s) shall be provided. The steady burn scene light shall incorporate Linear Super-LED® and Smart LED® technology.

The M92SLB shall be furnished with a black trim ring, a rubber gasket, screws, and screw grommets for installation. The M92SLB shall have the ability to be installed as a surface mount scene light.

SCENE LIGHT SWITCHING

The one (1) rear scene light(s) shall activate via a virtual scene light switch located on the driver's and officer's Vista screens.

## TRAFFIC ARROW

A chassis supplied traffic arrow shall be mounted on the rear of the vehicle. All system components shall be installed by the apparatus body manufacturer.

The traffic arrow light shall be surface mounted at the rear of the apparatus body.

## OVERALL DIMENSIONS

The vehicle shall have the following dimensions:

- Chassis wheelbase:
- Cab to axle dimension of chassis:
- Overall length:
- Overall width:
- Overall height

FLUID DATA PLAQUE

A fluid data plaque containing required information shall be provided based on the applicable components for this apparatus, compliant with NFPA Standards:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Drive axle lubricant
- Power steering fluid
- Pump transmission lubrication fluid
- Other NFPA applicable fluid levels or data as required

Location shall be in the driver's compartment or on driver's door.

HEIGHT LENGTH & WEIGHT WARNING LABEL

A highly visible label indicating the overall height, length, and weight of the vehicle shall be installed in the cab dash area.

NO RIDE LABEL

A "NO RIDERS" label shall be applied on the vehicle at the rear step area or other applicable areas. The label shall warn personnel that riding in or on these areas, while the vehicle is in motion is prohibited.

TIRE PRESSURE LABEL

A label shall be placed in a visible area that indicates the front and rear tire pressure.

CAB SEATING POSITION LIMITS

A label shall be installed in the cab to indicate seating positions for firefighters. A weight allowance of 250 pounds for each shall be factored into the gross vehicle weight rating of the chassis.

HELMET WARNING TAG

A label shall be installed in the cab, visible from each seating position. The label shall read "CAUTION: DO NOT WEAR HELMET WHILE SEATED." Helmets must be properly stowed while the vehicle is in motion according to the current edition of NFPA 1901.

**REAR TOW EYES**

There shall be two tow eyes furnished under the rear of the body. Tow eyes are to be constructed of 3/4" plate steel with a 3" I.D. hole, large enough for passing through a tow chain end hook.

The tow plates shall be painted black.

**TIRE PRESSURE INDICATOR**

There shall be a tire pressure indicator, p/n RWTG1235, at each tire's valve stem on the vehicle that shall indicate if there is insufficient pressure in the specific tire.

**EXHAUST HEAT SHIELD**

A heat shield shall be installed under the body in the areas where the exhaust system is routed.

**REAR MUD FLAPS**

A pair of black mud flaps shall be installed behind the rear wheels.

**CAB LIFT CONTROL LOCATION**

The cab lift controls for tilting the cab shall be recess mounted in the forward wall inside the driver front compartment or behind the pump compartment left side upper access (gauge) panel. Proper operation and warning labels shall be installed adjacent to the controls.

**WATEROUS CSUC22 SINGLE STAGE PUMP**

A Waterous model CSUC22, single stage centrifugal pump shall be designed to mount on the chassis frame rails and shall be split-drive shaft driven. The pump casing shall be of high-tensile, close-grained gray iron. Pump body shall be horizontally split in two (2) sections, for easy removal of impeller assembly including wear rings and bearings from beneath the pump without disturbing the mounting or piping.

IMPELLER

A matched bronze impeller specifically designed for the fire service will be provided. It will be accurately balanced both mechanically and hydraulically, for vibration-free operation. The impeller shaft shall be stainless steel, heat-treated and precisely ground to size. It shall be supported on both ends by oil or grease lubricated ball bearings.

Replaceable wear rings, bronze, reverse-flow, labyrinth-type shall be provided. Three (3) deep groove ball bearings shall be located outside the pump to give rugged support and proper alignment to the impeller shaft. The bearings shall be oil or grease lubricated. All bearings shall be completely separated from the water being pumped.

PUMP TRANSMISSION

The housing shall be constructed of high tensile aluminum and be of three (3) piece, horizontally split design. The transmission driveline shafts shall be made from alloy steel forging, hardened and ground to size. The drive and driven sprockets shall be made of steel and shall be carbonized and hardened. The drive chain shall be Morse HV involute form chain. The lubrication system shall be an impeller shaft driven oil pump to deliver oil to an integral spray header, to completely pressure lubricate the drive chain.

PUMP MOUNTING

The pump shall be bolted to steel angles in pump module, using grade 8 bolts.

DRIVELINE

Hollow-tube drivelines and universals shall be properly matched to the engine and transmission output torque ratings.

**1500 GPM FIRE PUMP SPECIFICATIONS**

The centrifugal type fire pump shall be a Waterous model CSUC22 midship mounted with a rated capacity of 1500 GPM. The pump shall meet NFPA 1901 requirements.

The pump shall be certified to meet the following deliveries:

1500 GPM @ 150 PSI
1500 GPM @ 165 PSI
1050 GPM @ 200 PSI
750 GPM @ 250 PSI

**LEFT SIDE -- 6" UNGATED INTAKE**

One (1) 6" ungated suction intake shall be installed on the left side pump panel to supply the fire pump from an external water supply. The threads shall be 6" NST. The intake shall be provided with a removable screen.

A 6" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped long handles.

**RIGHT SIDE -- 6" UNGATED INTAKE**

One (1) 6" ungated suction intake shall be installed on the right side pump panel to supply the fire pump from an external water supply. The intake shall be provided with a removable screen.

A 6" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped long handles.

**FIRE PUMP MECHANICAL SHAFT SEAL**

The Waterous fire pump shall be equipped with self-adjusting, maintenance free, 'mechanical shaft seal' which is designed to be functional in the unlikely event of a seal failure.

**IMPELLER HUBS**

The Waterous fire pump impeller hubs shall be "Flame Plated", impregnated with tungsten carbide to assure maximum pump life and efficiency despite the presence of abrasive particles, such as fine sand, in the water being pumped.

**ELECTRIC/PNEUMATIC PUMP SHIFT**

The fire pump shift shall be air-operated incorporating an air cylinder with an electrically actuated pneumatic switch to shift from ROAD to PUMP and back. The fire pump shift control switch and valve shall be mounted in the cab.

The fire pump shift system shall be equipped with a means to prevent unintentional movement of the control device from its set position. The system shall include a nameplate indicating the chassis transmission shift selector position to be used for pumping and located so that it can be easily read from the driver's position.

The system shall include the applicable NFPA standard interlocks, pump shift and OK TO PUMP indicator lights in the cab and pump panel. The fire pump shift system shall be equipped with an interlock system to ensure that the pump drive system components are properly engaged in the pumping mode of operation so the pumping system can be safely operated from the pump operator's position.

If applicable, the secondary braking device shall be automatically disengaged for pumping operations.

**TRIDENT PRIMER – AUTOMATIC**

An automatic fire pump priming system shall be provided and installed. The system shall be oil-less type and environmentally safe. Once engaged, the system shall be fully automatic and not require any action from the pump operator/engineer when pump draft is lost. This feature provides an additional safety margin by maintaining pump flow from the available water source automatically during drafting operations. When air is introduced during a drafting operation from conditions such as whirlpools or turbulence from porta-tank refill operations, the priming system shall automatically engage to remove the air and stabilize water flow and pump pressure. For additional safety, the entire system shall operate at less than 70dBA of ambient noise.

The priming system shall engage automatically whenever the pump discharge falls below five (5) psi and shall remain engaged until a pump prime has been achieved. The priming system shall automatically disengage when a positive pump discharge pressure has been established. The electrical current draw from the chassis batteries shall not exceed four (4) amps at any given time of operation and allow for unlimited run time without causing an overheat condition for of any of the system components.

A single engagement switch shall be provided on the pump control panel that will allow the operator to engage the automatic pump priming system. There shall be a light provided on the pump control panel to indicate when the system is engaged. The pump shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds with the pump dry, through 20 feet of suction hose of appropriate size. The priming system shall comply with applicable sections of NFPA standards.

**PRIMER CONTROL**

A rocker switch control shall be provided on the pump operator's panel, for the main pump primer control.

**PRIMER CONTROL**

One (1) additional primer control valve(s) shall be furnished to prime the front/rear suction line plumbing. The Trident Emergency products RPV (remote priming valve) shall activate using the same air that powers the AirPrime system when the coinciding panel valve is depressed. Priming the remote suction line evacuates air from that line and minimizes cavitation during remote suction operations. The valve control is to be co-located next to the main priming valve control on the pump operator's panel. A manual push button control shall be provided on the pump operator's panel.

**PRESSURE GOVERNOR AND ENGINE-PUMP MONITORING**

A Fire Research InControl series TGA400 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 5 1/2" high by 10 1/2" wide by 2" deep. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

The following continuous displays shall be provided:

- Pump discharge; shown with four daylight bright LED digits more than 1/2" high
- Pump Intake; shown with four daylight bright LED digits more than 1/2" high
- Pressure / RPM setting; shown on a dot matrix message display
- Pressure and RPM operating mode LEDs
- Throttle ready LED
- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display.

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

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button.

It shall monitor inputs and support audible and visual warning alarms for the following conditions:

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

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

Inputs to the control panel from the pump discharge and intake pressure sensors shall be electrical. The discharge pressure display shall show pressures from 0 to 600 psi. The intake pressure display shall show pressures from -30 in. Hg to 600 psi.

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

The pressure governor, monitoring and master pressure display shall be programmed to interface with a specific engine.

PUMP ANODES

There shall be sacrificial, zinc anodes in the pump steamer ports which shall protect the pump and piping from electrolysis. These anodes shall also act as screens.

PUMP PLUMBING SYSTEM

The fire pump plumbing system shall be of rigid stainless steel pipe or flexible piping with stainless steel fittings. Mechanical grooved couplings shall be installed to permit flexing of the plumbing system and allow for quick removal of piping or valves for service. Flexible hose couplings shall be threaded stainless steel or mechanical grooved coupling connections.

The fire pump and plumbing shall be hydrostatically tested in compliance to applicable sections of NFPA standards. The test results shall be included in the delivery documentation.

FIRE PUMP MASTER DRAIN

The fire pump plumbing system and fire pump shall be piped to a single push-pull type master pump drain assembly.

ADDITIONAL LOW POINT DRAINS

The plumbing system shall be equipped with additional low point manually operated drain valves to allow total draining of the fire pump plumbing system. These valves shall be accessible from the side of the vehicle and labeled.

PLUMBING SYSTEM

The plumbing system shall be unpainted.

HOSE THREADS

The hose threads shall be National Standard Thread (NST) on all base threads on the apparatus intakes and discharges.

**WATER TANK TO PUMP LINE**

A 3" water tank to the rear mounted fire pump line shall be provided with a full flow quarter turn ball valve, 4" piping, and with flex hose and stainless steel hose clamps. The tank to pump line shall be equipped with a check valve to prevent pressurization of the water tank.

The line shall be flow tested during the fire pump testing and shall meet applicable requirements of NFPA standards.

The tank to pump valve shall be controlled at the pump operator's panel.

The valve shall be an Akron 8000 Series three-inch (3") valve with a stainless ball.

An Akron valve equipped with a manually operated pull rod, with quarter-turn locking feature shall be provided on the intake. The handle shall be equipped with a color-coded name plate.

**FIRE PUMP TO WATER TANK FILL LINE**

A 2" fire pump to water tank refill and pump bypass cooler line shall be provided. The valve shall be a full flow quarter turn ball valve with 2" piping and flex hose to tank. The valve control handle shall have a nameplate located near the valve control.

The valve shall be an Akron 8000 Series two-inch (2") valve with a stainless ball.

An Akron valve equipped with a manually operated pull rod, with quarter-turn locking feature shall be provided on the intake. The handle shall be equipped with a color-coded name plate.

**FIRE PUMP SPLIT SHAFT DRIVESHAFTS AND INSTALLATION**

The mid-ship split shaft fire pump shall be installed and shall include installation of the fire pump, modification and/or fabrication of new drivelines and all pump-mounting brackets. The drive shaft(s) shall be spin balanced prior to final installation.

**UNDERWRITERS LABORATORIES FIRE PUMP TEST**

The pump shall undergo an Underwriters Laboratories Incorporated test per applicable sections of NFPA standards, prior to delivery of the completed apparatus.

The UL acceptance certificate shall be furnished with the apparatus on delivery.

**FIRE PUMP TEST LABEL**

A fire pump performance and rating label shall be installed on the fire apparatus pump panel. The label shall denote levels of pump performance and testing completed at factory. These shall include GPM at net pump pressure, RPM at such level, and other pertinent data as required by applicable NFPA standards. In addition, the pressure control device, tank to pump flow tests, and other required testing shall be completed.

In addition, the entire pump, suction and discharge passages shall be hydrostatically tested to a pressure as required by applicable NFPA standards. The pump shall be fully tested at the pump manufacturer's factory to the performance specifications as outlined by applicable NFPA standards. Pump shall be free from objectionable pulsation and vibration.

If applicable, the fire pump shall be tested and rated as follows:

- 100% of rated capacity at 150 pounds net pressure.
- 70% of rated capacity at 200 pounds net pressure.
- 50% of rated capacity at 250 pounds net pressure.
- 100% or rated capacity at 165 pounds net pressure.

INTAKE RELIEF/DUMP VALVE

An Elkhart Model 40, 2-1/2" intake relief/dump valve preset at 125 psi shall be permanently installed on the suction side of the fire pump. The valve shall have an adjustment range of 75 psi to 250 psi, and shall be designed to automatically self-restore to a non-relieving position when excessive pressure is no longer present.

Discharge side of the intake relief valve shall be plumbed away from the pump operator.

FIRE PUMP COOLING

The fire pump shall be equipped with 3/8" cooling line from the pump to the water tank. This pump cooling re-circulation line shall be controlled at the pump panel by a quarter-turn in-line ball valve with mini-twist control handle. The control handle shall be labeled "PUMP COOLING". There shall be a check valve installed in the pump cooler line to prevent tank water from back flowing into the pump when it is not in use.

CHASSIS ENGINE HEAT EXCHANGER COOLING SYSTEM

The apparatus shall be equipped with a heat exchanger for supplementary chassis engine cooling during fire pump operations. A manually operated quarter-turn in-line ball valve with mini-twist control handle mounted at the pump panel shall direct water from the fire pump to the heat exchanger that is mounted in the engine radiator cooling hose. The system shall provide cooling water from the fire pump to circulate around the engine radiator coolant without mixing or coming in direct contact with the engine coolant. The unit shall be installed by the chassis manufacturer and connected to the plumbing system by the fire apparatus manufacturer.

The control shall be identified with a chrome bezel label assembly labeled, "AUXILIARY ENGINE COOLER".

**GATED 5" INTAKE -- FRONT RIGHT BUMPER**

One (1) front right side bumper gated suction intake with 5" piping shall be provided. Intake pipe shall be provided with drain valves mounted at all low points of plumbing.

Intake shall be gated with an air operated 5" butterfly valve and shall have control switch at the pump operator's panel. The power valve operating mechanism shall prevent movement of the valve from the fully closed position to the fully open position or vice versa, in less than three seconds. The control switch shall have a colored identification label.

A pressure dump/relief valve shall be included that is factory preset at 125 PSI and field adjustable from 75 to 250 PSI. The pressure dump/relief valve shall provide over-pressure protection for the suction hose even when the intake valve is closed. The outlet of the dump/relief valve shall be 2.5" in diameter to allow directing the discharge flow away from the pump operator's position.

An inlet fitting with 5" NPT x 5" NST thread shall be provided, complete with a removable strainer screen. The front suction plumbing shall be bolted to the pump and be assembled with Victaulic type couplings.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift, to open and push down, to close.

**FRONT RIGHT SIDE INTAKE -- VERTICAL ABOVE BUMPER**

The front suction 5" piping shall extend vertical, then straight-forward above the bumper level. The piping shall be stainless steel with Victaulic couplings installed.

90 DEGREE SWIVEL 5" ELBOW

The front intake shall be equipped with a 5" chrome plated swivel adapter. The unit shall be equipped with 5" NPT female thread x 5" NST male thread.

A 5" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped long handles.

**LEFT SIDE -- 2-1/2" GATED INTAKE**

One (1) 2-1/2" gated suction intake shall be installed on left side pump panel to supply the fire pump from an external water supply. The control valve shall be a quarter turn ball valve and shall have 2-1/2" NST female thread of chrome plated brass.

The intake shall be equipped with a ¾" drain and bleeder valve. A nameplate label and removable screen shall be installed.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

A 2-1/2" chrome plated plug shall be provided. The threads shall be NST and the plug shall be equipped rocker lugs and chain or cable securement.

The valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

The valve shall be equipped with a manually operated, swing-type manual control located adjacent the intake. The valve shall be equipped with a color-coded name plate.

**RIGHT SIDE -- 2-1/2" GATED INTAKE**

One (1) 2-1/2" gated suction intake shall be installed on right side pump panel to supply the fire pump from an external water supply. The control valve shall be a quarter turn ball valve and shall have 2-1/2" NST female thread of chrome plated brass.

The intake shall be equipped with a ¾" drain and bleeder valve. A nameplate and removable screen shall be installed.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

A 2-1/2" chrome plated plug shall be provided. The threads shall be NST and the plug shall be equipped rocker lugs and chain or cable securement.

The valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

The valve shall be equipped with a manually operated, swing-type manual control located adjacent the intake. The valve shall be equipped with a color-coded name plate.

**1-1/2" DISCHARGE  FRONT RIGHT SIDE BUMPER, Chrome**

A 1-1/2" discharge shall be installed at front right side bumper area with chrome swivel outlet with 1-1/2" NST male threads.  The valve control shall be on pump panel and a nameplate label provided at valve control area.

The plumbing shall be flexible hose with abrasion resistant support mountings

A Class 1 automatic type 3/4" bleeder valve shall be installed.

The hose connection for the front discharge shall be a swivel type located inside the front bumper hosewell.

The specified valve shall be an Akron 8000 Series one and one half-inch (1-1/2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control.  The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage.  The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift.  Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided.  The face of the gauge shall be a WHITE dial with black letters.  The gauges will be located on the pump instrument panel.

**TWO (2) 1-1/2" SPEEDLAY DISCHARGES**

Two (2) 1-3/4" pre-connect hose speedlays shall be installed ahead of the front of body or pump enclosure, controlled with quarter turn 2" diameter ball valves. The outlets shall be equipped 2" NPT female swivel x 1-1/2" male NST hose threads.

The hosebed decking shall be constructed with slots integrated into the hosebed floor.

Each hose bed shall provide for a minimum capacity of 200 feet of 1-3/4" diameter double jacket hose with the hose and nozzle provided by the fire department.

A Class 1 automatic type 3/4" bleeder valve shall be installed.

The specified valve shall be an Akron 8000 Series two-inch (2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

Two (2) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

## 2-1/2" SPEEDLAY DISCHARGE

One (1) 2-1/2" pre-connect hose speedlay shall be installed ahead of the front of body or pump enclosure, controlled with quarter turn 2-1/2" diameter ball valve. The outlet shall be equipped 2-1/2" NPT female swivel x 2-1/2" male NST hose threads.

The hosebed decking shall be constructed with slots integrated into the hosebed floor.

Each hose bed shall provide for a minimum capacity of 200 feet of 2-1/2" diameter double jacket hose with the hose and nozzle provided by the fire department.

A Class 1 automatic type 3/4" bleeder valve shall be installed.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

## REMOVABLE TRAY FOR PRE-CONNECTED HOSE BEDS

The 2-1/2" pre-connect hosebed(s) shall be equipped with one (1) "U" shaped aluminum hose tray. The unit shall be equipped with pull out hand holes.

## REMOVABLE TRAY FOR PRE-CONNECTED HOSE BEDS

The 1-3/4" pre-connect hosebed(s) shall be equipped with two (2) "U" shaped aluminum hose tray(s). The unit shall be equipped with pull out hand holes.

## HEAT SHIELDS

Aluminum sheet panels shall be installed along the pump side of the speedlays to aid in heat retention within the pump compartment. The panels shall be removable to provide service access to components in the pump compartment.

**LEFT SIDE PUMP PANEL -- 2-1/2" DISCHARGE**

Two (2) 2-1/2" discharge shall be installed on the left side pump panel area and shall be controlled by a quarter turn ball valve. The discharge shall have 2-1/2" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

Two (2) chrome plated elbow with rocker lugs shall be provided with 2-1/2" NST swivel female x 2-1/2" NST male hose threads.

Two (2) 2-1/2" NST rocker lug chrome plated vented cap and cable or chain securement shall be provided.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

Two (2) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

**RIGHT SIDE PUMP PANEL -- 2-1/2" DISCHARGE**

One (1) 2-1/2" discharge shall be installed on the right side pump panel area and shall be controlled by a quarter turn ball valve. The discharge shall have 2-1/2" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

One (1) chrome plated elbow with rocker lugs shall be provided with 2-1/2" NST swivel female x 2-1/2" NST male hose threads.

One (1) 2-1/2" NST rocker lug chrome plated vented cap and cable or chain securement shall be provided.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

**RIGHT SIDE PUMP PANEL -- 3" x 4" DISCHARGE**

One (1) 3" discharge shall be installed on the right side pump panel area and shall be controlled by a full flow 3" slow-close quarter turn ball valve. The discharge shall have 4" NST male hose threads. A color coded nameplate label shall be provided adjacent the control handle.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift to open and push down to close.

One (1) lightweight aluminum elbow with 30 degree slant shall be provided. Threads shall be 5" Storz with lugs and manual locks x 4" female swivel NST with rocker lugs.

One (1) 5" lightweight aluminum Storz cap with cable or chain securement shall be provided.

The specified valve shall be an Akron 8000 Series three-inch (3") valve with a stainless ball.

One (1) Akron valve equipped with a manually operated pull rod, with quarter-turn locking feature and a manual slow-close device shall be provided on the specified discharge. The handle shall be equipped with color-coded type name plate.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

**RIGHT SIDE FRONT OF HOSEBED -- 2-1/2" DISCHARGE**

One (1) 2-1/2" discharge shall be to the right side front of hosebed area and controlled by a quarter turn ball valve on the pump panel. The discharge shall have 2-1/2" NPT x 2-1/2" NST male hose threads. An engraved nameplate label shall be provided adjacent the control handle.

A Class 1 automatic type 3/4" bleeder valve shall be installed.

The specified valve shall be an Akron 8000 Series two and one half-inch (2-1/2") valve with a stainless ball.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

**3" MONITOR DISCHARGE**

One (1) 3" discharge shall be piped to the area over the pump enclosure with 3" NPT male threads provided. The pipe shall be equipped with Victaulic couplings (if necessary) and shall be properly secured to prevent movement when a monitor or deck gun is attached. The quarter turn ball valve shall be controlled on pump panel.

A color coded nameplate label shall be provided adjacent the valve control handle.

An Innovative Controls ¾" cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift, to open and push down, to close.

The specified valve shall be an Akron 8000 Series three-inch (3") valve with a stainless ball.

One (1) Akron valve equipped with a manually operated pull rod, with quarter-turn locking feature and a manual slow-close device shall be provided on the specified discharge. The handle shall be equipped with color-coded type name plate.

One (1) 2-1/2" IC discharge pressure gauges (0-400 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

**PORTABLE MONITOR**

Task Force Tips Crossfire model # XFC-62 portable lightweight monitor package consisting of monitor top with storage bracket, MST-4NJ stacked tips shall be supplied, along with a choice of a Safe-Tak base, a stream straightener, a Master Stream nozzle, and a Extend-A-Gun and installation bracket set.

The package shall be configured as follows:

PORTABLE DECK GUN MONITOR TOP

Task Force Tips Crossfire, model # XFT-NJ portable monitor shall be provided. This top only portion with quick release swivel joint shall be designed for use on truck mounted risers and TFT Safe-Tak or Stow-A-Way 800 series portable bases. The monitor shall include safety devices that include a locking button which locks the quick release lever when monitor is pressurized, and a 1/4 turn rotational lever lock that secures the horizontal rotation and provides a visual indication that the monitor rotation is locked.

The monitor shall have a 3-1/4" waterway for delivery of up to 1250 GPM with low friction loss. Vertical elevation shall be controlled through use of a handwheel controlled stainless steel worm gear which allows full travel to the safety stop point of 35 degrees above horizontal with seven rotations of the wheel. When positioned on a truck mounted riser the monitor shall be able to be used below the 35 degree stop point through release of the spring loaded safety pin.

An automatic drain to remove remaining water and avoid freezing shall be included. Integral stainless steel stream straightener and pressure gauge shall be included. The monitor shall be configured with a Crossfire inlet and 2-1/2" male NH outlet.

MONITOR STORAGE BRACKET

Task Force Tips model # XF-B storage bracket and mounting screws shall be supplied. The bracket shall be constructed from stainless steel include a quick release retention strap and be designed for horizontal or vertical installation. The bracket is designed for storage of the Task Force Tips Crossfire SAFE-TAK and STOWAWAY 800 series portable monitor base with or without monitor top attached.

**MASTER STREAM NOZZLE**

Task Force Tips Master Stream 1250, # M-R1250S-NJ automatic master stream nozzle shall be provided. The nozzle shall be designed for use on monitors, ladder pipes, deluge guns and aerial platforms. For corrosion resistance the nozzle shall be constructed for lightweight hardcoat anodized aluminum.

The nozzle shall have a flow capability of 150 to 1250 GPM at a constant pressure rating of 100 PSI. A UV resistant rubber bumper with integral teeth designed to produce a finger free fog pattern shall be included. A halo ring shall be included to assist with stream shape control. The nozzle shall be suitable for foam solution application and designed to accept the Task Force Tips FJ-LX-M low expansion air aspirating attachment. The nozzle shall be configured with a 2-1/2" female NH swivel rocker lug coupling.

**SAFE-TAK PORTABLE MONITOR BASE**

Task Force Tips Safe-Tak 1250, model # XFH-2NJ portable monitor base shall be provided. The monitor shall include a Safe-Tak, spring loaded butterfly valve designed to rapidly reduce the water flow by 90 percent in the event that contact with the ground is lost. The device shall include an integral carrying handle, four folding stainless steel legs with replaceable tungsten carbide spikes and an anchoring strap (attached to a protective cap) designed to be stored inside the waterway. The butterfly valve shall have a reset handle located near the inlet to allow the water flow to be reestablished once the base is properly stabilized.

The base shall be constructed from hardcoat anodized aluminum and have a red powder coat interior and exterior finish. The inlet shall be configured with two (2) 2-1/2" female NH swivel rocker lug couplings with two-way clapper valve.

**STREAM STRAIGHTENER**

Task Force Tips model # XF-SS5 stream straightener shall be supplied. The straightener shall be constructed from extruded aluminum with internal vanes designed to reduce turbulence and increase the reach of smooth bore water streams. The device shall be five (5) inches in length and have 2-1/2" female NH rigid inlet and 2-1/2" male NH rigid outlet.

**MASTER STREAM STACK TIP SET**

Task Force Tips model # MST-4NJ smooth bore stacked tip set shall be provided. For corrosion resistance the tip set shall be constructed from hardcoat anodized aluminum alloy. The set shall consist of four (4) tips with the base tip having a 2-1/2" female NH swivel inlet and 2" outlet. The other tip sizes shall be 1-3/4", 1-1/2" and 1-3/8". Each tip shall be laser engraved with a flow/pressure chart, orifice size, thread size.

**MONITOR STORAGE BRACKET**

Task Force Tips model # XF-B storage bracket and mounting screws shall be supplied. The bracket shall be constructed from stainless steel include a quick release retention strap and be designed for horizontal or vertical installation. The bracket is designed for storage of the Task Force Tips Crossfire SAFE-TAK and STOWAWAY 800 series portable monitor base with or without monitor top attached.

## TELESCOPING MONITOR PIPE

Task Force Tips model # XG18VL-XL manually telescoping waterway shall be installed. The waterway shall be capable of being lowered to deck level (or into a monitor well) for storage and transportation and shall be capable of being raised to an extended height of 18" by lifting a quick release latch located at the base of the extension tube. This latching device shall be capable of locking the waterway in either the raised or lowered position while maintaining the ability to horizontally rotate the monitor device 360 degrees.

A sensor shall be located on the waterway that signals a 12 volt indicator light installed in the cab to illuminate to indicate that the monitor is raised.

The aluminum riser shall have a 3" waterway; hardcoat anodized finish and be furnished with a 3" Victaulic inlet and a Task Force Tips Crossfire coupling outlet.

## FOAM PRO FOAM SYSTEM

A FoamPro part number S105-2001 electronic foam proportioning system shall be provided. The system shall be capable of using both Class A and most Class B foam concentrates. The foam proportioning operation shall be designed for direct measurement of water flows, and shall remain consistent within the specified flows and pressures. The system shall be capable of accurately delivering foam solution as required by applicable sections of the NFPA standards.

The system shall be equipped with a digital electronic control display suitable for installation on the pump panel. There shall be a microprocessor incorporated within the electronic controls that shall receive input from the system's flow meter, while also monitoring the foam concentrate pump output. The microprocessor shall compare the values to ensure that the desired amount of foam concentrate is injected onto the discharge side of the fire pump.

Paddlewheel-type flow meter(s) shall be installed in the discharges specified to be "foam capable". When the use of more than one (1) flow meter is required, an electronic interface module will be provided to total these flows and send the flow total to the microprocessor in the computer control module.

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

- Provide push-button control of foam proportioning rates from 0.1% to 10%, in 0.1% increments
- Show current flow-per-minute of water
- Show total volume of water discharged during and after foam operations are completed
- Show total amount of foam concentrate consumed
- Simulate flow rates for manual operation
- Perform setup and diagnostic functions for the computer control microprocessor
- Flash a "low concentrate" warning when the foam concentrate tank (s) become low
- Flash a "no concentrate" warning and shut the foam concentrate pump off, preventing damage to the pump, should the foam tank(s) become empty

A 12 volt electric motor driven positive displacement foam concentrate pump shall be provided and installed in an accessible location. The pump capacity range shall be 0.1 to 2.6 GPM (9.8L/min) at 150 PSI with a maximum operating pressure up to 400 PSI (2750 kPa). The system shall draw a maximum of 40 amps at 12 volts. An electronic driver for the pump motor shall be mounted to the base of the pump and shall receive signals from the computer control display, and regulate the 1/2 horsepower (.40 Kw) electric motor directly coupled to the concentrate pump in a variable speed duty cycle to ensure that the correct proportion of concentrate, preset by the pump operator is injected into the water stream.

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

Components of the complete proportioning system as described above shall include:

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

The foam system shall be installed and calibrated to manufacturer's requirements. In addition the system shall be tested and certified by the apparatus manufacturer to meet applicable NFPA standards.

The foam system design shall be tested and pass environmental testing in accordance to SAE standards. The system shall be third party tested to certify compliance with RFI/EMI emissions per MIL-STD-416E.

An installation and operation manual shall be provided for the unit. The system shall have a one (1) year limited warranty by the foam system manufacturer.

CONTROL CONNECTION CABLE FOAM SYSTEM

The FoamPro 2001 Series foam system shall be provided with a twelve (12) foot control cable from the controller to the foam pump assembly.

PUMP PANEL CONTROL FOAM SYSTEM

The FoamPro 2001 Series foam system shall be provided with pump panel mounted control assembly.

INSTRUCTION AND RATING LABEL -- FOAM SYSTEM

A FoamPro part number 6032-0020 instruction and system rating label shall be provided. The label shall display information for a FoamPro 2001 Series foam system and shall meet applicable sections of the NFPA standards.

SCHEMATIC LABEL -- FOAM SYSTEM

A FoamPro foam system schematic label shall be installed on the pump panel near foam controls. The label shall be a diagram of the FoamPro 2001 foam system layout and shall meet applicable sections of the NFPA standards.

**1" FOAM TANK CONTROL -- CLASS A**

A Class A foam tank shall be plumbed with 1" valve and corrosion resistant hose from the foam tank to the foam inlet of the foam system. The manually opened valve shall be provided behind the pump panel with a label.

INTEGRAL CLASS A FOAM TANK -- 40 GALLON

A forty (40) gallon Class A foam tank shall be installed within the water tank. The non-corrosive foam tank shall meet applicable sections of NFPA standards. The foam concentrate tank shall be provided with sufficient wash partitions so that the maximum dimension perpendicular to the plane of any partition shall not exceed 36 inches. The swash partition(s) shall extend from wall to wall and cover at least 75 percent of the area of the plane of the partition.

The foam concentrate tank shall be provided with a fill tower or expansion compartment having a minimum area of 12 square inches and having a volume of not less than 2 percent of the total tank volume. The fill tower opening shall be protected by a completely sealed air-tight cover. The cover shall be attached to the fill tower by mechanical means. The fill opening shall be designed to incorporate a 1/4 inch removable screen and shall be located so that foam concentrate from a five (5) gallon container can be dumped directly to the bottom of the tank to minimize aeration without the use of funnels or other special devices.

The foam tank fill tower shall be equipped with a pressure/vacuum vent that enables the tank to compensate for changes in pressure or vacuum when filling or withdrawing foam concentrate from the tank. The pressure/vacuum vent shall not allow atmospheric air to enter the foam tank except during operation or to compensate for thermal fluctuations. The vent shall be protected to prevent foam concentrate from escaping or directly contacting the vent at any time. The vent shall be of sufficient size to prevent tank damage during filling or foam withdrawal.

A color coded label or visible permanent marking that reads "FOAM TANK FILL" shall be placed at or near any foam concentrate tank fills opening. A label shall be placed at or near any foam concentrate tank fill opening that specifies the type of foam concentrate the system is designed to use. Any restrictions on the types of foam concentrate that can be used with the system shall also be stated, and a warning message that reads "WARNING: DO NOT MIX BRANDS AND TYPES OF FOAM."

The foam concentrate tank outlet connection shall be designed and located to prevent aeration of the foam concentrate and shall allow withdrawal of 80 percent of the foam concentrate tank storage capacity under all operating conditions with the vehicle level.

The foam tank(s) shall be fabricated by United Plastic Fabricating.

FOAM TANK DRAIN -- UNDER TANK

The foam tank shall have a 1" gate valve drain provision installed.

CLASS A FOAM TANK GAUGE

A Fire Research TankVision Pro model WLA360-A00 foam tank indicator kit shall be installed at the operator's panel. The kit shall include an electronic indicator module, a pressure sensor, a 10-ft sensor cable and a tank vent. The indicator shall show the volume of Class A foam concentrate in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of Polycarbonate/Nylon, and have a distinctive green label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a datalink to connect remote indicators. Low foam warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the foam tank near the bottom. No probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors. The foam tank vent shall be installed on the foam fill tower.

**FOAM SYSTEM DESIGN AND PERFORMANCE REQUIREMENTS**

The proportioning system shall be capable of proportioning foam concentrate in accordance with the foam concentrate manufacturer's recommendations for the type of foam concentrate used in the system over the system's design range of flow and pressures. The foam proportioning system water flow characteristics and the range of proportioning ratio shall be specified as noted herein. The latest foam system shall be in compliance with applicable NFPA standards as it relates to this specified system

PLUMBING AND STRAINER

The foam concentrate supply line shall be non-collapsible. A means shall be provided to prevent water back flow into the foam proportioning system and the foam concentrate storage tank.

A strainer or filter shall be provided on the foam concentrate supply side of the foam proportioner to prevent any debris that might affect the operation of the foam proportioning system from entering the system. The strainer assembly shall consist of a removable straining element, housing, and retainer. The strainer assembly shall allow full flow capacity of the foam supply line.

FOAM SYSTEM CONTROLS

The foam proportioning system operating controls shall be located at or near the pump operator's position and shall be clearly identified. Foam proportioning system shall be provided with accessible controls to completely flush the system with water according to the manufacturer's instructions.

LABELS AND INSTRUCTIONS

An instruction plate shall be provided for the foam proportioning system that include, at a minimum, piping schematic of the system and basic operating instructions. Labels that are marked clearly with the identification and function shall be provided for each control, gauge, and indicator related to the foam proportioning system.

A label shall be provided on the pump operator's panel that identifies the type of foam concentrate that the foam proportioning system is designed to use. It shall also state the minimum/maximum foam proportioning rate at the minimum/maximum foam proportioning rated system flow and pressure.

Two (2) copies of an operations and maintenance manual shall be provided. They shall include a complete diagram of the system together with operating instructions and details outlining all recommended maintenance procedures.

FOAM SYSTEM TESTING

The accuracy of the foam proportioning system shall be certified by the foam equipment manufacturer and also tested by the installer prior to delivery of the apparatus in compliance to NFPA standards.

**SIDE MOUNT PUMP ENCLOSURE**

The side mount pump enclosure shall be removable and supported from the chassis frame rails. This enclosure will allow independent flexing of the pump enclosure from the body and allow for quick removal. The support structure shall be constructed of extruded aluminum tubing and angle.

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

The "master" gauges shall be suitably enclosed and mounted on a full pump compartment width "hinged" gauge panel constructed of the same material as the pump operators control panel, allowing access to the backside of all gauges and gauge lines. The individual gauges shall be mounted inline with the control handle or adjacent to the control handle. Panel is to include a stainless steel piano hinge, flush mounted chrome plated trigger latch, and stainless steel cable end stops. Electrical wiring and all gauge lines shall be properly tie wrapped to prevent kinking or cutting of the lines when the panel is opened.

The following controls and equipment as specified in the specifications, shall be provided on the pump panel or within the pump enclosure:

- Primer.
- Pump and plumbing area service lights.
- Pressure control device and throttle control.
- Fire pump and engine instruments.
- Pump intakes and discharge controls.
- Master intake and discharge gauges.
- Tank fill control.
- Tank suction control.
- Water tank level gauge.
- Pump panel lights.

SPEEDLAY INSTALLATION

Speedlay pre-connect hosebeds shall be installed in the forward section of the pump enclosure. The hosebed shall have smooth sides and a perforated floor to allow for drainage. Provisions shall be provided to secure hose and equipment per requirements of applicable NFPA standards.

**OPEN DUNNAGE COMPARTMENT -- OVER PUMP ENCLOSURE**

An open compartment shall be located on the top of the pump module. The compartment will be constructed as large as space permits with removable slip resistance floor material or decking in the base of the compartment.

LEFT SIDE RUNNING BOARD -- SIDE MOUNT PANEL

The left side mount pump panel shall be equipped with side running board. The running board will extend along the width of the pump enclosure from the forward end of the body module to behind the chassis cab.

The running board shall be constructed of aluminum tread plate, bolted in place with stainless steel fasteners. The step surfaces shall be in compliance with applicable sections of NFPA requirements.

HOSEWELL COMPARTMENT -- LEFT SIDE RUNNING BOARD

A hosewell shall be recessed in the left side running board of the apparatus pump panel. The hosewell shall be constructed of aluminum material and shall be provided with drain holes drilled in each bottom corner with plastic grating on the floor.

The hose and couplings shall be secured in compliance to applicable NFPA standards.

Capacity for the following purchaser supplied hose:

HOSE WELL SECUREMENT

There shall be two (2) Velcro straps provided for the securement of the hose in the running board hose well.

RIGHT SIDE RUNNING BOARD -- SIDE MOUNT PANEL

The right side mount pump panel shall be equipped with side running board. The running board will extend along the width of the pump enclosure from the forward end of the body module to behind the chassis cab.

The running board shall be constructed of aluminum tread plate, bolted in place with stainless steel fasteners. The step surfaces shall be in compliance with applicable sections of NFPA requirements.

HOSEWELL COMPARTMENT -- RIGHTSIDE RUNNING BOARD

A hosewell shall be recessed in the right side running board of the apparatus pump panel. The hosewell shall be constructed of aluminum material and shall be provided with drain holes drilled in each bottom corner with plastic grating on the floor.

The hose and couplings shall be secured in compliance to applicable NFPA standards.

Capacity for the following purchaser supplied hose:

HOSE WELL SECUREMENT

There shall be two (2) Velcro straps provided for the securement of the hose in the running board hose well.

GAUGE PANEL -- LEFT SIDE UPPER

A gauge panel shall be provided on the upper left side of the side mount pump enclosure. The gauge panel shall be constructed of 14 gauge #304 brushed stainless steel and hinged. The gauge panel shall be held in the closed position with push button type latches.

PUMP ENCLOSURE ACCESS DOOR -- RIGHT SIDE UPPER

A pump panel access door shall be provided on the upper right side of the side mount pump enclosure. The door shall be constructed of 14 gauge #304 brushed stainless steel with push button type latches.

PUMP PANELS -- SIDE MOUNT

The pump operator's panel, along with the lower left hand and right hand pump panels shall be constructed of 14 gauge #304 brushed stainless steel.

LEFT SIDE PUMP PANEL -- BOLTED

The pump panel installed on the left hand side of the pump enclosure shall be fastened to the pump enclosure with 1/4" stainless steel bolts.

The left hand side lower pump panel shall be recessed when using externally mounted intake valves.

RIGHT SIDE PUMP PANEL -- BOLTED

The pump panel installed on the right hand side of the pump enclosure shall be fastened to the pump enclosure with 1/4" stainless steel bolts.

ROLL UP PUMP PANEL DOOR -- LEFT SIDE

The left side pump panel shall have be enclosure with a roll-up style compartment door. The door shall be constructed of anodized aluminum slats, painted to match the body.

COMPARTMENT LIGHTS

Compartment shall be provided with two (2) fully recessed, rubber shock mounted, sealed and weathertight LED clear compartment light. The lights shall be totally enclosed (not exposed to the environment) and side wall recess mounted. One (1) light shall be mounted within 12.00" of the compartment ceiling. One (1) shall be mounted approximately one half the distance between the upper light and the compartment floor.

The lights shall be a minimum of 4.00" diameter and use recessed wiring, and are to be equipped with wire plugs for ease of removable or replacement.

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

ROLL UP PUMP PANEL DOOR -- RIGHT SIDE

The right side pump panel shall have be enclosure with a roll-up style compartment door. The door shall be constructed of anodized aluminum slats, painted to match the body.

COMPARTMENT LIGHTS

Compartment shall be provided with two (2) fully recessed, rubber shock mounted, sealed and weathertight LED clear compartment light. The lights shall be totally enclosed (not exposed to the environment) and side wall recess mounted. One (1) light shall be mounted within 12.00" of the compartment ceiling. One (1) shall be mounted approximately one half the distance between the upper light and the compartment floor.

The lights shall be a minimum of 4.00" diameter and use recessed wiring, and are to be equipped with wire plugs for ease of removable or replacement.

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

PUMP COMPARTMENT HEATER SYSTEM

The interior of the pump enclosure shall be equipped with a minimum of 30,000 BTU hot water heater system. The unit shall be piped to the chassis radiator system with standard heater hose. The hose shall be properly clamped and secured in place, and be properly protected from engine exhaust or mechanical damage.

The heater system shall be equipped with a 12-volt blower fan with switch located on the pump operator's panel. The switch shall be labeled accordingly.

PUMP ENCLOSURE HEAT PAN

A removable casing fabricated from smooth aluminum, completely enclosing the underside of the pump compartment and heated by the engine exhaust shall be provided. The heat pan assembly shall include individual panels that can be easily removed from there mounting locations. The two outer slide-out panels shall be bolted in place.

LABELS

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

The labels shall include rated capacities, pressure ratings, and engine speeds as determined by the certification tests. The no-load governed speed of the engine, as stated by the engine manufacturer, shall also be included.

The labels shall be provided with all information and be attached to the apparatus prior to delivery.

COLOR CODED PUMP PANEL LABELING AND NAMEPLATES

Discharge and intake valve controls shall be color coded in compliance to guidelines of applicable sections of NFPA standards.

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

MIDSHIP PUMP PANEL LIGHTS -- LEFT SIDE

Three (3) Grote #01-61F8-70 low profile LED lights with clear lenses shall be installed under an instrument panel light hood on the left side pump panel. The lights shall be controlled by a switch located on the operator's instrument panel.

MIDSHIP PUMP PANEL LIGHTS -- RIGHT SIDE

Three (3) Grote #01-61F8-70 low profile LED lights with clear lenses shall be installed under an instrument panel light hood on the right side pump panel. The lights shall be controlled by a switch located on the operator's instrument panel.

MASTER DISCHARGE AND INTAKE GAUGES

Two (2) 4" diameter IC discharge pressure and intake gauges (30"-0-600 PSI) shall be provided. The face of the gauge shall be a WHITE dial with black letters. The gauges will be located on the pump instrument panel.

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

TEST TAPS

Test taps for pump intake and pump pressure shall be provided on the pump instrument panel and be properly labeled.

WATER TANK GAUGE

A Fire Research TankVision Pro model WLA300-A00 tank indicator kit shall be installed on the pump panel. The kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall place on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

AIR HORN PUSH-BUTTON

A push button with a label shall be installed on the pump instrument panel to operate the air horns.

AIR OUTLET - LEFT SIDE PUMP PANEL

An auxiliary air outlet with a quick release fitting shall be installed on the driver side pump panel. The air outlet shall be piped to a protected air tank with a check valve on the chassis air brake system.

**WATER TANK - 1000 GALLON**

The apparatus shall be equipped with a one-thousand (1000) gallon polypropylene water tank. The tank shall be equipped with a four-inch (4") overflow pipe.

The apparatus shall be equipped with a polypropylene water tank. The tank body and end bulkheads shall be constructed of .75" thick, polypropylene, nitrogen-welded and tested inside and out. Tank construction shall conform to applicable NFPA standards. The tank shall carry a lifetime warranty.

The transverse and longitudinal .375" thick swash partitions shall be interlocked and welded to each other as well as to the walls of the tank. The partitions shall be designed and equipped with vent holes to permit air and liquid movement between compartments.

The .5" thick cover shall be recessed .375" from the top of the side walls. Hold down dowels shall extend through and be welded to both the covers and the transverse partitions, providing rigidity during fast fill operations. Drilled and tapped holes for lifting eyes shall be provided in the top area of the booster tank.

A combination vent/water fill tower shall be provided at front of the tank. The 0.5" thick polypropylene fill and overflow tower shall be equipped with a hinged lid and a removable polypropylene screen. The overflow tube shall be installed in fill tower and piped with a minimum schedule 40 PVC pipe through the tank.

The water tank sump shall be located in the forward area of the tank. There will be a schedule 40 polypropylene tank suction pipe from the front of the tank to the tank sump. The tank drain and clean out shall be located in the bottom of the tank sump. The sump shall have a minimum 3" threaded outlet on the bottom to be used for a combination clean out and drain.

The pump to tank refill connection shall be a sized to mate with tank fill discharge line. A deflector shield inside the tank will also be provided.

The tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area.

The tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4” x 1” and a hardness of approximately 60 durometer. The rubber must be installed so it will not become dislodged during normal operation of the vehicle. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both in the front and rear as well as side to side to prevent tank from shifting during vehicle operation.

A picture frame type cradle mount with a minimum of 2" x 2" x 1/4” mild steel, stainless steel, or aluminum angle shall be provided or the use of corner angles having a minimum dimension of 4" x 4" x 1/4” by 6” high are permitted for the purpose of capturing the tank.

Although the tank is designed on a free floating suspension principle, it is required that the tank have adequate vertical hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on top of the tank, half way between the front and the rear on each side of the tank. These stops can be constructed of steel, stainless steel or aluminum angle having minimum dimensions of 3" x 3" x 1/4” and shall be approximately 6” to 12” long. These brackets must incorporate rubber isolating pads with a minimum thickness of 1/4” inch and a hardness of 60 durometer affixed on the underside of the angle. The angle should then be bolted to the body side walls of the vehicle while extending down to rest on the top outside edge of the upper side wall of the tank.

Hose beds floors must be so designed that the floor slat supports extend full width from side wall to side wall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur. Tank top must be capable of supporting loads up to 200 lbs per sq. foot when evenly distributed. Other equipment such as generators, portable pumps, etc. must not be mounted directly to the tank top unless provisions have been designed into the tank for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

The tank construction shall include PolyProSeal™ technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method shall provide a liquid barrier, offering leak protection in the event of a weld compromise.

The tank shall be equipped with Polychromatic fill towers. The water fill tower shall be blue in color. The foam tank fill towers, if applicable, shall be yellow for foam A and green for foam B and black for any additional foam fill towers.

The water tank shall be certified for the capacity of the water tank prior to delivery of the apparatus. This capacity shall be recorded on the manufacturer's record of construction and the certification shall be provided to the purchaser when the apparatus is delivered.

The tank shall be manufactured by United Plastic Fabricating (UPF).

**WATER TANK FILL TOWER**

A fill tower measuring approximately 10” x 10” square shall be provided on the water tank.

Tank suction shall be located in a sump assembly located below the bottom of the tank, properly baffled to prevent surging of water. A 3" cleanout plug shall be provided in the bottom of the tank sump.

HOSEBED WIDTH

The width of the pumper body hosebed shall be 42".

**ALUMINUM HOSEBED GRATING**

The hose bed compartment deck shall be constructed entirely from maintenance-free, extruded aluminum slats. The slats shall have an anodized, radiused ribbed top surface. The slats shall be of widths approximately 3/4" high x 6" wide, space 1/2" apart and shall be welded into a one-piece grid system to prevent the accumulation of water and allow ventilation to assist in drying hose.

HOSE BED STORAGE CAPACITY

The hose bed shall be designed to have a storage capacity for a minimum of 30 cubic feet of fire department supplied fire hose.

The hose bed shall be designed to have storage capacity for six (6) 50-ft lengths of 2.5” Double Jacket fire hose.

The hose bed shall be designed to have storage capacity for ten (10) 100-ft lengths of 5” LDH Single Jacket rubber fire.

ALUMINUM HOSEBED DIVIDER

One (1) adjustable hosebed divider constructed of .250" aluminum shall be installed on the apparatus.

The divider shall be fully adjustable, mounted using extruded aluminum track at the rear and aluminum "C" channel tracks at the front of the divider for full side to side adjustment.

Each hosebed divider installed on the apparatus shall be provided with a hand hole cut-out approximately 3" wide x 8" long.

A stationary hosebed partition shall be provided in the main hosebed, mounted left to right. The partition shall be fabricated of .190" smooth aluminum. Partition shall be bolted in place using stainless steel fasteners to allow for ease of removal or relocation.

ALUMINUM HOSEBED COVER

Polished aluminum treadplate hosebed covers shall be furnished, extending the full length and width of the main hosebed.

Covers shall be fabricated of .125" polished aluminum treadplate with cross bracing for maximum strength, and to support the weight of a firefighter standing on the covers when closed. The covers shall be of the sloped design for proper water runoff. Each cover to be equipped with a full length stainless steel piano hinge. Hosebed covers shall include heavy duty stops to support them when in the opened position.

MAIN HOSEBED DIVIDER

One (1) stationary hosebed divider shall be provided in the main hosebed.

The hosebed divider shall be fabricated of 1/4" smooth aluminum sheet stock, pressed into a "T" shaped aluminum extrusion for added strength along the bottom and front edges of the divider.

Divider shall be bolted in place, front and rear, to allow for ease of removal or relocation.

MANUALLY OPERATED ALUMINUM HOSEBED COVER

The polished aluminum treadplate hosebed covers extending the full-length and width of the main hosebed shall have lift up handles installed on each hose cover to manually open the hosebed covers.

HOSEBED LED LIGHTS

Four (4) 48" long OnScene Solutions Access LED light shall be installed and produce approximately 10050 lumens per light. The light stick shall be rated at 100,000 hours of service and shall be provided with a 5 year free replacement warranty. The light shall have a 5/8" LEXAN™ polycarbonate tube enclosure for severe duty applications. The light stick shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.

The LED lights shall be recessed into the underside of the hinged aluminum hosebed covers to provide illumination for repacking of fire hose. The 12 volt LED lights shall be automatically controlled by a switch which activates upon opening of the door. The lights shall also be connected to the hazard light in the chassis cab to indicate when the hose bed covers are in the open position.

REAR VINYL FLAPS FOR ALUMINUM COVER

There shall be a vinyl flaps attached to each aluminum hosebed cover. The vinyl flaps shall cover the area on the rear of the hosebed from top to bottom. The flaps shall be independent of each other but attachable with velcro in the center. The bottom edge of the flap shall be shall be secured utilizing a hook and loop fastening system.

The vinyl cover shall be red in color.

**HEAVY DUTY EXTRUDED ALUMINUM BODY**

To prevent possible interaction of dissimilar metals and to reduce the weight of the completed apparatus, the body and ALL STRUCTURAL SUPPORTS shall be constructed entirely of aluminum sheet and aluminum extrusions.

Aluminum extrusions or sheet aluminum of smaller thicknesses or lesser grades to those specified herein are not acceptable.

The aluminum extrusion alloy shall be 6061 with a temper rating of T6, and have a tensile strength of 45,000 PSI and yield strength of 40,000 pounds.

The smooth aluminum sheet material alloy shall be 5052 with a temper rating of H32, and have a tensile strength of 33,000 PSI and yield strength of 28,000 pounds.

The aluminum treadplate alloy shall be 3003 with a temper rating of H22, and have a tensile strength of 30,000 PSI and yield strength of 28,000 pounds.

All extrusions utilized in the body superstructure, substructure and framing shall be 6061-T6 alloy aluminum. All extrusions shall be beveled at each joint and all seams shall be electrically seam welded using #5356 alloy aluminum wire. For strength and rigidity, all aluminum sheets utilized in the apparatus body for structural support shall be a minimum of **3/16"** 5052-H32 alloy aluminum sheet.

FASTENERS

All fasteners use in the apparatus body shall be attached with Ny-Lok type fasteners.

All aluminum and stainless steel components shall be attached using stainless steel fasteners. Zinc or cadmium plated fasteners are not acceptable for use with any aluminum or stainless steel components on the vehicle.

Compartment door hinges, handrails and running boards shall be attached using a minimum of 1/4" diameter machine bolt fasteners. Fasteners used in nonstructural areas such as; door handles, trim moldings, gauge mounting, etc shall be 3/16" in diameter.

BODY SUPERSTRUCTURE CONSTRUCTION

All vertical and horizontal structural members of the outer apparatus body shall be constructed of no less than 4.00" by 12.00", 6061-T6 aluminum extrusions with a minimum .200" wall thickness fully welded together forming a unitized support system for the body and compartments. In order to provide a complete internal and integrated body super-structure, full height extruded structural members shall be provided at each corner of the apparatus and between each exterior equipment compartment.

EXTERIOR COMPARTMENT CONSTRUCTION

Compartment sides and walls shall be welded to the super-structure. Seams shall be sealed using an engineered grade polyurethane adhesive-sealant.

The compartments shall be designed to provide protected raceways for vertically hinged door fastener retention elements. This requirement shall eliminate the possibility of door hinge hardware from being damaged by or damaging equipment stored in the compartments.

The compartment door openings are to be full width of the compartment with no loss of space. The raceways shall be designed to allow door hardware removal by a single person with simple hand tools.

Full height access panels fastened with stainless steel fasteners shall be provided to access all wiring routed through vertical super-structure extrusions. There shall be no exposed wiring allowed within the compartment interiors.

Compartment flooring shall be constructed of a combination aluminum extrusion and aluminum treadplate welded in place to the extruded aluminum framework creating a double compartment floor for added strength. Due to the high usage and wear and tear caused by removal of equipment, only treadplate aluminum with a raised pattern will be acceptable for compartment flooring. Bolted or welded in smooth raw aluminum or painted aluminum does not meet the intent nor technical requirement of raised pattern treadplate.

The tops of the side exterior compartments shall be constructed of NFPA #1901 Standards compliant non-slip polished aluminum treadplate fastened to the body with stainless steel fasteners. Compartment tops that are welded in place do not meet the serviceability intent of this requirement.

SHELVING TRACKS

The vertical extrusions forming the framework of the side exterior compartmentation shall be designed to incorporate FULLY RECESSED adjustable shelving standards. Shelving tracks shall run full height of **ALL** side exterior equipment compartment.

The intent of this requirement is to allow full use of the available storage areas without the interference of shelving tracks extending into and reducing the interior widths of the compartments which will allow equipment to be stored within the full width of the compartment interiors.

Shelving, when specified, shall have a width of no less than .50" of the overall compartment width.

Adjustable shelving tracks welded or bolted onto interior walls of the compartments do not meet the intent of these specifications.

HOSE BODY CONSTRUCTION

To maintain strength and rigidity, the main hose body shall be completely framed with a minimum of 2.00" X 3.00" 6061-T6 alloy aluminum extrusions with a minimum wall thickness .156" on the three inch legs and a minimum wall thickness of .188" on the two inch legs. The hose body extrusions shall be welded to the super-structure framework, becoming an integral portion of a complete unitized support system. Sheet metal or sheet aluminum with double or triple formed breaks, does not meet the technical requirement of the specification in providing a complete hosebody framework and are not acceptable. Sides shall be constructed of aluminum sheet welded to the framework.

**ELECTROLYSIS CORROSION CONTROL**

The apparatus shall be assembled using ECK or electrolysis corrosion control, on all high corrosion potential areas, such as door latches, door hinges, trim plates, fenderettes, etc. This coating is a high zinc compound that shall act as a sacrificial barrier to prevent electrolysis and corrosion between dissimilar metals. This shall be in addition to any other barrier material that may be used.

All 1/4" diameter and smaller screws and bolts shall be stainless steel.

Due to the expected life of the vehicle, proposals will only be acceptable from manufacturers that include these corrosion features.

**SIDE BODY HEIGHT**

The side body height from the top of the rear tailboard to the top of the body shall be 94" high to match the raised roof cab height. This height may also be referred to as the hose bed riser height.

**SIDE BODY HEADER**

All high side compartment tops shall be NFPA approved non-slip treadplate with the side body header area above the compartment doors a smooth aluminum painted surface.

Lower or rear face compartments, if specified shall be provided with polished aluminum drip rails.

## WHEEL WELL PANEL AND LINER

For ease of accessibility and maintenance, wheel well panels shall be double break formed painted smooth aluminum plate that is fully gasketed and bolted in place with stainless fasteners. Wheel wells shall be of the removable design so as to provide replacement in the event of damage. There shall be no visible bolt heads, retention nuts or fasteners on the exterior surface of the panel. Wheelwell panel shall be isolated from the apparatus body utilizing .25" nylon spacer blocks.

To fully protect the wheel well area from road debris and to aid in cleaning, a full depth (minimum of 24.00") radius wheel well liner constructed of exterior grade .25" black polyethylene sheet shall be provided. For ease of removal, the liner shall be held in place by a self-captive retention design. Due to possible corrosion and contamination by road debris in the wheel well area a minimal number of mechanical fasteners shall be used to secure the wheel well liner at the front and rear edges.

## FENDERETTES

The rear wheel wells shall be radius cut for a streamlined appearance. A polished type 304 stainless steel radius fenderette shall be furnished at each rear wheel well opening, held in place with concealed stainless steel fasteners with nylon isolators to prevent contact of the fastener with the wheelwell housing panel. A black rubber gasket shall be installed between the stainless fenderette and the apparatus body sides. Silicone caulking does not meet the intent nor the technical requirement of a solid gasket material in this area and is not acceptable.

## ALUMINUM SUB-FRAME

The surface of the chassis frame rails shall be isolated from the apparatus substructure by an elastomeric isolator.

The main body sub-frame shall be fully welded to the longitudinal chassis extrusions. Two (2) 6061-T6 aluminum longitudinal extrusions shall be provided, one (1) on each chassis frame rail running full length beneath the apparatus body. A minimum .50" extruded wall thickness shall be provided on the top flange of the chassis frame rail. Each extrusion shall be designed to cover the complete top flange and outside radius of the chassis frame rail extending down the outside web of the frame rail a minimum of 1.25" to prevent side to side shifting of the apparatus body.

The main body sub-frame shall be constructed of not less than four (4) 4.00" by 2.50" tubular, 6061-T6 aluminum, "I" beams with a .375" vertical main body crossmembers. A minimum of four (4) crossmembers shall be provided two ahead of and two behind the rear axle forming the main body support crossmembers.

The main cross tubes shall be routed through and fully welded to the vertical and horizontal extrusions forming the body super-structure.

For added strength and rigidity, no less than six (6) intermediate body crossmembers shall be provided constructed of solid aluminum structural "I" beams 4.00" high by 3.00" wide with a minimum .29" flange thickness. If necessary, additional crossmembers shall be provided, to meet the minimum booster tank mounting requirements, as published by the manufacturer of the booster tank provided.

The intermediate structural "I" beam crossmembers shall be interconnected and welded to the main body tubular crossmembers forming a fully welded support grid for the body super-structure compartments and booster tank.

A minimum of six (6) U-bolts shall be provided to secure the body sub-structure to the chassis frame. The forward two (2) U-bolts shall be shock absorbing spring tension type to allow for flexing without placing stress on the apparatus body or chassis frame rails.

**BODY WIDTH**

The overall width of the pumper body shall not exceed 100". The overall width across the rub rails shall be 101".

COMPARTMENT DEPTH

All left side compartments shall have an interior useable depth of not less than 26" the full height of each compartment with the specified doors in the closed position in order to provide the maximum amount of storage area.

All right side upper compartments shall have an interior usable depth of not less than 12" in the upper portion with the specified doors in the closed position.

The right side lower portion of the forward and rear side compartments of the body are to be notched in and under the water tank to a useable depth of 26" with the specified doors in the closed position in order to provide the maximum amount of storage area.

**ROLL-UP DOOR CONSTRUCTION**

Exterior side equipment compartments so specified shall be equipped with roll-up shutter doors to be installed as specified herein. The door shall be located above and outside of the interior of the compartments thereby protecting the door in the raised position from possible damage by the shifting of equipment.

The door roll mechanism shall also be protected from possible damage should equipment shift while the vehicle is in transit with the door in the closed position.

When the door is raised, the location of the drum assembly shall not allow water drainage from the doors into any portion of the interior of the compartment, thereby preventing the accumulation of water, snow, or ice from damaging the equipment located therein.

The roll-up door drum assembly shall be fully enclosed and protected from the elements. Provisions shall be made on each end and each side of the apparatus for moisture to self-drain from the raised doors to below the apparatus body using integral drainage ports.

To provide access for repairs and adjustments without removing equipment from the compartments, the door roll assemblies shall be serviced from above the compartment. There shall be no need to remove any equipment nor to open the door to provide service to the same. Should a door be prohibited from being raised because of damage to or a defect in the roller assembly, service must be capable of being performed without the cutting, damaging or destroying of the door shutters to gain access. Access to the door mechanism shall be provided through the removable door roller assembly access panel that requires only the use of common hand tools to remove.

Pendent plates supporting the door roll assembly shall be bolted in place, adjustable and capable of being removed with common hand tools. Pendent plates and supports that are welded in place do not meet the maintenance and service criteria of these specifications.

In order to provide unlimited access to stored equipment and to help prevent damage to the tracks by removing equipment, the tracks shall not protrude into any portion of the door frame opening. The width of the door frame opening shall be the actual useable width available to store and remove equipment. No Exception.

Door openings shall match the compartment sizes as specified.

The roll up door(s) shall be fabricated from aluminum extrusions and be manufactured and assembled in the United States.

The door slats shall be double-wall extrusions with dimensions of 1.366" high x .315" thick. The exterior surface shall be flat and the interior surface concave to deflect loose equipment to prevent the door from jamming. Each slat shall have interlocking end shoes to prevent the slat from moving side to side resulting in binding of the door. Each slat shall be separated by a co-extruded PVC and rubber inner seal to prevent metal to metal contact and minimize dirt and moisture from entering the compartment. The inner seal shall not be visible from the exterior to maintain a clean appearance of door. The slats shall have interlocking joints with a folding locking flange to provide security and prevent penetration by sharp objects.

The track shall be a one (1) piece aluminum assembly that has an attaching flange and finishing flange incorporated into the design that facilitates installation and provides a finished look to the door without additional trim or caulking. A low profile side seal shall be utilized to maximize usable compartment space.

A drip rail designed to prevent water from dripping into the compartment shall be provided. The drip rail shall have a built in replaceable non-contacting seal to eliminate scratching of the surface of the door.

Bottom rail extrusion must have smooth back to prevent loose equipment from jamming the door and have “V” shaped double seal to prevent water and debris from entering the compartment. A two (2) inch wide finger pull shall be integrated into the bottom rail extrusion for easy one hand opening and closing. The door latch system shall be a full width one (1) piece lift bar that enables the user to operate with one hand.

A magnetic door ajar system shall be integrated in the lift bar handle and the lift bar handle retainer block to signal an open door.

The roll mechanism shall have a clip system that connects the curtain slats to the operator drum to allow for easy tension adjustment without tools. A four (4) inch diameter counterbalanced operator drum to shall be incorporated to assist in lifting the door.

**EZ-PULL DOWN STRAPS**

Nine (9) elastic nylon straps shall be provided and installed on each roll up door. The straps shall be secured to the side wall of the interior compartment in a way that will allow the EZ-Pull strap to contract automatically and tuck inside the compartment when closed to prevent the strap from dangling and hindering closing of the door. When the door is the open position, the straps shall be installed so that they are fully extended as to not interfere with removing items from the compartment. For the ease of locating, the straps shall be bright orange in color.

**BODY LENGTH**

The apparatus body shall be 164" long, reference the drawing for actual body length.

## COMPARTMENT HEIGHT

The left side full height body compartments shall be 63" high and equipped with a 63" high clear door opening.

The left side upper level compartment(s) shall be 32" high and equipped with a 32" high clear door opening.

## LEFT FRONT COMPARTMENT

There shall be one (1) 44" wide full height compartment located ahead of the rear wheels. The compartment shall be equipped with a full height single painted roll up door.

The compartment shall be equipped with the following:

A removable louvered vent shall be provided in the compartment.

### ADJUSTABLE SHELF

Two (2) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

### COMPARTMENT LIGHTING

The compartment shall be provided with Rosenbauer InVisiLight LED Compartment lighting. The lighting shall be installed in the adjustable shelving track which shall be recessed into the side wall of the compartment. The lighting shall provide a continuous illumination from the compartment bottom to top and side to side while still allowing for full adjustment of any compartment provision (shelf/tray/etc.). To prevent damage, lights that protrude into the compartment in any fashion shall be deemed unacceptable.

The lights shall be installed in the shelving tracks; two (2) lights 56" in length shall be installed, one on each side of the compartment. The lights shall produce approximately 17 lumens per inch of lighting.

The lights shall be provided with a 5-Year warranty.

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

**LEFT OVERWHEEL COMPARTMENT**

There shall be one (1) 60" wide compartment above the rear wheels. The compartment shall be equipped with a single painted roll up door.

The compartment shall be equipped with the following:

A removable louvered vent shall be provided in the compartment.

ADJUSTABLE SHELF

One (1) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

COMPARTMENT LIGHTING

The compartment shall be provided with Rosenbauer InVisiLight LED Compartment lighting. The lighting shall be installed in the adjustable shelving track which shall be recessed into the side wall of the compartment. The lighting shall provide a continuous illumination from the compartment bottom to top and side to side while still allowing for full adjustment of any compartment provision (shelf/tray/etc.). To prevent damage, lights that protrude into the compartment in any fashion shall be deemed unacceptable.

The lights shall be installed in the shelving tracks; two (2) lights 28" in length shall be installed, one on each side of the compartment. The lights shall produce approximately 17 lumens per inch of lighting.

The lights shall be provided with a 5-Year warranty.

An additional InVisiLight up to 56" in length shall be installed in the recessed track in the ceiling.

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

## LEFT REAR COMPARTMENT

There shall be one (1) 44" wide full height compartment located behind the rear wheels. The compartment shall be equipped with a full height single painted roll up door.

The compartment shall be equipped with the following:

A removable louvered vent shall be provided in the compartment.

ADJUSTABLE SHELF

Two (2) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

COMPARTMENT DIVIDER

One (1) compartment divider constructed from 3/16" smooth aluminum material shall be installed. The divider shall be bolted in for ease of removal.

ADJUSTABLE SHELVING TRACKS

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

EQUIPMENT SECUREMENT

The compartment storage bins shall be equipped with nylon straps with velcro fasteners to secure the equipment. The nylon straps shall be secured with footman loops with stainless steel fasteners.

COMPARTMENT LIGHTING

The compartment shall be provided with Rosenbauer InVisiLight LED Compartment lighting. The lighting shall be installed in the adjustable shelving track which shall be recessed into the side wall of the compartment. The lighting shall provide a continuous illumination from the compartment bottom to top and side to side while still allowing for full adjustment of any compartment provision (shelf/tray/etc.). To prevent damage, lights that protrude into the compartment in any fashion shall be deemed unacceptable.

The lights shall be installed in the shelving tracks; two (2) lights 56" in length shall be installed, one on each side of the compartment. The lights shall produce approximately 17 lumens per inch of lighting.

The lights shall be provided with a 5-Year warranty.

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

## COMPARTMENT HEIGHT

The right side full height body compartments shall be 63" high and equipped with a 63" high clear door opening.

The right side upper level compartment(s) shall be 32" high and equipped with a 32" high clear door opening.

## RIGHT FRONT COMPARTMENT

There shall be one (1) 44" wide full height compartment located ahead of the rear wheels. The compartment shall be equipped with a full height single painted roll up door.

The compartment shall be equipped with the following:

A removable louvered vent shall be provided in the compartment.

### ADJUSTABLE SHELF

Two (2) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

### COMPARTMENT LIGHTING

The compartment shall be provided with Rosenbauer InVisiLight LED Compartment lighting. The lighting shall be installed in the adjustable shelving track which shall be recessed into the side wall of the compartment. The lighting shall provide a continuous illumination from the compartment bottom to top and side to side while still allowing for full adjustment of any compartment provision (shelf/tray/etc.). To prevent damage, lights that protrude into the compartment in any fashion shall be deemed unacceptable.

The lights shall be installed in the shelving tracks; two (2) lights 56" in length shall be installed, one on each side of the compartment. The lights shall produce approximately 17 lumens per inch of lighting.

The lights shall be provided with a 5-Year warranty.

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

## RIGHT OVERWHEEL COMPARTMENT

There shall be one (1) 60" wide compartment above the rear wheels. The compartment shall be equipped with a single painted roll up door.

The compartment shall be equipped with the following:

A removable louvered vent shall be provided in the compartment.

ADJUSTABLE SHELF

One (1) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

COMPARTMENT DIVIDER

One (1) compartment divider constructed from 3/16" smooth aluminum material shall be installed. The divider shall be bolted in for ease of removal.

SWING-OUT ALUMINUM TOOL BOARD

One (1) 250 lb. rated capacity swing-out tool board(s) shall be provided. There shall be mounting/pivot points located at both the top and bottom of the tool board. The mounting points on the apparatus body shall be suitably designed to support the intended weight.

A single latch mechanism shall be provided to lock the tool board in the stored position and in the open position.

The tool board shall be provided with a .125" aluminum tool board panel for mounting equipment.

COMPARTMENT LIGHTING

The compartment shall be provided with Rosenbauer InVisiLight LED Compartment lighting. The lighting shall be installed in the adjustable shelving track which shall be recessed into the side wall of the compartment. The lighting shall provide a continuous illumination from the compartment bottom to top and side to side while still allowing for full adjustment of any compartment provision (shelf/tray/etc.). To prevent damage, lights that protrude into the compartment in any fashion shall be deemed unacceptable.

The lights shall be installed in the shelving tracks; two (2) lights 28" in length shall be installed, one on each side of the compartment. The lights shall produce approximately 17 lumens per inch of lighting.

The lights shall be provided with a 5-Year warranty.

An additional InVisiLight up to 56" in length shall be installed in the recessed track in the ceiling.

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

**RIGHT REAR COMPARTMENT**

There shall be one (1) 44" wide full height compartment located behind the rear wheels. The compartment shall be equipped with a full height single painted roll up door.

The compartment shall be equipped with the following:

A removable louvered vent shall be provided in the compartment.

ADJUSTABLE SHELF

Two (2) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

500# ROLLOUT TRAY

One (1) rollout equipment tray shall be installed in a standard depth compartment. The 500# rated tracks shall have roller bearings. The tray shall be constructed of .188" smooth aluminum plate, fabricated with four 3" sides.

The unit shall roll fully out of the compartment, with a gas operator to hold tray in both the "in and out" positions.

## REFLECTIVE STRIPE

The outer edge and both sides of the shelf, slide-out tray, pull-out tool board, swing-out tool board, or pull-out and down tray shall have alternating red and white reflective DOT striping applied for safety.

### COMPARTMENT LIGHTING

The compartment shall be provided with Rosenbauer InVisiLight LED Compartment lighting. The lighting shall be installed in the adjustable shelving track which shall be recessed into the side wall of the compartment. The lighting shall provide a continuous illumination from the compartment bottom to top and side to side while still allowing for full adjustment of any compartment provision (shelf/tray/etc.). To prevent damage, lights that protrude into the compartment in any fashion shall be deemed unacceptable.

The lights shall be installed in the shelving tracks; two (2) lights 56" in length shall be installed, one on each side of the compartment. The lights shall produce approximately 17 lumens per inch of lighting.

The lights shall be provided with a 5-Year warranty.

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

## REAR BODY CONFIGURATION

The rear of the apparatus body shall be of the flat back design.

## REAR CENTER COMPARTMENT

There shall be one (1) full height compartment located at the rear of the apparatus. The compartment shall be equipped with a full height natural finish roll up door. The compartment shall be partitioned off from the side compartments.

The compartment shall be equipped with the following:

A removable louvered vent shall be provided in the compartment.

### ADJUSTABLE SHELF

One (1) compartment shelf(ves) shall be provided and constructed of .190" smooth aluminum, and are to have formed upward breaks on front and rear for added strength. Shelve(s) shall be fully adjustable within the compartments. Lighter gauge shelf materials are not acceptable.

Shelf(ves) shall extend full width of the compartments, within .50" of the overall width, and adjust up and down in the integral shelf tracks.

500# ROLLOUT TRAY

One (1) rollout equipment tray shall be installed in a standard depth compartment. The 500# rated tracks shall have roller bearings. The tray shall be constructed of .188" smooth aluminum plate, fabricated with four 3" sides.

The unit shall roll fully out of the compartment, with a gas operator to hold tray in both the "in and out" positions.

**REFLECTIVE STRIPE**

The outer edge and both sides of the shelf, slide-out tray, pull-out tool board, swing-out tool board, or pull-out and down tray shall have alternating red and white reflective DOT striping applied for safety.

COMPARTMENT LIGHTS

Two (2) 45" long OnScene Solutions Night Axe LED lights shall be installed, one on each side of the door opening. The lights shall contain 30 LEDs per light producing approximately 185 lumens (six LEDs and 37 lumens every 9"). The light stick shall be rated at 100,000 hours of service and shall be provided with a 10 year free replacement warranty. The light shall have a 5/8" LEXAN™ polycarbonate tube enclosure for severe duty applications.

The light stick shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.

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

**REAR STEP - 12” BOLT-ON**

A 12" deep step surface shall be provided at the rear of the apparatus body, bolted in place and easily removable for replacement or repair. The rear step/tailboard shall be notched in the center to provide easy access to the rear compartment, equipment, controls or any other items located at the rear center of the apparatus body. The tailboard shall be constructed of .188" aluminum diamond plate or equal non-slip surface in compliance with NFPA #1901 standards and "TIG" welded. The tailboard shall be equipped with cast aluminum replaceable radiused corners for a pleasing appearance.

The maximum height of the step assembly shall be no more than 24" from the ground when the apparatus is in the loaded condition. A label shall be provided warning personnel that riding on the rear step while the apparatus is in motion is prohibited.

## ACCESS LADDER - EZ CLIMB - LEFT REAR

There shall be a swing out and down access ladder supplied and installed for accessing the top of the apparatus. It shall be of an all aluminum design incorporating treads 13" inches wide spaced no more than eighteen (18") inches apart. The ground to the first step dimension, on level ground, shall be no more than twenty-four (24") inches. When in the deployed position the ladder shall have an angle of approximately 75-degrees to facilitate ascending and descending the ladder.

The access ladder shall have integrated hand holds in the steps, to aid in the ascent/descent of the ladder.

The ladder shall be retained in the stowed and deployed position by two (2) gas cylinders and shall not require the use of latches to hold it in position. The ladder overall width shall be approximately 14 inches wide.

## HANDRAIL EZ-CLIMB LADDER

Two (2) extruded aluminum non-slip handrails with offset brackets shall be installed on the EZ-Climb access ladder, one (1) on each side.

## STEP LIGHT

Two (2) Tecniq Model E03-W000-1 LED lights with clear lens shall be installed to illuminate the access ladder steps.

## WHEEL WELL COMPARTMENT LEFT SIDE AHEAD OF WHEELS

One (1) wheel well compartment shall be located on the left side in the rear wheel well panel ahead of the rear wheels of the type specified herein.

A breathing air cylinder storage compartment for three (3) SCBA cylinders (not supplied) shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of aluminum. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

The compartment shall be provided with SCBA cylinder scuff protection. A painted stainless steel door shall be provided.

An one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

**WHEEL WELL COMPARTMENT LEFT SIDE BEHIND WHEELS**

A wheel well compartment shall be located on the left side in the rear wheel well panel behind the rear wheels of the type specified herein.

A combination breathing air cylinder storage for two (2) SCBA cylinders and fuel fill compartment shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of aluminum. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement. The compartment shall be provided with SCBA cylinder scuff protection.

The assembly shall also include a fuel fill. A label indicating DIESEL FUEL ONLY shall be applied.

A single painted aluminum door shall be provided.

An one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

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## WHEEL WELL COMPARTMENT RIGHT SIDE AHEAD OF WHEELS

A wheel well compartment shall be located on the right side in the rear wheel well panel ahead of the rear wheels of the type specified herein.

A breathing air cylinder storage compartment for three (3) SCBA cylinders (not supplied) shall be provided and located in the rear wheel well of the apparatus body.

The cylinder storage compartment shall be constructed entirely of aluminum. The door assemblies shall be provided with a gasket between door and body side, bolted in-place and removable for repair or replacement.

The compartment shall be provided with SCBA cylinder scuff protection. A painted stainless steel door shall be provided.

An one-inch (1") wide loop of black webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in case of door failure. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

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## LEFT SIDE ROOF COMPARTMENTS

Two (2) upper body compartment shall be provided top of body with useable dimensions of approximately 24" wide by 20" deep by half the available upper body length.

The compartment shall have a lift-up door installed and constructed of 3/16" NFPA approved non-slip aluminum tread plate flanged downward to overlap the door opening. The door shall have a stainless steel hinge and dual gas openers. The door opening shall be flanged upward to prevent water from running into compartments when the door is closed. The gas openers shall be installed in a dual purpose over-center arrangement to hold the door in either the open or closed position. Two (2) heavy duty socket and plunger latches shall be installed to secure the door. A heavy duty chrome grab handle shall be provided to lift the door.

The compartment shall be located on the left side of the body.

### COMPARTMENT LIGHT

Two (2) 62" long OnScene Solutions Access LED light shall be installed on the door and contain 42 LEDs producing approximately 210 lumens per light (six LEDs and 30 lumens every 9"). The light stick shall be rated at 100,000 hours of service and shall be provided with a 5 year free replacement warranty. The light shall have a 5/8" LEXAN™ polycarbonate tube enclosure for severe duty applications. The light stick shall be waterproof and be connectible via a jumper wire to add additional lights in series if required.

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

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**SLIDE OUT VERTICAL LADDER COMPARTMENT**

The ground ladders shall slide into a compartment at the passenger rear of the apparatus beside the tank and below the hosebed. The vertically mounted slide in assembly shall be an integral part of the body and accessible through a hinged door.

**LADDER SOURCE**

New ground ladders shall be provided by the manufacturer.

**ROOF LADDER**

One (1) Duo Safety Model 775-A, 14 foot aluminum roof ladder with folding steel roof hooks on one end and steel spikes on the other end shall be provided on the apparatus. The ladder shall meet or exceed all latest NFPA Standards.

**EXTENSION LADDER**

One (1) Duo-Safety Model 900-A, 24 foot two (2) section aluminum extension ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA standards.

**FOLDING ATTIC LADDER MOUNTING**

A mounting in the ground ladder storage shall be provided for the specified folding attic ladder.

**FOLDING ATTIC LADDER SOURCE**

New folding attic ladders shall be provided by the manufacturer.

**FOLDING LADDER**

One (1) Duo Safety Model 585-A, 10 foot folding aluminum ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA Standards.

**PIKE POLE MOUNTING BRACKET**

Two (2) tube shall be provided for pike pole mounting. The tube shall have a 2-1/4" interior diameter and shall be mounted within the ladder compartment.

**PIKE POLES**

The following pike poles shall be provided.

**PIKE POLE**

One (1) 6' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

**PIKE POLE**

One (1) 10' pike pole with round handle shall be provided. The pike pole shall be of fiberglass construction.

**DRIVER REAR LONG STORAGE COMPARTMENT**

A fully enclosed long storage compartment shall be provided in the area behind the main body compartment roll-up doors and above the main body compartments on the driver side. The design, as a minimum, shall allow a 10' long hard suction hose or similar length equipment to be stored in the compartment. Individual equipment items shall be capable of being removed from the rear of the apparatus. The long storage compartment shall have a smooth aluminum door for chevron or paint, stainless steel vertical hinge and a single point latch.

**PASSENGER REAR LONG STORAGE COMPARTMENT**

A fully enclosed long storage compartment shall be provided in the area behind the main body compartment roll-up doors and above the main body compartments on the passenger side. The design, as a minimum, shall allow a 10' long hard suction hose or similar length equipment to be stored in the compartment. Individual equipment items shall be capable of being removed from the rear of the apparatus. The long storage compartment shall have a smooth aluminum door for chevron or paint, stainless steel vertical hinge and a single point latch.

**SUCTION HOSE SOURCE**

New suction hose shall be provided by the body builder.

**SUCTION HOSE**

Two (2) 6.0" x 10 foot length of Kochek PVC flexible suction hose shall be supplied. The suction hose shall have light weight couplings provided.

## HOSE COUPLINGS

Light weight aluminum couplings shall be provided on the suction hose. A long handle female swivel shall be provided on one end and a rocker lug male shall be provided for the other end.

## FRONT BODY PROTECTION PANELS

Aluminum tread plate overlays and panels shall be installed on the front of the body from the lower edge to the top of the compartment doors. The material shall be bolted in place and sealed to prevent any moisture entry between the overlay and the body structure.

## REAR BODY PROTECTION PANELS

Smooth aluminum shall be installed on the rear of the body, to allow for the installation of a "Chevron" stripe on the rear.

## FUEL TANK ACCESS PANEL

There shall be a removable panel in the rear compartment, used to gain access to the fuel tank and fuel gauge-sending unit.

## FOLDING STEP RIGHT SIDE REAR

A folding step of die cast high-strength zinc/aluminum alloy, plated with a superior automotive grade chrome finish shall be provided. The greater than 42 sq. in. serrated non-skid step traction area also offers an oversized non-slip grasp hand-hold. A heavy duty stainless steel spring design firmly holds the step in the open or closed positions. A rubber stop prevents any transit noise and rattles in the closed position. Step lighting shall be from a LED light mounted above the step.

The step has been third part tested to assure conformation of NFPA 1901 and FHA, 49CFR specifications for stepping surfaces and handhold.

The step shall be installed on the rear right side of the body.

## REAR INTERMEDIATE STEP

An intermediate fixed step measuring 42" wide by 8" deep shall be provided just below the main hose bed at the rear of the apparatus body. The step shall be constructed of .188” embossed aluminum diamond plate and bolted in place for easy replacement or repair.

## HANDRAIL REAR STEP

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

**HANDRAIL TOP OF BODY SIDES**

Two (2) extruded aluminum non-slip handrails, approximately 12" in length, shall be provided and mounted, one (1) each side at the top of the body sides, at the rear of the apparatus body.

**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 a heavy extruded aluminum "C" channel. There shall also be a bolt on aluminum corner casting on each rear corner to blend the rear tail board assembly with the side rub rails.

**POWER DISTRIBUTION STRIP**

One (1) 36" power distribution strip with six (6) straight blade receptacles shall be provided. The unit shall have a 15 amp capacity.

The electric receptacle shall be located inside the rear portion of the crew cab.

**SHORE POWER INLET**

One (1) receptacle for a shore power inlet line shall be provided to supply the cab interior 120-volt outlets.

**WINCH RECEIVER - FRONT**

The front of the chassis shall be equipped with a receiver assembly for high or low angle rescue or winch applications. The receiver shall be a square steel tube, same size as that of a trailer hitch. The unit shall be attached to the chassis frame assembly.

NO 12V Winch Power Receptacle

**WINCH RECEIVER - REAR**

The rear of the apparatus body shall be equipped with a receiver assembly for high or low angle rescue or winch applications. The receiver shall be a square steel tube, same size as that of a trailer hitch. The unit shall be attached to the body sub-frame assembly.

NO 12V Winch Power Receptacle

NO 12V Trailer Hitch Power Plug

## WINCH RECEIVERS - SIDE BODY

The body shall be equipped with two (2) receiver assemblies for high or low angle rescue or winch applications. The receivers shall be square steel tube, same size as that of a trailer hitch. The units shall be attached to the body sub-frame assembly or chassis frame rails and shall be located behind the rear wheels, one (1) on the left side and one (1) on the right side of the apparatus.

One (1) slide in receiver with the same dimensions as a trailer hitch receiver shall be shipped loose with the apparatus. The unit shall be equipped with a 2.5" eye opening.

The receiver assemblies (total of 2), shall be rated at a minimum of 9,000 pounds each, and each assembly shall be secured with one (1) safety pin.

NO 12V Winch Power Receptacle

## BODY PAINT PROCESS

While constructing the truck body, all aluminum parts that are to be finish painted shall be properly fitted on the body and then removed to be painted individually. The back side of all aluminum parts shall be sanded smooth of any burrs and sharp edges.

During reassembly of the apparatus, care shall be exercised in fitting and fastening the parts back in their respective position on the vehicle.

All aluminum parts shall be bolted to the body using stainless steel fasteners. Zinc or Cadmium plated fasteners are not acceptable. All bright metal fittings, if unavailable in stainless steel shall be heavily chrome plated. Iron fittings shall be copper plated prior to chrome plating.

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

The body and all parts shall be thoroughly washed with a grease cutting solvent (PPG DX330) prior to any sanding. After the body has been sanded and the weld marks and minor imperfections are filled and sanded, the body shall be washed again with (PPG DX330) to remove any contaminants on the surface.

A coating of epoxy sealer (PPG DP 48/50/90) shall be applied with a minimum of 1.0 mil dry film build. The epoxy sealer allows for maximum adhesion to the body material. A color coating of PPG Urethane Paint Direct Gloss with PPG Catalyst shall be applied with a minimum of 2.0 mil dry film build. The catalyst provides a base level UV barrier to prevent fading and chalking. A coating of PPG Clearcoat Topcoat Urethane with a minimum of 2.0 mil dry film build shall be applied. The clearcoat topcoat provides a maximum amount of UV barrier protection.

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

## INTERIOR COMPARTMENT FINISH

Eight (8) apparatus side compartment interiors are to be painted with a spatter Zolatone finish material. The compartments shall be cleaned with a grease remover, and then the surface sanded and prepared for painting.

The compartment shall be provided with a white base coat and then coated with a light gray spatter paint top coat.

## TOUCH-UP PAINT

One (1) two (2) ounce bottle of touch-up paint shall be furnished with the completed truck at final delivery.

## SIMULATED GOLD LEAF LETTERING

The lettering shall be applied in simulated gold leaf material, shaded in black and encapsulated in clear mylar.

A quantity of fifty (50), four (4) inch letters are to be placed on the cab and on the body as directed by the customer.

## SCOTCHLITE REFLECTIVE LETTERING

The lettering shall be applied with Scotchlite reflective material, shaded in black.

A quantity of fifty (50) letters are to be placed on the cab and on the body as directed by the customer. The letters shall be between eight and twelve inches in height.

## APPARATUS DOOR GRAPHICS

Two (2) custom door graphics designed primarily with artistic features shall be proposed for installation on the apparatus.

## REFLECTIVE STRIPING

A 4" wide 3M brand Scotchlite #680-10 reflective stripe shall be affixed to the perimeter of the vehicle. Striping shall conform to the applicable NFPA requirements. At least 50% of the perimeter length of each side and width of the rear and at least 25% of the perimeter width of the front of the vehicle shall have reflective stripe.

The side stripe shall be applied in a "Hockey Stick" pattern.

## COLOR OF STRIPING MATERIAL

The color of the 3M brand striping material shall be white.

**CHEVRON STRIPING**

The front bumper shall have 3M Diamond Grade reflective red and yellow striping installed. The chevron style striping shall be applied at a 45-degree upward angle.

**CHEVRON STRIPING**

The entire rear portion of the body shall have 3M Diamond Grade reflective red and yellow striping installed. The chevron style striping shall be applied at a 45-degree upward angle pointing towards the center upper portion of the rear panel.

**YELLOW SAFETY TAPE - STANDING & WALKING SURFACES**

The apparatus shall meet NFPA standard 15.7.1.6 designating any horizontal standing or walking surface higher than 48-in (1220 mm) from the ground and not guarded by railing or structure at least 12-in (300 mm) high shall have at least a 1-in (25 mm) wide safety yellow line delineation that contrasts with the background to mark the outside perimeter of the designated standing or walking surface area, excluding steps and ladders.

**WHEEL CHOCKS WITH MOUNTS**

A pair of Zico Model SAC-44 Quic-Chok folding wheel chocks shall be provided and mounted under the apparatus body with model SQCH-44H horizontal mounting brackets.