To:       Parties Interested In RFB2020-5
From:    Cindy Clack
Date:     August 14, 2019
Re:       RFB2020-5 – 2019 or 2020 Quint Fire Truck

RFB2020-5 is attached for your consideration. Anyone accessing this Request for Bid from the Barrow County website www.barrowga.org is responsible to insure the latest documents are in their possession including any addenda. All addenda, questions and answers will be posted on this site. **This site should be visited frequently to insure an awareness of any updates.**

Please insure bids are submitted exactly as specified in the RFB. If you have any questions, please submit them in writing as called for in the RFB.

Thank you.
REQUEST FOR BIDS
RFB2020-5

2019 or 2020
QUINT FIRE TRUCK
PER SPECIFICATIONS

BARROW COUNTY, GEORGIA
AUGUST 14, 2019

DATE OF OPENING: SEPTEMBER 12, 2019
REQUEST FOR BID RFB2020-5

BARROW COUNTY, GEORGIA

Date: August 14, 2019

PURPOSE:

The purpose of this request is to provide interested suppliers with the sufficient information to enable them to submit a uniform bid for the County’s review. Also, to set-forth a systematic method that will be fair and impartial to all parties concerned and to generate a response that can be equally evaluated by the County.

GENERAL:

Barrow County is in the process of securing sealed bids for one (1) Quint Fire Truck per attached specifications, graphics (Exhibit A), and loose equipment (Exhibit B) for the Barrow County Emergency Services (Fire Division). Bidder must be an authorized dealer for a minimum of three (3) consecutive years for the fire apparatus of which you are submitting a bid. Manufacturer certification may be required. Special attention should be given to the technical schedule and conditions below.

Regular Bid: Each supplier must comply with all requirements for a regular bid as directed or required by this notice. Notice is hereby given to all suppliers that if their bids are defective or irregular, the same may be rejected immediately.

Uniform Bid: To facilitate comparative analysis and evaluation of quotations, it is desired that a uniform format be employed in structuring each bid. The required format will coincide with specifications given later in this notice. The supplier’s degree of compliance with the requirements of this notice will be a factor in the subsequent evaluation and award of contract for these items. All instructions are to be considered an integral part of the RFB.

Right to Reject Any or All Bids: Barrow County reserves the right to reject any or all bids, to waive technicalities or informalities, and to accept any bid deemed in the best interest of the county. Where two or more suppliers are deemed equal, the County reserves the right to make the award to one of the suppliers.

Firm Price: Prices quoted by supplier shall be firm prices, and not subject to increase during the schedule hereinafter set-forth and shall not include Federal or State Tax.

Right to Submitted Materials: All responses, inquires, or correspondence relating or in reference to this schedule, exhibit, and other documentation by the supplier shall be properly identified as to supplier and will become the property of the County when received. Supporting technical
manuals will be returned at the request of the supplier. Selection of a suppliers bid does not affect this right.

INQUIRIES: Bidders shall not contact any members, or employees, of the Barrow County Board of Commissioners or any Barrow County Elected Officer or employee of Barrow County Elected Officer, regarding this RFB, bid evaluation, or selection process from the time the RFB is issued until the time a notification of intent to award is announced. Questions relating to this RFB must be submitted in writing to: Cindy Clack, Senior Buyer (email: cclack@barrowga.org). The deadline for submission of questions relating to this RFB shall be 12:00 (noon) “local time”, Tuesday, September 3, 2019. All questions submitted in writing prior to the deadline will be compiled, answered in writing and posted to the website www.barrowga.org as an addendum to the RFB.

SEALED QUOTATIONS: An original (un-bound) and four copies of the bid must be submitted in a sealed envelope, addressed to Owner. Each sealed envelope containing a bid must be plainly marked on the outside with “RFB2020-5 – 2019 or 2020 Quint Fire Truck”. If a bid is forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope to the attention of the Owner at the address previously given and also plainly marked with “RFB2020-5 – 2019 or 2020 Quint Fire Truck”. The county will not be responsible for late mail deliveries and no bid will be accepted if received after the time stipulated by this RFB. No bid may be withdrawn or modified in any way after the deadline for RFB opening. FAILURE TO COMPLY WITH THE ABOVE INSTRUCTIONS WILL DISQUALIFY BID QUOTE.

PROPOSALS SHALL BE SUBMITTED TO:
Barrow County Board of Commissioners
Danielle Austin, County Clerk’s Office
30 North Broad Street
Winder, GA 30680

EVENTS: Sealed bids will be accepted in the Clerk’s Office, no later than 12:00 Noon “local time”, Thursday, September 12, 2019. Bids will be opened and read aloud in the Historic Courthouse Conference Room at 30 North Broad Street, Winder, GA 30680 at 2:00 p.m. “local time” on September 12, 2019. All bids will be evaluated and the project will be awarded, if it is awarded, within 120 days of the bid opening. These prices will be good for 120 days from this date.

The following dates and times apply to this RFB:

Issue Request for Bid ----------------------------------August 14, 2019
Deadline for Questions ----------------------------------September 3, 2019 (12:00 noon “local time”)
Bid Due Date --------------------------------------September 12, 2019 (12:00 noon “local time”)
Bid Opening ----------------------------------------September 12, 2019 (2:00 p.m. “local time”)
DOCUMENTS: The following documents are included in this Request for Bid:
- Memo (1 Page)
- Request for Bid (4 Pages)
- Specifications with Exhibits A & B (133 Pages)
- Bid Form (6 Pages)
- Ethics Ordinance (30 Pages)

BID CONTENT: Please include the following documents with your submittal (an original unbound and four copies):
- Bid Form (All 6 Pages must be complete, and include unit prices on loose equipment)
- Manufacturer Specifications
- Descriptive Literature

DELIVERY TIME: Please advise number of days from the date of order in which delivery can be expected.

TECHNICAL REQUIREMENTS: The technical requirements are normally given as generic in nature, where a company’s part is listed, no exceptions or substitutions will be accepted, unless stated otherwise in the RFB.

PAYMENT: Payment will be made Net 10 Days from date of receipt of equipment. No monies will be paid up front with the order. Bidder agrees to render invoice electronically (payables@barrowga.org). Bidder agrees to accept the Barrow County Purchase Order Form to execute the actual purchase of equipment; no other contract document will be generated for the purchase.

LOCAL VENDOR’S PREFERENCE:

Because bids awarded to Local Vendors contribute to the County’s tax base and promote the local economy, the County has determined that, under certain circumstances described in this Section, Local Vendors shall be provided an additional privilege, whenever not otherwise prohibited by State law (including, but not limited to, public works and road construction projects as contemplated by Section 1-7(6) of the County’s Purchasing Policy), when bidding against non-Local Vendors.

For bids in the amount of $25,000.00 or more, if a Local Vendor’s bid shall meet all specifications and does not exceed four percent (4%) more than the lowest responsive and responsible bidder, the lowest bidding Local Vendor shall be offered three (3) business days from the opening of such bids in which to notify the Purchasing Office in writing that it agrees to match the low bid submitted by any non-Local Vendor. If such Local Vendor shall not agree to match the low bid, then the next lowest Local Vendor, if any, shall be offered within three (3) business days thereafter to notify the Purchasing Office in writing that it agrees to match the low bid submitted by any non-Local Vendor, and so on until all applicable Local Vendors are offered the opportunity to match the low bid.
BARROW COUNTY EMERGENCY SERVICES

Specification for Barrow County Emergency Services

BCES Quint Fire Truck
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**Intent of Specifications**

It is the intent of these specifications to clearly describe the furnishing and delivery to the Purchaser, a complete apparatus equipped as specified. The primary objective of these specifications is to obtain the most acceptable apparatus for service in the Fire Department. These specifications cover specific requirements as to the type of construction and tests the apparatus must conform, together with certain details as to finish, material preferences, equipment and appliances with which the successful bidder must conform.

The design of the apparatus must embody the latest approved automotive design practices. The workmanship must be of the highest quality in its respective field. Special consideration shall be given to service access to areas needing periodic maintenance, ease of operation, and symmetrical proportions. Construction must be heavy-duty and ample safety factors must be provided to carry loads as specified. The construction method employed will be in such a manner as to allow ready removal of any component for service or repair.

The apparatus shall conform to the National Fire Protection Association Standard for Automotive Fire Apparatus, number 1901, in its most recent edition, unless otherwise specified in this document. Only the specified firefighting support equipment listed in these specifications shall be provided.

The apparatus shall further conform to all Federal Motor Vehicle Safety Standards. No exception.

Each bidder shall furnish satisfactory evidence of their ability to design, engineer, and construct the apparatus specified and shall state the location of the factory producing the apparatus. They shall also substantiate they are in a position to render prompt and proper service and to furnish replacement parts for the apparatus.

Each bid must be accompanied by a set of detailed contractor's specifications consisting of a detailed description of the apparatus and equipment proposed. All bid proposal specifications must be in the same sequence as the advertised specification for ease of comparison. These specifications shall include size, location, type, and model of all component parts being furnished. Detailed information shall be provided on the materials used to construct all facets of the apparatus body. Any bidder who fails to submit detailed construction specifications, or who photo copies and submits these specifications as their own construction details will be considered non-responsive and shall render their proposal ineligible for award. No exception.

Bids will be addressed and submitted in accordance with the instructions provided on the cover sheet. The words "Fire Apparatus Proposal", the date, and bid opening time shall be stated on the front of the bid envelope.
Specification For Barrow Co. Fire and Emergency Services

It shall be the responsibility of the bidder to assure that their proposal arrives at the location and time indicated. Late proposals, telegrams, facsimile, or telephone bids will not be considered. No exception.

All bidders are required to detail the payment terms for apparatus on the bidder's proposal page. Any required prepayments or progress payments must be explained in detail.

Aerial Certification

Each bidder shall submit evidence of compliance to NFPA 1901 Standard for Aerial Ladder Fire Apparatus, in its latest edition, Sections 18-20 and 18-21, regarding structural and stability requirements. Evidence of a minimum 2.5 to 1 factor of structural safety based on the results of analytical, experimental, and structural analysis shall be provided with the bid. The analysis shall be performed and verified by a third party registered professional engineer. Submission of "in-house" certifications do not meet the requirements of this section. Failure to comply with this requirement will render the bidder's proposal unresponsive and ineligible for contract award.

Bid Bond

A bid security in the form of a Bid Bond, cashier's check, or certified check made payable to the Purchaser in the amount of ten percent (10%) of the total bid shall be required. This shall serve as a guarantee which may be forfeited and retained by the Purchaser in lieu of its other legal remedies if a successful bidder's proposal is accepted by the Purchaser and the bidder shall fail to execute and return to the Purchaser the required contract and bonds within ten (10) days after delivery. If a Bid Bond is provided, it shall be issued by a bonding company licensed to bond in this State.

Certificate of Insurance

Each bidder shall furnish, with their proposal, a Certificate of Product Liability Insurance for a minimum of ten (10) million dollars. Failure to provide this documentation shall render the proposal non-responsive and the bid shall be rejected. This certificate shall be from the prime builder only. Certificates submitted from various sub-contractors in order to total the ten million dollar minimum will not be acceptable as meeting the requirements of this section.

If one of the major portions of the apparatus (i.e. chassis, aerial, or body) is not designed, fabricated, and assembled by the prime builder, a separate Certificate of Liability Insurance for a minimum of ten (10) million dollars must be provided by each additional contractor.
Specification For Barrow Co. Fire and Emergency Services

The Certificate must be made out to the Purchaser and must be original. Submission of a non-original Certificate or a Certificate provided that is not made out to the Purchaser will not meet the requirements of this section.

Exceptions

The following apparatus specifications are considered minimum design and construction standards against which the apparatus will be inspected. It is the intent to receive proposals on equipment/apparatus meeting the attached detailed specifications in their entirety. Any proposals being submitted, without "Full Compliance" with these specifications shall so state on the bid proposal page, followed by a detailed "Letter of Exceptions" listing the areas of non-compliance. The reference must include page number, paragraph, and the exact nature of the exception.

Failure to follow this format, provided for the convenience of the Purchaser, will render the vendor's proposal non-responsive and ineligible for award of contract.

The Purchaser may add the statement "No Exception" to a component or design feature in these specifications. In the interest of fleet conformity or specific performance requirements, the Purchaser will not permit exceptions taken to these item(s). The Purchaser reserves the right to reject any or all bid proposals and purchase the equipment it deems most suitable to its needs. The Purchaser does not, in any way, obligate itself to accept the lowest or any bid. Any bidder taking total exception to the complete specification or a major element will result in immediate rejection of the proposal.

ISO Compliance

The manufacturer shall operate a Quality Management System meeting the requirements of ISO 9001:2000.

The International Organization for Standardization (ISO) is a recognized world leader in establishing and maintaining stringent manufacturing standards and values. The manufacturer’s certificate of compliance affirms that these principles form the basis for a quality system that unswervingly controls design, manufacture, installation, and service.

The manufacturer’s quality systems shall consist of, but not be limited to, all written quality procedures (aka QOP) and other procedures referenced within the pages of the manufacturer’s Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts products or processes. In addition, all apparatus assembly processes shall be documented for traceability and reference. The
manufacturer shall also engage the services of a certified third party for testing purposes where required.

If the manufacturer operates more than one manufacturing facility each facility must be ISO certified.

By virtue of its ISO compliance the manufacturer shall provide an apparatus that is built to exacting standards, meets the customer’s expectations, and satisfies the customer’s requirements.

A copy of the manufacturer’s certificate of ISO compliance for each manufacturing facility shall be provided with the bid.

**Proposal Price**

Each bidder's proposal must include all items required in the specifications unless a specific exception is taken. Any bidder who option prices an item included in these specifications that does not specifically require option pricing will have their proposal rejected without further cause.

**Service Requirements**

Each bidder shall supply, with their proposal, detailed information on the bidder's ability to perform routine and emergency service on the apparatus after delivery. Detailed information shall be provided on service facilities, personnel, service vehicles, and the type and nature of repair work the bidder is able to provide. Bidder shall state the number of miles from the Purchaser's facility to the nearest fully staffed repair facility operated by the bidder. It is the intent of the Purchaser to assure that parts and service are readily available for the equipment specified. Service capabilities will be one of the criteria for award of this contract.

**Single Source Manufacturing - Aerial**

In order to protect the Purchaser from divided warranty responsibility between chassis, aerial, and body manufacturers, proposals will only be considered from apparatus builders who design, fabricate, and assemble the complete apparatus at their own facilities. This shall include the cab shell, chassis assembly, aerial device, and complete body structure. Private labeling of another manufacturer's chassis, aerial, or body will not meet the requirements of this section.

**Hose Bed Capacity**
Hose bed hose load allowance on the apparatus shall be 1000 lbs.

**Overall Height Restriction**

The apparatus shall have overall height restriction (unloaded condition).

The height of the apparatus shall be measured with no water/foam in the water/foam tank, no equipment, no ground ladders and no hoses.

**Overall Length Restriction**

The unit has no overall length restrictions.

**NFPA Compliance**

The manufacturers supplied components of the apparatus shall be compliant with NFPA 1901, 2016 edition.

**Equipment Capacity**

Equipment allowance on the apparatus shall be 2500 lbs. This allowance is in addition to the weight of the hoses and ground ladders listed in the shop order as applicable.

**BUMPERS**

**Bumper**

A heavy duty 10" high steel channel type front bumper shall be provided. The front corners of the bumper shall be angled to reduce swing clearance. The bumper shall be painted job color.

**Front Bumper Extension**

The bumper shall be extended approximately 20” from the face of the cab as required.

**Bumper Gravel Shield**

The extended front bumper gravel shield shall be made of 3/16" (.188”) aluminum treadplate material. The gravel shield shall include 1" turn down lips to protect the top edge of the heavy duty bumper from damage.

**BUMPER TRAYS**

Lid, Bumper Hose Tray
The center bumper tray shall have a diamond plate lid. The lid shall be hinged and include a latch, rubber seal and held open with a pneumatic shock.

**Bumper Tray - Center**

A hose tray constructed of 1/8” aluminum shall be recessed into the front bumper extension. The tray shall be located in the center of the bumper and be approximately 12” deep (11” to the top of the slats). One inch thick aluminum slats shall be included in the bottom of the hose tray to aid in the dissipation of water from the tray.

**FRAME ASSEMBLY**

**Frame Rail Construction**

The chassis frame shall utilize an integral torque box type design. The integral torque box shall combine the chassis frame and aerial torque box into a single structure. The integral torque box shall provide an optimized design that lowers vehicle center of gravity, eliminates the need to torque aerial frame attachment bolts, and permits underslung outriggers to maximize body compartmentation.

The 20.75” high x 34” wide torque box frame shall be fabricated with 110,000-psi minimum yield, high strength steel. The side rails of the torque box chassis shall be constructed from 20.0” high x .375” thick formed high strength steel C-channel with 7.5” top and bottom flanges. In the jack leg areas the structure shall have .375” thick reinforcing plates spanning the width of the frame above and below the C-channels as well as .500” integral bulkhead supports. Between the front and rear jack areas tubular crossmembers shall be provided.

Certified welders shall construct the torque box. The design shall utilize 100% welded joints for a totally sealed box. Skip welding shall not be acceptable. Complete Finite Element Analysis and strain gauge testing shall be employed to verify minimum safety factors for road traveling (5:1) and aerial operation (2.5:1).

The torque box shall have the following attributes:

Resistance to bending moment shall range from 14,440,000 to 22,590,000 in. lbs.

Section modulus shall range from 131.28 to 205.35 cu. in.

The frame section immediately forward of the torque box shall have the following attributes:

Resistance to bending moment 6,090,000 in. lbs.

Section modulus 55.41 cu. in.

The torque box shall incorporate a stainless steel schedule 40 4” water pipe through the torque box below the turntable support for the aerial waterway inlet (if applicable). In addition, the
torque box shall have two (2) 3” conduits between the forward left and right outriggers and rearward left and right outriggers to encapsulate the hydraulic, air and electrical lines.

The entire assembly shall be sand-blasted and painted black before chassis assembly. A full lifetime warranty against defects in materials or workmanship shall be supplied by the apparatus manufacturer.

The custom chassis frame shall have a WHEEL ALIGNMENT in order to achieve maximum vehicle road performance and to promote long tire life. The alignment shall conform to the manufacturer’s internal specifications. All wheel lug nuts and axle U-bolt retainer nuts shall be tightened to the proper torque at the time of alignment. The wheel alignment documentation shall be made available at delivery upon request.

Coated Fasteners

The custom chassis frame assembly shall be assembled using GEOMET 720 coated fasteners for corrosion resistance.

AXLE OPTIONS

Shock Absorbers Front

Koni model 90 shock absorbers shall be provided for the front axle. The shocks shall be three way adjustable.

The shocks shall be covered by the manufacturer’s standard warranty.

Front Axle

The vehicle shall utilize a Dana D-2200W drop beam front axle with a rated capacity of 24,000 lbs. It shall have 71” kingpin centers. The axle shall be of I-beam construction and utilize grease-lubricated wheel bearings. The vehicle shall have a nominal cramp angle of 42 degrees including front suction applications.

The front axle hubs shall be made from ductile iron and shall be designed for use with 10 hole hub-piloted wheels in order to improve wheel centering and extend tire life.

The front springs shall be parabolic tapered, minimum 4” wide x 54” long (flat), minimum four (4) leaf, progressive rate. The springs shall have Berlin style eyes and rubber maintenance free bushings on each end with an additional standard wrap at the front eye. The capacity shall be 24,000 lbs. at the ground.

Tapered leaf springs provide a 20% ride improvement over standard straight spring systems. Supporting documentation/data shall be provided upon request.

The vehicle shall be equipped with a Sheppard integral model M-110 power steering gear, used in conjunction with a power assist cylinder. The steering assembly shall be rated to statically steer up to a maximum front axle load of 24,000 lbs. Relief stops shall be provided to reduce
system pressure upon full wheel cut. The system shall operate mechanically should the hydraulic system fail.

**Rear Axle**

The vehicle shall utilize an Meritor RS-35-187 single rear axle with single reduction hypoid gearing and a manufacturer’s rated capacity of 35,000 lbs. The axle shall be equipped with oil-lubricated wheel bearings with Meritor oil seals.

The rear axle hubs shall be made from ductile iron and shall be designed for use with 10 hole hub-piloted wheels to improve wheel centering and extend tire use.

**Suspensions**

**Rear Suspension**

The rear suspension shall be a Reyco model 79KB. The suspension shall include linear-rate slipper type leaf springs that eliminate spring eyes and shackles. The suspension shall include one (1) fixed torque arm, one (1) adjustable torque arm and cast spring hangers. The suspension shall be rated for 35,000 lbs.

**Wheel Options**

**Front Wheels**

The vehicle shall have two (2) polished (on outer wheel surfaces only) Alcoa aluminum disc wheels. They shall be forged from one-piece corrosion-resistant aluminum alloy and sized appropriately for the tires.

**Front Wheel Trim Package**

The front wheels shall have stainless steel lug nut covers (for use with aluminum wheels) or chrome plated plastic (for use with steel wheels). The front axle shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel universal baby moons. All stainless steel baby moons shall carry a lifetime warranty plus a 2 year re-buffing policy. There shall be two (2) baby moons and twenty (20) lug nut covers.

**Rear Wheels**

The vehicle shall have four (4) polished (on outer wheel surfaces only) Alcoa aluminum disc wheels. They shall be forged from one-piece corrosion-resistant aluminum alloy and sized appropriately for the tires.

**Rear Wheel Trim Package, Single Axle**
Specification For Barrow Co. Fire and Emergency Services

The rear wheels shall have stainless steel lug nut covers (chrome plated steel lug nut covers not acceptable), or American made chrome plated plastic lug nut covers. The rear axle shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel, spring clip band mount high hats, DOT user friendly. All stainless steel high hats shall carry a lifetime warranty plus a 2 year re-buffing policy. There shall be two (2) high hats and twenty (20) lug nut covers.

TIRE OPTIONS

Front Tires

The front tires shall be two (2) Michelin 425/65R22.5 tubeless type 20 PR radial tires with XFE highway tread.

The tires with wheels shall have the following weight capacity and speed rating:

Max front rating 22,800 @ 65 mph.

Max front rating with Alco aluminum wheels - 24,400 @ 65 MPH (intermittent fire service rating if GAW is over 22,800)

The wheels and tires shall conform to the Tire and Rim Association requirements.

Rear Tires

The rear tires shall be Michelin 315R22.5 tubeless type radial tires with XDN2 GRIP all weather tread.

The tires with wheels shall have the following weight capacity:

33,080 lbs. (dual) @ 75 MPH. (Intermittent fire service max load 35,396 lbs)

The wheels and tires shall conform to the Tire and Rim Association requirements.

Intermittent Tire Service Rating

The front and / or rear tires shall be provided with and intermittent emergency vehicle service rating. Tires rating shall conform to manufacturers’ service rating as applicable.

Tire Pressure Indicators

The apparatus shall be provided with Real Wheels AirGuard LED tire pressure indicating valve stem caps. When the tire is under inflated by 5-10 PSI, the LED indicator on the cap shall flash red. The indicator housings shall be shock resistant and constructed from polished stainless steel. The indicators shall be calibrated by attaching to valve stem of a tire at proper air pressure per load ratings and easily re-calibrated by simply removing and re-installing them during service.
Specification For Barrow Co. Fire and Emergency Services

Real Wheel Part number RWC1234 was superseded by RWC1235 as of June 2015

**BRAKE SYSTEMS**

**Front Brakes**

The front axle shall be equipped with Dana ADB22X 17 inch disc brakes.

A 3 year/unlimited miles parts and 3 year labor brake warranty shall be provided as standard by Dana. The warranty shall include bushings and seals.

**Brake System**

The vehicle shall be equipped with air-operated brakes and an anti-lock braking system (ABS). The brake system shall meet or exceed the design and performance requirements of the current Federal Motor Vehicle Safety Standard (FMVSS)-121, and the test requirements of the current NFPA 1901 Standard.

A dual-treadle brake valve shall correctly proportion the braking power between the front and rear systems. The air system shall be provided with a rapid pressure build-up feature, designed to meet current NFPA 1901 requirements, to allow the vehicle to begin its emergency response as quickly as possible.

A pressure-protection valve shall be installed to prevent use of the air horns or other air-operated devices should the air system pressure drop below 85 psi. This feature is designed to prevent inadvertent actuation of the emergency/parking brakes while the vehicle is in motion.

Two (2) air pressure needle gauges, one (1) each for front and rear air pressure, with a warning light and buzzer shall be installed at the driver’s instrument panel.

The braking system shall be provided with a minimum of three (3) air tank reservoirs for a total air system capacity of 5,214 cu. in. One (1) reservoir shall serve as the wet tank and a minimum of one (1) tank shall be supplied for each of the front and rear axles. The total system shall carry a sufficient volume of air to comply with FMVSS-121.

<table>
<thead>
<tr>
<th>Tank Capacities in Cubic Inches:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>1,738</td>
</tr>
</tbody>
</table>

Spring-actuated emergency/parking brakes shall be installed on the rear axle.

A Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, shall provide automatic emergency brake application when the air brake system pressure falls below 40 psi in order to safely bring the vehicle to a stop in case of an accidental loss of braking system air pressure.
Specification For Barrow Co. Fire and Emergency Services

A four-channel Wabco ABS shall be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system shall be fitted to both front and rear axles. All electrical connections shall be environmentally-sealed for protection against water, weather, and vibration.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which shall detect approaching wheel lock-up and instantly modulate (or pump) the brake pressure up to five (5) times per second to prevent wheel lock-up. Each wheel shall be individually controlled. To improve field performance, the system shall be equipped with a dual-circuit design configured in a diagonal pattern. Should a malfunction occur in one circuit, that circuit shall revert to normal braking action. A warning light at the driver’s instrument panel shall signal a malfunction.

The system shall also be configured to work in conjunction with all auxiliary engine, exhaust, or driveline brakes to prevent wheel lock-up.

To improve maintenance troubleshooting, provisions in the system for an optional diagnostic tester shall be provided. The system shall test itself each time the vehicle is started, and a dash-mounted light shall go out once the vehicle is moving above 4 MPH.

A 3 year/300,000 mile parts and labor Anti-Locking Braking System (ABS) warranty shall be provided as standard by Meritor Automotive.

Park Brake Release

One (1) Bendix-Westinghouse PP-5 parking brake control valve shall be supplied on the lower dash panel within easy reach of the driver.

Electronic Stability Control

The apparatus shall be equipped with a G4 4S4M Electronic Stability Control (ESC) system that combines the functions of Roll Stability Control (RSC) with the added capability of yaw - or rotational – sensing.

RSC focuses on the vehicle’s center of gravity and the lateral acceleration limit or rollover threshold. When critical lateral acceleration thresholds are exceeded, RSC intervenes to regulate the vehicle’s deceleration functions. The added feature of ESC is to automatically intervene to reduce the risk of the vehicle rotating while in a curve or taking evasive action, prevents drift out through selective braking, and controlling and reducing vehicle speed when lateral acceleration limits are about to be exceeded.

Intervention by the system occurs in three forms - engine, retarder and brake control. The ESC system uses several sensors to monitor the vehicle. These include a steering wheel angle sensor, lateral accelerometer, and yaw position sensor. ESC constantly monitors driving conditions and intervenes if critical lateral acceleration is detected or if the vehicle begins to spin due to low friction surfaces. The system provides control of engine and retarder torque as well as automatically controlling individual wheels to counteract both over steer and under steer.
To further improve vehicle drive characteristics, the unit shall be fitted with Automatic Traction Control (ATC). This system shall control drive wheel slip during acceleration from a resting point. An extra solenoid valve shall be added to the ABS system. The system shall control the engine and brakes to improve acceleration slip resistance. The system shall have a dash mounted light that shall come on when ATC is controlling drive wheel slip.

3 year/300,000 miles parts and labor warranties for ESC, RSC, and ATC shall be provided as standard by Meritor Automotive.

Rear Brakes

The rear axle shall be equipped with ArvinMeritor 16.5” x 8.625” P-Cast S-cam brakes with cast brake shoes. The brakes shall be furnished with Haldex automatic slack adjusters.

A 3 year/unlimited miles parts and 3 year labor rear brake warranty shall be provided as standard by ArvinMeritor Automotive. The warranty shall include bushings, seals, and cams.

AIR SYSTEM OPTIONS

Air Dryer

The chassis air system shall be equipped with a Bendix-Westinghouse AD-9 air dryer to remove moisture from the air in order to help prevent the air lines from freezing in cold weather and prolong the life of the braking system components.

Air Inlet

A 1/4” brass quick-release air inlet with a male connection shall be provided. The inlet shall allow a shoreline air hose to be connected to the vehicle, discharging air directly into the wet tank of the air brake system. It shall be located driver door jamb.

Air Lines

Air brake lines shall be constructed of color coded nylon tubing routed in a manner to protect them from damage. Brass fittings shall be provided.

Air Horns

Dual air horns shall be provided, connected to the chassis air system. The horns shall be mounted through the front bumper. The front bumper shall have two (2) holes punched to accommodate the air horns. A pressure protection valve shall be installed to prevent the air brake system from being depleted of air pressure.

ENGINES & TRANSMISSIONS
Transmission Selector

A push-button transmission shift module, Allison model 29538373, shall be located to the right side of the steering column within easy reach of the driver. The shift position indicator shall be indirectly lit for after dark operation. The shift module shall have a “Do Not Shift” light and a “Service” indicator light. The shift module shall have means to enter a diagnostic mode and display diagnostic data including oil life monitor, filter life monitor, transmission health monitor and fluid level. A transmission temperature gauge with warning light and buzzer shall be installed on the cab instrument panel.

Transmission Fluid

The transmission fluid shall be TranSynd, Shell Spirax S6ATF A295, or equivalent synthetic.

Vehicle Speed

Electronic speed limiting set at 60 MPH as required by NFPA 1901.

Engine/Transmission Package

Engine

The vehicle shall utilize a Cummins L9 engine as described below:

- 450 maximum horsepower at 2100 rpm
- 1250 lb-ft peak torque at 1400 rpm
- Six (6) cylinder, charge air cooled, 4-cycle diesel
- 543 cu. in. (8.9 liter) displacement - 4.49 in bore x 5.69 in stroke
- 16.6:1 compression ratio
- Viable Geometry Turbocharged
- Engine shall be equipped with Full-Authority Electronics
- Electronic Timing Control fuel system
- Fuel cooler (when equipped with a fire pump)
- Fleetguard FS1022 fuel filter with integral water separator and water-in-fuel sensor approved by Cummins for use on the ISL engine
- Fleetguard LF9009 Venturi Combo combination full-flow/by-pass oil filter approved by Cummins for use on the ISL engine
- Engine lubrication system, including filter, shall have a minimum capacity of 25 quarts
- Delco-Remy 39 MT-HD 12-volt starter
- Cummins 18.7 cubic foot per minute (cfm) air compressor
- Corrosion inhibitor additive for coolant system
- After treatment system consisting of a oxidation catalyst and diesel particulate filter and selective catalyst reduction system
- Ember separator compliant with current NFPA 1901 standard
- The engine shall be compliant with 2017 EPA Emission standards

The engine air intake shall draw air through the front cab grill. The intake opening shall be located on the officer (right) side behind front cab face with a plenum that directs air to the air
filter. The air cleaner intake piping shall be made from aluminized steel tubing with flexible rubber hoses. The intake piping clamps shall be heavy-duty, constant-torque, T-bolt style to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

The air cleaner shall be an 11” diameter K&N for lower restriction and high air flow. The filtration media shall be washable and easily accessed for service. The air filter shall have a 3 year / 300,000 mile warranty.

The engine exhaust piping shall be a minimum of 4” diameter welded stainless steel tubing. The aftertreatment system shall be mounted horizontally under the right-hand frame rail in back of the cab in order to minimize heat transmission to the cab and its occupants. The exhaust shall be directed away from the vehicle on the right side ahead of the rear wheels in order to keep exhaust fumes as far away as possible from the cab and pump operator position.

A 5-year/100,000-miles parts and labor warranty shall be provided as standard by Cummins.

A copy of the Engine Installation Review stating the engine installation meets Cummins recommendations shall be provided as requested. The engine installation shall not require the operation of any type of ”power-down” feature to meet engine installation tests.

**Transmission**

The vehicle shall utilize an Allison EVS3000P, electronic, 5-speed automatic transmission.

A push button shift module shall be located right side of the steering column, within easy reach of the driver. The shift position indicator shall be indirectly lit for after-dark operation. The shift module shall have a ”Do Not Shift” light and a ”Service” indicator light that are clearly visible to the driver. The shift module shall have means to enter a diagnostic mode and display diagnostic data.

A transmission oil temperature gauge with warning light and buzzer shall be installed on the cab instrument panel to warn the driver of high oil temperatures that may damage the transmission.

The transmission shall have a gross input torque rating of 1250 lb.-ft. and a gross input power rating of 450 HP.

The gear ratios shall be as follows:

1 - 3.49
2 - 1.86
3 - 1.41
4 - 1.00
5 - .75
The transmission shall have an oil capacity of 23 quarts and shall be equipped with a fluid level sensor (FLS) system, providing direct feedback of transmission oil level information to the driver.

A water-to-oil transmission oil cooler shall be provided to ensure proper cooling of the transmission when the vehicle is stationary (no air flow). Air-to-oil transmission oil coolers, which require constant air flow, are not acceptable.

The transmission shall be provided with two (2) engine-driven PTO openings located at the 4 o’clock and 8 o’clock positions for flexibility in installing pto-driven equipment.

The automatic transmission shall be equipped with a power lock-up device. The transmission lock-up shall prevent down shifting of the transmission when the engine speed is decreased during pump operations, thereby maintaining a constant gear ratio for safe operation of the pump. The transmission lock-up shall be automatically activated when the pump is engaged in gear. The transmission lock-up shall be automatically deactivated when the pump is disengaged for normal road operation.

A 5-year/unlimited miles parts and labor warranty shall be provided as standard by Allison Transmission.

**Automatic Shift to Neutral**

The transmission shall be programmed to comply with NFPA 1901 and automatically shift to neutral upon application of the parking brake.

**SECONDARY BRAKING**

**Jacobs Engine Brake**

One (1) Jacobs engine brake shall be installed to assist in slowing and controlling the vehicle as required by NFPA 1901 for vehicles with gross vehicle weight ratings (GVWR) of 36,000 lbs. or greater. An on-off control switch and a high-medium-low selector switch shall be mounted in the cab accessible to the driver.

When activated, the Jacobs engine brake shall cut off the flow of fuel to the cylinders and alter the timing of the exhaust valves. This shall transform the engine into a high-pressure air compressor, driven by the wheels, and the horsepower absorbed by the engine in this mode shall slow the vehicle. The selector switch allows the driver to select the amount of retarding power.

When the on-off switch is in the “on” position, the engine brake shall be automatically applied whenever the accelerator is in the idle position and the automatic transmission is in the lock-up mode. If the accelerator is depressed or if the on-off switch is placed in the “off” position, the engine brake shall immediately release and allow the engine to return to its normal function.

**Transmission Programming**
The transmission shall include the Allison 2nd gear Pre-Select feature. This option will direct the transmission to down shift to second gear when the throttle is released and the Jacobs engine brake (or Telma retarder wired to activate with release of throttle) is engaged. This feature is designed to increase brake life and aid vehicle braking.

**EXHAUST OPTIONS**

**Exhaust Blanket**

The exhaust shall be covered with an insulation blanket specifically designed for high temperature usage. The blanket shall have a silicone impregnated fiberglass sewn outer cover with a stainless steel knitted wire mesh inner liner. The cover shall be retained with stainless steel capstan rivets and stainless steel lacing wire. The blanket shall be installed from the engine turbo to the DPF.

**COOLING PACKAGE**

**Engine Cooling Package**

**Radiator**

The cooling system shall include an aluminum tube-and-fin radiator with a minimum of 1,408 total square inches of frontal area to ensure adequate cooling under all operating conditions. There shall be a drain valve in the bottom tank to allow the radiator to be serviced. A sight glass shall be included for quick fluid level assessment. The radiator shall be installed at the prescribed angle in order to achieve the maximum operational effectiveness. This shall be accomplished according to established work instructions and properly calibrated angle measurement equipment.

**Silicone Hoses**

All radiator and heater hoses shall be silicone. Pressure compensating band clamps shall be used to eliminate hose pinching on all hoses 3/4" diameter and larger. All radiator hoses shall be routed, loomed, and secured so as to provide maximum protection from chafing, crushing, or contact with other moving parts.

**Coolant**

The cooling system shall be filled with a 50/50 mixture of water and antifreeze/coolant conditioner to provide freezing protection to minus 40 (-40) degrees F for operation in severe winter temperatures.

**Coolant Recovery**

There shall be a coolant overflow recovery system provided.

**Charge Air Cooler System**
The system shall include a charge air cooler to ensure adequate cooling of the turbocharged air for proper engine operation and maximum performance.

**Charge Air Cooler Hoses**

Charge air cooler hoses shall be made from high-temperature, wire-reinforced silicone to withstand the extremely high temperatures and pressures of the turbocharged air. The hoses shall incorporate a flexible hump section to allow motion and misalignment of the engine relative to the charge air cooler. Charge air cooler hose clamps shall be heavy-duty, constant-torque, T-bolt clamps to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

**Fan/Shroud**

The fan shall be 30” in diameter with eleven (11) blades for maximum airflow and dynamic balance. It shall be made of nylon for strength and corrosion resistance. The fan shall be installed with grade 8 hardware which has been treated with thread locker for additional security. A fan shroud attached to the radiator shall be provided to prevent recirculation of engine compartment air around the fan in order to maximize the cooling airflow through the radiator. The fan shroud shall be constructed of fiber-reinforced high temperature plastic. The shroud shall be specifically formed with curved surfaces which improves air flow and cooling.

**Transmission Cooler**

The cooling system shall include a liquid-to-liquid transmission cooler capable of cooling the heat generated from the transmission. When a transmission retarder is selected, the cooler shall have an increased capacity to handle the additional heat load.

**FUEL SYSTEMS**

**Fuel Tanks**

Dual 25 gallon side-mounted fuel tanks shall be provided. Each tank shall be of an all-welded aluminized steel construction with anti-surge baffles and shall conform to all applicable Federal Highway Administration (FHWA) 393.65 and 393.67 standards. The tanks shall be mounted behind the rear axle. Each tank shall be secured by a wrap-around T-bolt type stainless steel strap. Each strap shall be fitted with protective rubber insulation and shall be secured with grade 8 hardware. This design allows for tank removal from below the chassis.

Each tank shall be equipped with a 2” filler neck, two (2) additional 80% draw pick-up/return connections, a vent with overturn leak protection, and a .50” NPT magnetic drain plug. The full 50 gallon capacity can be filled from either side of the vehicle. Fuel shall be drawn from one tank and returned to the other. The tanks shall be connected with a 1.0” crossover line for equalization.

A mechanical fuel pump sized to meet the engine requirements shall be provided.

**Fuel Re-Prime**
An auxiliary 12 volt fuel pump shall be included in the fuel system. The electric pump shall permit re-priming of the fuel lines and engine. The pump may be manually operated with a switch located accessible to driver. The electric pump shall also automatically operate in conjunction with the mechanical fuel pump as long as engine oil pressure is present. The system shall be plumbed to allow full flow to by-pass the pump.

**Fuel Shut-Off**

A shut-off valve shall be supplied to prevent drain back of fuel into the main supply line during filter changes. The valve(s) shall be located: one (1) inlet side of OEM fuel filter.

**Fuel Line**

All fuel lines shall be rubber.

**ALTERNATOR**

**360 Amp Alternator**

A Niehoff model C505 360 amp SAE (J56) rated, 320 amp at 200 degrees F NFPA 1901 rated brush-less type alternator with rectifier shall be provided. It shall be self-energized and shall have a negative voltage compensating remote solid-state voltage regulator. The alternator shall be installed in accordance with the engine manufacturer’s recommendations.

**BATTERIES**

**Battery System**

The manufacturer shall supply four (4) heavy duty Group 31 12-volt maintenance-free batteries. Each battery shall be installed and positioned so as to allow easy replacement of any single battery. Each battery shall be equipped with carrying handles to facilitate ease of removal and replacement. There shall be two (2) steel frame mounted battery boxes, one (1) on the left frame rail and one (1) on the right frame rail. Each battery box shall be secured to the frame rail with Grade 8 hardware. Each battery box shall hold (2) batteries. The batteries shall have a minimum combined rating of 4,000 (4 x 1000) cold cranking amps (CCA) @ 0 degrees Fahrenheit and 820 (4 x 205) minutes of reserve capacity for extended operation. The batteries shall have 3/8-16 threaded stud terminals to ensure tight cable connections. The battery stud terminals shall each be treated with concentrated industrial soft-seal after cable installation to promote corrosion prevention. The positive and negative battery stud terminals and the respective cables shall be clearly marked to ensure quick and mistake-proof identification.

Batteries shall be placed on non-corrosive rubber matting and secured with hold-down brackets to prevent movement, vibration, and road shock. The hold-down bracket J-hooks shall be cut to fit and shall have all sharp edges removed. The batteries shall be placed in plastic trays to provide preliminary containment should there be leakage of hazardous battery fluids. There shall be two (2) plastic trays, each containing (2) batteries. Each battery tray shall be equipped
with a rubber vent hose to facilitate drainage. The rubber vent hose shall be routed to drain beneath the battery box. The batteries shall be positioned in well-ventilated areas.

One (1) positive and one (1) negative jumper stud shall be provided.

Batteries shall have a warranty of twelve (12) months that shall commence upon the date of delivery of the apparatus.

**CHASSIS OPTIONS**

**Engine Fan Clutch**

The engine shall be equipped with a thermostatically controlled engine cooling fan. The fan shall be belt driven and utilize a clutch to engage when the engine reaches a specified temperature and / or the water pump is engaged (if equipped).

When disengaged, the fan clutch shall allow for improved performance from optional floor heaters, reduced cab interior noise, increased acceleration and improved fuel economy.

The fan shall be equipped with a fail-safe engagement so that if the clutch fails the fan shall engage to prevent engine overheating.

**Drivelines**

Drivelines shall have a heavy duty metal tube and shall be equipped with Spicer 1710HD universal joints to allow full-transmitted torque to the axle(s). Drive shafts shall be axially straight, concentric with axis and dynamically balanced.

**Front Tow Eyes**

Two (2) 3/4” thick heavy duty steel tow eyes shall be securely attached to the chassis frame rails at the front of the apparatus. They shall be mounted down below the bumper / cab.

**Rear Tow Eyes**

Two (2) heavy duty tow eyes made of 3/4” (0.75”) thick steel having 2.5” diameter holes shall be bolted directly to the rear of the frame to allow towing (not lifting) of the apparatus. The tow eyes shall be protruding into the rear compartment or out the rear of the body. The tow eyes shall be painted chassis black.

**Hydraulic Pump System**

A fixed-displacement hydraulic pump system shall be provided to operate all outrigger and aerial functions as well as the chassis power steering system. This shared hydraulic system is desired because it heats the hydraulic fluid while driving to provide smoother operation to other systems in cold climate conditions, rather than utilizing a separate pump.
Specify the hydraulic pump system shall allow the aerial system to be activated without having to shut down the water pump or reduce engine RPM’s by a switch located on the cab within easy reach of the driver. A system ”engaged” indicator light shall be provided on the activation switch. Engagement of the aerial circuit shall only be allowed with the transmission in the neutral or pump gear and the parking brake engaged.

The system's hydraulic pump shall be engine mounted and able to supply thirteen (13) gpm of hydraulic fluid at a maximum pressure of 3,000 psi. The hydraulic system shall normally operate between 1,000 and 2,500 psi. It shall have flow controls to protect hydraulic components and it shall incorporate a relief valve set at 2,800 psi to prevent over-pressurization (2950 on HP78 models).

**DEF Tank**

A diesel exhaust fluid (DEF) tank with a five (5) gallon capacity shall be provided.

The DEF tank shall include a heater fed by hot water directly from the engine block to prevent the DEF from becoming too cool to operate correctly per EPA requirements. The tank shall include a temperature sensor to control the heater control valve that controls the feed of hot water from the engine to the DEF tank heater.

A sender shall be provided in the DEF tank connected to a level gauge on the cab dash.

The tank shall be located left side below rear of cab.

**CAB MODEL**

**Cab Typhoon Medium**

The vehicle shall be distinguished by an all-welded aluminum and fully enclosed tilt cab. The cab shall be designed exclusively for fire/rescue service and shall be pre-engineered to ensure long life. It shall incorporate an integral welded substructure of high-strength aluminum alloy extrusions that creates an occupant compartment that is essentially a protective perimeter. The end result is a distinctive structure that is aesthetically appealing, functionally durable, and characterized by increased personnel safety.

The cab shall be constructed from 3/16” (0.188”) 3003 H14 aluminum alloy plate roof, floor, and outer skins welded to a high-strength 6063-T6 aluminum alloy extruded subframe. Wall supports and roof bows are 6061 T6 aluminum alloy. This combination of a high-strength, welded aluminum inner structure surrounded on all sides by load-bearing, welded aluminum outer skins provides a cab that is strong, lightweight, corrosion-resistant, and durable.

The inner structure shall be designed to create an interlocking internal “roll-cage” effect by welding two (2) 3” x 3” x 0.188” wall-thickness 6063-T5 aluminum upright extrusions between the 3” x 3” x 0.375” wall-thickness 6061-T6 roof crossbeam and the 2.25” x 3” x 0.435” wall-thickness 6063-T6 subframe structure in the front. An additional two (2) aluminum upright extrusions within the back-of-cab structure shall be welded between the rear roof perimeter extrusion and the subframe structure in the rear to complete the interlocking framework. The
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four (4) upright extrusions -- two (2) in the front and two (2) in the rear -- shall be designed to effectively transmit roof loads downward into the subframe structure to help protect the occupant compartment from crushing in a serious accident. All joints shall be electrically seam welded internally using aluminum alloy welding wire.

The subframe structure shall be constructed from high-strength 6061-T6 aluminum extrusions welded together to provide a structural base for the cab. It shall include a side-to-side 3” x 1.5” .375 thick C-channel extrusion across the front, with 3/4” x 2-3/4” (.75” x 2.75”) full-width crossmember tubes spaced at critical points between the front and rear of the cab.

The cab floor shall be constructed from 3/16” (0.188”) 3003 H14 smooth aluminum plate welded to the subframe structure to give the cab additional strength and to help protect the occupants from penetration by road debris and under-ride collision impacts.

The cab roof shall be constructed from 3/16” (0.188”) 3003 H14 aluminum treadplate supported by a grid of fore-aft and side-to-side aluminum extrusions to help protect the occupants from penetration by falling debris and downward-projecting objects. Molded fiberglass or other molded fiber-reinforced plastic roof materials are not acceptable.

The cab roof perimeter shall be constructed from 4” x 6-5/8” (4” x 6.625”) 6063-T5 aluminum extrusions with integral drip rails. Cast aluminum corner joints shall be welded to the aluminum roof perimeter extrusions to ensure structural integrity. The roof perimeter shall be continuously welded to the cab roof plate to ensure a leak-free roof structure.

The cab rear skin shall be constructed from 3/16” (0.188”) 3003 H14 aluminum plate. Structural extrusions shall be used to reinforce the rear wall.

The left-hand and right-hand cab side skins shall be constructed from 3/16” (0.188”) 3003 H14 smooth aluminum plate. The skins shall be welded to structural aluminum extrusions at the top, bottom, and sides for additional reinforcement.

The cab front skins shall be constructed from 3/16” (0.188”) 3003 H14 smooth aluminum plate. The upper portion shall form the windshield mask, and the lower portion shall form the cab front. Each front corner shall have a full 9” outer radius for strength and appearance. The left-hand and right-hand sides of the windshield mask shall be welded to the left-hand and right-hand front door frames, and the upper edge of the windshield mask shall be welded to the cab roof perimeter extrusion for reinforcement. The cab front shall be welded to the subframe C-channel extrusion below the line of the headlights to provide protection against frontal impact.

**Cab Exterior**

The exterior of the cab shall be 94” wide x 130” long to allow sufficient room in the occupant compartment for up to eight (8) fire fighters. The cab roof shall be approximately 101” above the ground with the flat roof option. The back-of-cab to front axle length shall be a minimum of 58”.

Front axle fenderette trim shall be brushed aluminum for appearance and corrosion resistance. Bolt-in front wheel well liners shall be constructed of 3/16” (0.188”) composite material to
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provide a maintenance-free, damage-resistant surface that helps protect the underside of the cab structure and components from stones and road debris.

A large stainless steel cooling air intake grille with an open area of no less than 81% shall be at the front of the cab.

The cab windshield shall be of a two-piece replaceable design for lowered cost of repair. The windshield shall be made from 1/4” (0.25”) thick curved, laminated safety glass with a 75% light transmittance automotive tint. A combined minimum viewing area of 2,700-sq. in. shall be provided. Forward visibility to the ground for the average (50th percentile) male sitting in the driver’s seat shall be no more than 11 feet 7 inches from the front of the cab to ensure good visibility in congested areas.

Windshield Wipers

Two (2) opposed radial style windshield wipers with two (2) separate electric motors shall be provided for positive operation. The wipers shall be tested beyond the minimum SAE requirement to a total of 3.3 million cycles. The wipers shall be a wet-arm type with a one (1) gallon washer fluid reservoir, an intermittent-wipe function, and an integral wash circuit. Wiper arm length shall be approximately 20”, and the blade length approximately 22”. Each arm shall have a 90 degree sweep for full coverage of the windshield. The wipers shall be synchronized so as to wipe each windshield simultaneously.

Cab Mounts and Cab Tilt System

The cab shall be independently mounted from the body and chassis to isolate the cab structure from stresses caused by chassis twisting and body movements. Mounting points shall consist of two (2) forward-pivoting points, one (1) on each side; two (2) intermediate rubber load-bearing cushions located midway along the length of the cab, one on each side; and two (2) combination rubber shock mounts and cab latches located at the rear of the cab, one (1) on each side.

An electric-over-hydraulic cab tilt system shall be provided to provide easy access to the engine. It shall consist of two (2) large-diameter, telescoping, hydraulic lift cylinders, one (1) on each side of the cab, with a frame-mounted electric-over-hydraulic pump for cylinder actuation.

Safety flow fuses (velocity fuses) shall be provided in the hydraulic lift cylinders to prevent the raised cab from suddenly dropping in case of a burst hydraulic hose or other hydraulic failure. The safety flow fuses shall operate when the cab is in any position, not just the fully raised position.

The hydraulic pump shall have a manual override system as a backup in the event of an electrical failure. Lift controls shall be located in a compartment to the rear of the cab on the right side of the apparatus. A parking brake interlock shall be provided as a safety feature to prevent the cab from being tilted unless the parking break is set.

The entire cab shall be tilted through a 42-45 degree arc to allow for easy maintenance of the engine, transmission and engine components. A positive-engagement safety latch shall be
provided to lock the cab in the full tilt position to provide additional safety for personnel working under the raised cab.

In the lowered position, the cab shall be locked down by two (2) automatic, spring-loaded cab latches at the rear of the cab. A "cab ajar" indicator light shall be provided on the instrument panel to warn the driver when the cab is not completely locked into the lowered position.

**Cab Interior**

The interior of the cab shall be of the open design with an ergonomically-designed driver area that provides ready access to all controls as well as a clear view of critical instrumentation.

The engine cover between the driver and the officer shall be a low-rise contoured design to provide sufficient seating and elbow room for the driver and the officer. The engine cover shall blend in smoothly with the interior dash and flooring of the cab. An all-aluminum subframe shall be provided for the engine cover for strength. The overall height of the engine enclosure shall not exceed 23” from the floor at each side and 27” in the center section. The engine cover shall not exceed 41” in width at its widest point.

The rear portion of the engine cover shall be provided with a lift-up section to provide easy access for checking transmission fluid, power steering fluid, and engine oil without raising the cab. The engine cover insulation shall consist of 3/4” dual density fiberglass composite panels with foil backing manufactured to specifically fit the engine cover without modification to eliminate “sagging” as found with foam insulation. The insulation shall meet or exceed DOT standard MVSS 302-1 and V-0 (UI subject 94 Test).

All cab floors shall be covered with a black rubber floor mat that provides an aggressive slip-resistant surface in accordance with current NFPA 1901.

The rear engine cover area shall be covered with molded 18 lb/cu. ft. (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/- 5.0) per ASTM F1957-99. The cover shall be approximately .5" thick with a minimum skin thickness of 0.0625 inches. The cover shall be provided to reduce the transmission of noise and heat from the engine. The cover shall be black with a pebble grain finish for slip resistance.

A minimum of 57.25” of floor-to-ceiling height shall be provided in the front seating area of the cab and a minimum of 55.25” floor-to-ceiling height shall be provided in the rear seating area. A minimum of 36” of seated headroom at the "H" point shall be provided over each fenderwell.

The interior side to side dimensions shall be 87" from wall padding to wall padding and 89.5" from door to door.

The floor area in front of the front seat pedestals shall be no less than 24" side to side by up to 25” front to rear for the driver and no less than 24" side to side by up to 27” front to rear for the officer to provide adequate legroom.
Battery jumper studs shall be provided to allow jump-starting of the apparatus without having to tilt the cab.

All exposed interior metal surfaces shall be pretreated using a corrosion prevention system.

The interior of the cab shall be insulated to ensure the sound (dbA) level for the cab interior is within the limits stated in the current edition of NFPA 1901. The insulation shall consist of 2 oz. wadding and 1/4” (0.25”) foam padding. The padding board shall be backed with 1/4” (0.25”) thick reflective insulation. The backing shall be spun-woven polyester. Interior cab padding shall consist of a rear cab headliner, a rear wall panel, and side panels between the front and rear cab doors.

The vehicle shall use a seven-position tilt and telescopic steering column to accommodate various size operators. An 18” padded steering wheel with a center horn button shall be provided.

Storage areas, with hinged access doors, shall be provided below the driver and officer seats. The driver side compartment shall be approximately 20” deep x 12” wide x 3.5” high and the officer side compartment shall be approximately 14” deep x 12” wide x 11” high (height will be reduced with air or electric seat). Note: With RollTek option the compartments may be occupied by air bag system components.

The front cab steps shall be a minimum of 8” deep x 24” wide. The first step shall be no more than 24.0” above the ground with standard tires in the unloaded condition per NFPA 1901 standards. The rear cab steps shall be a minimum 12” deep x 21” wide. The first step shall be no more than 24.0” above the ground with standard tires in the unloaded condition per NFPA 1901 standards. The front and rear steps shall incorporate full width intermediate steps for easy access to the cab. The step surfaces shall be aluminum diamond plate with a multi-directional, aggressive gripping surface incorporated into the aluminum diamond plate in accordance with current NFPA 1901.

A black grip handle shall be provided on the interior of each front door below the door window to ensure proper hand holds while entering and exiting the cab. An additional black grip handle shall be provided on the left and right side windshield post for additional handholds.

**Cab Doors**

Four (4) side-opening cab doors shall be provided. Doors shall be constructed of a 3/16” (0.188”) aluminum plate outer material with an aluminum extruded inner framework to provide a structure that is as strong as the side skins.

Front cab door openings shall be approximately 36” wide x 72.5” high, and the rear cab door openings shall be approximately 33.75” wide x 72.5” high. The front doors shall open approximately 75 degrees, and the rear doors shall open approximately 80 degrees.

The doors shall be securely fastened to the doorframes with full-length, stainless steel piano hinges, with 3/8” (0.375”) diameter pins for proper door alignment, long life, and corrosion resistance. Mounting hardware shall be treated with corrosion-resistant material prior to
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installation. For effective sealing, an extruded rubber gasket shall be provided around the entire perimeter of all doors.

The front door windows shall provide a minimum viewing area of 518 sq. in. each. The rear door windows shall provide a minimum viewing area of 554 sq. in. each. All windows shall have 75% light transmittance automotive safety tint.

The door handles on the exterior of the cab shall be a pull type with vertical orientation. The handles shall be made with corrosion free material and have a black finish. Each exterior door handle shall have an integral keyed lock.

Recessed paddle-style door latches shall be provided on the interiors of the doors. The latches shall be designed and installed to protect against accidental or inadvertent opening as required by NFPA 1901. The rear cab door handles shall have a vertical orientation making them easily accessible from forward or rearward outboard seating positions. Each cab door shall have a manually operated door lock actuated from the interior of each respective door.

**Cab Instruments and Controls**

Cab controls shall be located on the cab instrument panel in the dashboard on the driver’s side where they are clearly visible and easily reachable. Chassis operation switches shall be installed in removable panels for ease of service. The following gauges and/or controls shall be provided:

- Speedometer/Odometer
- Tachometer
- Engine hour meter
- Engine oil pressure gauge with warning light and buzzer
- Engine water temperature gauge with warning light and buzzer
- Transmission oil temperature gauge
- Two (2) air pressure gauges with a warning light and buzzer (front air and rear air)
- Fuel gauge with low fuel indicator light
- Voltmeter
- Master battery/ignition switch (rocker with integral guard)
- Engine start switch (rocker)
- Heater and defroster controls with illumination
- Marker light/headlight control switch (rocker)
- Panel light dimmer switch (rocker)
- Self-canceling turn signal control with indicators
- Windshield wiper switch with variable speed and washer controls
- Pump shift control with green “pump in gear” and “o.k. to pump” indicator lights
- Parking brake controls with red indicator light on dash
- Automatic transmission shift console
- Electric horn button at center of steering wheel
- Master warning light switch
- Cab ajar warning indicator
- Air filter restriction indicator
Controls and switches shall be identified as to their function by backlit wording adjacent to each switch, or indirect panel lighting adjacent to the controls.

**Electrical System**

The cab and chassis system shall have designated electrical distribution areas. All electrical components shall be located such that standard operations shall not interfere with or disrupt vehicle operation. An access cover shall be provided for maintenance access to the electrical distribution area. Circuit protection shall be provided by fuses, thermal reset breakers and/or solid state controls.

A 6 place, constantly hot, and 6 place ignition switched fuse panel and ground for customer-installed radios and chargers shall be provided at the electrical distribution area. Radio suppression shall be sufficient to allow radio equipment operation without interference.

All wiring shall be mounted in the chassis frame and protected from impact, abrasion, water, ice, and heat sources. The wiring shall be color-coded and functionally-labeled every 3” on the outer surface of the insulation for ease of identification and maintenance. The wiring harness shall conform to SAE 1127 with GXL temperature properties. Any wiring connections exposed to the outside environment shall be weather-resistant. All harnesses shall be covered in a loom that is rated at 280 degrees F to protect the wiring against heat and abrasion.

**Daytime Running Lights**

Two (2) dual rectangular chrome plated headlight bezels shall be installed on the front of the cab. The low beam headlights shall activate with the release of the parking brake to provide daytime running lights (DRL) for additional vehicle conspicuity and safety. The headlight switch shall automatically override the DRL for normal low beam/high beam operation.

**Fast Idle System**

A fast idle system shall be provided and controlled by a switch accessible by the driver. The system shall increase engine idle speed to a preset RPM for increased alternator output.

**Cab Crashworthiness Requirement**

The apparatus cab shall meet and/or exceed relevant NFPA 1901 load and impact tests required for compliance certification with the following:

Side Impact Dynamic Pre-Load per SAE J2422 (Section 5).

Testing shall meet and/or exceed defined test using 13,000 ft-lbs of force as a requirement. The cab shall be subject to a side impact representing the force seen in a roll-over. The cab shall exhibit minimal to no intrusion into the cab’s occupant survival space, doors shall remain closed and cab shall remain attached to frame.

Cab testing shall be completed using 13,776 ft-lbs of force exceeding testing requirements.
Quasi-static Roof Strength (proof loads) per SAE J2422 (Section 6) / ECE R29, Annex 3, paragraph 5.

Testing shall meet and/or exceed defined test using 22,046 lbs of mass as a requirement. Testing shall be completed using platen(s) distributed uniformly over all bearing members of the cab roof structure.

Cab testing shall be completed using 23,561 lbs of mass exceeding testing requirements. The cab shall exhibit minimal to no intrusion into the cab’s occupant survival space and doors shall remain closed.

Additional cab testing shall be conducted using 117,336 lbs of mass exceeding testing requirements by over five (5) times. The cab shall exhibit minimal to no intrusion into the cab’s occupant survival space and the doors shall remain closed.

Frontal Impact per SAE J2420.

Testing shall meet and/or exceed defined test using 32,549 ft-lbs of force as a requirement. The cab shall be subject to a frontal impact as defined by the standard. The cab shall exhibit minimal to no intrusion into the cab’s occupant survival space, doors shall remain closed and cab shall remain attached to frame.

Cab testing shall be completed using 34,844 ft-lbs of force exceeding testing requirements.

Additional cab testing shall be conducted using 65,891 ft-lbs of force exceeding testing requirements by over two (2) times.

The cab shall meet all requirements to the above cab crash worthiness; NO EXCEPTIONS.

A copy of a certificate or letter verifying compliance to the above performance by an independent, licensed, professional engineer shall be provided upon request.

For any or all of the above tests, the cab manufacturer shall provide either photographs or video footage of the procedure upon request.

**Seat Mounting Strength**

The cab seat mounting surfaces shall be third party tested and in compliance with FMVSS 571.207.

**Seat Belt Anchor Strength**

The cab seat belt mounting points shall be third party tested and in compliance with FMVSS 571.210.
ISO Compliance

The manufacturer shall ensure that the construction of the apparatus cab shall be in conformance with the established ISO-compliant quality system. All written quality procedures and other procedures referenced within the pages of the manufacturer’s Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts this process shall be strictly adhered to. By virtue of its ISO compliance the manufacturer shall provide an apparatus cab that is built to exacting standards, meets the customer’s expectations, and satisfies the customer’s requirements.

CAB ROOF TYPE

Raised Rear Cab Roof (Split)

The outboard roof of the rear crew area shall be raised 12” allowing the rear cab doors to be extended up providing improved egress. The forward end of the raised roof shall be tapered for a streamlined appearance. The interior of the raised cab roof areas shall be provided with padded headliner material to match the center cab ceiling.

The center of the cab roof shall include a 1.5" deep waterway clearance notch from front to rear minimizing overall travel height of the vehicle. The center cab roof notch shall not affect the interior cab ceiling or cab structure.

CAB BADGE PACKAGE

Logo Package

The apparatus shall have manufacturer logos provided on the cab and body as applicable.

CAB DOOR OPTIONS

Rear Cab Door Position

The cab rear doors shall be moved to the rear of the wheel opening. This door placement facilitates easier entry and egress by reducing the rear facing seat protrusion into the door opening.

Rear door position to the 58” or (medium cab).

Cab Door Locks

The cab shall have 1250 keyed door locks provided on exterior doors to secure the apparatus.
**Cab Door Panels**

The inner door panels shall be made from 14 gauge brushed finish stainless steel for increased durability. The cab door panels shall be split just below the handrail and incorporate an easily removable panel for access to the latching mechanism and window regulator for maintenance or service.

**Cab Door Locks**

Each cab door shall have a manually operated door lock actuated from the interior of each respective door. Exterior of each cab door shall be provided with a keyed lock integrated with the cab door handle.

**Cab Door Reflective Material**

Reflexite V98 [#COL] striping shall be provided approximately 12” high on the lower cab door panels. The stripes shall run from the top outer corner to the bottom inside corner of the lower door area, forming a "A" shape when viewed from the rear. The reflective material shall meet NFPA 1901 requirements.

**Cab Front Door Windows**

Full roll-down windows shall be provided for the front cab doors with manually operated worm gear drive cable operation for positive operation and long life. Scissors or gear-and-sector drives are not acceptable.

**Cab Rear Door Windows**

Full roll-down windows shall be provided for the rear crew doors with manually operated worm gear drive cable operation for positive operation and long life. Scissors or gear-and-sector drives are not acceptable.

**Cab Door Style**

The cab doors shall extend down to cover lower step well.

**CAB STEP OPTIONS**

**Cab Step**

An auxiliary step below the cab door shall be provided. The step shall be constructed of .188” aluminum tread brite. The step surface shall be provided with an aggressive skid-resistant surface and have an open back. The step shall be in accordance with current NFPA requirements and shall include a multi-directional aggressive gripping surface incorporated into the diamond plate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8” (0.125”). Gripping surfaces shall be circular in design, a minimum of 1” diameter and on centers not to exceed 4”.
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The step shall be located driver's front door, officer's front door, driver side rear door, officer side rear door.

Steps under front cab doors shall not interfere with approach angle.

**Cab Steps**

The lower cab steps shall extend 3.5" past the side of the cab to provide increased surface area.

**MIRRORS**

**Mirror Extension**

There shall be a 2” extension provided for each Ramco mirror.

**Mirrors, Heated**

Driver and officer cab mirrors to be heated. Includes all surfaces (flat and convex, as applicable).

**Cab Mirrors**

Two (2) Ramco model 6001FFR remote controlled aluminum mirrors shall be installed. The mirrors shall incorporate a full face main section with a convex mirror with housing model CAS750, mounted to the top. The adjustment of main sections shall be through dash mounted switches. Location: mounted on front corners of cab.

**MISC EXTERIOR CAB OPTIONS**

**Cab Canopy Window**

There shall be a fixed window provided between the front and rear doors on the driver’s side of the cab.

Window dimensions shall be as follows:

- 44" C/A cab (short cab): 16"W x 24.5"H
- 58" - 80" C/A cab (medium - extended): 26.69"W x 24.5"H

**Cab Canopy Window**

There shall be a fixed window provided between the front and rear doors on the officer’s side of the cab.

Window dimensions shall be as follows:

- 44" C/A cab (short cab): 16"W x 24.5"H
• 58" - 80" C/A cab (medium - extended): 26.69"W x 24.5"H

Front Mud Flaps

Black linear low density polyethylene (proprietary blend) mud flaps shall be installed on the rear of the cab front wheel wells. The design of the mud flaps shall have corrugated ridges to distribute water evenly.

Handrails

Cab door assist handrails shall consist of two (2) 1.25” diameter x 18” long 6063-T5 anodized aluminum tubes mounted directly behind the driver and officer door openings one each side of the cab. The handrails shall be machine extruded with integral ribbed surfaces to assure a good grip for personnel safety. Handrails shall be installed between chrome end stanchions and shall be positioned at least 2” from the mounting surface to allow a positive grip with a gloved hand.

Rear Cab Wall Construction

The rear cab wall shall be constructed with the use of 3/16" aluminum diamond plate interlocking in aluminum extrusions.

Cab Wheel Well

The cab wheel well shall be increased in size to provide additional clearance for larger tires. The fender trim shall be adjustable in and out to better accommodate various wheel / tire offsets.

Receptacle Mounting Plate

A mounting plate shall be provided for the battery charger receptacle, battery charger indicator and if applicable the air inlet, etc. The plate shall be constructed of 14 gauge brushed finish stainless steel and be removable for service access to the receptacle(s) and indicator.
HVAC

Heat, Supplemental

A single 40,000 BTU water heater shall be supplied in the front area of the cab. The unit shall heat the lower section of the driver’s and officer’s footwell.

Dual 23,000 BTU water heaters with diamond plate covers shall be supplied in the rear of the cab to heat the rear cab lower section.

Dual climate control will be achieved via dual switches installed on a front instrument panel. On units with optional multiplex display climate control, the floor heaters shall be controlled through the HVAC screen in the display.

HVAC Control Location

Heating and air conditioning controls shall be located in the center dash area.

Air Conditioning

An overhead air-conditioner / heater system with a single radiator mounted condenser shall be supplied.

The unit shall be mounted to the cab interior headliner in a mid-cab position, away from all seating positions. The unit shall provide fourteen (14) comfort discharge louvers, eight (8) to the back area of the cab, six (6) to the front area of the cab including one (1) each side outboard in the forward overhead console. These louvers will be used for both AC and heated air delivery. Two (2) additional large front louvers shall be damper controlled to provide defogging and defrosting capabilities to the front windshield as necessary.

The unit shall consist of a high output evaporator coil and heater core with one (1) high output dual blower for front air delivery, and two (2) high performance single wheel blowers for rear air delivery. For improved corrosion resistance the evaporator shall have a hydrophilic blue fin coating.

The control panel shall actuate the air-distribution system using electric actuators. The control panel shall allow blended airflow to both the comfort air vents and defrost vents. Separate three-speed blower switches shall be provided to independently control air speed for the front and rear blowers.

The condenser shall be radiator mounted and have a minimum capacity of 65,000 BTUs and shall include a receiver drier.

Performance Data: (Unit only, no ducting or louvers)
• AC BTU: 55,000
• Heat BTU: 65,000
• CFM: 1300 @ 13.8V (All blowers)
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The compressor shall be a ten-cylinder swash plate type Seltec model TM-31HD with a capacity of 19.1 cu. in. per revolution.

The system shall be capable of cooling the interior of the cab from 100 degrees ambient to 75 degrees or less with 50% relative humidity in 30 minutes or less.

**SEATS**

**Seating Capacity Tag**

A tag that is in view of the driver stating seating capacity of four (4) personnel shall be provided.

**SCBA Bracket SmartDock**

A IMMI SmartDock Gen2 SCBA storage bracket shall be provided. The SmartDock is a strap-free docking station that offers single-motion SCBA insertion and hands-free release when the firefighter stands up to exit the seat. SmartDock has undergone extensive testing to ensure that it meets or exceeds industry standards. When evaluated to the NFPA 1901 Standard for Automotive Fire Apparatus, SmartDock met requirements for retaining both the cylinder and the pack in dynamic testing.

Location: officer's seat, rear facing driver's side, rear facing officer's side.

**Seat Belt Extender**

ReadyReach seat belt extenders shall be provided. The extender shall include an arm that places the shoulder belt D-loop in a closer, easier to reach location.

The extenders shall be provided for the driver's seat, officer's seat, rear facing driver's side, rear facing officer's side seat.

**Cab Seats**

All cab seats shall be Valor brand.

**Seat Cover Material**

All seats shall have Valor Tech XD military grade upholstery material.

**Seat Fabric Color**

The color of all seats shall be black with red top stitching.

**Seat, Driver**

A USSC Valor P1A air suspension seat shall be supplied for the driver’s position.
Features shall include:

- Dymetrol® Active suspension
- Low-profile air suspension
- 2.75 Suspension stroke
- 350 lb. capacity
- Fore and aft adjustable tracks with 6-inches of travel
- Rotational knob for infinitely adjustable lumbar
- Adjustable seat backrest
- Integral headrest

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

**Seat, Officer**

A USSC Valor fixed SCBA seat shall be supplied for the officer’s position in front of the cab.

Features shall include:

- 95-Degree back angle
- Fixed headrest
- Magnetic SCBA harness securement

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

**Seat, Rear Facing**

Rear facing USSC Valor fixed SCBA seat driver’s side.

Features shall include:

- 95-Degree back angle
- Fixed headrest
- Magnetic SCBA harness securement

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.
Seat, Rear Facing

Rear facing USSC Valor fixed SCBA seat officer’s side.

Features shall include:

- 95-Degree back angle
- Fixed headrest
- Magnetic SCBA harness securement

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

MISC INTERIOR CAB OPTIONS

Cab Interior Color

Cab instrument panel, overhead console, trim panels, headliner, and door panels shall be gray.

Sun Visors

Padded sun visors shall be provided for the driver and officer matching the interior trim of the cab and shall be flush mounted into the underside of the overhead console.

Air Horn Lanyard

There shall be a “Y” style lanyard mounted in the center of the cab that allows the driver and officer to operate the air horns. The lanyard shall activate an electrical air switch.

Engine Cover

The engine cover shall blend in smoothly with the interior dash and flooring of the cab. The upper left and right sides shall have a sloped transition surface running front to rear providing increased space for the driver and officer.

The engine cover and engine service access door cover shall be molded 18 lb/cu. ft. (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/- 5.0) per ASTM F1957-99. The cover shall be approximately .5” thick with a minimum skin thickness of 0.0625 inches. The cover shall be provided to reduce the transmission of noise and heat from the engine. The cover shall be black and feature a pebble grain finish for slip resistance.

Cup Holder / Storage Tray

A cup holder and tray assembly shall be provided on the cab engine cover between the driver and officer. The tray shall be approximately 14" wide x 10" long x 1.5” tall and constructed
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from .125" aluminum plate. The top edge of the tray sides shall have a .5" lip and the front corners of the tray shall be tapered for dash access. The two (2) cup holders shall be constructed from 3.5" diameter pipe approximately 2.5" tall and be located one each side at the rear corners of the tray. The assembly shall be painted to match the cab interior color.

**Overhead Console**

An overhead console shall be provided in the front of the cab for the driver and officer. The areas in front of the driver and officer shall be removable panels that can be used for switches and other electrical items. The entire overhead console shall be hinged for service access.

The center of the overhead console shall have a lowered area for mounting of up to three (3) electrical components like siren heads, directional bar controllers, etc.

The overhead console shall be constructed of aluminum smooth plate painted to match the cab interior. The console shall be installed using stainless steel fasteners.

**Rear Engine Cover**

The rear engine cover shall be provided with a reduced profile for increased legroom on the forward facing rear inboard seats.

**Cab Dash - Low Profile Severe Duty**

The driver side and center dash shall be constructed from cast aluminum for durability and long life.

The driver side cast aluminum dash shall enclose the instrument cluster.

The center dash area shall be a low profile design to provide optimal forward visibility. The driver and officer sides shall be angled for ergonomic access and designed for either a color display or switches. Access panels shall be provided on the top, front and officer side for easy service access.

The officer side dash shall be low profile and constructed from .125" smooth aluminum plate. A service access panel shall be provided in the top surface.

The driver, center and officer side dash shall be painted to match the cab interior.

The lower kick panels below the dash to be constructed from .125 aluminum plate painted to match the cab interior. The panels shall be removable to allow for servicing components that may be located behind the panels.

**Cab Insulation Package**

The cab shall be insulated to mitigate noise and ensure maximum cooling/heating capacity. The insulation package shall include 1" Polyester foam with Mylar facing for the front wall, rear
wall, side walls, and ceiling, Reflectex (or equal) inside each cab door and 1" closed cell foam insulation below the front and rear facing seat risers.

**CAB ELECTRICAL OPTIONS**

**Cab Dome Lights**

A Weldon LED dome light assembly with one (1) white lens and one (1) red lens and plastic housing shall be installed. The white light activates with appropriate cab door and light assembly switch, the red light activates with light assembly mounted switch only.

There shall be two (2) mounted in the front of the cab, one (1) in the driver and one (1) in the officer ceiling.

There shall be two (2) mounted in the rear of the cab, one (1) in the driver side and one (1) in the officer side ceiling.

**Push-Button Switch**

A heavy duty metal push-button switch shall be installed on the officer’s side switch panel to operate the Q2B siren.

**Push-Button Switch**

A heavy duty metal push-button switch shall be installed on the officer’s side switch panel to operate the Q2B siren brake.

**Auto-Eject Battery Charger Receptacle**

The battery charger receptacle shall be a Kussmaul 20 amp NEMA 5-20 Super Auto-Eject #091-55-20-120 with a cover. The Super Auto-Eject receptacle shall be completely sealed and have an automatic power line disconnect.

The receptacle shall be located outside driver's door next to handrail and the cover color shall be Yellow.

**Horn Button Switch**

A two (2) position rocker switch shall be installed in the cab accessible to driver and properly labeled to enable operator to activate the OEM traffic horn or Federal Signal Q2B siren from the steering wheel horn button.

**English Dominant Gauge Cluster**

The cab operational instruments shall be located in the dashboard on the driver side of the cab and shall be clearly visible. The gauges in this panel shall be English dominant and shall be the following:
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- Speedometer/Odometer
- Tachometer with integral hour meter
- Engine oil pressure gauge with warning light and buzzer
- Engine water temperature gauge with warning light and buzzer
- Two (2) air pressure gauges with a warning light and buzzer (front air and rear air)
- Fuel gauge
- Voltmeter
- Transmission oil temperature gauge

This panel shall be backlit for increased visibility during day and night time operations.

**Headlights**

The front of the cab shall have four (4) headlights. The headlights shall be mounted on the front of the cab in the lower position. The headlights shall be day time operational.

**12 Volt (or 24 Volt) Outlet**

A plug-in type receptacle for hand held spotlights, cell phones, chargers, etc. shall be installed driver side dash, officer's switch panel. The receptacle shall be wired battery hot.

**Battery Charger Location**

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

**Battery Charger**

An Kussmaul LPC 20 battery charger with remote mounted LED display shall be installed.

A fully automatic charging system shall be installed on the apparatus. The system shall have a 120 volt, 60 hertz, 7 amp AC input with an output of 20 amps 12 volts DC. The battery charging system shall be connected directly to the shoreline to ensure the batteries remain fully charged while the vehicle is in the fire station or firehouse.

The system shall include a remote charging status indicator panel. The panel shall consist of two (2) LED lights to provide a visual signal if battery voltage is good or drops below 11.5 volts. The microprocessor shall be continuously powered from the battery to provide the charge status.

**Cab USB Charging Port**

A dual USB charging port for cell phones, chargers, etc. shall be installed driver side dash, officer's switch panel. The receptacles shall be wired battery hot.

**DPF Regeneration Override**

A momentary override switch shall be provided for the Diesel Particulate Filter (DPF) regeneration. The switch will inhibit the regeneration process until the switch is reset or the engine is shut down and restarted. The switch shall be located within reach of the driver.
LED Cab Headlights

Peterson LED headlights shall be provided. LED lights shall be provided in the low and high beam position of the head lamp assembly.

Cab Door Step Area Lighting

There shall be eight (8) clear TecNiq model D07 LED lights provided to illuminate the cab step well areas. Two (2) lights shall be located at each door area, one (1) above each step. The lights shall have polished stainless steel housings. The lights shall be activated by the cab door ajar circuit.

Cab Turn Signals

A pair of TecNiq LED (Light Emitting Diode) turn signal lights with clear lens shall be installed on the front of the cab. The strip type lights shall be 1.25" high x 15" long and be mounted in a polished cast aluminum housing between the quad bezels.

BODY SPEC

Aerial Equipment Body

Performance

The aerial body shall be designed to permit the reloading of fire hose without raising the aerial from the stored position. This requirement is essential to the effective operation of the apparatus when pumper operations are required. **NO EXCEPTIONS.**

The apparatus body shall be constructed entirely of aluminum extrusions with interlocking aluminum plates. An extruded modular aluminum body is required due to the high strength-to-weight ratio of aluminum, corrosion-resistant body structure, easy damage repair, and lighter overall body weight to allow for increased equipment carrying capacity.

The apparatus shall incorporate a rescue style body design to maximize compartment space. The rescue style left and right side body shall combine upper and lower compartments to provide more efficient use of body storage capacity.

The entire vehicle shall be constructed of aluminum extrusions. Body designs that incorporate steel sub-frames connected to aluminum compartments are not as corrosion-resistant and not acceptable.

Body Mainframe

The body mainframe shall be entirely constructed of aluminum. The complete framework shall be constructed of 6061T6 and 6063T5 aluminum alloy extrusions welded together using 5356 aluminum alloy welding wire.
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The mainframe shall incorporate a series of vertical frame components connected in series. Each vertical frame assembly shall be constructed with 3” x 3” extrusions welded together in a square frame configuration. The open center shall permit the installation of a tunnel for ground ladder storage. The mainframe shall be held together from front to rear by two (2) solid 1/2” x 3” aluminum braces on each side of the vertical frame components. The braces shall also serve as the connection point between the torque box and body frame. The body side compartments shall be connected and supported by the extruded aluminum mainframe assembly.

**Body Side Assemblies**

The left and right side body assemblies shall be framed with 6063T5 1 1/2” x 4” 3/16” wall extrusions. The left side body compartments shall be framed to make full height compartments ahead and behind the wheel well opening. The body side assemblies shall be designed so that the compartment walls are not required to support the body. The compartments shall be interlocked and welded to the side assembly extrusions.

The top of the body side assemblies shall be supplied with embossed diamond plate covers with polished corners to minimize maintenance and provide service access to electrical components.

**Stabilizer Openings**

The body shall be designed to accommodate a four (4) stabilizer aerial system. One (1) opening shall be supplied behind the rear axle as close to the wheel well opening as possible to maximize rear angle of departure and to prevent the stabilizer pads from contacting the ground during driving. The second set shall be mounted just behind the pump compartment. The openings shall be framed in aluminum extrusions. A stabilizer cover made from treadplate shall be supplied on the extendable stabilizer. The cover shall provide a pleasing appearance and mounting location for a red stabilizer warning light as outlined in NFPA 1901.

The stabilizer openings shall be supplied with clear lights to illuminate the stabilizers and the ground surrounding the openings. The lights shall illuminate when any stabilizer is moved from the stored position.

**Body Mounting System**

The body shall attach to the integral torque box with grade 8 bolts connected through steel mounts welded on the side of the torque box. To isolate dissimilar metals a 1/4” fiber-reinforced rubber dielectric barrier between the aluminum body and steel torque box shall be supplied. Body designs that weld to the aerial torque box or chassis frame rails shall not be acceptable due to the stress imposed on the vehicle during road travel and aerial operations.

**Rear Body Design**

The rear body shall be designed to provide ground ladder storage, hose deployment, and service access to aerial components. The center rear of the body shall be open for ground ladder storage. The area below the ground ladder storage shall be for a waterway inlet (if applicable), the stabilizer control panel and have access doors to hydraulic components.
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The aerial master control panel that is located on the rear of the body shall consist of a master switch, interlock light, and indicators that illuminate when each stabilizer is deployed. The stabilizer controls shall be divided into two (2) boxes located one (1) each side on the rear body so the operator may observe the stabilizers being deployed on each side of the apparatus as outlined in NFPA 1901.

**Side Aerial Access Staircase**

A single access staircase shall be supplied on the driver’s side of the apparatus to the aerial turntable. The staircase shall incorporate a pocket-style drop-down step in the body rubrail to reduce ground to staircase step height when the unit is up on jacks. The angled staircase shall be supplied with extruded aluminum handrails on both sides of the staircase frame.

**Water Tank Mounting System**

The body design shall allow the booster tank to be completely removable without disturbing or dismounting the apparatus body structure. The water tank shall rest on top of a 3” x 3” frame assembly covered with rubber shock pads and corner braces formed from 3/16” angled plate to support the tank.

The booster tank mounting system shall utilize a floating design to reduce stress from road travel and vibration. To maintain low vehicle center of gravity, the water tank bottom shall be mounted within 5” of the frame rail top. Designs that store ground ladders under the water tank and raise center of gravity shall not be acceptable.

**Compartments**

All body compartment walls and ceilings shall be constructed from 1/8” formed aluminum 3003 H14 alloy plate. Each compartment shall be modular in design and shall not be part of the body support structure.

Compartment floors shall be constructed of 1/8” aluminum diamond plate welded in place. Compartment floors that are over 15” deep shall be supported by a minimum 1.5” x 3” x 1/8” walled aluminum extrusions. The compartment seams shall be sealed using a permanent pliable silicone caulk. A series of louvers shall be supplied to facilitate ventilation of each compartment. Each louver shall be 3” wide by 3/4” tall and 1/2” deep. Right side rear compartment to have .5” extruded aluminum flabar welded to the underside centered equally between outside to inside for added support.

**Handrails**

Access handrails shall be provided at all step positions, including, but not limited to, the rear corner tailboard and installed to NFPA 1901 15.8. All body handrails shall be constructed of maintenance-free, corrosion-resistant, extruded aluminum. Handrails shall be a minimum of 1.25” OD and shall be installed between chrome end stanchions at least 2” from the mounting surface to allow for access with a gloved hand. The extruded aluminum shall be ribbed to assure a good grip for personnel safety.
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The handrails shall be installed as follows:

Two (2) 48” handrails, one (1) each side, located on the aerial access stair case.

**Steps, Standing, and Walking Surfaces**

The maximum stepping distance shall not exceed 18”, with the exception of the ground to first step. The ground to first step shall not exceed 24”. The ground to first step shall be maintained when the stabilizers are deployed by an auxiliary set of steps installed at the aerial access staircase. All steps or ladders shall sustain a minimum static load of 500 lbs. without deformation as outlined in NFPA 15.7.2.

All exterior steps shall be designed with a minimum slip resistance of 0.52 when tested wet using the Brungraber Mark II tester in accordance with the manufacturer's instructions.

**Apparatus Warning Labels**

A label shall be supplied on the rear body to warn personnel that riding in or on the rear step is prohibited as outlined in NFPA 1901 15.7.5. A label shall be applied to both sides of the apparatus and the rear to warn operators that the aerial is not insulated.

**Rubrail**

The body shall have a rubrail along the length of the body on each side and at the rear. The rubrail shall be constructed of minimum 3/16” thick anodized aluminum 6463T6 extrusion. The rubrail shall be a minimum of 2.75” high x 1.25” deep and shall extend beyond the body width to protect compartment doors and the body side.

The rubrail shall be of a C-channel design to allow marker and warning lights to be recessed inside for protection. The top surface of the rubrail shall have a minimum of five (5) serrations raised .1” high with cross grooves to provide a slip-resistant edge for the rear step and running boards. The rubrail shall be spaced away from the body using 3/16” nylon spacers. The ends of each section shall be provided with a rounded corner piece. The area inside the rubrail C-channel shall be inset with a reflective material for increased side and rear visibility.

**Pump Compartment**

The pump operator’s control panel and pump compartment shall be located towards the front of the body. The operator’s controls and gauges shall be located on the left side (street side) of the apparatus. The compartment shall be designed following NFPA 1901 15.6.

**ISO Compliance**

The manufacturer shall ensure that the construction of the apparatus aerial body shall be in conformance with the established ISO-compliant quality system. All written quality procedures and other procedures referenced within the pages of the manufacturer’s Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts this process shall be strictly adhered to. By virtue of its ISO compliance
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the manufacturer shall provide an apparatus aerial device that is built to exacting standards, meets the customer’s expectations, and satisfies the customer’s requirements.

BODY COMPT REAR

Rear Body Panels

The rear body panels shall be smooth 1/8” un-painted aluminum plate to facilitate rear body striping. The panels shall be bolt-on for a clean appearance and easier repair in the event of damage.

AERIAL BODY OPTIONS

Triple Crosslay Hosebed

Three (3) crosslay hosebeds shall be provided at the front area of the body. Two (2) crosslay sections shall have a capacity for up to 200’ of 2.0” double-jacket fire hose single stacked and preconnected to the pump discharge. One (1) crosslay section shall have a capacity for up to 150-200’ of 2.5” double-jacket fire hose single stacked and preconnected to the pump discharge. The crosslay decking shall be constructed entirely of maintenance-free 3/4” x 2-3/4” hollow aluminum extrusions.

Stainless steel rollers with nylon guides set in aluminum extrusions shall be installed horizontally and vertically on each end of the crosslay to allow easy deployment of the hose and help protect the body paint.

Dunnage Pan

A dunnage pan constructed of 3/16” (.188”) aluminum treadplate shall be located rearward of the crosslays. The dunnage pan shall be sized to maximize available storage space.

Storage Pan

A shallow pan shall be provided in the forward area of the upper open storage area.

The pan shall constructed of 3/16? (.188?) aluminum treadplate.

Ladder Tunnel Doors

A pair of 3/16” (.188) aluminum smooth plate doors with D-ring style handles shall be installed for access to the rear ladder tunnel. Each door shall open a full 90 degrees to allow easy removal of ground ladders. The doors shall match the rear body finish.

Rear Control Doors

The driver/officer jack and master control switch panels at the rear of the body shall be provided with access doors. The doors shall have the same finish as the rear of the body.
Outrigger Covers

Two (2) piece outrigger covers constructed of 14 gauge brushed finish stainless steel plate shall be provided for the jack leg openings. One piece of the cover shall be sized to cover just the extending outrigger in order to require a minimal amount of set-up space. The second piece of the cover shall be fixed and mounted to the body to cover the remaining outrigger opening.

Fuel Fill Door

The hinged fuel fill door and fixed panel below door each side to rear of rear axle shall be 14 ga brushed S/S.

Auxiliary Ground Pads

Four (4) auxiliary ground pads shall be provided. The pads shall be 24” x 24” x 1/2” thick aluminum plate with a 20 degree formed handle with cutout for hand hold. The pads shall be stored in double brackets holding two (2) pads each that are welded below the body.

Front Body Module

There shall be a forward body module that will enclose the water tank and provide additional compartmentation. The body design shall provide 32.44 cubic feet of storage.

Compartment Sizes

The compartment sizes and location shall be as follows:

Left Side:
There shall be one (1) compartment (L1) over the forward stabilizer. The compartment shall be approximately 47.5” wide x 28.5” high x 16” deep and contain approximately 12.53 cubic feet of storage space. The door opening shall be approximately 47.5” wide x 28.5” high.

Right Side:
There shall be one (1) compartment (R1) over the forward stabilizer. The compartment shall be approximately 29” wide x 28.5” high x 16” deep and contain approximately 7.65 cubic feet of storage space. The door opening shall be approximately 29” wide x 28.5” high.

There shall be one (1) compartment (OS1) over the forward stabilizer. The compartment shall be approximately 14.5” wide x 63.5” high x 23” deep and contain approximately 12.26 cubic feet of storage space. The door opening shall be approximately 14” wide x 63.5” high.

Driver Side Compartments

The driver side body design shall provide 95.82 cubic feet of storage, which exceeds the minimum NFPA 1901 Chapter 8.5 requirement of 40 cubic feet.

There shall be one (1) compartment (L2) ahead of the rear wheels. The compartment shall be approximately 44” wide x 11.5” high x 21” deep (upper) and 44” wide x 57” high x 26” deep...
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(lower) and contain approximately 44.67 cubic feet of storage space. The door opening shall be approximately 44” wide x 69.5” high.

There shall be one (1) compartment (L3) over the rear wheels. The compartment shall be approximately 62.5” wide x 23” high x 26” deep (forward) and 7” wide x 23” high x 23” deep (rearward) and contain approximately 23.77 cubic feet of storage space. The door opening shall be approximately 69.5” wide x 23” high.

There shall be one (1) compartment (L4) over the rear stabilizer. The compartment shall be approximately 45” wide x 23” high x 23” deep (upper), 28” wide x 28” high x 16” deep (lower forward) and 17” wide x 28” high x 23” deep (lower rearward) and contain approximately 27.38 cubic feet of storage space. The door opening shall be approximately 45” wide x 51” high.

Fuel Fill

The apparatus shall be supplied with a fuel fill on the driver side of the body. The fuel fill shall have a hinged door.

Officer Side Compartments

The officer side body design shall provide 64.61 cubic feet of storage.

There shall be one (1) compartment (R2) ahead of the rear wheels. The compartment shall be approximately 44” wide x 11.5” high x 21” deep (upper) and 44” wide x 57” high x 26” deep (lower) and contain approximately 44.67 cubic feet of storage space. The door opening shall be approximately 44” wide x 69.5” high.

There shall be one (1) compartment (R3) over the rear stabilizer. The compartment shall be approximately 25” wide x 24” high x 16” deep and contain approximately 5.56 cubic feet of storage space. The door opening shall be approximately 25” wide x 24” high.

There shall be one (1) compartment (R4) behind the rear stabilizer. The compartment shall be approximately 40” wide x 27” high x 23” deep and contain approximately 14.38 cubic feet of storage space. The door opening shall be approximately 40” wide x 27” high.

The hosebed shall contain 40 cubic feet. The hosebed shall measure 21” deep by 23” wide and 146” long.

The hosebed compartment deck shall be constructed entirely from maintenance-free extruded aluminum. Extrusions shall have an anodized ribbed top surface for maintenance-free service life. Extruded aluminum slats shall be 3/4” x 2 3/4” and shall be riveted into a one-piece grid system to prevent the accumulation of water and allow ventilation to assist in drying hose. The hosebed compartment shall be free of sharp edges and projections to prevent hose damage. The compartment deck design shall incorporate a track for the installation of adjustable hosebed dividers. The track shall hold the nut straight so only a TORX’s head screwdriver is required to adjust the divider from side to side.
The hosebed sides shall consist of aluminum plate and a framework of 1.5” x 4” x 3/16” and 3” x 3” x 3/16” aluminum slotted extrusions welded both vertically and horizontally for high rigidity.

**Fuel Fill**

The apparatus shall be supplied with a fuel fill on the officer side of the body. The fuel fill shall have a hinged door.

**Rear Pike Pole/Attic Ladder Storage**

A storage compartment shall be provided at the rear of the body for four (4) pike poles and one (1) attic ladder with feet. The storage area shall be labeled for two (2) 6` poles, one (1) 8` pole, one (1) 10` pole and one (1) 10` attic ladder. The pike poles and attic ladder shall be secured by a hinged aluminum plate door that matches the rear body finish.

**DOORS**

**Single Compartment Door**

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall beveled and shall be constructed from 3/16” (0.188”) aluminum plate. The inner door pan shall be constructed from 3/32” (0.090”) smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail.

The compartment door shall have a 1” x 9/16” (1” x 0.43”) closed-cell ”P” EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle a with #459 latch shall be provided on the door. The 4-1/2” (4.5”) D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The compartment door shall be securely attached to the apparatus body with a full-length stainless steel 1/4” (0.25”) rod piano-type hinge isolated from the body and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe. The door shall have a gas shock-style hold-open device.

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): R1, R3
Single Compartment Door

A single compartment door shall be constructed using a box pan configuration. The outer door pan shall beveled and shall be constructed from 3/16” (0.188”) aluminum plate. The inner door pan shall be constructed from 3/32” (0.090”) smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail.

The compartment door shall have a 1” x 9/16” (1” x 0.43”) closed-cell “P” EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle a with #459 latch shall be provided on the door. The 4-1/2” (4.5”) D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The compartment door shall be securely attached to the apparatus body with a full-length stainless steel 1/4” (0.25”) rod piano-type hinge isolated from the body and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe. The door shall have gas shock-style hold-open devices.

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): L3
The compartment door shall be securely attached to the apparatus body with a full-length stainless steel 1/4” (0.25”) rod piano-type hinge isolated from the body and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe. The door shall have a gas shock-style hold-open device.

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): OS1

**Roll Up Compartment Door**

An AMDOR brand roll up door with painted finish shall be provided on a compartment. The door(s) shall be installed in the following location(s): L2, L4, R2. The door slats shall be 1” aluminum double wall slats with continuous ball & socket hinge joint and recessed dual durometer slat seal, double wall reinforced bottom panel with stainless steel lift bar latching system, bottom panel flange with cut-outs for ease of access with gloved hands, reusable slat shoes with positive snap-in securement, smooth interior door curtain to prevent equipment hang-ups. The slats shall have interlocking end shoes on each slat. The slats shall have interlocking joints with a PVC/vinyl inner seal to prevent any metal to metal contact and inhibit moisture and dust penetration.

The track shall be a one-piece painted aluminum door track / side frame, top gutter with non-marring seal, non-marring recessed side seals with UV stabilizers to prevent warpage, dual leg bottom seal, with all wear component material to be Type 6 Nylon. The track shall have a replaceable side seal to prevent water and dust from entering the compartment.

Door ajar switch system shall be magnetic proximity based components. Door striker will include support beneath the lift bar to prevent door curtain bounce.

The door opening shall be reduced by 2” in width and approximately 8-9” in height depending on door height.

**Reverse Hinge**

Vertically hinged single compartment door OS1 shall be reversed hinged to the back side of the compartment opening.

A vertically mounted drip rail shall be installed along the forward compartment opening to divert the elements from entering the compartment along the forward compartment opening while the apparatus is responding.

**Double Compartment Door**

Double compartment doors shall be constructed using a box pan configuration. The outer door pans shall bevel ed and shall be constructed from 3/16” (0.188”) aluminum plate. The inner door pans shall be constructed from 3/32” (0.090”) smooth aluminum plate and shall have nutsert
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fittings to attach hold-open hardware. The inner pans shall have a 90-degree bend to form an integral drip rail.

The compartment doors shall have a 1” x 9/16” (1” x 0.43”) closed-cell ”P” EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the doors to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle a with #459 latch shall be provided on the primary door. The 4-1/2” (4.5”) D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The secondary door shall have a dual stage rotary latch with a 750 lb rating to hold the door in the closed position. The latch shall be mounted at the top of the door. A stainless steel paddle style handle shall be mounted on the interior pan of the door to actuate the rotary latch. The paddle handle shall be connected to the rotary latch by a 5/32” (.156”) diameter rod. Cable actuation shall be deemed un-acceptable due to the potential for cable stretch and slippage. The striker pin shall be 3/8” (.38”) diameter with slotted mounting holes for adjustment.

Double door latch to have latch brackets fabricated from .125 aluminum smooth plate, installed with "PULL" tags #1032993 for left side and #1032294 for right side.

The compartment doors shall be securely attached to the apparatus body with a full-length stainless steel 1/4” (0.25”) rod piano-type hinge isolated from the body and compartment doors with a dielectric barrier. The doors shall be attached with machine screws threaded into the doorframe.

The doors shall have a gas shock-style hold-open device. The gas shocks shall have a 30 lb rating and be mounted near the top of the door (when possible).

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): L1, R4

COVERS

Rear Hose Bed Cover

A cover constructed of [#COL] 18 oz. PVC vinyl coated polyester shall be installed at the rear apparatus hose bed. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 per square inch.

The top of the cover shall be mechanically attached to the rear hose bed cover extrusion. The lower portion of the cover shall be secured in place with heavy duty nylon straps to comply with the latest edition of NFPA 1901.
**Cover Hose Bed-Aluminum**

An aluminum cover shall be provided to protect fire hose stored in the hose bed.

The hose bed cover shall be constructed of 1/8” aluminum tread brite and shall be one (1) piece in design. The cover shall be hinged with a full-length stainless steel knuckle hinge. For ease of use a pneumatic cylinder (gas shock) shall be used at the front of the cover. Recessed handles shall be provided at the front and rear of the cover.

The cover shall have a single water and corrosion resistant switch that will activate the red flashing door ajar light in the cab to alert the driver that the cover is open.

**Vinyl Crosslay Cover**

A cover constructed of [#COL] 18 oz. PVC vinyl coated polyester shall be installed on the crosslay. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 per square inch.

The cover shall be held in place across the top of the body by chrome snaps. The sides of the cover shall have integral flaps that extend down to cover the sides of the crosslay. The side flaps shall be secured in place to comply with the latest edition of NFPA 1901.

**PUMP PANELS**

**Side Mount Pump Panels**

The driver and officer side pump panels shall be constructed of 14 gauge stainless steel. Each panel shall have the ability to be removed from the module for easier access and for maintenance in the pump area.

**Hinged Gauge Panel**

The driver side upper gauge panel(s) shall be hinged to provide access to panel mounted electrical connections.

The gauge panel(s) shall be hinged to open upward with a full-length stainless steel piano type hinge with 1/4” pins. The hinge shall be ”staked” on every other knuckle to prevent the pin from sliding.

The gauge panel(s) shall include latches to secure the panel in the closed position and two (2) mechanical/pneumatic (as applicable with the panel size) hold-opens for the open position.

**Pump Access Door**

The officer side pump module shall have a three (3) piece panel, one (1) above the discharge outlets, one (1) encompassing the discharges and intakes and one (1) low for bleeder valves.
The upper two (2) pump panel sections shall have a vertical stainless steel piano type hinge with 1/4” pins along the forward edge of the pump module. The hinges shall be "staked" on every other knuckle to prevent the pin from sliding. The panels shall have push button style latches to secure the panels in the closed position. The upper panel shall have one (1) pneumatic shock to hold the panel in the open position.

**MISC PUMP PANEL OPTIONS**

**Pump Panel Tags**

Color coded pump panel labels shall be supplied to be in accordance with NFPA 1901 compliance.

**PUMP MODULE OPTIONS**

**Notched Preconnect Divider**

The crosslay preconnect divider(s) shall be notched to accommodate a bail handled nozzle. The notch(es) shall be approximately 5” high x 12” deep to allow nozzle(s) to be stowed in the preconnect storage area and allow for the addition of a preconnect cover.

**Flex Joint**

The area between the pump modules and body shall include a rubber flex joint.

**Air Horn Switch**

A heavy duty weatherproof push-button switch shall be installed at the pump operator’s panel to operate the air horns.

The switch shall be labeled "Evacuation Alert".

Location: driver side pump panel.

**WATER TANK**

**Booster Tank**

The booster tank shall be T-shaped in configuration and shall have a usable capacity of 500 gallons (U.S.). The booster tank shall be completely removable without disturbing or dismounting the apparatus body structure. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal.

The booster tank top, sides, and bottom shall be constructed of a minimum 1/2” (0.50”) thick black UV-stabilized copolymer polypropylene. Joints and seams shall be fused using nitrogen
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gas as required and tested for maximum strength and integrity. The tank construction shall include technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The tank cover shall be constructed of 1/2" thick polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40” apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions.

The tank shall have a combination vent and manual fill tower with a hinged lid. The fill tower shall be constructed of 1/2" polypropylene and shall be a typical dimension of 8" x 8" outer perimeter (subject to change for specific design applications). The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid.

The booster tank shall have two (2) tank plumbing openings. One (1) for a tank-to-pump suction line with an anti-swirl plate, and one (1) for a tank fill line. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates per the tank fill inlet size.

The sump shall be constructed of a minimum of 1/2" polypropylene. The sump shall have a minimum 3” N.P.T. threaded outlet for a drain plug per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3” above the inside floor.

The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength.

Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with an I.D. of 3" or larger that is designed to run through the tank. This outlet shall direct the draining of overflow water past the rear axle, thus reducing the possibility of freeze-up of these components in cold environments. This drain configuration shall also assure that rear axle tire traction shall not be affected when moving forward.

The booster tank shall undergo extensive testing prior to installation in the truck. All water tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale.

Each tank shall be weighed empty and full to provide precise fluid capacity. Each tank shall be delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. Engineering estimates for capacity calculations shall not be permitted for capacity certification. The tank must be designed and fabricated by a tank manufacturer that
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is ISO 9001:2008 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

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

The tank shall have a limited Lifetime warranty that provides warranty service for the life of the fire apparatus in which the tank is installed. Warranties are transferable if the apparatus ownership changes by requesting the transfer from the tank manufacturer.

TANK PLUMBING

Tank Fill 1.5 Akron Valve

One (1) manually operated 1-1/2” Akron valve shall be installed between the pump discharge and the booster tank in order to fill the tank. The valve control shall be located at the pump operator’s panel, and shall visually indicate the position of the valve at all times.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Tank to Pump 3 Akron Air Valve

One (1) air actuated 3” Akron valve shall be installed between the pump suction and the booster tank. Includes flex hose with stainless steel hose clamps for connection to the 4” tank sump outlet. The valve control shall be located at the pump operator’s panel and shall visually indicate the position of the valve at all times.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.
All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

A check valve shall be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank.

**LADDER STORAGE / RACKS**

**Bracket Horizontal Ladder**

Extension ladder mounting assembly shall consist of a 1/8” diamond plate boot bolted to the compartment top and a chrome plated handle to secure the ladder into the boot.

Location and type of ladder: over L2 for Little Giant model 17.

**Rear Ladder Storage**

A ladder storage tunnel shall be provided beneath the aerial device frame work. There shall be access to the ladders via an opening at the rear.

This tunnel shall be lined with .090” aluminum. The ladders will be held captive top and bottom by aluminum tracks and slide on friction reducing material. All ladders shall be removable individually without having to remove any other ladder.


**HANDRAILS / STEPS**

**Slide-Out Platform**

The slide-out platform shall be approximately 21” deep and shall be constructed of 1/8” aluminum treadplate. The platform shall be mounted under the apparatus body. The platform shall utilize a maintenance-free slide system incorporating stainless steel shoulder bolts that slide in slotted heavy wall aluminum angles. Notches shall be provided at each end of the slots to hold the platform in both the extended and retracted positions.

A chrome grab handle shall be provided on the front face of the platform for ease of operation.

Non-slip aluminum hand rail(s) with chrome plated stanchions shall be provided as best suited for use with the platform operation.

If applicable, NFPA pump throttle height requirement shall be measured from the top of the slide-out platform on all aerials and from the ground on side mounted pump operator panels on non-aerial apparatus.

Location: below driver side pump panel.
**Auxiliary Step**

A step below the body shall be provided. The step shall be constructed of .188” aluminum tread brite. The step surface shall be provided with an aggressive skid-resistant surface. The step shall be in accordance with current NFPA requirements and shall include a multi-directional aggressive gripping surface incorporated into the diamond plate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8” (0.125”). Gripping surfaces shall be circular in design, a minimum of 1” diameter and on centers not to exceed 4”. The step shall be located below rear of officer side pump panel.

One (1) handrail shall be installed in compliance with current NFPA. The handrail shall be constructed of 6063T5 1.25” OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

**MISC BODY OPTIONS**

**Mud Flaps**

Black mud flaps with manufacturers logo shall be provided for the body wheel wells.

**Swirled Finish**

The body compartment interior (ceilings and walls) shall have a swirl finish. The swirl finish shall also be included on the inner pan of hinged doors and compartment floors (if smooth plate) and tool compartments (as applicable). Compartment floors shall remain diamond plate if so equipped.

**Side Body Platework**

The painted aluminum smooth plate body side panels shall be flush with the supporting extrusions.

**Anodize Aluminum Trim**

A anodize aluminum trim shall be located at the bottom edge of all body compartment openings with painted edge (as applicable). The trim shall provide added protection of the painted surface of the body when equipment is removed from the compartment.

**Tilt Jack Location**

The cab tilt jack shall be located right side forward jack leg compartment low behind door in access panel (tilt sw behind door).

**Body Wheel Well**

The body wheel well frame shall be constructed from 6063-T5 aluminum extrusion with a slot the full length to permit an internal fit of 3/16” (0.188”) aluminum smooth plate supports. The
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outer body side wheel well plate shall be 3/16” (0.188”) aluminum smooth plate welded flush with the body side and painted job color.

The fenderettes shall be bolt-on and shall be easily removable. The fenderette shall be constructed from .080” aluminum with a mirror finish. The fenderette shall be 2 1/2” (2.5”) wide x 2 1/4” (2.25”) tall with a 26 7/8” (26.875”) radius. A “P” shaped rubber gasket shall be provided between the fenderette and wheel well body panel.

The wheel well liners shall be constructed of a 3/16” (.187”) composite material. The liners shall be bolt-on and shall provide a maintenance-free and damage-resistant surface.

SCBA BOTTLE STORAGE

SCBA Wheel Well Bottle Storage

The body wheel well area shall store up to four (4) SCBA bottles- two (2) on the officer side and two (2) on the driver side. The bottles shall be secured in each storage area by a vertical hinged door which shall be secured in the closed position by a push button latch. The doors shall have a brushed stainless steel finish.

Each storage area shall provide individual storage of a bottle and shall not allow forward or rearward movement of the bottle. The bottle(s) shall be removable from the storage area without the bottle(s) coming into contact with any surface area of the wheel well (NO EXCEPTIONS).

SCBA Strap

Straps shall be provided in each exterior storage compartment to provide secondary means to hold each SCBA bottle in the compartment. The straps shall be constructed from 1” nylon webbing formed in a loop. The strap(s) shall be mounted to the storage compartment ceiling directly inside the door opening at each bottle location.

PUMPS

Pump Rating

The fire pump shall be rated at 1500 GPM.

Fire Pump System

Pump

The pump shall be a midship-mounted Hale DSD 750-1500 single stage centrifugal pump. The pump shall be mounted on the chassis frame rails and shall be split shaft driven.

The entire pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (207 Mpa). All metal moving parts in contact with water shall be
of high quality bronze or stainless steel. Pump body shall be vertically on a single plane, for easy removal of impeller assembly, including clearance rings.

The pump impeller shall be hard, fine grain bronze of the mixed flow design; accurately machined, hand-ground, and individually balanced. The vanes of the impeller intake eye shall be hand-ground and polished to a sharp edge, and be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower.

The impeller shaft shall be constructed of heat-treated stainless steel and shall be rigidly supported by two (2) ball bearings for minimum deflection. Impeller clearance rings shall be bronze and easily removable without replacing impellers or pump volute body. The pump drive line shall be of heat-treated chrome nickel steel and shall withstand the full torque of the engine in both road and pump operating conditions. The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI.

The pump shaft shall have only one (1) mechanical seal. The mechanical seal shall be spring-loaded, maintenance-free, and self-adjusting. Impeller clearance rings shall be bronze, easily renewable without replacing impellers or pump volute body.

**Intake Manifold**

Two (2) 6.0`` diameter suction ports with 6`` NST males threads and removable screens shall be provided, one (1) each side. The ports shall be mounted one (1) on each side of the midship pump and shall extend through the side pump panels. Inlets shall come equipped with long handle chrome caps.

**Discharge Manifold**

The pump system shall utilize a stainless steel discharge manifold system that allows a direct flow of water to all discharge valves. The manifold and fabricated piping systems shall be constructed of a minimum of Schedule 10 stainless steel to reduce corrosion.

**Pump Shift**

The pump shift shall be pneumatically-controlled using a power shifting cylinder.

The power shift control valve shall be mounted in the cab and be labeled ´´PUMP SHIFT´´. The apparatus transmission shift control shall be furnished with a positive lever, preventing accidental shifting of the chassis transmission.

A green indicator light shall be located in the cab and be labeled ´´PUMP ENGAGED´´. The light shall not activate until the pump shift has completed its full travel into pump engagement position.

A second green indicator light shall be located in the cab and be labeled ´´OK TO PUMP´´. This light shall be energized when both the pump shift has been completed and the chassis automatic transmission has obtained converter lockup (4th gear lockup).
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One (1) pump panel-mounted `GREEN` indicator light shall be positioned above the throttle control on the pump operator`s panel. The light shall be energized when the pump shift has been completed, chassis automatic transmission has obtained converter lockup (4th gear lockup), and the chassis parking brake is set.

**Test Ports**

Two (2) test plugs shall be pump panel-mounted for third party testing of vacuum and pressures of the pump.

**PUMP CERTIFICATION**

**Pump Certification**

The pump, when dry, shall be capable of taking suction and discharging water in accordance with current NFPA 1901. The pump shall be tested at the manufacturer`s facility by an independent, third-party testing service. The conditions of the pump test shall be as outlined in current NFPA 1901.

The tests shall include, at a minimum, the pump test, the pumping engine overload test, the pressure control system test, the priming device tests, the vacuum test, and the water tank to pump flow test as outlined in current NFPA 1901.

A piping hydrostatic test shall be performed as outlined in current NFPA 1901.

The pump shall deliver the percentage of rated capacities at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure
- 100% of rated capacity at 165 psi net pump pressure
- 70% of rated capacity at 200 psi net pump pressure
- 50% of rated capacity at 250 psi net pump pressure

A test plate, installed at the pump panel, shall provide the rated discharges and pressures together with the speed of the engine as determined by the certification test, and the no-load governed speed of the engine.

A Certificate of Inspection certifying performance of the pump and all related components shall be provided at time of delivery. Additional certification documents shall include, but not limited to, Certificate of Hydrostatic Test, Electrical System Performance Test, Manufacturer`s Record of Pumper Construction, and Certificate of Pump Performance from the pump manufacturer.

**PUMP OPTIONS**

**Speed Counter**

The test connection shall be installed on the pump panel to manually verify the vehicle engine speed displayed on the electronic tachometer.
Steamers, Flush+1

The pump 6” steamer intake(s) shall be mounted approximately 1” from the pump panel to back of cap when installed. The "Flush+1" dimension can vary + or - 1-1/4" or as practicable depending on the pump module width and options selected. (Example 72" or 76" modules.)

Location: driver's side, officer's side.

Manual Master Drain

A manual master drain valve shall be installed and operated from the driver side. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal.

The manual master drain valve shall have twelve (12) individually-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines. It shall be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 PSI.

The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices.

Pump Cooler

The pump shall have a 3/8” line installed from the pump discharge to the booster tank to allow a small amount of water to circulate through the pump casing in order to cool the pump during sustained periods of pump operation when water is not being discharged. The pump cooler line shall be controlled from the pump operator's panel by a Innovative Controls 1/4 turn valve with "T" handle. Each 1/4 turn handle grip shall feature built-in color-coding labels and a verbiage tag.

Trident Primer

A Trident air operated priming system shall be installed. The unit shall be of all brass and stainless steel construction and designed for fire pumps of 1,250 GPM (4,600 LPM) or more. Due to corrosion exposure no aluminum or vanes shall be used in the primer design. The primer shall be three-barrel design with ¾” NPT connection to the fire pump.

The primer shall be mounted above the pump impeller so that the priming line will automatically drain back to the pump. The primer shall also automatically drain when the panel control actuator is not in operation. The inlet side of the primer shall include a brass "wye" type strainer with removable stainless steel fine mesh strainer to prevent entry of debris into the primer body.

The system shall create vacuum by using air from the chassis air brake system through a two-barrel multi-stage internal “venturi nozzles” within the primer body. The noise level during operation of the primer shall not exceed 75 Db.
Air Flow Requirements

The primer shall require a minimum of 15.6 cubic foot per minute air compressor and shall be capable of meeting drafting requirements at high idle engine speed. The air supply shall be from a chassis supplied "protected" air storage tank with a pressure protection valve. The air supply line shall have a pressure protection valve set between 70 to 80 PSIG.

Primer Control

The primer control shall have a manually operated, panel mounted “push to prime” air valve. The valve shall direct air pressure from the air brake storage tank to the primer body. To prevent freezing, no water shall flow to and from the panel control.

Warranty

The primer shall be covered by a five (5) year parts warranty.

INTAKES

Left Intake 2.5 Akron Valve

One (1) 2-1/2” suction inlet with a manually operated 2-1/2” Akron valve shall be provided on the left side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The outlet of the valve shall be connected to the suction side of the pump with the valve body located behind the pump panel. The valve shall come equipped with a brass inlet strainer, 2-1/2” NST female chrome inlet swivel, and shall be equipped with a chrome plated rockerlug plug with a retainer device.

The valve control shall be located at the pump operator’s panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance, and decreased friction loss.

A 3/4” bleeder valve assembly will be installed on the left side pump panel.
INTAKE OPTIONS

Intake Relief Valve

The pump shall be equipped with an Akron style 53 cast brass, variable-pressure-setting relief valve on the pump suction side. It shall be designed to operate at a maximum inlet pressure of 200 PSI. The relief valve shall be normally closed and shall be set to begin opening at 125 PSI in order to limit intake pressures in the pumping system. When the relief valve opens, the overflow water shall be directed through a plumbed outlet to discharge below the body in an area visible to the pump operator. The overflow outlet shall terminate with a male 2-1/2” NST threaded fitting to allow the overflow water to be directed away from the vehicle with a short hose (supplied by the fire department) during freezing weather or under other conditions where an accumulation of water around the apparatus might be hazardous.

DISCHARGES AND PRECONNECTS

Front Jump Line 1.5 Akron Valve

One (1) 1-1/2” preconnect outlet with a manually operated Akron valve shall be supplied to the extended front bumper. The preconnect shall consist of a 2” heavy duty hose coming from the pump discharge manifold to a 2” FNPT x 1-1/2” MNST mechanical swivel hose connection to permit the use of the hose from either side of the apparatus.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

An air blow-out valve shall be installed between the chassis air reservoir and the front jump line. The control shall be installed on the pump operator’s panel.

The discharge shall be supplied with a Class 1 automatic 3/4” drain valve assembly. The automatic drain shall have an all-brass body with stainless steel check assembly. The drain shall normally be open and automatically close when the pressure is greater than 6 psi.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.
**Front Bumper Discharge Swivel, Brass In Tray**

There shall be a brass swivel provided for the front bumper discharge located in hose tray center front bumper on lower back wall.

**Two (2) 1.5 Single Crosslay Akron Valve**

One (1) single crosslay discharge shall be provided at the front area of the body. The crosslay shall include one (1) 2” brass swivel with a 1-1/2” hose connection to permit the use of hose from either side of the apparatus.

The crosslay hose bed shall consist of a 2” heavy-duty hose coming from the pump discharge manifold to the 2” swivel. The hose shall be connected to a manually operated 2” Akron valve. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator’s panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: crosslay 1 & 2.

**Single Crosslay 2.5 Akron Valve**

One (1) single crosslay discharge shall be provided at the front area of the body. The crosslay shall have one (1) 2-1/2” mechanical swivel hose connection to permit the use of the hose from either side of the apparatus.

The crosslay hose bed shall consist of a 2-1/2” heavy-duty hose coming from the pump discharge manifold to the 2-1/2” swivel. The hose shall be connected to a manually operated 2-1/2” Akron valve. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator’s panel and shall visually indicate the position of the valve at all times.
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All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: crosslay 3.

Left Panel 2.5 Discharge Akron Valve

One (1) 2-1/2” discharge outlet with a manually operated Akron valve shall be provided at the left hand side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: left side discharge 1, left side discharge 2.

Right Panel 2.5 Discharge Akron Valve

One (1) 2-1/2” discharge outlet with a manually operated Akron valve shall be provided at the right side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: right side discharge 2.
**4" Panel Discharge w/ 3" Electric Akron**

One (1) 4” panel discharge with an 3” electrically actuated Akron valve shall be provided. The discharge shall consist of a 3” valve with a 4” MNST adapter as a integral part of the valve. The adapter shall protrude through the pump panel and be equipped with a chrome-plated, rocker-lug cap with a retainer.

The valve shall be an Akron 8600HD series with 316 stainless ball and polymer seals for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless ball when in a throttle position with water flowing. The valve shall be of the unique Akron Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve shall utilize an electric driven worm gear actuator. The valve may also be operated manually in case of electrical system failure.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

*Location: right side discharge 1

*Waterous pumps high output location is forward lower port (right side discharge 2).

**4" Waterway Discharge Electric Akron**

A 4” diameter discharge with an electrically actuated Akron valve shall be provided from the pump to the aerial waterway.

The valve shall be 4" Akron 8800HD series with bronze flat ball and polymer seals for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the brass ball when in a throttle position with water flowing. The valve shall be of the unique Akron Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. The end of the discharge outlet shall be equipped with a chrome-plated, rocker-lug cap with a retainer.

The valve shall utilize an electric driven worm gear actuator. The valve may also be operated manually in case of electrical system failure.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

**DISCHARGE OPTIONS**

**IC Push/Pull Control**

The apparatus pump panel shall be equipped with Innovative Controls Side Mount Valve Controls. The ergonomically designed ¼ turn push-pull T-handle shall be chrome-plated zinc with recessed labels for color-coding and verbiage. An anodized aluminum control rod and
housing shall, together with a stainless spring steel locking mechanism, eliminate valve drift. Teflon impregnated bronze bushings in both ends of the rod housing shall minimize rod deflection, never need lubrication, and ensure consistent long-term operation. The control assembly shall include a decorative chrome-plated zinc panel-mounting bezel with areas for color-coding and/or FOAM and CAFS identification labels.

**Bleeder Drain Valve**

The bleeder/drain valves shall be Innovative Controls ¾” ball brass drain valves with chrome-plated lift lever handles and ergonomic grips. Each lift handle grip shall feature built-in color-coding labels and a verbiage tag identifying each valve, also supplied by Innovative Controls. The color labels shall also include valve open and close verbiage.

**Discharge/Intake Bezel**

Innovative Controls intake and/or discharge swing handle bezels shall be installed to the apparatus with mounting bolts. These bezel assemblies will be used to identify intake and/or discharge ports with color and verbiage. These bezel 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.

**Akron Electric Valve 9333 Controller**

An Akron Brass Style 9333 Valve Controller shall be provided with a five year manufacturer warranty. The display shall be a full color LCD display with a backlight and manual adjustment of the brightness as well as an auto-dimming option. The electric controls shall provide true position feedback, requiring no clutches in the motor or current limiting. The unit shall be sealed with momentary open, close as well as an optional one touch full open feature to operate the actuator. The controller will provide an LCD display showing valve position indication and have up to three preset locations that can be user set and easily recalled upon each use. Valve position indication will be determined from true position feedback and indicate the exact position of the valve.

Two additional buttons shall be available to be used for preset selection, preset activation and menu navigation.

Locate on pump operator panel to control waterway discharge, right side discharge 1.

**PRESSURE GOVERNORS**

**Pump Pressure Governor**

The apparatus shall be equipped with a Class 1 "TOTAL PRESSURE GOVERNOR” (TPG) Integrated pump control system. The TPG shall have a weatherproof color display. The TPG
will operate as an engine/pump pressure governor/throttle system that is connected directly to
the Electronic Control Module (ECM) mounted on the engine. The TPG is to operate as a
pressure sensor (regulating) governor (PSG).

The TPG shall display engine RPM, oil pressure, engine temperature and voltage along with
providing critical warnings. The warning levels for oil pressure, high engine temperature, low
voltage and high voltage shall be independently programmable.

GAUGES

2.5” Discharge Gauges w/ Bezel

The valve discharge gauges shall be 2 ½“(63mm) diameter Innovative Controls pressure gauges.
Each gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant
molded crystals with captive O-ring seals to ensure distortion free viewing and 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 –40F to
+160F. 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 stainless steel bezel shall be provided to prevent corrosion and protect
the lens and gauge case. The gauges shall be installed into decorative chrome-plated mounting
bezels that incorporate valve-identifying verbiage and/or color labels. The gauges shall display a
range from 0 to 400 psi with black graphics on a white background.

4” Master Pressure Gauges w/Bezel

The master intake and master discharge gauges shall be 4“(101mm) diameter IC pressure
gauges. Each gauge shall have a rugged corrosion free stainless steel case and clear scratch
resistant molded crystals with captive O-ring seals to ensure distortion free viewing and 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
–40F to +160F. Each gauge shall meet ANSI B40.1 Grade 1A requirements with an accuracy of
+/- 1% 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.

The two master gauges shall be installed into decorative chrome-plated zinc mounting bezel that
also incorporates a test port manifold and a graphic overlay that identifies the master intake and
discharge gauges, the vacuum test port, and the pressure test port. The test port manifold is solid
cast brass with chrome plated plugs. The master gauges shall be installed on the pump panel no
more than 6 inches apart. The gauge on the left shall be the master pump intake gauge and
display a range from 30” vac to 400 psi with black graphics on a white background. The gauge
on the right shall be the master pump discharge gauge and display a range from 0 to 400 psi
with black graphics on a white background.
GAUGE IC SL PLUS LED WATER TANK LEVEL

An Innovative Controls SL Plus Tank Level Monitor System shall be installed. The system shall include [1] electronic display module(s), a stainless steel pressure transducer sender unit, and the necessary wiring with water-tight plug terminations that do not require sealing grease.

The master display module shall show the tank level using 16 super-bright easy-to-see LEDs. Tank level indication shall be achieved by the appropriate illumination of 4 horizontal rows of LEDs, with 4 LEDs per row. Full and near-full levels shall be indicated with the illumination of all 4 rows of LEDs, including the illumination of the top row of 4 green LEDs. Tank levels between ½ and ¾ full shall be indicated with the illumination of the bottom 3 rows of LEDs, including the illumination of the top row of 4 blue LEDs. Tank levels between ¼ and ½ full shall be indicated with the illumination of the bottom 2 rows of LEDs, including the illumination of the top row of 4 amber LEDs. Tank levels between ¼ full and near empty shall be indicated with the illumination of the bottom row of 4 red LEDs only. Tank levels between near empty and empty shall be indicated by flashing the bottom row of 4 red LEDs.

The master display shall have a backlit area above at the top with illuminated [water icon/ foam icon / foam A icon / foam B icon / WATER LEVEL text / FOAM LEVEL text / FOAM A text / FOAM B text] and a backlit area at the bottom with illuminated [tank capacity / IC logo / OEM logo].

A wide-angle polycarbonate diffusion lens in front of the LEDs shall produce a 180° viewing angle. The electronic display module shall be waterproof and shock resistant being encapsulated in a urethane-based potting compound. The potted display electronics shall be integral to a chrome-plated panel-mount reflector that is secured to the apparatus panel with 4 screws installed from the inside of the panel or optional decorative bezel, through the reflector, and into 4 threaded inserts in the outer diffusion lens.

FOAM SYSTEMS

Foam Ready System

Foam ready manifold shall be supplied for dealer installed Hale FoamLogix 2.1, 3.3 or 5.0 or FoamPro 2001/2002 system with 3.0" plumbing feeding the foam manifold. Includes foam pump mounting bracket.

The installer of the foam system shall be responsible for all current NFPA required testing of the completed system.

FOAM SYSTEM OPTIONS

Foam System Plumbing

The specified foam system shall be plumbed to 1.5 first crosslay, 1.5 second crosslay, first 2.5 crosslay, center bumper front jump line.
ELECTRICAL SYSTEMS

Multiplex Electrical System

Electrical System

The apparatus shall incorporate a Weldon V-MUX multiplex 12 volt electrical system. The system shall have the capability of delivering multiple signals via a CAN bus. The electrical system installed by the apparatus manufacturer shall conform to current SAE standards, the latest FMVSS standards, and the requirements of the applicable NFPA 1901 standards.

The electrical system shall be pre-wired for optional computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics.

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 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 maximum current for which the circuit is protected. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards.

Any electrical junction or terminal boxes shall be weather-resistant and located away from water spray conditions.

Multiplex System

For superior system integrity, the networked multiplex system shall meet the following minimum component requirements:

• The network system must be Peer to Peer technology based on RS485 protocol. No one module shall hold the programming for other modules. One or two modules on a network referred to as Peer to Peer, while the rest of the network consists of a one master and several slaves is not considered Peer to Peer for this application.
• Modules shall be IP67 rated to handle the extreme operating environment found in the fire service industry.
• All modules shall be solid state circuitry utilizing MOS-FET technology and utilize Deutsch series input/output connectors.
• Each module that controls a device shall hold its own configuration program.
• Each module should be able to function as a standalone module. No “add- on” module will be acceptable to achieve this form of operation.
• Load shedding power management (8 levels).
• Switch input capability for chassis functions.
• Responsible for lighting device activation.
• Self-contained diagnostic indicators.
• Wire harness needed to interface electrical devices with multiplex modules.
• The grounds from each device should return to main ground trunk in each sub harness by the use of ultrasonic splices.
Wiring

All harnessing, wiring and connectors shall be manufactured to the following standards/guidelines. No exceptions.

- NFPA 1901-Standard for Automotive Fire Apparatus
- SAE J1127 and J1127

All wiring shall be copper or copper alloys of a gauge rated to carry 125% of the maximum current for which the circuit is protected. Insulated wire and cable 8ga and smaller shall be SXL, GXL, or TXL per SAE J1128. Conductors 6ga and larger shall be SXL or SGT per SAE J1127.

All wiring shall be colored coded and imprinted with the circuit’s function. Minimum height of imprinted characters shall not be less than .082” plus or minus .01”. The imprinted characters shall repeat at a distance not greater than 3”.

A coil of wire shall be provided behind electrical appliances to allow them to be pulled away from mounting area for inspection and service work.

Wiring Protection

The overall covering of the conductors shall be loom or braid.

Braid style wiring covers shall be constructed using a woven PVC-coated nylon multifilament braiding yarn. The yarn shall have a diameter of no less than .04” and a tensile strength of 22lbs. The yarn shall have a service temperature rating of -65 F to 194 F. The braid shall consist of 24 strands of yarn with 21 black and 3 yellow. The yellow shall be oriented the same and be next to each other.

Wiring loom shall be flame retardant black nylon. The loom shall have a service temperature of -40 F to 300 F and be secured to the wire bundle with adhesive-backed vinyl tape.

Wiring Connectors

All connectors shall be Deutsch series unless a different series of connector is needed to mate to a supplier’s component. The connectors and terminals shall be assembled per the connector/terminal manufacturer’s specification. Crimp/Solderless terminals shall be acceptable. Heat shrink style shall be utilized unless used within the confines of the cab.

NFPA Required Testing of Electrical System

The apparatus shall be electrical tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with delivery documentation per requirements of NFPA #1901. 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 test fail.

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, an alarm sounded by excessive battery discharge, as detected by the system required in NFPA #1901 Standard, or a system voltage of less than 11.7 volts dc for a 12 volt nominal system, for more than 120 seconds, shall be considered a test 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 nominal 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:

   a. The nameplate rating of the alternator
   b. The alternator rating under the conditions
   c. Each specified component load
   d. Individual intermittent loads
Vehicle Data Recorder

A vehicle data recorder system shall be provided to comply with the 2009 and 2016 editions of NFPA 1901. The following data shall be monitored:

- Vehicle speed MPH
- Acceleration (from speedometer) MPH/Sec.
- Deceleration (from speedometer) MPH/Sec.
- Engine speed RPM
- Engine throttle position % of full throttle
- ABS Event On/Off
- Seat occupied status Occupied Yes/No by position
- Seat belt status Buckled Yes/No by position
- Master Optical Warning Device Switch On/Off
- Time: 24 hour time
- Date: Year/Month/Day

Occupant Detection System

There shall be a visual and audible warning system installed in the cab that indicates the occupant buckle status of all cab seating positions that are designed to be occupied during vehicle movement.

The audible warning shall activate when the vehicle’s park brake is released and a seat position is not in a valid state. A valid state is defined as a seat that is unoccupied and the seat belt is unbuckled, or one that has the seat belt buckled after the seat has been occupied.

The visual warning shall consist of a graphical representation of each cab seat in the multiplex display screen that will continuously indicate the validity of each seat position.

The system shall include a seat sensor and safety belt latch switch for each cab seating position, audible alarm and braided wiring harness.

Multiplex Display

The V-MUX multiplex electrical system shall include a Vista IV color display.

The display shall have the following features:

- Aspect ratio of 16:9 (Wide Screen)
- Diagonal measurement of no less than 7”
- Master warning switch
- Engine high idle switch
- Five (5) tactile switches to access secondary menus
- Eight (8) multi-function programmable tactile switches
- Specific door ajar indication
- Real time clock
- Provides access to the multiplex system diagnostics
Specification For Barrow Co. Fire and Emergency Services

- Video capability for optional back-up camera(s) and GPS display

The display shall be located driver's side engine cover.

**Electrical Connection Protection**

The vehicle electrical system shall be made more robust by the application of a corrosion inhibiting spray coating on all exposed electrical connections on the chassis and body. If equipped with an aerial device, the exposed connections on the aerial components shall also be protected.

The coating shall use nanotechnology to penetrate at the molecular level into uneven surfaces to create a protective water repellant film. The coating shall protect electrical connections against the environmental conditions apparatus are commonly exposed to.

**Smart Truck Technology**

**User Interface**

The apparatus shall be equipped with a smart truck technology system designed specifically for first responder apparatus. The system shall interconnect major apparatus CAN networks including but not limited to the chassis J1939/OBD2 data, vehicle multiplex system, water pump pressure governor, electric valves and electric actuated deck gun. The system shall securely report real-time vehicle information from these systems via cellular data to a globally supported cloud computing service for storage and real time access via web dashboards. The dashboards shall be accessible by the department's computers, tablets and smartphones.

The smart truck technology installed on the apparatus shall provide real-time notification via text or e-mail when a check engine light is displayed. The notification shall include the fault code and brief explanation for the code to reduce down-time.

The system shall feature a truck down feature on the web-based user interface to allow instant notification of needed apparatus service to both the authorized dealership and OEM via text or e-mail.

The system shall provide remote diagnostics of vehicle subsystems such as VMUX, pressure governors, electric monitors and electric valves.

By use of the web based user interface, the system shall allow for over the air programming updates to various subsystems should the need arise.

The web-based user interface shall also provide the following:

- Fuel and DEF levels
- GPS tracking
- Data logging for apparatus multiplex system
- Easy access to the NFPA VDR data
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The smart truck technology shall also feature seamless integration to the HAAS ALERT Safety Cloud providing Responder to Vehicle (R2V) alerts to motorists using navigation apps such as WAZE.

The system shall be designed with an open architecture to incorporate future growth with new technology partners designed to enhance fireground operations

**Hardware**

**Vehicle Gateway**

The vehicle gateway module shall be rugged in construction using a durable cast aluminum enclosure designed for emergency vehicle applications. The module shall have sealed Deutsch connectors providing four (4) CAN network ports, one (1) RS-485 port, one (1) Ethernet RJ45 port, embedded cellular modem, Bluetooth and GPS capability. The IoT Core Vehicle Gateway shall be capable of 2 way vehicle telemetry, supporting both remote diagnostics and remote over-the-air software updates.

**Antenna**

A low profile cellular antenna shall be installed on the cab roof.

**Data Plan**

A 5 year data plan shall be provided with the initial vehicle purchase. At the end of the 5 year period the department shall be given the option to extend service.

**LIGHT BARS**

**Front Light Bar Color(s)**

The front light bar shall be provided with the following color LED modules: [#COL]

If applicable, includes side facing light bars when colors are the same.

**Light Bars**

A pair of side facing Whelen Mini Freedom IV Series 21.5" LED light bars shall be provided. Each light bar shall contain four (4) LED modules. Each side facing light bar shall contain one (1) corner LED module forward facing, two (2) side facing LED modules and one (1) corner LED module rearward facing.

The white LEDs (if equipped) shall be switched off in blocking right of way mode.

The light bars shall be installed in the following location: centered above rear cab doors.
Light Bar Mount

One (1) pair of Whelen 1.5" tall (model MKEZ7) mounts shall be provided on each front mini light bars.

Light Bar Mount

One (1) pair of Whelen 1.5" tall (model MKEZ7) mounts shall be provided on the side facing mini light bars.

Light Bars

A pair of Whelen Mini Freedom IV Series 21.5" LED light bars shall be provided.

Each light bar shall contain two (2) corner LED modules forward facing, two (2) forward facing Long LED modules and one (1) outward facing Short LED module. No rear facing LEDs.

The white LEDs (if equipped) shall be switched off in blocking right of way mode.

The light bars shall be installed in the following location: front cab corners at 20 degree angle.

WARNING LIGHT PACKAGES

Lower Level Warning Light Package

Eight (8) Whelen M6RC Super LED red light heads with clear lens and two (2) Whelen M2RC Super LED red light heads with clear lens shall be provided.

The lights shall include chrome flanges where applicable. The lights shall be wired with weatherproof connectors and shall be mounted as close to the corner points of the apparatus as is practical as follows:

• Two (2) Whelen M6RC Super LED Red lights on the front of the apparatus facing forward
• Two (2) Whelen M6RC Super LED Red lights on the rear of the apparatus facing rearward
• Two (2) lights each side of the apparatus, one (1) Whelen M6RC Super LED Red each side at the forward most point (as practical), and one (1) Whelen M2RC Super LED Red each side at the rearward most point (as practical).
• One (1) Whelen M6RC Super LED Red light each side of the apparatus centrally located to provide mid ship warning light.

The side facing lights shall be located at forward most position, centered in rear wheel well, and side facing at rear of body in rubrail if equipped.

All warning devices shall be surface mounted in compliance with NFPA standards.
WARNING LIGHTS

Hazard (Door Ajar) Light

There shall be a 2” red LED hazard light installed as specified.

The light shall be located center overhead.

Upper Rear Warning Lights

Two (2) Whelen model L31H Super LED beacons with Red LED with Clear lens domes shall be supplied.

The lights shall be located rear upper body on aerial style brackets to meet Zone C upper requirements.

Warning Lights

Two (2) Whelen M6 Series Linear Super LED red light heads with clear lens shall be provided. The rectangular lights shall include chrome flanges where applicable.

Location: (1) each side in front quad inboard of NFPA warning light, (1) each side of cab down low just ahead of rear doors.

SIRENS

Electronic Siren

A Federal PA300 siren model 690010 solid state electronic siren with attached noise-canceling microphone shall be installed. The unit shall be capable of driving a single high power speaker up to 200 watts to achieve a sound output level that meets Class "A" requirements.

Operating modes shall include Hi-Lo, yelp, wail, P.A., air horn and radio re-broadcast.

The siren shall be recessed mounted in the cab.

Electronic Siren Control Location

The electronic siren control shall be located in the center overhead.

Mechanical Siren

A chrome plated and pedestal mounted Federal Q2B-P coaster siren shall be installed on top of the front bumper extension. An electric siren brake switch shall be located in the cab accessible to the driver.

The siren shall be located driver side front bumper.
SPEAKERS

Siren Speaker

One (1) Federal Signal model ES100 Dynamax 100 watt speaker shall be flush mounted as far forward and as low as possible on the front of the vehicle. A polished speaker grille shall be provided on the outside of the speaker to prevent road debris from entering the speaker.

Speaker dimensions shall be: 5.5 in. high x 5.9 in. wide x 2.5 in. deep. Weight = 5.5 lbs.

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

The speaker shall be located driver side front bumper, officer side front bumper.

DOT LIGHTING

License Plate Light

One (1) Truck-Lite model 15905 white LED license plate light mounted in a Truck-Lite model 15732 chrome plated plastic license plate housing shall be mounted at the rear of the body.

Marker Lights

One (1) pair of Britax model L427.203L.12V LED amber/red marker rubber housed lights shall be provided. The lights shall be located on the rear body corners mounted in the down angle position. The red lenses shall illuminate to the rear of the apparatus and the amber shall illuminate to the front of the apparatus. The lights shall be wired to the marker light circuit.

Tail Lights

Three (3) Whelen model M6 series LED (Light Emitting Diode) lights shall be installed horizontally with individual housings each side at rear.

Light functions shall be as follows:

• LED red running light with red brake light in outboard position.
• LED amber populated arrow pattern turn signal in middle position.
• LED clear back-up light in inner position.

LED Marker Lights

LED clearance.marker lights shall be installed on the cab. The body marker lights shall be TecNiq 3/4” grommet mounted LED.

Upper Cab:
• Five (5) amber LED clearance lights on the cab roof.
Lower Cab:
• One (1) amber LED side turn/marker each side of cab ahead of the front door hinge.

Upper Body:
• One (1) red LED clearance light each side, rear of body to the side.

Lower Body:
• Three (3) red LED clearance lights centered at rear, recessed in the rubrail.
• One (1) red LED clearance light each side at the trailing edge of the apparatus body, recessed in the rubrail.
• One (1) amber LED clearance light each side front of body just in front of rear wheels, recessed in the rubrail.
• Two (2) amber LED (one (1) clearance; one (1) auxiliary turn) lights each side front of body, recessed in the rubrail.

LIGHTS - COMPARTMENT, STEP & GROUND

Compartment Light Package
One (1) Amdor Luma-Bar compartment light strip shall be mounted in each body compartment greater than 4 cu. ft. Transverse compartments shall have two (2) lights, located one (1) each side of truck.

Compartment lights shall be wired to a master on/off rocker switch on the cab switch panel.

Step Light Package
The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the steps around the apparatus in accordance with current NFPA requirements. The lights shall be 2" circular Whelen LED (Light Emitting Diode) model T0CACC or with clear lenses mounted in a resilient shock absorbent mount for improved bulb life. The wiring connections shall be made with a weather resistant plug in style connector.

The step lights shall be switched from the cab dash with the work light switch.

Ground Lights
The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the ground areas around the apparatus in accordance with current NFPA requirements. The lights shall be TecNiq model T440 4” circular LED (Light Emitting Diode) with clear lenses mounted in a resilient shock absorbent mount for improved bulb life. The wiring connections shall be made with a weather resistant plug in style connector.

Ground area lights shall be switched from the cab dash with the work light switch.

One (1) ground light shall be supplied under each side of the front bumper extension if equipped.
Lights in areas under the driver and crew area exits shall be activated automatically when the exit doors are opened.

**Cab Ground / Auxiliary Step Lights**

The cab shall be equipped with a sufficient quantity of lights to properly illuminate the auxiliary steps and the ground areas below them in accordance with current NFPA requirements. The lights shall be EON LED (Light Emitting Diode) with clear lenses. The wiring connections shall be made with a weather resistant plug in style connector.

The lights shall be switched from the cab dash with the work light switch. The lights shall also be activated automatically when the exit doors are opened.

**Three (3) Ladder Tunnel Lights**

An EON LED light shall be provided to illuminate the ladder tunnel at the opening. The light shall be wired through the door ajar circuit on the ladder tunnel door.

**LIGHTS - DECK AND SCENE**

**Deck/Scene Light Wired to Back-Up Lights**

The rear deck or scene lights shall be activated when the chassis is placed in reverse to provide additional lighting, in addition to the back-up lights, when backing the vehicle.

**Deck Lights**

Two (2) Whelen round 12 Super LED model PFBP12C floodlights with black housing and chrome rear covers shall be installed at the rear of the apparatus. The rear deck lights shall be switched with the work light switch in the cab.

Location: (1) each side over rear ladder tunnel.

**Crosslay Light**

A Whelen LED light model PFBP12C shall be installed at the rear area of the crosslay to provide crosslay lighting per current NFPA 1901. The crosslay light shall be switched with work light switch in the cab.

**Hose Bed Light**

A Whelen LED light model PFBP12C shall be installed at the front area of the hose bed to provide hose bed lighting per current NFPA 1901. The hose bed light shall be switched with work light switch in the cab.
LIGHTS - NON-WARNING

LED Pump Panel Light Package

Three (3) TecNiq model E10 LED lights shall be mounted under a light shield directly above each side pump panel. The work light switch in the cab shall activate the lights when the park brake is set.

Pump Compartment Light

An LED light shall be provided in the pump compartment area for NFPA compliance. The light shall be an Optronics ILL22 Series that has a polycarbonate lense and sealed / waterproof housing. The light shall be wired through a switch inside the pump compartment access door / panel.

Engine Compartment Light

There shall be lighting provided to illuminate the engine compartment area in compliance with NFPA 1901. The light shall be an Optronics ILL22 Series LED that has a polycarbonate lense, sealed / waterproof housing and integral switch. The light wiring circuit shall activate when the cab is tilted and master power is switched on.

CONTROLS / SWITCHES

Door Ajar Alarm

An audible alarm shall be provided through the multiplex display(s) in the cab wired into the door ajar or indicator.

Switch

A relay shall be provided to allow operation of the specified 110/240 volt device from a remote location other than the circuit breaker box. The relay shall be mounted in a weather resistant enclosure mounted near the breaker box or as instructed from engineering. A remote switch shall be mounted as specified.

Location: programmed to multiplex display for driver's side cab/body 120/240V scene light(s), programmed to multiplex display for officer's side cab/body 120/240V scene light(s).

CAMERAS / INTERCOM

Camera Shield

A diamond plate protective shield shall be provided for the top and sides of a camera. The shield shall be designed not to impede in the operational envelope of the camera.
Camera Back-Up

There shall be a Voyager camera model number VCCS150B provided mounted on the rear of the apparatus. The camera shall feature a wide angle lens, IR LED assisted illumination for enhanced low-light performance, non-corrosive mounting bracket, and stainless steel hardware. The camera shall be interlocked with the chassis transmission. When the apparatus is placed in reverse the camera shall automatically be activated and when the transmission is placed in any other gear the screen shall return to the previously displayed screen.

The camera shall having the following specifications:

- NTSC/PAL Video output signal format
- 150º Viewing angle
- Housing: Aluminum
- Waterproof: IPX7
- Built-in microphone
- Dimensions: 2.7" W x 1.7" H x 2.5" D

The camera shall be located at the rear of the truck, up as high as possible. Optimize mounting position using space not allocated by other equipment/options unless otherwise specified.

Two-Way Intercom

A Fire Research ACT two-way intercom system shall be installed to provide communications between the turntable control station and the aerial tip. The intercom system shall include two (2) speakers and two (2) control modules; one (1) with a push-to-talk button at the turntable control station and one (1) hands free at the aerial tip.

The control modules shall have push-button volume control and a LED volume display. The hands free module shall constantly transmit to the other module unless the push-to-talk button is pressed.

The intercom shall have active noise cancellation and be designed for exterior use.

MISC ELECTRICAL

Back-Up Alarm

An electronic back-up alarm shall be supplied. The 97 dB alarm shall be wired into the chassis back-up lights to signal when the vehicle is in reverse gear.
**GENERATOR**

**Hydraulic Generator**

A Harrison model LPG 8KW hydraulic generator system shall be supplied and installed in front of open storage area in shallow pan. The generator shall come with an axial piston hydraulic pump, reservoir, cooler, voltage regulator and a gauge panel.

The gauge panel shall display voltage, hour meter, frequency, and amperage.

The hydraulic motor-generator system shall be modular design with dimensions of approximately 40” long x 18.6” wide x 14.1” high and shall be permanently mounted on the apparatus.

The hydraulic pump shall be driven by a chassis transmission mounted power take off (PTO).

A generator control / PTO engage switch shall be mounted on the cab instrument panel to engage the PTO and start the generator.

**Ratings and Capacity**

Rating: 8,000 watts continuous  
Volts: 120/240 volts  
Phase: Single, 4-wire  
Frequency: 60 Hz  
Amps: 33 amps at 240 volts, 68 amps at 120 volts  
Engine Speed at Engagement: Idle  
Pump Speed Operating Range: 950 to 3300 RPM  
Weight: Approximately 250 lbs.

**Testing**

The generator shall be tested in accordance with current N.F.P.A. 1901 standards.

**Notes:**

*All ratings and capacities shall be derived utilizing current NFPA 1901 test parameters.*  
*Extreme ambient temperatures could affect generator performance.*

**GENERATOR TEST**

**3rd Party Generator Testing**

The generator shall be tested at the manufacturer’s facility by an independent, third-party testing service. The conditions and testing of the generator shall be as outlined in current NFPA 1901.

The test shall include operating the generator for two hours at 100% of the rated load. Power source voltage, amps, frequency shall be monitored. The prime mover’s oil pressure, water
temperature, transmission temperature (if applicable) and power source hydraulic fluid temperature (if applicable) shall be monitored during testing.

The results of the test shall be recorded and provided with delivery documentation.

**BREAKER BOXES**

**Circuit Breaker Panel**

A twelve (12) place breaker box with up to twelve (12) appropriately sized ground-fault interrupter circuit breakers shall be supplied. The breaker box will include a master breaker sized according to the generator output. The breaker box will be located in the specified compartment, not to exceed 12’ run of wire.

Note: If generator is 5.5KW or less, the main breaker will occupy 2 places, leaving 10 available.

Dimensions: 17.92” high x 14.25” wide x 3.75” deep.

Location: L2 upper forward wall.

**LIGHTS - QUARTZ**

**Whelen Pioneer 120V LED Flood Light**

A Whelen Pioneer Plus series 120V flood light LED light fixture(s) shall be provided on a Whelen permanent mount non-telescoping base. The rectangular extruded light fixture with die cast end caps shall measure 14” wide by 4-5/8” high by 3” deep and have a white powder coat finish. The light fixture shall have a dual panel (4) clusters of LED lamps with molded vacuum metalized reflector that draws 1.25 amps and produce 11,000 usable lumens.

The light assembly shall be mounted on the body as specified. The base shall allow for 360-degree rotation of the light. A locking knob shall hold the pole at the desired angle. A switch shall be provided in the warning light switch panel.

Location: above forward area of L3, fixed cover ahead of hosebed.

**Two (2) Whelen Pioneer 12V LED Flood Lights**

A Whelen Pioneer Plus series 80 watt 12V flood light model PFH1 single panel LED light head shall be provided on a PBHE1 cab brow mount. The rectangular extruded light fixture with die cast end caps shall measure 8.35” wide by 4.25" high by 3” deep and have a white powder coat finish. The light fixture shall have eighteen (18) white Super-LEDs with molded vacuum metalized reflector that draws 6.5 amps and produce 8,875 usable lumens.

Location(s): driver and officer side front cab brow.
**Two (2) Whelen Pioneer 12V LED Flood Lights**

A Whelen Pioneer Plus series 160 watt 12V flood light model PFH2 dual panel LED light head shall be provided on a cab brow mount. The rectangular extruded light fixture with die cast end caps shall measure 14" wide by 4.25" high by 3" deep and have a white powder coat finish. The light fixture shall have thirty-six (36) white Super-LEDs with molded vacuum metalized reflector that draws 13 amps and produce 17,750 usable lumens.

Location(s): driver and officer side over canopy area.

**RECEPTACLES**

Receptacle

A 20 amp, 110 volt NEMA L5-20 twist lock receptacle with a weatherproof cover plate shall be installed as specified by the department.

Location: driver side rear wheel well offset forward, officer side rear wheel well offset forward.

**ELECTRIC CORD REELS**

Rollers, Cord Reel

Rollers, stainless steel cord reel rollers shall be installed and located through a panel.

The rollers shall be located officer side pump module in line with reel.

The rollers shall facilitate smooth removal of the electric cord.

Cord Reel Rewind Switch

A heavy duty rubber covered electric reel rewind button shall be installed officer side pump panel.

**Electric Cord Reel**

Hannay electric rewind cord reel(s) (ECR 1614-17-18) shall be installed and located pump module storage pan officer side.

The reel(s) shall include 150’ of yellow 10 gauge 3 conductor type SOWA cord. The cord shall be rated at 20 amps @ 110 volts. The end of the cord shall be terminated for the installation of a department required connector.
AERIAL MODEL

100’ Aerial Device

Aerial Ladder Requirements

It is the intent of these specifications to describe a telescopic aerial ladder of the open truss design that is compliant with NFPA 1901 (2016 edition) chapter 19 sections 19.2 through 19.6 and sections 19.17 through 19.25. Some portions of this specification exceed minimum NFPA recommendations and are to be considered a minimum requirement to be met.

The aerial ladder shall consist of four (4) extruded aluminum telescopic ladder sections operating from -6 degrees to 81 degrees and designed to provide continuous egress for firefighters and civilians from an elevated position to the turntable.

The aerial device shall have a vertical height of 100 ft at full extension and elevation. The measurement of height shall be consistent with NFPA 1901 section 19.2.2.

The rated horizontal reach shall be 85 ft. The measurement of horizontal reach shall be consistent with NFPA 1901 19.2.3. The measurement shall be from the outermost rung at full extension to the centerline of turntable rotation.

The aerial shall have a maximum stabilizer spread of 11 ft from pin to pin.

The ladder shall be able to provide full operating capacities in up to 50 mph wind conditions.

Aluminum Aerial Ladder

The aerial ladder shall exceed the aerial ladder requirements found in section 19.2 of NFPA 1901 as detailed in these specifications. To ensure a high strength-to-weight ratio and an inherent corrosion resistance, the aerial ladder shall be completely constructed of high strength aluminum. All side rails, rungs, handrails, uprights and K-braces shall be made of structural 6061T6 aluminum alloy extrusions. All material shall be tested and certified by the material supplier. All ladder sections shall be semi-automatically welded by inert gas shielded arc welding methods using 5356 aluminum alloy welding wire. Structural rivets or bolts shall not be utilized in the ladder weldment sections.

Due to the unpredictable nature of fireground operations, a minimum safety factor of 2.5 to 1 is desired. This structural safety factor shall apply to all structural aerial components including turntable and torque box stabilizer components. Definition of the structural safety factor shall be as outlined in NFPA 1901 A.19.20.1:

\[ \text{DL} = \text{Dead load stress. Stress produced by the weight of the aerial device and all permanently attached components.} \]
\[ \text{RL} = \text{Rated capacity stress. Stress produced by the rated capacity load of the ladder.} \]
\[ \text{WL} = \text{Water load stress. Stress produced by nozzle reaction force and the weight of water in the water delivery system.} \]
FY = Material yield strength. The stress level at which the material exhibits permanent deformation.

\[ 2.5 \times DL + 2.5 \times RL + WL \leq FY \]

The minimum NFPA specification of 2.0 to 1 is exceeded in this paragraph by requiring a 2.5 to 1 safety margin on dead load and live load while flowing water.

The stability factor or tip over safety margin shall be a minimum of 1.5 to 1 as defined by NFPA 1901 19.21. The 1.5 to 1 stability factor shall be achieved in all ranges, including the front working area, without relying on the chassis front axle for stabilization.

An independent engineering firm shall verify the aerial safety factor. Design verification shall include computer modeling and analysis, and extensive strain gauge testing performed by an independent registered professional engineer. Verification shall include written certification from the independent engineering firm made available by the manufacturer upon request from the purchaser.

All welding of aerial components, including the aerial ladder sections, turntable, torque box and outriggers shall be performed by welders who are certified to American Welding Society Standards D1.1, D1.2 and D1.3 as outlined in NFPA 1901 19.22.3.1.

The weldment assemblies of each production unit shall be tested visually and mechanically by an ASNT certified level II non-destructive test technician to comply with NFPA 1901 19.22.2. Testing procedures shall conform to the American Welding Society Standard B1.10 Guide for non-destructive testing. Test methods may include dye penetrate, ultrasound and magnetic particle where applicable.

Each ladder section shall consist of two (2) heavy extruded aluminum side rails and a combination of aluminum rungs, tubular diagonals, verticals and two (2) full-length handrails. The rungs on all four (4) ladder sections shall be K-braced for maximum lateral stability. This K-bracing shall extend to the center of each rung to minimize ladder side deflection.

The ladder rungs shall be designed to eliminate the need for rubber rung covers. The rungs shall be spaced on 14 inch centers and have an integral skid-resistant surface as outlined in NFPA 1901 19.2.5 through 19.5.2.3. An oval-shaped rung shall be utilized to provide a larger step surface at low angles and more comfortable grip at elevated positions. The minimum design load shall be 500 pounds distributed over a 3 1/2” wide area per rung as outlined in NFPA 1901 19.2.5.4.

The aerial ladder shall exceed NFPA 1901 sections 19.2.6 and 19.2.8 governing the minimum ladder section width and handrail height.

<table>
<thead>
<tr>
<th>Section</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Section</td>
<td>36”</td>
<td>28-1/2”</td>
</tr>
<tr>
<td>Second Section</td>
<td>29-3/4”</td>
<td>25-3/4”</td>
</tr>
<tr>
<td>Third Section</td>
<td>24-3/8”</td>
<td>23”</td>
</tr>
<tr>
<td>Fly Section</td>
<td>19-3/4”</td>
<td>20-3/8”</td>
</tr>
</tbody>
</table>
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Ladder Extension Mechanism

Both power extension and retraction shall be furnished and meet the requirements of NFPA 1901 section 19.19, 19.20.3, and 19.5.3. Extension shall be by way of two (2) extending cylinders mounted on the underside of the base section of the ladder.

Extension Cylinder Size
Bore: 3-1/4”
Stroke: 94”

The cylinders shall operate through a block and tackle cable arrangement to extend and retract the ladder. Maximum extension of the ladder is to be automatically limited by the stroke of the cylinders. The normal operating cable safety factor shall be 5:1 and the stall safety factor shall be 2:1 based on the breaking strength of the cables. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used shall be 1 to 12. The cables shall be treated with Pre-Lube 6 for increased service life.

Ladder Cable Size
1st section (4 cables - 2 extend, 2 retract) 1/2” 6 x 19 galvanized cable
2nd section (4 cables - 2 extend, 2 retract) 5/16” 6 x 25 galvanized cable
3rd section (4 cables - 2 extend, 2 retract) 5/16” 6 x 25 galvanized cable

The ladder assembly shall consist of four (4) separate weldments that shall extend and retract within each other. Nylatron NSM slide pads shall be utilized between each section to minimize friction. Nylatron NSM slide pads shall be installed at the tip of the lower three sections to accommodate the sliding loads as the ladder is extended.

Aerial Extension Indicator

Reflective tape stripes shall be installed on the ladder top handrail of the base section to indicate extension in 5 ft increments. Numeric indicators shall be placed at 10 ft increments. A reflective dot on the base of the 2nd section shall provide a visual reference for the operator to estimate aerial elevation.

Aerial Finish

To reduce maintenance expense the aerial shall have a natural aluminum swirled finish. Visible inspection of all ladder weld joints shall be possible without having to remove paint or body filler to reveal the weld bead.

Operation Times

The aerial shall complete the NFPA 1901 19.2.12 time test in no more than 120 seconds. This test involves raising the aerial from the bedded position to full elevation and extension and rotating to 90 degrees. This test is to begin with the stabilizers deployed.

Time to extend ladder maximum 30 seconds
Time to retract ladder maximum 30 seconds
Time to raise ladder maximum 25 seconds
Time to lower ladder  maximum 25 seconds
Time to rotate 180 degrees  maximum 80 seconds

Aerial Ladder Rated Capacity

The aerial device shall have a rated capacity of 750 lbs. consistent with NFPA 19.3.1 through 19.3.2. The aerial device shall be rated in multiple configurations as outlined in 19.3.4. A sign mounted at the base of the aerial shall communicate the following ratings in the unsupported fully extended configuration while maintaining a 2.5 to 1 safety margin as defined in NFPA 1901 A.19.20.1. The loads in each configuration are in addition to 75 lbs. of equipment mounted at the tip.

Condition #1- Tip load only, no water flowing.

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Capacity</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 6 to 50 degrees</td>
<td>3 person</td>
<td>750 lbs.</td>
</tr>
<tr>
<td>51 to 81 degrees</td>
<td>4 people</td>
<td>1000 lbs.</td>
</tr>
</tbody>
</table>

Condition #2- Distributed loads no water flowing. (These include one person at the tip)

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Capacity</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 6 to 20 degrees</td>
<td>3 person</td>
<td>750 lbs.</td>
</tr>
<tr>
<td>21 to 40 degrees</td>
<td>4 people</td>
<td>1000 lbs.</td>
</tr>
<tr>
<td>41 to 60 degrees</td>
<td>6 people</td>
<td>1500 lbs.</td>
</tr>
<tr>
<td>61 to 81 degrees</td>
<td>10 people</td>
<td>2500 lbs.</td>
</tr>
</tbody>
</table>

Condition #3- Ladder tip load while flowing pre-piped waterway

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Capacity</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>-6 to 44 degrees</td>
<td>2 people</td>
<td>500 lbs.</td>
</tr>
<tr>
<td>45 to 81 degrees</td>
<td>3 people</td>
<td>750 lbs.</td>
</tr>
</tbody>
</table>

Hydraulic System

The hydraulic plumbing shall consist of hydraulic stainless steel tubing wherever possible in order to:

• Eliminate hose wear.
• Eliminate the corrosion associated with galvanized steel tubing.
• Provide a stronger medium to carry the hydraulic fluid.

An interlock device shall be provided to prevent activation of the aerial ladder hydraulic pump until either the transmission is placed in neutral and the parking brake is set, or the transmission is placed in drive and the rear driveline is disengaged as outlined in NFPA 19.17.3.

The hydraulic system shall be of the latest design and incorporate features to minimize heat build up and provide smooth control of the aerial ladder. The system shall meet the performance
Specification For Barrow Co. Fire and Emergency Services

requirement in NFPA 19.19.6 and 19.19.7, which requires adequate cooling under 2 1/2 hours of operations.

All hydraulic components that are non-sealing whose failure could result in the movement of the aerial shall comply with NFPA 19.19.1 and have burst strength of 4 to 1. Dynamic sealing components whose failure could cause aerial movement shall have a margin of 2 to 1 on maximum operating pressure per NFPA 19.19.1.1. All hydraulic hoses, tubes and connections shall have minimum burst strength of 3 to 1 per NFPA 19.19.2.

A hydraulic oil pressure gauge shall be supplied at the base control location per NFPA 1901 19.19.4.

The hydraulic system shall consist of a 55 gallon reservoir mounted to the torque box and plumbed to the hydraulic pump. The tank shall be supplied with a removable top to access tank strainer filter. There shall be plumbing for a supply and return line and a tank drain on the reservoir. The reservoir cap shall be marked per NFPA 19.19.5.2. Gated valves under the tank shall facilitate filter changes.

The hydraulic system shall use 5w-20 multi-weight, SAE 32 grade oil and incorporate the following filters to provide dependable service:

- Reservoir Breather: 10-micron
- Magnetic Reservoir Strainer: 125-mesh
- Pressure Filter (Torque Box): 3-micron
- Return Filter: 10-micron

The aerial hydraulic system shall be designed in such a manner that a hydraulic pump failure or line rupture shall not allow the aerial or outriggers to lose position. Hydraulic holding valves shall be mounted directly on cylinders. To ensure reliable performance of holding valves, no hoses shall be permitted between a holding valve and cylinder.

The hydraulic system shall be designed with an auxiliary power unit meeting the guidelines of NFPA 1901 19.18.7. The auxiliary power unit shall be a 12-volt pump connected to the chassis electrical system. The pump shall provide operation at reduced speeds to store the aerial device and outriggers for road transportation. Self-centering switches shall be provided at the turntable and each stabilizer control station to activate the system. The system shall be designed to provide a minimum of five (5) minutes of hydraulic power to operate functions.

Hydraulic power to the ladder shall be transferred from the torque box by a hydraulic swivel.

**Aerial Torque Box**

The aerial shall utilize an integral torque box design. The integral torque box design shall serve to carry the chassis, body and aerial device as an integrated system. The system design shall provide a lower center of gravity to enhance road performance, a mounting location for under-slung stabilizers, and additional space for body compartments. The strength of the torque box shall be a minimum 12.6 million-inch pounds resistance to bending moment. The stabilizers and turntable supports shall be welded directly to the torque box.
Specification For Barrow Co. Fire and Emergency Services

Stabilization

The unit shall be equipped with two (2) sets of extendable crisscross under-slung stabilizers. The stabilizers shall have a spread of 11 feet centerline to centerline of the stabilizer pads when fully extended. One (1) set of stabilizers shall be mounted in the forward body area and a second set close to the rear axle to minimize impact on departure angle. The stabilizers shall have an inner and outer tube that slide on low friction pads for deployment. The stabilizers shall have a tip over safety margin of 1 1/2 times the rated load imposed by the aerial in any position the aerial device can be placed as outlined in NFPA 1901 19.21.2. The apparatus stabilization shall be accomplished without the assistance of the chassis suspension or tires in contact with the ground.

The aerial shall be able to sustain a 1 1/3 to 1 rated load on a 5 degree slope downward in the position most likely to cause overturning as outlined in NFPA 1901 19.21.3. The maximum ground slope the apparatus can be set up on is 12 percent. On the 12 percent slope the apparatus can be leveled within a 6 percent operating range for the apparatus.

The cylinders shall be supplied with dual pilot-operated check valves on each stabilizer cylinder to hold the cylinder in the stowed or working position should a charged line be severed at any point in the hydraulic system. The stabilizers shall level side to side, corner to corner and front to rear on uneven terrain. Stabilizers shall contain safety lock valves. This assures there will be no "leak down" of stabilizer legs. Mechanical pins are not required. This feature contributes to efficient set-up and field operation.

The stabilizer lift cylinders shall be sized to maximize ground penetration. The lift cylinders shall be mounted on the side of the torque box for protection and shall have the following dimensions:

Bore: 5"
Stroke: 11"

The stabilizer extension cylinders shall have the following dimensions:

Bore: 2"
Stroke: 26"

Each Stabilizer that can be extended from the body shall be supplied with a red warning light as outlined in NFPA 19.21.4.4. A stabilizer extended warning light shall be supplied in the cab to warn the driver of an extended stabilizer condition as outlined in NFPA 1901 13.11. A floodlight shall be supplied in each stabilizer location to illuminate the stabilizer and ground. The light shall automatically turn on with the deployment of the stabilizer.

The stabilizer ground contact area for each foot pad shall be 10” x 14” without auxiliary pads and 24” x 24” with auxiliary pads deployed. The ground pressure shall not exceed 75 psi with auxiliary pads deployed when the apparatus is fully loaded and the aerial device is carrying its rated capacity in every position. This shall be accomplished with the stabilizer pads deployed, as outlined in NFPA 19.21.4.2.
**Stabilizer Controls**

Four (4) electric solenoid valves shall control the stabilizers. The control switches shall be located at the rear of the apparatus so the operator may observe the stabilizers during deployment. An audible alarm with a minimum 87 dBA shall also sound while the stabilizers are in motion as required by NFPA 19.21.4.1. Stabilizer deployment shall be completed in less than 60 seconds.

There shall be an interlock that prevents the operation of the ladder until the stabilizers are down and properly set as outlined in NFPA 19.17.5. Four (4) micro-switches, one (1) on each jack leg, shall sense when all four (4) jack feet are in firm contact with the ground. This condition shall be indicated when all four (4) yellow jack-down indicator lights are on and the green interlock light is on. When the apparatus has been leveled, a manual transfer switch shall be used to shift hydraulic power to ladder operations. The interlock system shall have a manual override with access through a door on the rear control panel.

To simplify leveling the apparatus, two (2) color-coded level indicators shall be supplied at the rear of the apparatus. One (1) indicator shall be for front to rear level and one (1) for side to side level.

**Forward Aerial Support**

The aerial ladder support shall be fabricated from steel components and be welded directly to the torque box chassis. The ladder support uprights shall be constructed from 7/8” thick steel plate. Bolt-in diagonal bracing shall be installed on the support structure in an "X" pattern to restrict to side movement. This design shall allow for a pre-determined amount of flex preventing premature failure that can be found in an overly rigid structure. The support shall be located behind the rear wall of the cab.

**Turntable Support Assembly**

The aerial ladder turntable assembly shall be mounted at the rear of the apparatus. The turntable support assembly shall be welded to the integral torque box for efficient transfer of aerial loads to the stabilizers and shall permit storage of ground ladders in the center rear of the apparatus. The complete turntable support assembly shall be multi-pass welded to the sides of the combination chassis frame torque box.

The turntable support assembly shall be a steel weldment constructed of four (4) vertical 1/2” x 5” x 5” square tubing with identical tubing welded in between the top ends of the verticals.

A bearing mounting plate shall be welded to the top of the verticals and sides of the horizontal on the turntable pedestal. The bearing mounting plate shall be 43” x 43” and shall have a 1-1/2” thickness. This bearing mounting plate shall be attached to a 3/4” steel plate that is welded to the bottoms of the horizontal tubing. The use of multi-pass welding shall be utilized wherever possible.

A 34-1/4” rotation bearing with a 3” face drive gear shall be bolted to the top of the bearing mounting plate with thirty (30) 3/4” grade 8 plated bolts. The gear tooth shall be stub tooth form.
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**Upper Turntable**

The upper turntable assembly shall attach to the rotation bearing and the base of the ladder.

The turntable working platform shall be a fabricated steel structure covered with a non-skid 3/16” thick aluminum material for operator safety. Two (2) railings 42” high shall be provided along the perimeter of the turntable as outlined in NFPA 1901 19.18.1. Two (2) Mansaver bars shall be provided to allow access to the turntable area. There shall be a control pedestal mounted on the left side of the turntable. The turntable assembly shall provide a mounting base for the ladder and elevating cylinders. The turntable assembly shall be bolted to the turntable bearing by twenty (20) 3/4” grade 8 plated bolts.

An 11” high step shall be installed on the turntable deck to provide convenient access to the ladder sections for egress.

Two (2) lights shall be provided in the turntable step to illuminate the turntable deck area per NFPA requirements.

The ladder pivot point shall connect to the upper turntable assembly by two (2) 2-1/4” ID spherical bearings.

**Elevation Mechanism**

The aerial shall utilize dual 5” bore 42 5/8” stroke elevating cylinders to attach the upper turntable assembly and bottom of the base ladder section. A 1 3/4” pin and bearing system shall connect to the turntable. A 2” pin and bearing system shall connect to the base section of the ladder. The elevation system shall be designed following NFPA 1901 19.5.1. The elevation hydraulic cylinders shall incorporate cushions on the upper limit of travel. The hydraulic elevation cylinders shall also serve as a locking device to hold the aerial in the stored position for road travel.

**Rotation Mechanism**

The aerial shall be supplied with a hydraulically-powered rotation system as outlined in NFPA 1901 19.5.2. The hydraulic rotation motor and planetary gear drive system shall provide continuous rotation under all rated conditions and be supplied with a spring-applied brake to prevent unintentional rotation.

**Aerial Electric Power**

A hydraulic swivel shall be installed to provide hydraulic fluid transfer to the aerial ladder cylinders, electrical power to the aerial ladder, and water delivery to the pre-plumbed waterway while permitting continuous 360-degree rotation. The swivel shall provide two (2) hydraulic circuits, twenty four (24) electrical circuits, and one (1) 4” passage for waterflow. The swivel shall be environmentally-sealed to prevent contamination of the hydraulic fluid.
Aerial Ladder Operating Position

An aerial ladder operator’s position shall be supplied as outlined in NFPA 1901 19.4.1. The operator’s position shall be located on the left side of the aerial turntable. The apparatus shall be supplied with labels to warn of electrocution hazard. The control console shall provide a service access door on the front and side of the console to access hydraulic and electrical connections. The electrical panel shall be contained in junction box with labeled wires. The console shall be angled, labeled, and supplied with lights for night operation.

Console Cover

A diamond plate contoured hinged cover shall be supplied to protect the console from the elements. The cover shall latch in the stored position and swing away from the console so as not to interfere with sight of the aerial device.

Aerial Ladder Control Levers

The control levers shall be arranged as outlined in NFPA 19.17.7. The first lever from the left shall be the extension control (forward for extend and back for retract). The second lever shall be for rotation (forward for clockwise and back for counter clockwise). The third handle shall control elevation (forward for down and back for up). The aerial shall employ direct hydraulic controls for precise control and dependable service with minimal electrical functions. A ring around the control console shall be provided to prevent unintentional movement as outlined in NFPA 19.17.6.2.

Rung Alignment Indicator

A light on the control console shall indicate when the ladder rungs are aligned for climbing.

Aerial Alignment Indicator

A reflective arrow mounted to the body and the turntable shall indicate when the aerial is aligned for travel bed.

Load Indication System

A lighted elevation/safe load indicator diagram shall be located on the lower left side of the base section to indicate safe load capacity at any angle of elevation. The safe load indicator shall be 15” x 15” in size and clearly communicate aerial capacity in any one of the following conditions: tip load only, tip load with water flowing, and distributed load at full extension. The chart shall identify capacity using graphic characters to indicate each 250 lb. increment. The chart shall be equipped with lighting and warn of electrocution hazards from power lines and lightning.

Aerial Waterway

A pre-piped waterway shall be supplied as outlined in NFPA 1901 19.6. The waterway shall telescope to the end of the fourth section. A waterway of 4” internal diameter shall run through
the turntable and a swivel joint to connect to the tubular aerial waterway. The tubular waterway shall run under the aerial ladder. The waterway tubes shall have the following sizes:

Base Section: 5” OD  
Mid Section: 4-1/2” OD  
3rd Section: 4” OD  
Fly Section: 3-1/2” OD

The tubes shall be constructed of hard coat anodized aluminum and shall be telescopic with the aerial ladder through sealed slip joints. The slip joints shall be designed with grease zerk fittings to facilitate lubrication.

A 1-1/2” drain valve shall be installed and operated from the rear of the apparatus.

The water system shall be capable of flowing 1000 gpm at 100 psi nozzle pressure at full elevation and extension. The friction loss between the tip and below the swivel shall not exceed 100 psi while flowing 1000 gpm as outlined in NFPA 1901 19.6.1 and 19.6.2.

**Waterway Relief Valve**

An automatic relief valve preset at 250 psi shall be installed in the aerial waterway to prevent over-pressurization of waterway system. The relief valve shall be mounted in the lower portion of the waterway where it enters the aerial torque box frame and dumps under the apparatus.

**Ladder Tip Step**

Two (2) split design folding steps shall be located near the ladder tip to provide a position for a firefighter using the ladder pipe/monitor as outlined in NFPA 1901 19.2.9. The steps shall have a raised surface for traction and cut outs for deployment.

**ISO Compliance**

The manufacturer shall operate a Quality Management System meeting the requirements of ISO 9001:2015.

The International Organization for Standardization (ISO) is a recognized world leader in establishing and maintaining stringent manufacturing standards and values. The manufacturer’s certificate of compliance affirms that these principles form the basis for a quality system that unswervingly controls design, manufacture, installation, and service.

The manufacturer’s quality systems shall consist of, but not be limited to, all written quality procedures (aka QOP) and other procedures referenced within the pages of the manufacturer’s Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts products or processes. In addition, all apparatus assembly processes shall be documented for traceability and reference. The manufacturer shall also engage the services of a certified third party for testing purposes where required.
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If the manufacturer operates more than one manufacturing facility each facility must be ISO certified.

By virtue of its ISO compliance the manufacturer shall provide an apparatus that is built to exacting standards, meets the customer’s expectations, and satisfies the customer’s requirements.

A copy of the manufacturer’s certificate of ISO compliance for each manufacturing facility shall be provided with the bid.

AERIAL HYDRAULIC SYSTEM OPTIONS

Aerial Hydraulic Oil Level Gauge

A hydraulic oil level gauge shall be supplied for easy fluid level verification. The three-light system shall indicate full oil level with a green light, acceptable oil level with yellow light, and low oil level with a red light. The display shall be located on pump operator’s panel.

Filter Isolation Kit

Three (3) valves shall be provided to minimize fluid loss when changing the aerial hydraulic filter elements during routine maintenance. One (1) 1” ball valve shall be installed at the inlet side of the return filter. Two (2) 3/4” check valves shall be installed on the pressure filter, one (1) on the inlet side and one (1) on the outlet side.

AERIAL CONTROLS

Aerial Control System

The aerial hydraulic system shall be equipped with a microprocessor based electric over hydraulic control system. The system shall include electronic ramping to provide smooth acceleration and deceleration of aerial functions during sudden movements of the operator control levers. The ladder shall utilize three (3) combination proportional control valves for smooth aerial device movements. The hydraulic system valve body shall be located in the turntable console.

The control system shall have manual overrides in the event of a system failure. The overrides shall be located directly on the electric / hydraulic control valve within easy reach of the turntable operator. The manual system shall be organized to match the base controllers with the functions clearly labeled.

The switch modules on the console shall be CAN based for reliable operation.

An emergency stop switch shall be provided on the console that de-energizes the PTO in the event the aerial must be stopped immediately.
Aerial Speed Switch

The control system shall be provided with a "creep speed" switch for precise aerial movement. When activated, the aerial shall operate a slow speed and the chassis engine will remain at idle speed.

Variable Ramping

A three (3) position switch shall be provided to select system ramping (ladder movement when initiating or ceasing movement of a control lever). The switch shall allow selection of normal, firm or soft ramping based on operator preference.

Display

A CAN based multifunction display shall be installed on the turntable control console. The display shall be a 3.2" backlit LCD to provide daylight readability and be IP67 rated. The display shall contain four (4) integrated navigation buttons and communicate via J1939 protocol.

The display shall provide the following information:

- Hydraulic system pressure
- Aerial hours
- Waterway flow
- Total waterway flow (with reset button)

The display shall be capable of showing system units in standard or metric values.

The background of the display shall change color based on status. Colors shall be blue/green for normal, yellow for caution and red for warning.

If equipped with breathing air the display shall provide the following additional information:

- Breathing air system max pressure (0, 2250, 4500 or 6000psi)
- Visual and audible alarms (alarms at 20% and 5%)
- Unique alarm tone with ground level visual indicator
- Alarm mute capability

If equipped with short jacking feature the display shall provide the following additional information:

- Rotation limited indicator
- Aerial angle in degrees
- Aerial tip load represented in 250 lb increments via simple firefighter icons
- System limit notifications (Example: "Right Rotation Limited – Short Jack")
Stow Switch

The control system shall also include a switch to deploy and stow the waterway monitor (if equipped with a pre-piped waterway).

Cradle Alignment Light

A green light shall be provided at the turntable control console to indicate when the aerial is aligned for bedding.

MONITORS

Monitor Finish

The aerial monitor(s) shall be ordered from the OEM manufacturer painted silver.

Electric Monitor

The aerial ladder shall be equipped with an Akron style 3486 StreamMaster II electrically controlled monitor with integrated shut-off valve (AVM). The monitor shall be made from Akron’s unique lightweight Pyrolite construction to minimize ladder tip loads. The monitor shall be equipped with an Akron style 5177 Akromatic electrically controlled automatic nozzle capable of discharging 250-1,250 gpm at 80 psi nozzle pressure. This waterflow capability shall be available at any extension, elevation, or position. A minimum stability factor of 1.5 to 1 shall be maintained in this configuration.

The operational range of the electric monitor and nozzle shall be 135 degrees through the vertical plane (90 degrees upwards from a line perpendicular to the aerial ladder and 45 degrees downward), and 180 degrees through the horizontal plane (90 degrees to either side of the aerial ladder center line). The monitor shall be able to move in the horizontal and vertical axis simultaneously.

The monitor relay box shall include an electronic control system that is attached to the inlet base of the monitor and be totally encapsulated to prevent moisture intrusion. The monitor shall have fully enclosed motors and gears with built in manual override capability and quick-attach handles. A battery, which continuously charges from the vehicle power system shall provide power for monitor movement. Systems which do not utilize a battery shall not be acceptable due to the higher incidence of failure with this type of system. NO EXCEPTIONS.

Control switches for horizontal movement, vertical movement and pattern selection shall be located at the aerial control console.

Monitor Tip Controls

In addition to the controls at the operator console, electric monitor directional and stream controls shall be installed in close proximity to the monitor on the ladder to allow operation by a firefighter on the ladder.
Shut-Off Valve

The monitor shall have an integrated ball valve to control flow of water to the monitor. The valve shall have a manual gear actuator.

2.5" Valve

An auxiliary 2.5" discharge elbow shall be mounted at the base of the monitor. The outlet shall include a 1/4 turn ball valve.

Monitor Upgrade

The Akron monitor shall have an extended vertical range of travel.

AERIAL WARNING LIGHTS

Ladder Tip Warning Lights

Two (2) Whelen Vertex model VTX609R red Super-LED light heads with clear lenses shall be supplied and mounted one each side at the ladder tip. The lights shall include model VTXFC chrome flanges.

The lights shall be wired to activate with the aerial master power switch.

LED Outrigger Lights (4)

Four (4) Whelen M6V2RC Super LED red light heads with clear lens shall be provided. The rectangular lights shall include chrome flanges. The lights shall be surface mounted on the outrigger covers in compliance with current NFPA 1901. Warning and ground lights shall be activated with aerial master switch.

AERIAL LIGHTING

Ladder Base Lighting

Two (2) Whelen round 12 Super LED model PFBP12C floodlights with black housing and chrome rear cover shall be mounted one on each side at the bottom of the ladder base section. They shall be controlled from the turntable operating pedestal.

Tip Light Locations

All spot, flood and quarts lights at the the tip of the fly section shall be mounted back as far as possible from the tip of the ladder.
Ladder Climbing Lights

A Luma-Bar Pathfinder LED lighting system shall be provided to illuminate the climbing area inside each ladder section. The strip type lights shall be located above ladder rung level and directed toward the centerline of the ladder to reduce glare. The lights shall be mounted to a 1.25" x .5" x .125" extruded aluminum channel and wired to not be an obstruction during climbing. The lights shall be controlled with the ladder lights switch at the operators control console.

The LED lights shall be (Specify Color).

LED 120V Flood Light

A Whelen Pioneer Plus series 120V flood light model PFP1AP1 LED light fixture(s) shall be provided on a Whelen model PBAPEDA permanent mount non-telescoping base. The rectangular extruded light fixture with die cast end caps shall measure 8-3/16" wide by 4-5/8" high by 3" deep and have a white powder coat finish. The 75W LED light head shall be rated at 7,500 usable Lumens that draws .6 amps.

The light assembly shall be mounted at the tip of the aerial as specified. The base shall allow for 360-degree rotation of the light. A locking knob shall hold the pole at the desired angle. The light shall be fitted with a weather-resistant switch to control the light when the aerial power circuit is activated.

Location(s): left side tip.

WATERWAY OPTIONS

Pinned Waterway Upgrade

A remote-controlled monitor/nozzle assembly shall be attached to a ladder fly section through C-channel slide pads which shall allow the monitor/nozzle assembly to be positioned at the tip of a section for maximum master stream reach or at the tip of the next section down for unobstructed rescue capabilities. The monitor/nozzle assembly shall be pinned at either operating location with a single stainless steel "T" handle locking ball pin. A monitor control station shall be attached to the sliding monitor/nozzle assembly and shall move with it.

The turntable monitor controls shall be connected to the sliding monitor system using an electronic multiplexing system that sends all monitor control signals over a shielded pair of wires through a spring retract electric cable reel. The collector rings in the cable reel shall be specifically designed for accurate transmission of electronic signals.

A gel-cell rechargeable battery shall be located on the sliding monitor assembly. A dedicated ground wire and 12VDC positive charging wire shall be routed from the turntable control station through the electric cable reel to the monitor battery. The charging wire shall be directly connected to the chassis 12VDC battery system through a 20 amp auto reset circuit breaker.
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The moveable monitor/nozzle assembly shall be capable of flowing from 300 gpm to 1000 gpm while maintaining a constant 80-100 psi nozzle pressure for maximum stream projection.

**Waterway Inlet**

One (1) 4” inlet shall be provided at the rear of the apparatus and shall be connected to the vertical pedestal waterway piping to supply water to the aerial waterway from an outside source. All fabricated piping shall be constructed of a minimum of Schedule 10 stainless steel piping to help prevent corrosion. The threads shall be NST. A long handle chrome plated 4” NST cap shall be installed on the inlet.

**Waterway Relief Valve**

A Hale P40 pilot operated relief valve shall be provided for the aerial waterway.

**Waterway Pressure Gauge**

The valve discharge gauges shall be 2 ½“(63mm) diameter Innovative Controls pressure gauges. Each gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and 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 –40F to +160F.

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 stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauges shall be installed into decorative chrome-plated mounting bezels that incorporate valve-identifying verbiage and/or color labels. The gauges shall display a range from 0 to 400 psi with black graphics on a white background.

**MISC AERIAL ELECTRICAL**

**Aerial Tip Receptacle**

A 110 volt twist lock 20 amp receptacle outlet shall be installed at the tip of the aerial device and wired into an apparatus breaker box with a 30 amp breaker. The breaker shall be fitted with a GFI protection feature. The receptacle box shall be fitted with a weather-resistant cover.

**AERIAL EQUIPMENT**

**Axe Bracket**

An axe bracket shall be provided on the aerial ladder. The bracket shall be Zico model# H-AB blade guard and PAC TRAC model# 1004 clamp for the handle. The bracket shall be designed to hold a 6 lb. axe.
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Location: left side fly section.

**Pike Pole Mount**

There shall be (2) two PAC TRAC positive locking brackets for one (1) 6’ pike pole.
Location: right side fly section.

**Lifting Eyes**

A pair of lifting eyes shall be located one each side at the ladder tip. The lifting eyes shall be constructed of 6061T6 aluminum and be welded one each side to the tip of the aerial’s fly section main rail. The hole in the eye shall have chamfered edges and be designed to allow attachment of 2" webbing. The lifting eyes shall have a capacity of 250 lbs. each / 500 lbs. Load on eyes and personnel at tip not to exceed rated capacity of the ladder.

**AERIAL LADDER BRACKETS**

**Roof Ladder Bracket**

A lift-out style roof ladder mounting bracket shall be installed on the outside of the ladder base section. The bracket shall be designed to hold a PRL-12 on right side of base section.

**SIGN PLATES**

**Aerial Sign Plate**

Two (2) 22” x 144” x 1/8” (0.125”) thick smooth aluminum plates shall be provided. The plates shall have 1” lips top and bottom for rigidity. Each sign plate shall be bolted on either side of the base section, approximately at the midpoint. The plates shall be provided to display the department’s name or other information. The plates shall be painted [#COL] as specified by the customer.

**AERIAL TESTING**

**Third-Party Flow Test**

A flow test shall be conducted to determine that the water system is capable of flowing 1,000 gpm at 100 psi nozzle pressure with the aerial device at full extension and elevation. When the aerial apparatus is equipped with a fire pump, the test shall be conducted using the onboard pump. Intake pressure for the onboard pump shall not exceed 20 psi.

In addition to the flow test, a hydrostatic test shall be done on the waterway system. The permanent water system, piping, and monitor shall be hydrostatically tested at the maximum operating pressure required to flow 1,000 gpm at 100 psi nozzle pressure at maximum elevation and extension.
These results shall be certified by an independent, third-party testing organization, per NFPA 16.13.1 through 16.13.1.3.

**Aerial Certification**

All certification shall be performed by a certification organization that is accredited for inspection and testing systems on fire apparatus in accordance with ISO/IEC 17020.

The aerial ladder shall be tested in compliance with the current editions of NFPA 1901 and NFPA 1911. All critical structural components of the aerial shall include 100% nondestructive testing (NDT) before assembly and body mounting. All NDT testing shall be performed by Level II or Level III technicians who have been certified in the test methods used in accordance with ANSI/ASNT CP-189.

Welds for structural load-supporting elements shall be performed by certified welders under the guidelines of AWS. Each aluminum ladder section shall be subjected to 100% NDT visual weld inspection followed by Liquid Penetrant NDT inspection as required to qualify suspected weld defect indications. Each steel ladder section shall be subjected to 100% Magnetic Particle NDT weld inspection to assure the structural integrity of the welds.

A 100% Magnetic Particle weld inspection shall be conducted on the torque box, aerial support structure, outriggers, outrigger support structure and all other structural ferrous aerial components. This test shall be performed to assure the structural integrity of the weldment.

After the aerial is assembled and installed on the vehicle, an operational inspection shall be made and the aerial shall be tested to comply with the applicable standards in the current editions of NFPA 1901 and NFPA 1911.

In addition to the above tests, the aerial shall successfully complete the following operational tests:

1) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. The aerial shall lift a test weight equal to the rated tip load capacity, as specified herein, with the aerial at full extension, 0 degrees elevation, and rotated 90 degrees to either side of the truck chassis. The test weight shall be lifted from 0 degrees to 15-20 degrees. The test weight shall be suspended from a position equal to the position of the outermost rung of the fly section or the center of the platform when so equipped. The aerial shall lift the test weight smoothly and evenly with no twisting or jerking. This test shall be performed at the normal hydraulic system relief valve setting. No temporary adjustments to the relief valve shall be allowed.

2) The completed apparatus shall be placed on a firm, level surface with the aerial ladder stabilizers extended and down. A test weight equal to 1.5 times the aerial’s rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center of the platform when so equipped), with the aerial in the straight-ahead position. The aerial shall then be rotated a full 360 degrees around the vehicle with the aerial at full extension and at 0 degrees elevation (or high enough to clear vehicle-mounted equipment). The aerial and vehicle shall show no signs of instability. This test shall be performed with no
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water in the tank, or hose, ladders, or removable equipment that would act as a counterbalance in order to simulate a worst-case condition.

3) The completed apparatus shall be placed on a firm surface having a minimum 5 degrees side slope with the aerial stabilizers extended and down. A test weight equal to 1.5 times the aerial’s rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center of the platform when so equipped), with the aerial in the straight-ahead position. The aerial shall then be rotated 90 degrees to the downhill side with the aerial at full extension, 0 degrees elevation (or high enough to clear vehicle-mounted equipment). The aerial and vehicle shall show no signs of instability, and all of the stabilizers shall remain firmly on the ground. This test shall be performed with no water in the tank, or hose, ladders, or removable equipment that would act as a counterbalance in order to simulate a worst-case condition.

4) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. A test weight equal to 2.0 times the aerial’s rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center of the platform when so equipped), with the aerial in the straight-ahead position at full extension and at 8 degrees elevation (or high enough to clear vehicle-mounted equipment). After ten (10) minutes, the weight shall be removed, and the aerial shall be inspected for any abnormal twist or deflection.

5) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. The aerial will be positioned at full extension at 0 degrees elevation at some position out of the travel rest and off the side or rear of the truck. For units without a pre-piped waterway to the tip, a test weight of 220# shall be applied horizontally and perpendicular to the tip of the aerial at the location of the outermost rung. The rotation brake shall not release nor shall the aerial’s deflection exceed the manufacturer’s accepted tolerances. For aerials with pre-piped waterways, a test weight of 350# will be applied at the location of water nozzle.

Upon satisfactory completion of all inspections and tests, an independent third-party inspection firm shall submit a certificate indicating that all specified standards have been met.

GROUND LADDERS

Alco-Lite Roof Ladder

An Alco-Lite PRL-12, 12’ roof ladder shall be provided. Folding steel roof hooks shall be attached to one end of the ladder with steel spikes on the other.

Alco-Lite Roof Ladder

An Alco-Lite PRL-14, 14’ aluminum roof ladder shall be provided. Folding steel roof hooks shall be attached to one end of the ladder with steel spikes on the other.
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**Alco-Lite Roof Ladder**

An Alco-Lite PRL-16, 16’ aluminum roof ladder shall be provided. A pair of folding 3/4” (0.75”) steel roof hooks shall be attached to one end of the ladder, and a pair of steel spiked feet on the other end. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931.

**Alco-Lite Extension Ladder**

One (1) Alco-Lite PEL-24, 24’ aluminum 2-section extension ladder shall be provided. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931.

**Alco-Lite Extension Ladder**

An Alco-Lite PEL-28, 28’ aluminum two-section extension ladder shall be provided.

**Alco-Lite 3-Section Extension Ladder**

One (1) Alco-Lite PEL3-35, 35’ aluminum 3-section extension ladder shall be provided. The fly section shall be operated by a cable and shall automatically extend as the center section is raised. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931.

**Little Giant Model 17 Ladder**

**A-Frame Ladder**

One (1) Wing Enterprises Little Giant model 17 aluminum A-frame ladder shall be supplied. The ladder shall be equipped with a heavy gauge steel locking device and ladder shoes for extra safety. It shall be capable of being used either as a 9’ to 15’ variable-length straight ladder or as an adjustable step ladder with the ability to be erected on stairs or other offset horizontal surfaces.

**Alco-Lite Folding Ladder with Shoes**

This unit shall be supplied with one (1) Alco-Lite FL-10, 10’ 6” long aluminum folding attic ladder with safety shoes.

**MISC LOOSE EQUIPMENT**

**DOT Required Drive Away Kit**

Three (3) triangular warning reflectors with carrying case shall be supplied to satisfy the DOT requirement.
EXTERIOR PAINT

Paint Break with Dip to Grille

The cab shall have a two-tone paint break. The break line shall be approximately 31.5 inches below the cab roof drip rail. The paint break shall include a dip down to the corners of the cab grille.

Painted Pump/Pre-Connect Module(s)

The apparatus pump/pre-connect module(s) shall be painted job color.

The paint process shall match what is applied to the body.

Painted Header Plate

The roll up door header plates shall be painted job color for all painted roll-up doors.

Paint Custom Cab – Black over Red

The apparatus cab shall be painted Sikkens [#COL]. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum cab exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces. Cab doors and any hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on cab, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of
penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

**Paint Cab Two-Tone Color**

The upper section of the cab shall be painted Black over Red.

The paint process of the secondary cab color shall be the same as the primary color.

**Paint Body Large**

The apparatus body shall be painted Sikkens [#COL]. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- **Corrosion Prevention** - all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- **Sikkens Sealer/Primer LV** - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- **Sikkens High Solid LVBT650 (Base coat)** - a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- **Sikkens High Solid LVBT650 (Clear coat)** - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails,
doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

**Aerial Paint**

The lift cylinders, extension cylinders and upper turntable steelwork (less turntable) shall be painted to match the primary job color.

**INTERIOR PAINT**

**Cab Interior Paint**

The interior of the cab shall be painted Zolatone gray #20-64. Prior to painting, all exposed interior metal surfaces shall be pretreated using a corrosion prevention system.

**LETTERING**

**STRIPING**

**Reflective Tape on Jacks**

The four outriggers that protrude beyond the side of the body shall be striped with white reflective tape. The tape shall be visible from the front or rear of the unit.

**Reflective Stripe in Rubrail**

The reflective stripe in the body rubrail shall be white.

**Cab and Body Stripe**

A single Scotchlite stripe, upto 6 inches in width shall be installed on the cab and body. The stripe shall have a hockey style, Z or S style or any other customer specific design style.

The stripe shall be NFPA compliant and the size, color and location shall be as specified by the customer.

**Cab and Body Stripe**

An additional Scotchlite stripe, up to 3 inches in width shall be installed on the cab and body.

The stripe shall be NFPA compliant and the design, size, color and location shall be as specified by the customer.
Scotchlite Cab Stripe

Scotchlite cab stripe shall be 3/4” in width total, 1/2” gold stripe with a 1/8” customer specified color outline on both sides and a clear polyurethane coating. Stripe shall be centrally located and shall contour with the cab, following the paint break.

Front Bumper Reflective Striping

Chevron style Reflexite V98 striping shall be provided on the front bumper of the apparatus. The stripes shall consist of 6" [#COL] alternating stripes in an "A" pattern.

Rear Body Reflective Striping

Chevron style Reflexite V98 striping shall be provided on the rear of the apparatus. The stripes shall consist of 6" [#COL] alternating stripes in an "A" pattern. The striping shall be located on the rear facing extrusions, panels and doors inboard and outboard of the beavertails if applicable.

Designated Standing / Walking Area Indication

1" wide yellow perimeter marking consisting of individual Reflexite diamonds shall be applied to indicate the outside edge of designated standing and walking areas above 48" from the ground in compliance with 2016 NFPA 1901. Steps, ladders and areas with a railing or structure at least 12" high are excluded from this requirement.

GRAPHICS

Customer Graphics

Customer Graphics shall be applied on the aerial lift cylinders. Graphics to be sign gold material approx 14" long located midway along the outward surface of each cylinder.

WARRANTY / STANDARD & EXTENDED

Standard 1 Year Warranty

The apparatus manufacturer shall provide a full 1-year standard warranty. All components manufactured by the apparatus manufacturer shall be covered against defects in materials or workmanship for a 1-year period. All components covered by separate suppliers such as engines, transmissions, tires, and batteries shall maintain the warranty as provided by the component supplier. A copy of the warranty document shall be provided with the proposal.

Lifetime Frame Warranty

The apparatus manufacturer shall provide a full lifetime frame structural warranty. This warranty shall cover all apparatus manufacturer designed frame, frame members, and cross-
Specification For Barrow Co. Fire and Emergency Services

members against defects in materials or workmanship for the lifetime of the covered apparatus. A copy of the warranty document shall be provided with the proposal. Frame warranties that do not cover cross-members for the life of the vehicle shall not be acceptable.

10 Year 100,000 Mile Structural Warranty

The apparatus manufacturer shall provide a comprehensive 10 year/100,000 mile structural warranty. This warranty shall cover all structural components of the cab and/or body manufactured by the apparatus manufacturer against defects in materials or workmanship for 10 years or 100,000 miles, whichever occurs first. Excluded from this warranty are all hardware, mechanical items, electrical items, or paint finishes. A copy of the warranty document shall be provided with the proposal.

10 Year Stainless Steel Plumbing Warranty

The apparatus manufacturer shall provide a full 10-year stainless steel plumbing components warranty. This warranty shall cover defects in materials or workmanship of apparatus manufacturer designed foam/water plumbing system stainless steel components for 10 years. A copy of the warranty document shall be provided with the proposal.

20 Year Aerial Device Structural Warranty

The aerial manufacturer shall provide a 20 year structural integrity warranty on the aerial device. This warranty shall cover structural components and shall be extended for a period of 20 years after the date on which the vehicle is delivered to the original purchaser. A copy of the warranty document shall be provided with the proposal. Please refer to warranty document for complete details and exclusions.

10 Year Paint and Corrosion Warranty

The apparatus manufacturer shall provide a 10-year limited paint and corrosion perforation warranty. This warranty shall cover paint peeling, cracking, blistering, and corrosion provided the vehicle is used in a normal and reasonable manner.

The paint shall be prorated for 10 years as follows:

**Topcoat & Appearance:**
(Gloss, Color Retention, Cracking)
- 0 to 72 months: 100%
- 73 to 120 months: 50%

**Coating System, Adhesion & Corrosion:**
(Includes Dissimilar metal corrosion, Flaking, Blistering, Bubbling)
- 0 to 36 months: 100%
- 37 to 84 months: 50%
- 85 to 120 months: 25%
Specification For Barrow Co. Fire and Emergency Services

Corrosion perforation shall be covered 100% for 10 years. Corrosion perforation is defined as complete penetration through the exterior metal of the apparatus.

The warranty period shall begin upon delivery of the apparatus to the original user-purchaser. A copy of the warranty document shall be provided with the proposal.

UV paint fade shall be covered in a separate warranty supplied by Akzo Nobel (Sikkens) and shall be for a minimum of 10 years.

**Meritor Rear Axle Warranty**

A 5-year/unlimited miles, 5-year parts and 5-year labor rear drive single or rear drive tandem axle warranty shall be provided by Meritor Automotive.

**Front Axle Warranty**

A 5-year/unlimited miles, 5-year parts and 5-year labor front non-drive steer axle warranty shall be provided by Dana Corporation.

**SUPPORT, DELIVERY, INSPECTIONS AND MANUALS**

**Training**

The manufacturer shall provide three (3) days of training covering vehicle maintenance and operational familiarization.

This training shall be provided by a full time, manufacturer employee trainer who specializes in aerial training.

**Pump Panel Approval Drawing**

A detailed large scale approval drawing of the pump panel(s) shall be provided. The drawing shall be provided on a purchased unit prior to the construction process.

**Approval Drawings**

A general arrangement drawing depicting the vehicles appearance shall be provided. The drawing shall consist of left side, right side, front, and rear elevation views.

Vehicles requiring pump controls shall include a general arrangement view of the pump operator’s position, scaled the same as the elevation views.

**Approval Drawings - Dash Panel Layout**

A detailed large scale approval drawing of the dash/console panel layout shall be provided. The drawing shall be provided on a purchased unit prior to the construction process.
Electronic Manuals

Two (2) copies of all operator, service, and parts manuals MUST be supplied at the time of delivery in digital format -NO EXCEPTIONS! The electronic manuals shall include the following information:

- Operating Instructions, descriptions, specifications, and ratings of the cab, chassis, body, aerial (if applicable), installed components, and auxiliary systems.
- Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and firefighting systems.
- Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.
- Instructions regarding the frequency and procedure for recommended maintenance.
- Maintenance instructions for the repair and replacement of installed components.
- Parts listing with descriptions and illustrations for identification.
- Warranty descriptions and coverage.

The electronic document shall incorporate a navigation page with electronic links to the operator’s manual, service manual, parts manual, and warranty information, as well as instructions on how to use the manual. Each copy shall include a table of contents with links to the specified documents or illustrations.

The electronic document must be formatted in such a manner as to allow not only the printing of the entire manual, but to also the cutting, pasting, or copying of individual documents to other electronic media, such as electronic mail, memos, and the like.

A find feature shall be included to allow for searches by text or by part number.

These electronic manuals shall be accessible from any computer operating system capable of supporting portable document format (PDF). Permanent copies of all pertinent data shall be kept file at both the local dealership and at the manufacturer’s location.

NOTE: Engine overhaul, engine parts, transmission overhaul, and transmission parts manuals are not included.

Fire Apparatus Safety Guide

Fire Apparatus Safety Guide published by FAMA, latest edition. This safety manual is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of a fire apparatus and to suggest possible ways of dealing with these situations. This manual is NOT a substitute for the manufacturer’s fire apparatus operator and maintenance manuals or commercial chassis manufacturer’s operator and maintenance manuals.

EXHIBIT A (Graphics)
EXHIBIT B (Loose Equipment)
Exhibit A
(Graphics)

Front View
Driver Side View
Officer Side View
Rear View
“BCES Logo” to be placed on the front driver and Officer door.
Exhibit B
(Loose Equipment)

The following loose equipment and mounting brackets shall be an option provided and priced separately to Barrow County Emergency Services.

**Fire Hose**
(20) 50’ Sections of 1.75” DJ Fire Hose w/ 1.5” Light Weight Couplings
(16) 50’ Sections of 3.00” DJ Fire Hose w/ 2.5” Light Weight Couplings
(15) 100’ Sections of 5.00” LDH Rubber Covered Supply Hose w/ Storz Couplings – Yellow
(1) 25’ Section of 5.00” LDH Rubber Covered Supply Hose w/ Storz Couplings – Yellow

*** All Fire Hose to have a 10 Year Warranty. Pre-connect hoses to be colored coordinating with pump panel labeling.

**Nozzles**
(5) Elkhart Phantom 1.75” Nozzle
(4) Elkhart Phantom 2.50” Nozzle
(4) Elkhart Phantom 2.50” Nozzle

**Hand Tools**
(2) Akron # FHY-6 Flat Head Ax w/ Fiberglass Handle
(2) Akron # PHY-6 Pick Head Ax w/ Fiberglass Handle
(2) South Park # ZSMA5201C Axe Side Mount Handle Bracket
(2) South Park # ZAH5101C Axe Blade Bracket
(1) Akron #PPB-36 36” Pinch Point Pry Bar
(1) South Park # CHR5501C SpringLoaded Bar Set
(1) Akron # TRI-36 36” Forcable Entry Tri Bar
(1) Zico #MB-2 Tri Bar Mounting Bracket
(1) Akron # FSY-8 8lb. Sledge Hammer w/ Fiberglass Handle
(1) Ziamatic # SHB Sledge Hammer Bracket
(1) FireHooks # BC-36 36” Bolt Cutter
(1) Zico # BCB Bolt Cutter Bracket
(2) Akron # SS-48F 48” Square Point Shovel
(1) Akron # AS-27D 27” Scoop Shovel w/ D-Handle
(1) Akron # FR-60F 60” Fire Rake
(8) PAC # 1004 HandleLok Mounts

**Pike Poles**
(1) Akron # UT-3 3’ Pike Pole w/ Fiberglass Handle
(1) Akron # UT-6 6’ Pike Pole w/ Fiberglass Handle
(1) Akron # UT-8 8’ Pike Pole w/ Fiberglass Handle
(1) Akron # UT-10 10’ Pike Pole w/ Fiberglass Handle
(1) Akron # UT-12 12’ Pike Pole w/ Fiberglass Handle

*** All Pike Poles Shall Have Mounting Brackets
Drywall Puller

(1) Akron # UT-3-D-DWH 3’ Dry Wall Hook w/ Fiberglass Handle and D-Grip
(1) Akron # UT-6-D-DWH 6’ Dry Wall Hook w/ Fiberglass Handle and D-Grip
(1) Akron # UT-8-D-DWH 8’ Dry Wall Hook w/ Fiberglass Handle and D-Grip

*** All Drywall Hooks Shall Have Mounting Brackets

Ladders

(1) Alcolite # FL-10 10’ Folding Attic Ladder
(1) Alcolite # PRL-14 14’ Pumper Roof Ladder
(1) Alcolite # PEL-24 24’ 2-Section Extension Ladder

Gas Cans / Safety

(1) 2 Gallon Safety Gas Can
(1) 5 Gallon Safety Gas Can
(5) # TC0228PU5 Pop Up Safety Cone w/ Carrying Bag

Hydrant Bag

(1) Hydrant Bag shall be provided with the following items:
   (1) Elkhart # X-86A Hydrant Gate Valve
   (1) Red Head #S54 Rocker Lug 2.5” FNST x 5” Storz Adaptor
   (1) Red Head #S54 Long Handle 4.5” FNST x 5” Storz Adaptor
   (1) Red Head # 105 Hydrant Wrench
   (2) Red Head # 101 Spanner Wrenches
   (2) Red Head # SW-1 Small Storz Wrenches
   (2) Red Head # SW-2 Large Storz Wrenchs

Gas Powered Equipment

(1) Subaru 5000W Generator
(1) Stihl # TS410 Cutquik K12 Type Saw
(1) Stihl # MS290 Chainsaw

Area Electrical / Lighting

(4) Akron # ELBE-500-PL 500W Portable Lights
(2) Akron # ERCP-10 Live Cord Reels – Portable
(200’) Akron # 123B300 Electrical Cord ( 100’ For Each Reel )
(4) Streamlight # 44451 Orange LED Light Box w/ Vehicle Mount Charging Base
**Extinguishers / Misc.**
(1) Haz Mat Kit
(2) Husky 12’x14’ 10oz. Red Vinyl Salvage Covers
(1) Amerex # AX240 2.5 Gallon Water Extinguisher
(1) Amerex # AX411 20lb. ABC Extinguisher
(2) Amerex # 864A Extinguisher Vehicle Bracket w/ Cord

**Engineer Compartment Equip.**
(1) Hebert LDH 5-6” Screw Type Hose Clamp
(1) Hebert Running Board Mounting Bracket
(1) Leather Hose Jacket
(4) Red Head # 35 2.5” DF Adaptors
(4) Red Head # 36 2.5” DM Adaptors
(3) Red Head # 148-3 Triple Combo Wrench Bracket w/ (2) Spanners & (1) Hydrant Wrench
(3) Kochek # KS34 Storz Spanner Wrench Holder w/ (4) Wrenchs
Submit one original (un-bound) and 4 copies

NAME OF VENDOR:  ________________________________________________________
ADDRESS:  ________________________________________________________
CITY/STATE/ZIP:  ________________________________________________________
TELEPHONE:  ________________________________________________________
EMAIL ADDRESS:  ________________________________________________________
PERSON TO CONTACT:  ________________________________________________________

We herewith submit as follows:

CHASSIS MAKE:  ________________________________________________________
MODEL/TYPE:  ________________________________________________________
F.O.B. POINT:  Delivered
TERMS:  Net 10 Days from Date of Receipt.
ADDENDA ACKNOWLEDGEMENT: #1 ______ #2_______ #3_______ #4 _______ #5 _______

<table>
<thead>
<tr>
<th>Rescue Pumper</th>
<th>Delivered Price</th>
<th>Delivery In Calendar Days</th>
<th>Warranty Period</th>
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<tbody>
<tr>
<td>1 Ea. New 2019 or 2020 Quint Fire Truck per attached Specifications, and Graphics (Exhibit A). (Attach detail explanation of any deviations to Specifications)</td>
<td>$____________________Each</td>
<td>___________________Days</td>
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<tr>
<td>GRAND TOTAL – 1 VEHICLE</td>
<td>$____________________</td>
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<td>*Attach Warranty Statement</td>
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1 Lot or Individually Loose Equipment (Exhibit B) Please list pricing separately on the form attached. Barrow County Emergency Services would like the option to either purchase in 1 lot or individually purchase the loose equipment listed on Exhibit B.

| 1 Lot or Individually Loose Equipment (Exhibit B) | $____________________Lot | | |
| GRAND TOTAL (Exhibit B)                          | $____________________ | | *Exhibit B Unit Prices (3 Pages Must be attached with Bid Form) |

RFB IS:  
_________ AS PER SPECIFICATION, TAKING NO EXCEPTIONS
_________ TAKING ONLY THOSE SPECIFICATION EXCEPTIONS AS LISTED ON PAGE 6.
## Loose Equipment (Exhibit B)  Page 2 of 6

(The following loose equipment and mounting brackets shall be an option provided and priced separately to Barrow County Emergency Services)

<table>
<thead>
<tr>
<th>Item</th>
<th>Est. Qty.</th>
<th>Unit Price</th>
<th>Totals</th>
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</thead>
<tbody>
<tr>
<td><strong>Fire Hose</strong></td>
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<tr>
<td>50’ Sections of 1.75” DJ Fire Hose w/ 1.5” Light Weight Couplings</td>
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<td>50’ Sections of 3.00” DJ Fire Hose w/ 2.5” Light Weight Couplings</td>
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<tr>
<td>100’ Sections of 5.00” LDH Rubber Covered Supply Hose w/ Storz Couplings – Yellow</td>
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<tr>
<td>25’ Section of 5.00” LDH Rubber Covered Supply Hose w/ Storz Couplings – Yellow</td>
<td>1</td>
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</tr>
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</table>

*** All Fire Hose to have a 10 Year Warranty. Pre-connect hoses to be colored coordinating with pump panel labeling.

<table>
<thead>
<tr>
<th>Item</th>
<th>Est. Qty.</th>
<th>Unit Price</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nozzles</strong></td>
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<tr>
<td>Elkhart Phantom 1.75” Nozzle</td>
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<tr>
<td>Elkhart Phantom 2.50” Nozzle</td>
<td>4</td>
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<tr>
<td>Elkhart Phantom 2.50” Nozzle</td>
<td>4</td>
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<table>
<thead>
<tr>
<th>Item</th>
<th>Est. Qty.</th>
<th>Unit Price</th>
<th>Totals</th>
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</thead>
<tbody>
<tr>
<td><strong>Hand Tools</strong></td>
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<tr>
<td>Akron # FHY-6 Flat Head Ax w/ Fiberglass Handle</td>
<td>2</td>
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<td>Akron # PHY-6 Pick Head Ax w/ Fiberglass Handle</td>
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<tr>
<td>South Park # ZSMA5201C Axe Side Mount Handle Bracket</td>
<td>2</td>
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<td>South Park # ZAH5101C Axe Blade Bracket</td>
<td>3</td>
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<tr>
<td>Akron #PPB-36 36” Pinch Point Pry Bar</td>
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<tr>
<td>South Park # CHR5501C Spring Loaded Bar Set</td>
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<tr>
<td>Akron # TRI-36 36” Forceable Entry Tri Bar</td>
<td>1</td>
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<tr>
<td>Zico #MB-2 Tri Bar Mounting Bracket</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>Akron # FSY-8 8lb. Sledge Hammer w/ Fiberglass Handle</td>
<td>1</td>
<td></td>
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<tr>
<td>Ziamatic # SHB Sledge Hammer Bracket</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FireHooks # BC-36 36” Bolt Cutter</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zico # BCB Bolt Cutter Bracket</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>Akron # SS-48F 48” Square Point Shovel</td>
<td>2</td>
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<tr>
<td>Akron # AS-27D 27” Scoop Shovel w/ D-Handle</td>
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<tr>
<td>Akron # FR-60F 60” Fire Rake</td>
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<tr>
<td>PAC # 1004 HandleLok Mounts</td>
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<table>
<thead>
<tr>
<th>Item</th>
<th>Est. Qty.</th>
<th>Unit Price</th>
<th>Totals</th>
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<tr>
<td><strong>Pike Poles</strong></td>
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<tr>
<td>Akron # UT-3 3’ Pike Pole w/ Fiberglass Handle</td>
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<tr>
<td>Akron # UT-6 6’ Pike Pole w/ Fiberglass Handle</td>
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<td>Akron # UT-8 8’ Pike Pole w/ Fiberglass Handle</td>
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<tr>
<td>Akron # UT-10 10’ Pike Pole w/ Fiberglass Handle</td>
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<tr>
<td>Akron # UT-12 12’ Pike Pole w/ Fiberglass Handle</td>
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</table>

*** All Pike Poles Shall Have Mounting Brackets
(The following loose equipment and mounting brackets shall be an option provided and priced seperately to Barrow County Emergency Services)

<table>
<thead>
<tr>
<th>Item</th>
<th>Est. Qty</th>
<th>Unit</th>
<th>Price</th>
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</thead>
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<tr>
<td><strong>Drywall Puller</strong></td>
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<tr>
<td>Akron # UT-3-D-DWH 3’ Dry Wall Hook w/ Fiberglass Handle and D-Grip</td>
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<tr>
<td><em>All Drywall Hooks Shall Have Mounting Brackets</em></td>
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<tr>
<td><strong>Ladders</strong></td>
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<td>Alcolite # FL-10 10’ Folding Attic Ladder</td>
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<td>Alcolite # PRL-14 14’ Pumper Roof Ladder</td>
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<tr>
<td>Alcolite # PEL-24 24’ 2-Section Extension Ladder</td>
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<td><strong>Gas Cans / Safety</strong></td>
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<td># TC0228PU5 Pop Up Safety Cone w/ Carrying Bag</td>
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<tr>
<td><strong>Hydrant Bag</strong></td>
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<tr>
<td>Hydrant Bag shall be provided with the following items:</td>
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<tr>
<td>Elkhart # X-86A Hydrant Gate Valve</td>
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<td>Red Head # SW-2 Large Storz Wrenches</td>
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<td><strong>Gas Powered Equipment</strong></td>
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<td>Subaru 5000W Generator</td>
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<tr>
<td>Stihl # TS410 Cutquik K12 Type Saw</td>
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<tr>
<td>Stihl # MS290 Chainsaw</td>
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<td><strong>Area Electrical / Lighting</strong></td>
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<td>Akron # ELBE-500-PL 500W Portable Lights</td>
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<td>Akron # ERCP-10 Live Cord Reels – Portable</td>
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<td><strong>Extinquishers / Misc.</strong></td>
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<td>Haz Mat Kit</td>
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<td>Husky 12’x14’ 10oz. Red Vinyl Salvage Covers</td>
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<td>Amerex # AX240 2.5 Gallon Water Extinguisher</td>
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<td>Amerex # AX411 20lb. ABC Extinguisher</td>
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<tr>
<td>Amerex # 864A Extinguisher Vehicle Bracket w/ Cord</td>
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</table>
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Barrow County Board of Commissioners would like to explore all of its options when considering the purchase of a Quint Fire Truck. Therefore, we have made a provision below for your Company to provide additional information for units you may have available.

Optional:
Please list any available “Demo” Quint Fire Truck below along with prices. Provide a complete set of specifications for each along with a list of existing equipment for each, photos, warranty and delivery in calendar days.

| DEMO* | $____________________ Each |

*Please include price of graphics from Exhibit A with your demo price. Also, if you quote demo make sure loose equipment is still filled out in its entirety as 1 lot on page 1 and separately on pages 2-4.

*Barrow County will consider a “demo” apparatus if the apparatus has less than 1000 hours and/or less than 10,000 miles on the equipment. The apparatus shall also be in great working condition with a comparable design as specified in the specifications in RFB2020-5.

It is agreed by the undersigned vendor that the signature and submission of this RFB represents the vendor’s acceptance of all terms, conditions, and requirements of RFB specifications and, if awarded, the Barrow County Purchase Order, along with the RFB, will represent the agreement between the two parties.

SIGNED: _______________________________ DATE: __________________________
NAME PRINTED: _______________________________ TITLE: __________________________

NOTE: All variations and/or exceptions must be listed on the attached pages, by page and paragraph number from specifications and explained in detail. Failure to so list exceptions will disqualify the RFB.
Bid Form – RFB2020-5
(Page 6 of 6)

EXCEPTIONS / CLARIFICATIONS

Each vendor may copy this form, as necessary to sufficiently list all exceptions and variations from specifications. (Please list as shown, by page, reference number, and check if vendor chooses not to supply, or is unavailable, or describe deviation or substitution in detail, if furnished). Purchaser will be the sole judge of proposed substitution equivalency.

VENDOR NAME: __________________________________________

OFFERING: _______________________________________________

EXCEPTION PAGE: ___________________ of ___________________

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COUNTY OF BARROW
STATE OF GEORGIA

BARROW COUNTY ETHICS ORDINANCE

AN ORDINANCE TO AMEND THE CODE OF ORDINANCES OF BARROW COUNTY, TO ESTABLISH THE CODE OF ETHICS FOR BARROW COUNTY; TO FURTHER AND INCORPORATE THE POLICIES AND LAWS OF THE STATE OF GEORGIA RELATING TO ETHICAL STANDARDS; TO CREATE THE BOARD OF ETHICS AND PROVIDE FOR ITS CONSTITUENT MEMBERSHIP, DUTIES, AND RESPONSIBILITIES; TO PROVIDE FOR THE INVESTIGATION OF ETHICS COMPLAINTS; TO PROVIDE FOR THE ENFORCEMENT OF ETHICAL STANDARDS; TO PROVIDE FOR SEVERABILITY; TO PROVIDE FOR AN EFFECTIVE DATE; AND FOR OTHER PURPOSES.

WHEREAS, the Constitution of the State of Georgia, approved by the voters of the State in November of 1982, and effective July 1, 1983, provides in Article IX, Section II, Paragraph I Thereof, that the governing authority of the county may adopt clearly reasonable ordinances, resolutions and regulations;

WHEREAS, O.C.G.A. § 36-1-20 authorizes counties to enact ordinances for protection and preserving the public health, safety and welfare of the population of the unincorporated areas of the County;

WHEREAS, the governing authority of Barrow County, to wit, the Board of Commissioners, desires to exercise its authority in adopting this Ordinance;

WHEREAS, it is essential to the proper operation of democratic government that public officials of independent and impartial, that governmental decisions and policy be made in the proper channels of the governmental structure, that public office not be used for private gain other than the remuneration provided by law, and that there be public confidence in the integrity of government;
WHEREAS, the attainment of one or more of these ends is impaired whenever there exists a conflict between the private interests of an elected official or a governmental employee and his duties as such;

WHEREAS, the public interest, therefore, requires that the law protect against such conflicts of interest and establish appropriate ethical standards with respect to the conduct of elected officials and government employees in situations where conflicts exist;

WHEREAS, it is also essential to the proper operation of government that those best qualified be encouraged to serve the government. Accordingly, legal safeguards against conflicts of interest must be so designed as not unnecessarily or unreasonably to impede the recruitment and retention by the government of those men and women who are best qualified to serve it;

WHEREAS, an essential principle underlying the staffing of our government structure is that its elected officials and employees should not be denied the opportunity, available to all other citizens, to acquire and retain private economic and other interests, except where conflicts with the responsibility of such elected officials and employees to the public cannot be avoided;

WHEREAS, in recognition of these goals and principles, it is the policy of the Board of Commissioners to institute, establish, promote and enforce standards of ethical conduct for all of Barrow County’s officers and employees; and

WHEREAS, it is a further policy of the Board of Commissioners that the proper administration of Barrow County’s government and the promotion and enforcement of standards of ethical conduct for Barrow County’s officers and employees would be best served by the creation of a Barrow County Board of Ethics for the investigation of complaints related to ethical standards;
NOW, THEREFORE, BE IT ORDAINED AND RESOLVED BY THE BOARD OF

COMMISSIONERS OF BARROW COUNTY, GEORGIA AS FOLLOWS:

ARTICLE ONE: GENERAL PROVISIONS

Section One. Short Title.

This Ordinance shall be known as "The Barrow County Ethics Ordinance," and may be Cited and referred to as such.

Section Two. Definitions.

For the purposes of this Ordinance, the following terms, phrases, words and their derivations shall have the meaning provided herein. When no inconsistent with the context, words used in the present tense include the future, words in the plural number included the singular number and words in the singular number include the plural number.

(A) "Board" means the Barrow County Board of Commissioners.

(B) "Board of Ethics" means the Barrow County Board of Ethics as formed and described herein.

(C) "Business Entity" means any business of whatever nature regardless of how designated or formed, whether a sole proprietorship, partnership, joint venture, association, trust, corporation, limited liability company, or any other type of business enterprise and whether a person acting on behalf of, or as a representative or agent of, the business entity.

(D) "Confidential Information" means any information that, by law or practice, is not reasonably available to the public.

(E) "County Official" means the Barrow County Board of Commissioners, any member of a board, commission or authority appointed by the Board, the Chief of
Operations or his/her equivalent and any other elected or appointed officer or employee of Barrow County, including those employees who are exempt from the Barrow County Civil Service System, except to the extent prohibited by law.

(F) "Employee" means all those persons employed on a regular or part-time basis by The County, as well as those persons whose services are retained under the terms of a contract with the County, including those employees who are exempt from the Barrow County Civil Service System, except to the extent prohibited by law.

(G) "Family" means the spouse, parents, children, brothers and sisters, related by blood or marriage of a county official or employee.

(H) "Interest" means direct or indirect pecuniary or material benefit accruing to a County Official or Employee as a result of a contract or transaction which is or may be the subject of an official act or action by or with the County, except for such contracts or transactions which, by their terms and by the substance of their provisions, confer the opportunity and right to realize the accrual of similar benefits to all other persons and/or property similarly situated. The term "interest" shall not include any remote interest. For purposes of this Ordinance, a County Official or Employee shall be deemed to have an interest in the affairs of:

(1) His or her family;

(2) Any business entity in which the county official or employee is a member, officer, director, employee or prospective employee;

(3) Any business entity as to which the stock, legal ownership, or beneficial ownership of a county official or employee is in excess of five percent (5%) of the total stock or total legal and beneficial ownership, or which is
controlled or owned directly or indirectly by the county official or employee.

(1) "Official Act" or "Official Duties" means any legislative, administrative, appointive or discretionary act of any County Official or Employee of the County or any agency, board, authority or commission thereof.

ARTICLE TWO: CODE OF ETHICS FOR COUNTY SERVICE GENERALLY AND FOR EMPLOYEES

This Article Two is intended to adopt and incorporate herein for local enforcement the ethical standards of O.C.G.A. § 45-10-1, as it may be amended from time to time.

Any person in County service shall;

Section One.

Put loyalty to the highest moral principles and to country above loyalty to person, party, or government department.

Section Two.

Uphold the Constitution, laws and legal regulations of the United States and the State of Georgia and of all governments therein and never be a party to their evasion.

Section Three.

Give a full day's labor for a full day's pay and give to the performance of his duties his earnest effort and best thought.

Section Four.

Seek to find and employ more efficient and economical ways of getting tasks accomplished.
Section Five

Never discriminate unfairly by the dispensing of special favors or privileges to anyone, whether for remuneration or not, and never accept, for himself or his family, favors or benefits under circumstances which might be construed by reasonable persons as influencing the performance of his governmental duties.

Section Six

Make no private promises of any kind binding upon the duties of office, since a government employee has no private word that can be binding on public duty.

Section Seven.

Engage in no business with the government, either directly or indirectly, which is inconsistent with the conscientious performance of his governmental duties.

Section Eight.

Never use any information coming to him confidentially in the performance of governmental duties as a means for making private profit.

Section Nine.

Expose corruption wherever discovered.

Section Ten.

Uphold these principles, ever conscious that public office is a public trust.

ARTICLE THREE: CODE OF ETHICS FOR COUNTY OFFICIALS AND DEPARTMENT DIRECTORS

This Article Three is intended to adopt and incorporate herein for local enforcement the ethical standards of O.C.G.A.§ 45-10-3, as it may be amended from time to time.

All County Officials and Department Directors shall:
Section One.
Uphold the Constitution, laws and regulations of the United States, the State of Georgia, the County of Barrow and all governments therein and never be a party to their evasion.

Section Two.
Never discriminate by the dispensing of special favors or privileges to anyone, whether or not for remuneration.

Section Three.
Not engage in any business with the government, either directly or indirectly, which is inconsistent with the conscientious performance of his governmental duties.

Section Four.
Never use any information coming to him confidentially in the performance of governmental duties as a means for making private profit.

Section Five.
Expose corruption wherever discovered.

Section Six.
Never solicit, accept, or agree to accept gifts, loans, gratuities, discounts, favors, hospitality or services from any person, association or corporation under circumstances from which it could reasonably be inferred that a major purpose of the donor is to influence the performance of the member's official duties.

Section Seven.
Never accept any economic opportunity under circumstances where he knows or should know that there is a substantial possibility that the opportunity is being afforded him with intent to influence his conduct in the performance of his official duties.
Section Eight.

Never engage in other conduct which is unbecoming to a member or which constitutes a breach of public trust.

Section Nine.

Never take any official action with regard to any matter under circumstances in which he knows or should know that he has a direct or indirect monetary interest in the subject matter of such matter or in the outcome of such official action.

ARTICLE FOUR: SPECIFIC PROVISIONS RELATED TO CONFLICT OF INTEREST TRANSACTIONS AND DISCLOSURES

The following provisions related to conflict of interest transactions and disclosures are intended to supplement and elaborate upon the Code of Ethics set forth in Articles Two and Three above and all such provisions shall be read and interpreted in accordance therewith.

Section One. Compliance with Applicable Law.

No County Official or Employee shall engage in any activity or transaction that is prohibited by law, now existing or hereafter enacted, which is applicable to him or her by virtue of his or her office or employment. Other provisions of law or regulations shall apply when any provisions of this Ordinance shall conflict with the laws of the State of Georgia or the United States, except to the extent that this Ordinance permissibly sets forth a more stringent standard of conduct. The laws of the State of Georgia or the United States shall apply when this Ordinance is silent.

Section Two. Conflict of Interest Transactions.

(A) No County Official or Employee shall acquire or maintain an interest in any contract or transaction if a reasonable basis exists that such an interest will be affected directly by his or her official act or action or by official acts or actions of
the County, which the County Official or Employee has a reasonable opportunity
to influence, except consistent with the disclosure and abstention provisions set
forth herein.

(B) Barrow County shall not enter into any contract involving services or property
with a County Official or Employee or with a business entity in which the County
Official or an Employee has an interest. Provided that the disclosure and
abstention provisions set forth herein are followed, this paragraph shall not apply
to the following:

(1) The designation of a bank or trust company as a depository for county
funds;

(2) The borrowing of funds from any bank or lending institution which offers
competitive rates for such loans;

(3) Contracts entered into with a business which employs a consultant,
provided that the consultant’s employment with the business is not
incompatible with this Ordinance;

(4) Contracts for services entered into with a business which is the only
available source for such goods or services; and

(5) Contracts entered into under circumstances that constitute and emergency
situation, provided that a record explaining the emergency is prepared by
the Board and submitted to the Chief of Operations (or his/her equivalent)
to be kept on file.
Section Three. Financial Disclosures.

Financial disclosures shall be governed by federal and state law as it may be amended from time to time and this Ordinance shall not require any additional financial disclosure reports to be filed other than those required by federal and state law.

Section Four. Zoning Application Disclosures.

All disclosures with regard to zoning applications shall be governed in their entirety by the Conflict of Interest in Zoning Actions provisions contained in O.C.G.A.§ 36-67A-1, et seq., as it may be amended from time to time.

Section Five. Disclosures Related to Submission of Bids or Proposals for County Work or Contract.

Persons submitting bids or proposals for county work who have contributed $250.00 or more to a County Official must disclose on their bid or proposal the name of the County Official(s) to whom the contribution was made and the amount contributed. Such a disclosure must also be made prior to a request for any change order or extension of any contract awarded to the person who submitted the successful bid or proposal.

Section Six. Withholding of Information.

No County Official or Employee shall knowingly withhold any information that would impair the proper decision making of the Board or any of the County's boards, agencies, authorities or departments.

Section Seven. Incompatible Service.

No County Official or Employee shall engage in or accept private or public employment or render service for any private or public entity, when such employment or service is incompatible with the proper discharge of his or her official duties or would tend to impair his or her independence of judgment or action in the performance of his or her official duties, unless

10
otherwise permitted by law and unless public disclosure is made.

**Section Eight. Unauthorized Use of Public Property.**

No County Official or Employee shall request or permit the unauthorized use of county-owned vehicles and equipment, including but not limited to computers, pagers and cellular telephones, materials or property for personal convenience or profit.

**Section Nine. Political Recrimination and Activity.**

(A) No County Official or Employee, whether elected or appointed, shall either cause the dismissal or threaten the dismissal from any county position as a reward or punishment for any political activity. No County Official or Employee shall direct any person employed by the County to undertake political activity on behalf of such County Official or Employee, any other County Official or Employee, or any other individual, political party, group or business organization, during such time that the Employee is required to conduct county business. This section does not prohibit incidental telephone calls made for the purpose of scheduling a County Official’s daily county business.

(B) Employees of the county are encouraged to exercise their right to vote, but no employee shall make use of government time or equipment to aid a political candidate, party or cause; or use a government position to influence, coerce, or intimidate any person in the interest of a political candidate, party or cause. No employee shall be hired, promoted, favored or discriminated against with respect to employments because of his or her political opinions or affiliations.

(1) *Seeking elective office.* A government employee seeking elective office within the county may, upon declaring candidacy, either resign or submit a
request in writing to the Chief of Operations (or his/her equivalent) for a
leave of absence without pay from the date of his or her announcement
through the duration of the campaign or announcement of the election
results. In the alternative, the government employee seeking elective
office within the County may continue to work for the County, provided,
however, that the employee shall not engage in election activities during
his or her County working hours or with use of County equipment. If
elected to office, the employee shall immediately, upon the date of
election, be separated from employment with the county upon written
request and approval of the Chief of Operations (or his/her equivalent).

(2) Political campaign involvement. A government employee may not be
involved in any political activity which would constitute a conflict of
interest; including participation in any aspect of any political campaign for
any office in Barrow County Government.

(3) Solicitation of contributions. A government employee may not knowingly
solicit, accept or receive political contributions from any person, to be
used in support of or opposition to any candidate for office in the county.

Section Ten. Appearance Before County Entities.

No County Official or Employee shall appear on behalf of any private person other than
himself or herself, his or her spouse, or his or her minor children, before any county agency,
authority or board. However, a member of the Board of Commissioners may appear before such
groups on behalf of his constituents in the course of his duties as a representative of the
electorate or in the performance of public or civic obligations.
Section Eleven. Timely Payment of Debts to the County and Fiscal Responsibility.

All County Officials and Employees shall pay and settle, in a timely and prompt fashion, all accounts between them and Barrow County, including the prompt payment of all taxes and shall otherwise demonstrate personal fiscal responsibility.

Section Twelve. Solicitation or Acceptance of Gifts.

(A) County Officials and employees shall not accept gifts, gratuities or loans from organizations, business concerns, or individuals with whom he or she has official relationships on business of the county government. These limitations are not intended to prohibit the acceptance of articles of negligible value which are distributed generally, nor to prohibit employees from accepting social courtesies which promote good public relations, or to prohibit employees from obtaining loans from regular lending institutions. It is particularly important that inspectors, contracting officers and enforcement officers guard against relationships which might be construed as evidence of favoritism, coercion, unfair advantage or collusion.

(B) Consistent with the provisions set forth in Articles Two and Three and Section 12(A) above, there shall be no violation of this Ordinance in the following circumstances:

(1) Meals and beverages given in the usual course of entertaining associated with normal and customary business or social functions.

(2) An occasional gift from a single source of $101.00 or less in any calendar year.

(3) Ceremonial gifts or awards.
(4) Gifts of advertising value only or promotional items generally distributed To public officials.

(5) Awards presented in recognition of public service.

(6) Reasonable expenses of food, travel, lodging and scheduled entertainment for a meeting that is given in return for participation in a panel or speaking engagement at the meeting.

(7) Courtesy tickets or free admission extended for an event as a courtesy or for ceremonial purposes, given on an occasional basis and not to include season tickets of any nature.

(8) Gifts from relatives or members of the County Official or Employee's household.

(9) Honorariums or awards for professional achievement.

(10) Courtesy tickets or free admission to educational seminars, educational or information conventions or other similar events.

**Section Thirteen. Disclosure of Interest.**

Any member of the Board who has a financial or personal interest in any proposed legislation or action before the Board shall immediately disclose publicly the nature and extent of such interest.

Any other County Official or Employee who has a financial or personal interest in any proposed legislation or action before the Board and who participates in discussion with or gives an official opinion or recommendation to the Board in connection with such proposed legislation or action shall disclose publicly the nature and extent of such interest.
Section Fourteen. Abstention to Avoid Conflicts of Interest.

(A) Except as otherwise provided by law, no County Official or Employee shall participate in the discussion, debate, deliberation, vote or otherwise take part in the decision-making process on any item before him in which the County Official or Employee has a conflict of interest as set forth above.

(B) To avoid the appearance of impropriety, if any County Official or Employee has a conflict of interest or has an interest that he or she has reason to believe either violates this Ordinance or may affect his or her official acts or actions in any matter, the County Official or Employee shall immediately leave the meeting room, except that if the matter is being considered at a public meeting, the County Official or Employee may remain in the meeting room.

(C) In the event of a conflict of interest, the County Official or Employee shall announce his or her intent to abstain prior to the beginning of the discussion, debate, deliberation or vote on the item, shall not participate in any way, and shall abstain from casting a vote.

ARTICLE FIVE: THE BOARD OF ETHICS

Section One. Creation and Composition of Board of Ethics.

There is hereby created a five-member Barrow County Board of Ethics, which shall consist of the following members:

(A) One appointee by the Board of Directors of the Barrow County Chamber of Commerce.

(B) One appointee selected by a majority of the voting County elected officials (not including the members of the Board of Commissioners) who shall each have one vote for such appointee:
(C) One appointee selected by a majority of the voting employees of Barrow County (not including the County elected officials or the members of the Board of Commissioners) who are in the employ of Barrow County on a full-time basis on the effective date of the vote, which vote shall be conducted by the Director of Human Resources or his/her designee;

(D) One appointee of the Barrow County Personnel Review Board; and

(E) One appointee of the Barrow County Board of Commissioners, which appointee shall be selected by a majority vote of the Board of Commissioners.

Section Two. Appointment Procedures.

The initial appointments of the members of the Board of Ethics shall be accomplished as follows: Within five (5) business days of the effective date of this Ordinance, the Barrow County Chief of Operations (or his/her equivalent) or his/her designee shall notify the respective appointing body or individuals of the duty to appoint or vote upon a member for placement on the Board of Ethics. The body or individuals so notified shall have thirty (30) days in which to conduct their appointment process and provide the Chief of Operations (or his/her equivalent) with the name of the appointment, or the name of the individual for whom he or she is voting as the appointee in the case of the elected officials. Within five (5) business days of receipt of the appointment information or calculation of the votes as the case may be, the Chief of Operations (or his/her equivalent) shall thereafter provide the names of the appointees to the Board of Commissioners. The Board of Commissioners shall appoint the five persons so identified at the next regular meeting of the Board of Commissioners following receipt of the names of the appointees from the Chief of Operations (or his/her equivalent).

All appointments following the expiration of the initial terms and all appointments made
In the cases of vacancies created during a particular term shall be made by the applicable body or individuals as indicated in Section One of this Article. The Chief of Operations (or his/her equivalent) or his/her designee shall notify the applicable body or individuals responsible for making an appointment at least forty-five (45) days prior to the expiration of the respective term or immediately upon knowledge of a vacancy created during a term. Upon such notification, the appointment process shall proceed as set forth above in this Section.

**Section Three. Qualifications of Members of Board of Ethics.**

A person is eligible to be appointed as a member of the Board of Ethics if the person, while serving:

(A) Resides in the County and is a registered voter;

(B) Is not an Employee or County Official and has not been an Employee or County Official during the three (3) months immediately preceding his or her appointment or be the spouse, parent, child or sibling of an Employee or County Official;

(C) Is not an officer or employee of any political party;

(D) Does not hold any elected or appointed office and is not a candidate for office of the United States, this State or the County and has not held any elected or appointed office during the three (3) months immediately preceding his or her appointment.

**Section Four. Terms; Vacancies.**

Members of the Board of Ethics shall each serve a two (2) year term without compensation, and shall continue to serve until their successors are appointed and qualified. The Board positions appointed pursuant to sub-sections (A), (B), and (C) of Section One of this
Article shall serve an initial full two-year term and shall thereafter serve two-year terms upon appointment. The Board positions appointed pursuant to sub-sections (D) and (E) of Section One of this Article shall serve an initial one-year term and shall thereafter serve two-year terms upon appointment. If any vacancy occurs during a term, the remaining members shall at that time choose an alternate member mutually agreed upon to temporarily serve until the position is filled by appointment as provided in Section One and Section Two to fulfill the remainder of the then existing term.

Section Five. Removal of Member.

The Board of Commissioners may remove a member of the Board of Ethics on the grounds of neglect of duty, misconduct in office or engagement in political activity in violation of this Ordinance. Before initiating the removal of a member from the Board of Ethics, the Board of Commissioners shall give the member written notice of the reason for the intended action and the member shall have the opportunity to reply. Thereafter, the Board of Commissioners shall afford such member an opportunity for a hearing before the Board of Commissioners.

Section Six. Organization and Internal Operating Regulations.

(A) Members of the Board of Ethics shall not be compensated.

(B) The Board of Ethics shall elect one of its members to act as Chairperson for a term of one year or until a successor is duly elected. The Board of Ethics shall also elect one of its members to act as Vice-Chairperson for the same term and to act for the Chairperson in his or her absence, because of disqualification or vacancy.

(C) There shall be no regularly scheduled monthly or bimonthly meetings of the
Board of Ethics, however, the Board of Ethics shall meet at least once annually in January of each year for purposes of election of officers and such other business as the Board of Ethics deems proper and in accordance with this Ordinance. Meetings shall be called by majority vote or by call of the chairperson. Meetings of the Board of Ethics shall be conducted in the public hearing room utilized by the Board of Commissioners, shall be duly publicized, and shall be otherwise conducted in accordance with the open meetings requirements under state law.

(D) Three members of the Board of Ethics shall constitute a quorum for the transaction of business. The Chairperson shall be entitled to the same voting rights as the other members of the Board of Ethics.

(E) No official action concerning complaints shall be taken by the Board of Ethics, except by the affirmative vote of at least four (4) members of the Board of Ethics.

Section Seven. Duties and Powers.

The Board of Ethics shall have the following duties and powers:

(A) To establish any procedures, rules and regulations governing its internal organization and conduct of its affairs, provided that such procedures, rules and regulations do not conflict with any provision contained herein.

(B) To receive and hear complaints of violations of standards required by this Ordinance.

(C) To make investigations as it deems necessary to determine whether any person has violated this Ordinance, but only after a least four (4) members of the Board of Ethics have voted affirmatively to conduct the investigation.

(D) To take such action as provided in this Ordinance as deemed appropriate because of any violation of this Ordinance.
(E) To perform any other function authorized by this Ordinance.

(F) To issue advisory opinions as provided in this Ordinance.

Section Eight. **Staffing and Expenses.**

The Board of Ethics shall be provided sufficient meeting space and other reasonable supportive services to carry out its duties required under this Ordinance. The Chief of Operations (or his/her equivalent) shall designate an administration employee who shall serve as the filing clerk for the Board of Ethics and who shall be authorized to receive all filings before the Board of Ethics to publish notices of all meetings upon request of the Board of Ethics' Chairperson and to serve as the recording clerk for the Board of Ethics.

Section Nine. **Counsel.**

The Board of Ethics may petition the Barrow County Board of Commissioners for appointment of counsel on a case-by-case basis to assist it in carrying out its responsibilities or to act as a hearing officer. Any such appointed counsel shall be approved by the Board of Commissioners, shall perform services at an approved hourly rate, and shall serve at the joint pleasure of the Board of Ethics and the Board of Commissioners.

Section Ten. **Adherence to the Ethics Ordinance.**

The Board of Ethics shall be governed by and subject to this Ordinance, except as to any requirements related to financial disclosures. If a member of the Board of Ethics has a conflict of interest or must disqualify himself under this Ethics Code or by law, the remaining members shall at that time choose an alternate person mutually agreed upon to hear that matter.
Section Eleven.  **Prohibition Against Certain Conflicting Political Activity.**

(A) **Definitions.** The following words, terms and phrases, when used in this section, shall have the meanings ascribed to them, except where the context clearly indicates a different meaning:

(1) "**Member of the Board of Ethics**" means an individual who occupies the position of a member of the Board of Ethics or a prospective member of the Board of Ethics.

(2) "**Political Party**" means a national political party, a state political party, a political action committee, and/or any affiliated organization.

(3) "**Election**" includes a primary, special and general election.

(4) "**Nonpartisan Election**" means:

   (a) An election at which none of the candidates is to be nominated or elected as representing a political party, any of whose candidates for presidential elector received votes in the last preceding election at which presidential electors were selected; and

   (b) An election involving a question or issue which is not specifically identified with a political party, such as a constitutional amendment, referendum, approval of a governmental ordinance, or any question or issue of similar character

(5) "**Partisan**" when used as an adjective, refers to a political party.

(6) "**Political Fund**" means any fund, organization, political action committee or other entity that, for purposes of influencing in any way the outcome of any partisan election, receives or expends money or
anything of value or transfers money or anything of value to any other

fund, political party, candidate, organization, political action committee
or other entity.

(7) "Contribution" means any gift, subscription, loan, advance, deposit of
money, allotment of money, or anything of value given or transferred by
one person to another, including in cash, by check, by draft, through a
payroll deduction or allotment plan, by pledge or promise, whether or
not enforceable, or otherwise.

(B) **Permissible Activities.** All members of the Board of Ethics are free to engage in
political activity to the widest extent consistent with the restrictions imposed in
this Section, which restrictions are imposed for the sole purpose of ensuring
neutrality and the appearance of neutrality of the Board of Ethics. Each member
of the Board of Ethics retains the right to:

(1) Register and vote in any election;

(2) Participate in the nonpartisan activities of a civic, community, social,
labor, or professional organization or of a similar organization;

(3) Be a member of a political party or other political organization and
participate in its activities to the extent consistent with law;

(4) Attend a political convention, rally, fundraising function, or other
political gathering;

(5) Sign a political petition as an individual;

(6) Make a financial contribution to a political party or organization;

(7) Take an active part, as a candidate or in support of a candidate, in a
nonpartisan election;

(8) Be politically active in connection with a question which is not specifically identified with a political party, such as a constitutional amendment, referendum, approval of a governmental ordinance or any other question or issue of a similar character;

(9) Serve as an election judge or clerk or in a similar position to perform nonpartisan duties as prescribed by state or local law; and

(10) Otherwise participate fully in public affairs in a manner which does not materially compromise his or her efficiency or integrity as a member of the Board of Ethics or the neutrality, efficiency or integrity of the Board of Ethics.

(C) Prohibited Activities.

(1) A member of the Board of Ethics may not take an active part in political management or in a political campaign, except as permitted by subsection of this section.

(2) A member of the Board of Ethics shall not take part in or be permitted to do any of the following activities:

(a) Serve as an officer of a political party, a member of a national, state or local committee of a political party, an officer or member of a committee of a partisan political club, or be a candidate for any of these positions;

(b) Organize or reorganize a political party organization or political club;

(c) Directly or indirectly solicit, receive, collect, handle, disburse, or
account for assessments, contributions or other funds for a partisan political purpose;

(d) Organize, sell tickets to, promote or actively participate in a fundraising activity of a candidate in a partisan election or of a political party or political club;

(e) Take an active part in managing the political campaign of a Candidate for public office in a partisan election or a candidate for political party office;

(f) Become a candidate for, or campaign for, an elective public office in a partisan election;

(g) Solicit votes in support of or in opposition to a candidate for Public office in a partisan election;

(h) Act as recorder, watcher, challenger or similar officer at the polls on behalf of a political party or a candidate in a partisan election;

(i) Drive voters to the polls on behalf of a political party or a candidate in a partisan election;

(j) Endorse or oppose a candidate for public office in a partisan election or a candidate for political party office in a political advertisement, broadcast, campaign literature, or similar material;

(k) Serve as a delegate, alternate or proxy to a political party convention;

(l) Address a convention, caucus, rally or similar gathering of a political party in support of or in opposition to a partisan
candidate for public office or political party office;

(m) Initiate or circulate a partisan nominating position.

(3) Nothing contained in this section shall prohibit activity in political management or in a political campaign by any member of the Board of ethics connected with a nonpartisan election or a nonpartisan issue of any type.

Section Twelve. Limitation of Liability.

No member of the Board of Ethics, or any person acting on behalf of the Board of Ethics, shall be liable to any person for any damages arising out of the enforcement or operation of this Ethics Ordinance, except in the case of willful or wanton conduct. This limitation of liability shall apply to the County, the members of the Board of Ethics, the employees of the Board of Ethics and any person acting under the direction of the Board of Ethics.

Section Thirteen. Advisory Opinion.

The Board of Ethics shall render an advisory opinion based on a real or hypothetical set of circumstances when requested to do so in writing by a County Official or Employee related to that County Official's or Employee's conduct or transaction of business. Such advisory opinions shall be rendered pursuant only to a written request, fully setting forth the circumstances to be reviewed by the Ethics Board. The proceedings of the Ethics Board pursuant to this section shall be held in public to the extent consistent with state law and the opinions of the Ethics Board shall be made available to the public.

Section Fourteen. Complaints.

The Board of Ethics shall be responsible for hearing and deciding any complaints filed regarding alleged violations of this Ordinance by any person. The following procedures shall be followed when filing a complaint:
(A) Any person may file a complaint alleging a violation of any of the provisions of this Ordinance by submitting it to the Chief of Operations (or his/her equivalent), who shall immediately deliver such complaint to the Chairman of the Board of Ethics or his or her designee. A copy of such complaint shall immediately be forwarded by registered mail to the County Official or Employee against whom the complaint was filed. The complaint must be supported by affidavits based on personal knowledge, shall set forth such facts as would be admissible in evidence, and shall show affirmatively that the affiant is competent to testify to the matters stated therein. All documents referred to in an affidavit(s) should be attached to the affidavit(s). The person filing the complaint shall verify the complaint by his or her signature thereon. A complaint must be filed within six (6) months of the date the alleged violation is said to have occurred, or in case of concealment or nondisclosure within six (6) months of the date the alleged violation should have been discovered after due diligence. In the event the Board of Ethics makes an initial determination that a complaint is technically deficient, the Board of Ethics shall submit a list of deficiencies to the complainant and offer the complainant the opportunity to correct the deficiencies within seven (7) days prior to the complaint being dismissed for technical deficiencies.

(B) Upon receipt of a complaint alleging misconduct, the County Official or Employee against whom the complaint was filed may reply to the complaint within thirty (30) days, unless such time for reply is extended by the Board of Ethics upon good cause shown. The response of the County Official or Employee must be supported by affidavits based on personal knowledge, must set forth such facts as would be admissible in evidence and must show
affirmatively that the affiant is competent to testify to the matters stated therein.

All documents referred to in an affidavit(s) should be attached to the affidavit(s).

(C) Within sixty (60) days of receipt of a complaint, the Board of Ethics shall conduct an investigatory review to determine whether specific substantiated evidence from a credible source(s) exists to support a reasonable belief that there has been a violation of this Ordinance. If after reviewing the complaint the Board of Ethics by vote determines that no specific, substantiated evidence from a credible source(s) exists to support a reasonable belief that there has been a violation of this Ordinance or determines that no violation occurred, it may dismiss the complaint without further proceedings. In the event a complaint is dismissed based upon the merits of the complaint, the complaint may not be re-filed.

(D) If the Board of Ethics determines that specific, substantiated evidence from a credible sources(s) exists to support a reasonable belief that there has been a violation of this Ordinance, certified written notice of a hearing, containing the time, date and place of such hearing, shall be given to each party by the Board of Ethics and a formal public hearing shall be conducted and both parties afforded an opportunity to be heard. Any formal public hearing shall be conducted in accordance with the requirements of due process. The Board of Ethics is authorized to swear witnesses.

(E) Any final determination resulting from the hearing shall include written findings of fact and conclusions of law. The Board of Ethics shall determine if clear and convincing evidence shows any violation of this Ordinance.

(F) Nothing in this section shall be considered to limit or encumber the right of the Board of Ethics to initiate an investigation on its own cognizance as it deems
Necessary to fulfill its obligations under this Ordinance.

Section Fifteen. Disciplinary Action.

(A) Upon a determination that an employee has violated this Ordinance, the Board of Ethics may recommend the following penalties and actions:

(1) Written warning or reprimand;
(2) Suspension without pay;
(3) Termination of employment; and
(4) Repayment to the County of any unjust enrichment.

(B) Upon a determination that a County Official has violated this Ordinance, the Board of Ethics may recommend the following penalties and actions:

(1) Written warning, censure or reprimand;
(2) Removal from office to the extent provided by Georgia law; and
(3) Repayment to the County of any unjust enrichment.

(C) Upon direction of the Board of Ethics, a petition may be filed for injunctive relief, or any other appropriate relief, in the county superior court or in any other court having proper venue and jurisdiction, for the purpose of requiring compliance with the provisions of this Ordinance. In addition, the court may issue an order to cease and desist from the violation of the Ordinance. The court also may void an official action that is the subject of the violation, provided that the legal action to void the matter was brought with ninety (90) days of the occurrence of the official action, if the court deems voiding the action to be in the best interest of the public. The Court, after hearing and considering all the circumstances in the case, may grant all or part of the relief sought. However, the court may not void any official action appropriating public funds, levying taxes or providing for the
issuance of bonds, notes or other evidence of public obligation under this Ordinance.

(D) In addition to any other remedy provided herein, upon determination of a Violation of this Ordinance, the Board of Ethics may recommend to the Board of Commissioners in writing that any contract, bid or change order that was the Subject of the violation should be cancelled or rescinded. The Board of Commissioners, however, shall retain the discretion to determine whether such a Cancellation or rescission would be in the best interest of the County and shall not be bound in any way by a recommendation of the Board of Ethics.

(E) The Ethics Board may also forward its findings of fact and conclusions of law to the Barrow County District Attorney's Office and/or the Office of the Governor for appropriate action.

**Section Sixteen. Judicial review.**

(A) Any party against whom a decision of the Board of Ethics is rendered may obtain judicial review of the decision by writ of certiorari to the superior court of the County. The application for the writ must be filed within thirty (30) days from the date of the written decision. Judicial review shall be based upon the record. No party shall be entitled to a de novo appeal.

(B) Upon failure to timely request judicial review of the decision by writ of certiorari as provided in this section, the decision shall be binding and final upon all parties.

(C) The appellate rights afforded hereunder shall be in lieu of any right to appeal an adverse employment action under the Barrow County Civil Service
System, to the extent the County Official or employee may be subject to the Civil Service System.

ARTICLE SIX: MISCELLANEOUS

Section One. Severability.

If any provision of this Ordinance is found by a court of competent jurisdiction to be invalid or unconstitutional, or if the application of this Ordinance to any person or circumstances is found to be invalid or unconstitutional, such invalidity or unconstitutionality shall not affect other provisions or applications of this Ordinance which can be given effect without the invalid or unconstitutional provision or application.

Section Two. Repealer

All laws, resolution, or ordinances or parts thereof that conflict with the provisions of this Ordinance are repealed.

Section Three. Effective Date.

The effective date of this Ordinance shall be July 1, 2004.

AMENDED:

Article Five, Section 1, Subparagraph (A) January 25, 2005
Article Five, Section 6, Subparagraph (C) January 8, 2008