Yorktown Fire Department

RFP for 100ft Quint Platform Fire Apparatus

INVITATION TO BID

Sealed bids will be received by the Town of Yorktown, until 10:00 a.m. local time, on Thursday, July 17th, 2014, in the Office of the Chief, 8905 West Smith Street, Yorktown, Indiana, 47396 and then publicly opened and read for furnishing the following:

One (1) 100' Aerial Platform Quint Truck

Bid specifications are attached. The Town of Yorktown is requesting bid prices on one (1) 100' or greater Aerial Platform Quint Truck. Please direct any questions to David Boone, Chief (765) 759-5836 or dboone@yfd-in.org. Bids must be submitted within a sealed envelope addressed:

Yorktown Fire Department
Apparatus Technical Committee
8905 West Smith Street
Yorktown, Indiana 47396

The envelope must be plainly marked on the outside as follows:

BID:	One (1) 100' Aerial Platform Quint Truck
Opening:	Yorktown Town Council Meeting
Date:	July 18th, 2014

The Town of Yorktown reserves the right, as the best interest of the town may require, to award the purchase contract from any of the bids, to reject any or all bids, and to waive any informalities in bids received. Bids will be good for ninety (120) days after being opened by the Town of Yorktown, Indiana.

The successful bidder will note that the Town pays by invoice monthly after claim submittal and approval by the Town Council meeting held on the third Monday of the month. Invoices must be received by accounts payable at least seven working days before the scheduled check write. If you have any questions concerning billing, contact our accounts payable office at (765) 759-4010.

Chief David Boone
Yorktown Fire Department

Assistant Chief Ben Strunck
Yorktown Fire Department

1.0 General Background / Special Terms and Conditions

The Town of Yorktown is requesting a combined Statement of Qualifications and RFP from capable respondents for the supply of one custom built 100ft Quint ladder apparatus as per the specifications attached hereto as Schedule "B".

It is understood that the information in the Statement of Qualifications and the Price shall be the general basis for the selection of the respondent for this RFP. The scoring evaluation section 5.0 shall consider each respondent's ability to perform in the service area, their experience, delivery time, and quoted price. This is not an offer. The Town does not bind itself to accept the lowest price proposal or any proposal submitted.

The bidder acknowledges that the Town shall have the right to reject any, or all, Proposals for any reason, or to accept any Proposal which the Municipality in its *sole* unfettered discretion deems most advantageous to itself. The lowest, or any, Proposal will not necessarily be accepted and the Town shall have the unfettered right to:

(i) Accept a non-compliant Proposal;
(ii) Accept a Proposal which is not the lowest Proposal; and
(iii) Reject a Proposal that is the lowest Proposal even if it is the only Proposal received.

The bidder acknowledges that the Town may rely upon the criteria which the Municipality deems relevant, even though such criteria may not have been disclosed to the bidder. By submitting a Proposal, the bidder acknowledges the Town's rights under this Section and absolutely waives any right, or cause of action against the Town, by reason of the Town's failure to accept the Proposal submitted by the bidder, whether such right or cause of action arises in contract, negligence, or otherwise

If a contract is to be awarded as a result of the Request for Proposal, it will be awarded to the bidder whose proposal, in the Town's opinion, provided the best potential value to the Town and is capable in all respects to fully perform the contract requirements and the integrity to assure performance of the contract obligations based on the
objective assessment outlined in Schedule "A".

2.0 Statement of Qualifications

Each respondent must respond to the following requests/questions in a clear and comprehensive manner.
a) Provide the full name and main office address of the responding entity.
b) Identify when the respondent was organized and if a corporation, when incorporated and how many years engaged in this type of business/service.
c) Identify and set out the qualifications of any firms or individuals that the respondent intends to use to perform work/service on this RFP including warranty or follow ups.
d) Respondent must list 5 references of sales of identical units with contact information for said owners.
e) Respondent must also list qualifications of instructors preforming training on use and care of said unit.

3.0 Respondents Proposal

Each respondent must respond to each of the following areas in a clear and comprehensive manner.

a) Complete all areas of the RFP form for price.

b) If there are any payments expected to be received by the respondent prior to the delivery then the timing of the same are to be identified.

c) Identify all areas where the Specifications as set out have not been met and what the alternative is, if any.

d) Identify all areas where the Specifications as set out have been exceeded and how they have been exceeded.

e) All warranties are to be clearly specified. This is to include the length of the warranty, the method of requesting the warranty service and who is to provide the warranty service.

f) All loose equipment must be line itemed out as individual prices (itemized) for review

g) Proposal must include down payment amount required, schedule of payments throughout the process listed with milestones tied to payment

4.0 Schedule of Events

Each respondent will submit two (2) copies of their qualification information, the completed requested respondent proposal information no later than:

10:00am Thursday July 17th, 2014 addressed to the Yorktown Fire Department Apparatus Technical Committee.

Any RFP received after the above deadline will be returned unopened to the respondent.

5.0 Scoring of Qualifications and Price

The evaluation of the Qualifications and Price will be carried out by municipal staff with a recommendation brought forward to the Council. The Council will make its decision based on information gathered during the procurement process and the evaluation criteria outlined in this section. Failure to provide relevant information may result in penalties being assessed on the evaluation score. The evaluation matrix outlined in Tables I will be used to address the following criteria.

• Qualification to provide the requested items based on previous experience capabilities and resources.

• The quality of the submitted proposal in terms of clarity, meeting the specifications, and qualification requirements.

• The business approach in meeting customer service and satisfaction in a timely manner.

• Price. _____

Criteria Matrix	**Max Points**
1. Respondent Profile	10
□ General Capabilities	
□ Customer Service and commitment to customer's needs	
□ Details of follow up service	
□ References	
□ ISO and other certifications (provide details)	
2. Meeting the Specifications	30
□ Areas in excess of Specification	
□ Areas not meeting Specification	
□ Completeness of the Request for Proposal	
□ General commitment to meet the request of the RFP	
3. General	10
□ Delivery time	
□ Terms and conditions of payment	
□ Warranties	
□ Details of warranty service location and provider	
□ Completeness of the submission	
Total Score Statement of Qualifications	50

GENERAL DIRECTION

Yorktown Fire Department in conjunction with the Town of Yorktown, desires a new 100ft+ rear mount aerial platform fire truck meeting or exceeding the following specifications or accepted equivalents

Each bidder is required to list out the following approximate dimensions of the apparatus being submitted: overall length, height, wheelbase, aerial length and cab to axle. This vehicle must fit into a door opening of 12' high and 10'-0" wide.

The apparatus will meet or exceed NFPA 1901 acceleration requirements and NFPA 1901 braking requirements. The apparatus when fully loaded will not have less than 25% or more than 50% on the front axle and not less than 50% or more than 75% on the rear axle.

There shall be three (3) days of instruction which will be provided by a factory authorized representative. The instruction program shall be designed to instruct the firefighters and engineers on the aerial device. The individual will be thoroughly taught the operation system of the aerial device utilizing the new apparatus.

COMMERCIAL GENERAL LIABILITY INSURANCE

Certification of insurance coverage will be enclosed.

NFPA 2014 STANDARDS

This unit will comply with the NFPA standards effective January of 2014.

A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.

AERIAL APPARATUS CLASSIFICATION

This apparatus will be classified as a quint fire apparatus. Per NFPA 1901 requirements, this apparatus will include the following components:

Fire pump: Waterous 2250 gpm minimum
Water tank: 500 gallon minimum capacity
Ground ladder storage: 115ft minimum
Hose storage: 800 ft large diameter hose with 400ft 1.5" and 200 ft of 2.5" in cross lays (3 cross lays)

NFPA COMPLIANCY

Apparatus proposed by the bidder will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications will be indicated in the proposal as "non-NFPA"

INSPECTION CERTIFICATE

A third party inspection certificate for the aerial device will be furnished upon delivery of the aerial device. The certificate will be Underwriters Laboratories Inc. Type 1 and will indicate that the aerial device has been inspected on the production line and after final assembly.

The following tests will be conducted:

- Magnetic particle inspection will be conducted on every structural weld to assure the integrity of the weldments and to detect any flaws or weaknesses. Magnets will be placed on each side of the weld while iron powder is placed on the weld itself. The powder will detect any crack that may exist. This test will conform to ASTM E709 and be performed prior to assembly of the aerial device.

- With aluminum structural components, visual inspection will be performed on aluminum surfaces (non-magnetic). A liquid penetrant test will be performed on any suspected defective area. This test will conform to ASTM E165 and be performed prior to assembly of the aerial device.

- Ultrasonic inspection will be used to detect any flaws in pins, bolts and other critical mounting components.

Functional tests, load tests, stability tests, and visual structural examinations will be performed. These tests will determine any unusual deflection, noise, vibration, or instability characteristics of the unit. Apparatus shall be delivered under its own power. A qualified delivery engineer representing the contractor shall deliver the apparatus and remain for a sufficient time to instruct personnel in the proper operation, care and maintenance of the apparatus.

PUMP TEST

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

TOTAL VEHICLE ASSESSMENT CERTIFICATION

The apparatus will be third party, independent, audit certified through Underwriters Laboratory (UL) to the current edition of NFPA 1901 standards. The certification includes all design, production, operational and performance testing of the apparatus.

GENERATOR TEST

If the unit has a generator, the generator will be tested, approved, and certified by Underwriters Laboratories at the manufacturer's expense. The test results will be provided to the Fire Department at the time of delivery.

BREATHING AIR TEST

If the unit has breathing air, Underwriters Laboratories will draw an air sample from the air system and certify that the air quality meets the requirements of NFP A 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection.*

APPROVAL DRAWING

A drawing of the proposed apparatus will be prepared and provided to the purchaser for approval before construction begins. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus will be prepared and submitted to the purchaser showing any changes made to the approval drawing.

WARRANTY

Limited Warranty

Except as provided below, and provided the vehicle will have been placed in service within 60 days after delivery to the original purchaser as established by our original invoice, for a period of **12 months** after delivery to the original purchaser. A copy of the warranty will be included with this proposal.

CHASSIS

Chassis provided will be a new, tilt-type custom fire apparatus. The chassis will be designed and manufactured for heavy-duty service, with adequate strength, capacity for the intended load to be sustained, and the type of service required. The chassis will be the manufacturer's heavy-duty line tilt cab.

SEATING CAPACITY

The seating capacity in the cab will be six (6).

FRAME

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus.

FRAME RAIL WARRANTY

Limited Warranty

Except as provided below, and provided the vehicle will have been placed in service within 60 days after delivery to the original purchaser as established by our original invoice, for a period of **25 years,** which is the estimated useful life of the vehicle, after delivery to the original purchaser, Then manufacturer warrants to the user that its chassis frame rail manufactured are free of defects in design, material, or workmanship A copy of the warranty is included with this proposal.

WARRANTY, FRONT NON DRIVE AXLE

Will have a **three (3) year** parts and labor warranty. All steering linkages, pumps etc., are covered under the standard chassis warranty.

OIL SEALS
Oil seals with viewing window will be provided on the front axle.

SHOCK ABSORBERS
Heavy-duty telescoping shock absorbers will be provided on the front suspension.

REAR AXLE
The rear axle will be a tandem axle assembly with an inter-axle differential, which divides torque evenly between axles, will be provided, with an indicator light mounted on the cab instrument panel.

REAR AXLE WARRANTY
A two (2) year, unlimited mileage, parts and labor warranty will be provided with this axle.

TOP SPEED OF VEHICLE
A rear axle ratio shall be furnished to allow the vehicle to reach an approximate top speed of 67 MPH.

OIL SEALS
Oil seals will be provided on the rear axle.

FRONT SUSPENSION
Front independent suspension will be provided with a minimum ground rating of 22,800 pounds.

The independent suspension system will be designed to provide maximum ride comfort. The design will allow the vehicle to travel at highway speeds over improved road surfaces and at moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

Each wheel will have torsion bar type spring. In addition, each front wheel end will also have energy absorbing jounce bumpers to prevent bottoming of the suspension.

The suspension design will be such that there is at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms.

The torsion bar anchor lock system allows for simple lean adjustments, without the use of shims. One can adjust for a lean within 15 minutes per side. Adjustment design is such that it allows for ride height adjustment on each side.

REAR SUSPENSION
The rear suspension will be a spring system with an equalizing beam design that distributes the load equally between the two (2) axles. The ground rating of the suspension will be 58,000 pounds.

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with an, anti-lock braking system. The ABS will provide a four (4) channel anti-lock braking control on both the front and rear wheels (rear tandem wheels). A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any particular wheel begins to lockup, a signal will be sent to the control unit. This control unit then will reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

ANTI-LOCK BRAKE SYSTEM WARRANTY

The will come with a **three (3) year or 300,000 mile parts and labor** warranty

BRAKES

The service brake system will be full air type. The front brakes will be disc type with a 17.00" ventilated rotor for improved stopping distance. The brake system will be certified, third party inspected, for improved stopping distance. The rear brakes will be cam operated with automatic slack adjusters.

ENGINE BRAKE

Telma

An engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver. The driver will be able to turn the engine brake system on/off and have high, medium and low setting. The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated. The ABS system will automatically disengage the auxiliary braking device, when required.

AIR COMPRESSOR, BRAKE SYSTEM

The air compressor will have as a minimum 15.8 cubic feet per minute output at 1250 RPM.

BRAKE SYSTEM

The brake system will include:

- dual brake treadle valve with vinyl covered foot surface
- automatic moisture ejector on air dryer
- Total air system capacity of 8,108 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- spring set parking brake system
- Parking brake operated by a control valve
- A parking "brake on" indicator light on the instrument panel
- A valve, in conjunction with a double check valve system, including an automatic spring brake application at 40 psi

BRAKE LINES

Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.

AIR INLET

One (1) air inlet with male coupling will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will be located in the driver side lower step well of cab. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the "wet" tank of the brake system. A mating female coupling will also be provided with the loose equipment.

ALL WHEEL LOCK-UP

An additional all wheel lock-up system will be installed which applies air to the front brakes only. The standard spring brake control valve system will also be used for the rear.

ENGINE

The chassis will be powered by a Cummins ISX 500hp engine as described below:

- Peak Torque: 1650 lb-ft at 1200 rpm
- Governed Speed: 2000 rpm
- Number of Cylinders: Six (6)
- Horse power will be a minimum of 500 hp at 2000 rpm.

Standard equipment on the engine will include the following:

- Governor: Limiting speed type
- Injectors: Cam operated, unit type, clean tip
- Starting Motor: 12-volt
- Turbocharger
- Air To Air Aftercooled
- Lube Oil Cooler
- Lube Oil Filter: Full flow
- Air Cleaner: Farr or equal
- Fuel Filters: Dual, with check valve
- Coolant Filter: Spin-on with shut off valves on the supply and return line pre-charged with coolant inhibitor)

ENGINE WARRANTY

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

CONTROLS AND INDICATOR LIGHTS

The following amber indicator lights will be located on the driver's side of the cab to denote engine information:

- Diesel Particulate Filter (DPF)
- High Exhaust Temperature (HET)
- Malfunction Indicator Lamp (MIL)

A switch to initiate the diesel particulate filter regeneration cycle will be located on the driver's side instrument panel.

ENGINE AIR INTAKE

The air intake with an ember separator will be mounted high on the passenger side of the cab, to the front of the crew cab door. The ember separator is designed to prevent road dirt and recirculating hot air from entering the engine. The ember separator will be easily accessible through a hinged stainless steel grille, with one (1) flush quarter turn latch.

EXHAUST SYSTEM

The exhaust system will be stainless steel from the turbo to the inlet of the diesel particulate filter and will be 5.00" in diameter. The exhaust system will include a diesel particulate filter and a diesel oxidation catalyst to meet current EPA standards. The exhaust will terminate horizontally ahead of the passenger side rear wheels. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. An insulation wrap will be provided on the exhaust pipe between the turbo and DPF inlet to minimize the transfer of heat to the cab.

Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

CLUTCH FAN

A fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" and "Pump" position.

HIGH IDLE

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

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

COOLANT LINES

Silicone hoses will be used for all engine coolant/heater lines.

Hose clamps will be the stainless steel constant torque type to prevent coolant leakage. They will expand and contract according to coolant system temperature thereby keeping a constant clamping pressure on the hose.

RADIATOR

Radiator and the complete cooling system will meet or exceed NFPA cooling system standards. Cooling system capacity will exceed all cooling requirements specified by the engine manufacturer under all truck operating conditions. It will have a built-in low coolant sight glass and an electronically controlled low coolant display mounted on the instrument panel. An integral surge and de-aeration tank will be provided to optimize the cooling system for all operating conditions.

The cooling system will be designed to maintain a minimum pressure of nine (9) psi. A drain valve will be located at the lowest point of the cooling system and at other points to permit complete flushing of the coolant from the system. Cooling air will be drawn in by a heavy-duty fan, shrouded by recirculation shields that permit only fresh cool air through the radiator.

Radiator will be of the serpentine design and bonded together by the patented "beta-weld" process for increased strength, longer road life and solder-bloom corrosion protection. Radiator will be mounted in a manner to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. Radiator core will be compatible with commercial antifreeze solutions. Cooling system will exhibit rapid warm-up without use of radiator shutters.

FUEL TANK

A 65-gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent.

A drain plug will be located in a low point of the tank for drainage.

A fill inlet will be located on the driver's side of the body and is covered with a hinged, spring loaded, stainless steel door that is marked "Diesel Fuel Only".

A vent will be installed from tank top to just below fuel fill inlet.

The fuel tank will meet all FHWA 393.67 requirements including a fill capacity of 95% of tank volume.

All fuel lines will be provided as recommended by the engine manufacturer.

FUEL COOLER

An air to fuel cooler will be installed, in the engine fuel return line.

FUEL SHUTOFF

A shutoff valve will be installed in the fuel line, on both sides of the fuel filters.

TRANSMISSION

An Allison EVS 4,000 electronic, torque converting, automatic transmission with retarder will be provided.

Two (2) PTO openings shall be provided to accommodate pump and generator connections.

A transmission temperature gauge, with red light and audible alarm, will be installed on the cab instrument panel.

The transmission retarder control will be activated 33% by letting off the accelerator pedal or 100% by applying the brake pedal. A second on/off switch is provided to activate and deactivate the auto apply portion.

The transmission will have the 1600 ft. lb. torque (medium) spring setting for retardation force.

The transmission retarder will have a master "on/off" switch on the instrument panel. A red indicator light will be provided to warn that the transmission is being overworked.

The retarder will be wired to the brake lights so they are energized when the retarder is slowing the vehicle down.

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

TRANSMISSION SHIFTER

A six (6)-speed push button shift module will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation.

TRANSMISSION COOLER

A transmission oil cooler will be provided, using engine coolant to control the transmission oil temperature.

TRANSMISSION COOLER WARRANTY

The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the warranty coverage, and will not exceed $10,000 per occurrence.

TRANSMISSION WARRANTY

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100% parts and labor.

DRIVELINE

Drivelines will be a heavy-duty metal tube and be equipped with universal joints.

The shafts will be dynamically balanced before installation.

A splined slip joint will be provided in each driveshaft, slip joint will be coated with Glidecoat or equivalent.

STEERING

Dual steering gears, with integral heavy-duty power steering, will be provided. The power steering will incorporate three (3)-line hydraulic pump with integral pressure and flow control.

The steering wheel will be:

- 18.00" in diameter
- Capable of tilting and telescoping
- Four (4)-spoke design

STEERING WARRANTY
The steering gear will have a three (3) year parts and labor warranty.

TIRES
Front tires will be 425/65R22.50 radials, 20 ply The tires will be mounted on 22.50" x 12.25" wheels with ten (10) studs.

Rear tires will be eight (8) 315/80R22.50 radials, 20 ply. The tires will be mounted on 22.50" x 9.00" wheels with ten (10)-studs.

WHEELS
Aluminum Alcoa Rims

LUG NUT COVERS
Chrome plated lug nut covers will be installed on all lug nuts.

WHEEL CHOCKS
There will be one (1) sets of folding, aluminum alloy, Quick-Choc or equivalent wheel blocks, with easy-grip handle and horizontal mounting brackets provided. The chocks will be mounted on the under passengers side running board.

HUB COVERS (front)
Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.

WHEEL SAFETY BANDS
The following two (2) wheels, located front tires, will have the wheel safety bands installed. Chassis steering and handling will be improved when a tire with a band fails.

HUB COVERS (Rear)
A pair of stainless steel, high hat, hub covers will be provided on the rear axle hubs.

MUD FLAPS
Mud flaps will be installed behind the front and rear wheels.

CAB
The cab will be designed specifically for the fire service and manufactured by the chassis builder.

Construction of the cab will consist of stainless steel construction

The crew cab will be of the totally enclosed design, with access doors constructed in the same manner as the driver and passenger doors.

The cab will be a full tilt cab style. The engine will be easily accessible and capable of being removed with the cab tilted. The cab will be capable of tilting 45 degrees and 90 degrees with crane assist.

The cab will have three (3)-point rubber mounting and will be tilted by a hydraulic pump connected to two (2) cab lift cylinders. The cab will then be locked down by a two (2)-point automatic locking mechanism that actuates after the cab has been lowered.

The lower exposed step area at each door location will be trimmed with aluminum treadplate and have a grip strut insert in the bottom step.

The inside cab steps will not exceed 18.00" high.

A 20.00", slip resistant, handrail will be provided adjacent to all door openings to assist entrance into the cab.

A chrome handrail will be provided inside each front cab door, for ease of entry.

The cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of .125". The exterior skins will be constructed from .090" aluminum.

All cab doors will be full length construction.

Flush mounted, chrome plated paddle type door handle will be provided on the exterior of the cab doors.

All interior cab door handles will also have flush paddle handles.

The door hinge will be a stainless steel piano type

There will be double automotive type rubber seals around the perimeter of the door framing and door edges to ensure a weather tight fit.

Full height polished stainless steel scuff plates will be installed on the inside of all cab doors.

Cab door panels will be removable without disconnecting door and window mechanisms.

Engine hood side walls will be constructed of .50" aluminum, top will be constructed of .19" aluminum and will be tapered at top to allow for more driver and passenger elbow room.

The engine hood will be insulated for protection from heat and sound. The noise insulation keeps the DBA level within the limits stated in the current NFPA series 1900 pamphlet. There will be access, 15.00" wide x 11.25" high, at the rear of the engine tunnel to access the engine fluid checks.

Full circular inner fender liners, in the wheel wells, will be provided.

Bright aluminum tread plate will be over layed on the outside rear wall of the crew cab except

for areas that are not typically visible when the cab is lowered.

A curved, safety glass windshield will be provided, All cab glass will be tinted.

Economical windshield replacement glass will be readily available from local auto glass suppliers.

Two (2) smoked Lexan sun visors, 8.75” x 31.00" long, will be provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

Two (2) Electric windshield wipers with washer will be provided that meet FMVSS and SAE requirements.

A glove box with a drop-down door will be installed in the front dash panel in front of the officer's position.

Two (2) compartments will be constructed and mounted next to the two forward facing seats. One on each side of the cab against the back wall, this will put be next to exterior doors.

A universal helmet style helmet bracket shall be provided for each riding position. A placard will be provided for each riding position warning that injury may occur if helmets are worn while seated.

CAB INTEGRITY CERTIFICATION

The manufacturer will provide a certification states that the cab must meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29
- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks

CAB MODIFICATION

The engine tunnel will be designed to provide maximum occupant space, and required clearance to the engine and related components. The engine tunnel will include a modification on the passenger side to accommodate the Turbo and related components if necessary.

CAB FLOOR

The cab and crew cab floor areas will be covered with coustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

CREW CAB WINDOWS

On each side of the crew cab, a window with tinted glass will be provided.

ELECTRIC OPERATED CAB DOOR WINDOWS

All four (4) cab doors will be equipped with electric operated windows. The door switches will be flush mounted automotive style.

The driver's side lower instrument panel will also have four (4) controls, one (1) for each door window.

FENDER CROWNS

Stainless steel fender crowns will be installed at the cab wheel openings. The fender crowns will have a radius outside corner that will allow the fender crown to extend out further than the standard width crown, thus extending beyond the sidewall of the front tires and allow the crew cab doors to open fully.

DOOR JAM SCUFFPLATES

All cab door jambs will be furnished with a polished stainless steel scuff plate, mounted on the striker side of the jam.

CAB LIFT

A hydraulic cab lift system will be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

Lift controls will be on a panel located on the pump panel or front area of the body in a convenient location.

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

The hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located in the tilt position.

A redundant mechanical stay arm will automatically be engaged once the cab has been fully raised. Before lowering the cab, this device must be disengaged using the stay arm control located near the cab raise/lower switch.

CAB INTERIOR

The engine tunnel will be padded and covered with 46 ounce leather grain vinyl resistant to oil, grease and mildew.

The headliner will be installed in both forward and rear cab sections. Headliner material will be vinyl. A sound barrier will be part of its composition. Material will be installed on Stainless steel and securely fastened to interior cab ceiling.

Forward portion of cab headliner will provide easy access for servicing electrical wiring or for other maintenance needs without removing the entire unit.

INTERIOR PAINT (Cab)
A rich looking interior will be provided by painting all the metal surfaces inside the cab with vinyl texture paint.

GRAB HANDLE
A rubber covered grab handle will be mounted on the lower portion of the driver's side cab entrance to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and steering wheel column.

A long rubber grab handle will be mounted on the dash board in front of the officer.

DRIVER SEAT
An air-ride high-back style seat will be provided in the cab for the driver.

The driver's seat will be furnished with three (3)-point shoulder type seat belt. The seat belt will be furnished with automatic retractor. Extension will be provided with the seat belt so the male end can be easily grasped and the female end easily located while sitting in a normal position.

The seat back will be removable for ease of access to components located behind the driver seat.

OFFICER SEAT
A seat with high-back will be provided in the cab for the officer. The SCBA cavity will be adjustable front to rear in 0.50" increments to accommodate different size SCBA bottles.

Moving the SCBA cavity will be accomplished by unbolting, relocating and rebolting in the desired location.

The officer seat will be furnished with three point shoulder type seat belts. The seat belts will be furnished with automatic retractors. Extensions will 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.

SEATING (Rear Facing Crew Cab)
Two (2) rear facing, SCBA seats will be provided in the outboard positions in crew cab. The SCBA cavity in each seat will be adjustable front to rear in .50" increments to accommodate different size SCBA bottles.

Moving the SCBA cavity will be accomplished by unbolting, relocating and rebolting in the desired location.

Seats will be furnished with three point shoulder type seat belts. The seat belts will be furnished with automatic retractors. Extensions will 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.

SEATING (Forward Facing Crew Cab)

Two (2) forward facing, SCBA seats will be provided in the center positions against the cab rear wall. The SCBA cavity in each seat will be adjustable front to rear in .50" increments to accommodate different size SCBA bottles.

Moving the SCBA cavity will be accomplished by unbolting, relocating and rebolting in the desired location.

Seats will be furnished with three (3) point shoulder type seat belts. The seat belts will be furnished with automatic retractors. Extensions will 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.

INTERLOCK, CAB LIFT TO PARKING BRAKE

The cab lift system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position, if the parking brake is released the cab tilt mechanism will be disabled.

MIRRORS

One (1), polished aluminum mirror will be mounted on each of the cab doors. The mirrors will be 9.25" x 13.50", with a full flat face. An additional convex section will be bolted to the bottom of each mirror. The mirror head will have a highly polished aluminum finish.

The flat glass in each mirror will be heated and adjustable, with remote controls that are convenient to the driver.

The convex section in each mirror will be adjusted manually.

BUMPER

A one (1) piece**,** type polished stainless steel bumper, a minimum of 10.00" high, will be attached to a bolted modular extension frame constructed of 50,000 psi tensile steel "C" channel mounted directly behind it to provide adequate support strength.

The bumper will be extended about 24.00" from front face of cab with an raised compartment storage lid for center storage compartment to be utilized for a high rise pack and RIT pack. Drain holes to be provided as well as rubber gasket lid and turtle tile inlay in the bottom.

GRAVEL PAN

A gravel pan, constructed of bright aluminum tread plate, will be furnished between the bumper and cab face. The gravel pan will be properly supported from the underside to prevent flexing and vibration of the aluminum tread plate.

LIFT AND TOW MOUNTS WITH TOW EYES

Mounted to the frame extension will be lift and tow mounts. Incorporated in the mounts will be two (2) painted steel tow eyes. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems. The tow eyes will not be used for lifting of the

apparatus.

The inner and outer edges of the tow eyes will have a .25" radius.

The lift and tow mounts with eyes will be painted the same color as the frame.

AIR BOTTLE HOLDERS

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket (Bostrom) in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back.

For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat for up to a 30G force (dynamic sled test), and will exceed the NFPA standard of 9G by more than 3 times. Bracket designs with manual restraints (belts, straps, buckles) that could be inadvertently left unlocked and allow the SCBA to move freely within the cab during an accident, will not be acceptable. There will be a quantity of five (5) SCBA brackets inside the cab.

The brackets will be sized to fit NXG - 4500 PSI, 5.48" Diameter, Carbon.

SHOULDER HARNESS HEIGHT ADJUSTMENT

All seating positions furnished with three (3)-point shoulder type seat belts will include a height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter.

SEAT BELTS

All seating positions in cab and crew cab will have seat belts.

FRONTAL IMPACT PROTECTION

The cab will be equipped with a frontal impact protection system consisting of one (1) air bag in front of the driver, one (1) knee bolster air bag in front of the forward passenger seating position, and S4 for suspension seats or belt pretensioners for fixed seats in the driver and forward passenger positions. The air bags will be designed specifically for the cab configurations.

The cab and chassis design will have been subjected, via third party test facility, to a 21 MPH crash impact during frontal and oblique impact testing. Testing will include all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspension components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing will provide configuration specific information used to optimize the timing for firing the air bags.

The driver side air bag will be mounted in the steering wheel and will be designed to protect the head and upper torso of the occupant, when used in combination with the 3- point seat belt,

in the event of a frontal or oblique impact. The passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt, in the event of a frontal or oblique impact.

In the event of a frontal or oblique impact, the system will deploy the front driver and passenger side air bags, and activate the following components integrated into the driver and front passenger cab seats: Suspension seats will be retracted to lowest travel position.

CAB WARRANTY

Limited Warranty

Except as provided below, and provided the vehicle will have been placed in service within 60 days after delivery to the original purchaser as established by our original invoice, for a period of **ten (10) years** after delivery to the original purchaser **or the first 100,000 miles** of use, whichever first occurs, A copy of the warranty is included with this proposal.

ENGINE COMPARTMENT LIGHT

An engine compartment light will be installed under the engine hood, of which the switch is an integral part. Light will have a hole in its lens to prevent moisture retention.

CAB INTERIOR LIGHTING

Auxiliary lights will be provided in the cab and consist of

- Two (2) Red/Clear Dome Lights: One (1) on each side controlled by an automatic door switch or a switch on the light
- Two (2) Adjustable Map Lights: With switches mounted on the cab ceiling.

CREW CAB INTERIOR LIGHTING

Auxiliary lights will be provided in the crew cab and consist of:

- Two (2), Red/Clear dome lights located one (1) each side, controlled by the following: Clear forward light controlled by the door switch and the lens switch.
- Red rearward light controlled by the lens switch.
- A courtesy light at each door opening, controlled by automatic door switches

STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there will be four (4), LED, step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step, in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

The lights will be activated when the adjacent door is opened.

CAB DEFROSTER

There will be at least a 41,000 BTU/hr defroster in the cab.

The defroster ventilation will be built into the design of the cab dash instrument panel and will

be easily removable for maintenance.

The defroster will have a three (3) speed blower, and temperature controls accessible to the driver and officer.

The defroster ducts will be designed to provide maximum defrosting capabilities for the front cab windows.

CAB/CREW CAB HEATER

Two (2) auxiliary heaters with a minimum of 32,000 BTU/hr each will be provided in the cab. The heaters will have a three (3) speed blower, and temperature controls accessible to the driver and officer. There will also be louvers located below the rear facing seat riser and below the driver and officer positions for airflow.

The heaters will be mounted, one (1) within each rear facing seat riser.

AIR CONDITIONING HOUSINGS

The housings protecting the air conditioning units on either side of the cab will be fabricated from smooth aluminum and painted to match the exterior of the cab roof, in place of the standard 4-way aluminum.

AIR CONDITIONING

A high performance air conditioning system will be furnished inside the cab and crew cab.

A compressor will be installed on the engine.

A combination condenser/evaporator with a BTU rating sufficient to meet the performance specification will be installed on each side of the cab roof.

There will be air flow outlets located in the following locations:

- Two (2) in the ceiling, just above the driver and the officer
- Six (6) in the crew cab, mounted in ceiling, positioned to maximize cooling

The evaporator units will have an adequate BTU rating to meet the performance specifications. The air conditioning system will have adjustable air outlets incorporated into the cab ceiling at the driver, officer, and crew cab positions. The air conditioner refrigerant will be R-134A, installed by a certified technician.

INTERIOR CAB INSULATION

The cab and crew cab walls will be insulated with 2.00" insulation where possible and the roof with 1.00" insulation to aid in cooling.

The insulation will be covered with a vinyl liner or a metal panel painted to match the interior.

An additional red warning light will be installed to the side of the exterior air conditioning housing. The light will match the upper zone lighting package to meet NFPA requirements.

CAB INSTRUMENTATION

Instrument panel controls and switches will be identified as to function by imprinted word(s) adjacent to each item. Actuation of the headlight switch will illuminate ("back-lit") wording for after dark operation. Turn signal and high beam headlight indicator lights will be provided.

To avoid confusion, warning indicators will be (where possible) the "dead front" type, meaning the warning light and word identification of same does not show up unless it is necessary. The built-in emergency light switch panel will have a master switch plus individual switches for selective control.

The switch panel will be located on top of the engine tunnel within easy reach of the driver. Switches will be rocker type with an indicator light, of which is an integral part of the switch. The emergency switch control panel configuration will be as such that the driver's will be the primary user. Instrument panel gauges, vehicle lights and other electrical accessories will have proper size wiring to accommodate expected current load. Wiring will meet SAE J-1128 specifications for high temperature (250 degrees Fahrenheit minimum) conditions and be color, number and function coded.

Cab instruments and controls will be conveniently located within the forward cab section. Gauges and emergency vehicle switches will be installed on removable panels for ease of service. The following gauges and controls will be furnished:

- Speedometer/Odometer: Electric
- Tachometer: Electric
- Hour meter for Engine
- Engine Oil Pressure Gauge: Red warning light and an audible alarm
- Engine Coolant Temperature Gauge: Red warning light and an audible alarm
- Automatic Transmission Oil Temperature Gauge: Red warning light and an audible alarm
- Two (2) Air Pressure Gauges: Red warning lights and an audible alarm
- Voltmeter: Warning light and audible alarm indicating high or low voltage
- Low Coolant Indicator Light (amber): Audible alarm
- Fuel Gauge
- Low Fuel Indicator Light: Audible alarm
- Ignition Switch: Green indicator light
- Starter Control
- Heater Controls
- Headlight Switch
- Self-Canceling Turn Signal Switch (arm): Visual indicators
- Headlight Dimmer and Hazard Switch: Incorporated into turn signal arm
- Warning Light Switch Control Panel
- Parking Brake Control: Red indicator light.
- Horn Button: Center of the steering wheel (for dual electric horns)

- Control to Check Engine Warning System Indicators.
- Air Restriction Indicator (electronic with indicator light).
- Open door and/or compartment indicator

VEHICLE DATA RECORDER

An Akron / Weldon vehicle data recorder as required by the 2009 edition of NFPA 1901 shall be installed. Vehicle Data shall be sampled at a rate of 1 second per 48 hours and 1 minute per 100 engine hours. Software will be provided to allow the fire department to collect data as needed.

WIPER CONTROL

Wiper control will consist of a two (2)-speed individual windshield wiper control with intermittent feature and windshield washer controls. The control will also have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.

HOUR METER - AERIAL DEVICE

A hour meter for the aerial device will be provided and located within the cab display or instrument panel.

AERIAL MASTER

There will be a master switch for the aerial operating electrical system provided.

AERIAL PTO

A PTO switch for the aerial with indicator light will be provided.

PLATFORM TILT SWITCH

There will be a platform tilt switch to allow driver to raise the tilt of platform in cradle to allow for better visibility of traffic signal and aerial obstruction during driving operations and positioning apparatus.

RADIO

An AM/FM/CD Weatherband stereo radio including an Auxiliary port, the stereo radio will be mounted within reach of the driver and officer seats

The quantity and location of the speakers will be one (1) pair of 5.25" speakers located in the cab and one (1) pair of 5.25" speakers located in the crew cab.

The type and location of the antenna will be a roof-mounted rubber antenna located in an open space, on the cab roof.

RADIO ANTENNA MOUNT

An antenna-mounting base, with coax cable and weatherproof cap will be provided for a two-way radio. The mount will be located on the cab roof just to the rear of the officer seat. The cable will be routed to the seat box on the officer side with enough cable for customer to route to the instrument panel if needed.

SWITCH PANELS

The built-in emergency light switch panel will have a master switch plus individual switches for selective control. The switch panel will be located in the "overhead" position above the windshield on the driver's side to allow for easy access. Switches will be rocker type with an indicator light, of which is an integral part of the switch.

ELECTRICAL POWER CONTROL SYSTEM

A compartment will be provided in or under the cab to house the vehicles electrical power and signal circuit protection and control components. The power and signal protection and control compartment will contain circuit protection devices and power control devices. Power and signal protection and control components will be protected against corrosion, excessive heat, excessive vibration, physical damage and water spray.

Serviceable components will be readily accessible.

Circuit protection devices, which conform to SAE standard, will be utilized to protect each circuit. All circuit protection devices will be sized to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting) and conform to SAE J553 or J258. PTO power circuits will be protected by Type III manual reset non-cycling circuit breakers conforming to SAE J553 or J258 which remain open until manually reset. When required, automotive type fuses conforming to SAE J554, J1284, J1888 or J2077 will be utilized to protect electronic equipment.

Power control relays and solenoids will have a direct current (dc) rating of 125 percent of the maximum current for which the circuit is protected.

Visual status indicators will be supplied to identify control safety interlocks and vehicle status. In addition to visual status indicators, audible alarms designed to provide early warning of problems before they become critical will be used.

VOLTAGE MONITOR SYSTEM

A voltage monitor system will be provided to indicate the status of each battery system connected to the vehicles electrical load. The monitor system will provide visual and audio warning when the system voltage is above or below optimum levels.

TWO WAY RADIO COMMUNICATIONS

Allowance to be provided for installation of said radios listed below:

- 1 Motorola UHF 800 MHz base
- 1 Kenwood VHF Base
- 6 ICOM IC-F3161S standard VHF portables with lapel microphones or comparable
- 6 Motorola 800 portables – these radios and 6 bank charger to be provided by Yorktown Fire Department

All portables to be installed in charging station to be accessible on console between rear facing forward seats

HANDHELD THERMAL IMAGER WITH CHARGING BASE

Provide and Install - 1 Bullard N4 Thermal Imager with spare battery and charging base accessories on center console

PORTABLE LIGHTS WITH CHARGERS

- Provide and Install - 2 Streamlight E spot light boxes (one mounted by each crew cab door on back wall)
- Provide and Install - 2 Streamlight E flood light boxes (one mounted by each crew cab door on back wall)
- Provide and Install 6 Streamlight Survivor Lights rechargeable style on center console and applicable charging bases

EMI/RFI PROTECTION

The electrical system proposed will include means to control undesired electromagnetic and radio frequency emissions. State of the art electrical system design and components will be used to insure radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions are suppressed at their source.

The apparatus proposed will have the ability to operate in the electromagnetic environment typically found in fire ground operations. The contractor will be able to demonstrate the EMI and RFI testing has been done on similar apparatus and certifies that the vehicle proposed meets SAE J551 requirements.

EMI/RFI susceptibility will be controlled by applying immune circuit designs, shielding, twisted pair wiring and filtering. The electrical system will be designed for full compatibility with low level control signals and high powered 2-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI-RFI susceptibility.

BATTERY SYSTEM

Six (6) 12 volt, batteries that include the following features will be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Group 31
- Rating of 5700 CCA at 0 degrees Fahrenheit
- 1140 minutes of reserve capacity
- SAE Posts

Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45 degree tilt capacity.

The inside of each battery will consist of a "maintenance free" grid construction with poly

wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

A single starting system will be provided.

An ignition switch and starter button will be located on the instrument panel.

MASTER BATTERY SWITCH

A master battery switch, to activate the battery system, will be provided inside the cab within easy reach of the driver.

An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

BATTERY COMPARTMENTS

Batteries will be placed on non-corrosive mats and be stored in well-ventilated compartments located under the cab. The battery hold-downs will be of a non-corrosive material. All bolts and nuts will be stainless steel.

Heavy-duty battery cables will be used to provide maximum power to the electrical system. Cables will be color-coded.

Battery terminal connections will be coated with anti-corrosion compound. Battery solenoid terminal connections will be encapsulated with semi-permanent rubberized compound.

There will be a door in the crew cab floor to provide access to the battery terminals.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers will be installed on the front side of battery box on the driver's side. This will allow enough room for easy jumper cable access. A tag will be provided for positive/negative terminals.

BATTERY CHARGER

A Remote battery charger will be provided. A bar graph display indicating the state of charge will be provided.

The charger will have a maximum output of 40 amps and a fully automatic regulation. The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger.

The battery charger indicators will be located on the driver's seat riser and rear of apparatus above ac plug in. Battery charger/compressor will be located in the crew cab seat riser.

ALTERNATOR

A C. alternator will be provided. It will have a rated output current of 400 amp as measured by SAE method J56. It will have a high volume air cooling fan and fan guard. It will also have a custom three (3)-set point voltage regulator. The alternator will be connected to the

power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

ELECTRONIC LOAD MANAGEMENT

A electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, and automatically reduces the electrical load in the event of a low voltage condition and by doing so, ensures the integrity of the electrical system.

The ELM monitors the vehicle's voltage while at the scene (parking brake applied). It will sequentially shut down individual electrical loads when the system voltage drops below a preset value. Five (5) separate electrical loads are controlled by the load manager. The ELM will sequentially re-energize electrical loads as the system voltage recovers.

The (ELM) also includes sequencer function for the five (5) managed loads and two (2) additional.

AMP DRAW REPORT

The bidder will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus will provide the following:

1) Documentation of the electrical system performance tests.

2) A written load analysis, which will include the following:
   - The nameplate rating of the alternator.
   - The alternator rating under the conditions specified per: Applicable NFPA 1901 or 1906 (Current Edition).
   - The minimum continuous load of each component that is specified per: Applicable NFPA 1901 or 1906 (Current Edition).
   - Additional loads that, when added to the minimum continuous load, determine the total connected load.
   - Each individual intermittent load.

All of the above listed items will be provided by the bidder per the applicable NFPA 1901 or 1906 (Current Edition).

EXTERIOR LIGHTING

Exterior lighting will meet or exceed Federal Department of Transportation, Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements in effect at time of proposal.

Front headlights will be halogen, rectangular quad type mounted in a chrome and polished aluminum housing.

Five (5) LED style clearance/marker lights with armored mounting brackets will be provided on the platform with wide basket and the (Three (3) to the front and one (1) on each 45 degree

corner.

There will also be four (4), LED style clearance/marker lights provided on the cab. Two of the lights will be provided on each side of the cab, one (1) facing forward and one (1) facing to the side.

WARNING LIGHTS (Cab Face)
Two (2) pair of LED lights will be installed on the cab face, above the headlights, mounted in a common bezel.

The outer LEDS will be required for NFPA and will meet or exceed the NFPA required light output for the front lower zone.

The color of these LEDs will be red Super LED/clear lens. The inner LEDs will be additional lighting.
The color of these lights will be red Super LED/clear lens.

Both sets of lights will be activated by the same switch in the cab.

BACK-UP ALARM
A solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum five (5) dBA above surrounding environmental noise levels.

BACKUP CAMERA
A rear mounted backup camera shall be provided, with a dash mount monitor.

MANUAL, FIRE APPARATUS PARTS
Three (3) custom parts manuals for the complete fire apparatus will be provided in hard copy with the completed unit.

One (1) custom parts manual for the complete fire apparatus will be provided in digital copy with the completed unit.

The manual will contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in Alphabetical order
- Instructions on how to locate a part

The manual will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

MANUALS, CHASSIS SERVICE

Three (3) hard copy chassis service manuals containing parts and service information on major components will be provided with the completed unit.

One (1) digital copy chassis service manual containing parts and service information on major components will be provided with the completed unit.

The manuals will contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes
- Engine
- Tires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

The manual will be specifically written for the chassis model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

MANUALS, CHASSIS OPERATION

Three (3) hard copy chassis operation manuals will be provided.
One (1) digital copy chassis operation manual will be provided.

ELECTRICAL WIRING DIAGRAMS

Three (3) hard copy electrical wiring diagrams, prepared for the model of chassis and body, will be provided.
One (1) digital copy electrical wiring diagram, prepared for the model of chassis and body, will be provided.

WATER TANK

It will have a capacity of 500 gallons and will be constructed of polypropylene plastic. The joints and seams will be nitrogen welded inside and out. The tank will be baffled in accordance with NFPA Bulletin 1901 requirements. The baffles will have vent openings at both the top and bottom of each baffle to permit movement of air and water between compartments. The longitudinal partitions will be constructed of .38" polypropylene plastic and extend from the bottom of the tank through the top cover to allow positive welding. The transverse partitions extend from 4" off the bottom to the underside of the top cover. All partitions interlock and will be welded to the tank bottom and sides. The tank top will be constructed of .50" polypropylene. It will be recessed .38" and will be welded to the tank sides and the longitudinal partitions. It will be supported to keep it rigid during fast filling

conditions. Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two of the dowels will be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes. A sump will be provided at the bottom of the water tank. The sump will include a drain plug and the tank outlet. Tank will be installed in a fabricated "cradle" assembly constructed of structural steel. Sufficient cross members are provided to properly support bottom of tank. Cross members are constructed of steel bar channel or rectangular tubing. Tank "floats" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on. Stops are provided to prevent an empty tank from bouncing excessively while moving vehicle. Tank mounting system is approved by the manufacturer.

Fill tower will be constructed of .50" polypropylene and will be a minimum of 8.00" wide x 14.00" long. Fill tower will be furnished with a .25" thick polypropylene screen and a hinged cover. An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

WATER TANK WARRANTY

The tank will have a **lifetime** warranty.

If the tank manufacturer determines that the tank problem has rendered the truck out -of-service, the tank manufacturer will dispatch a service technician WITHIN 48 HOURS (2 DAYS) to repair the tank (This time period is for the United States and Canada only).

HOSE BED

The hose bed will be fabricated of .125" thick aluminum with a tensile strength range of 31,000 to 38,000 psi. The sides of the hose bed will not form any portion of the fender compartments. The upper and rear edges of the hose bed side panels will have a double break for rigidity. The hose bed will be located ahead of the ladder turntable, between the tank and the side compartments.

There will be one (1) hose chute to the rear of the hose bed, on the passenger side, to allow for payout/removal of the hose. The hose chute will be enclosed with a full-height aluminum tread plate door and a spring-loaded hinge at the top of the door.

The hose bed flooring will consist of removable aluminum grating with a top surface that is corrugated to aid in hose aeration. The grating slats will be spacing between the slats for hose ventilation.

Hose capacity will be a minimum of 800 feet of 5.00" large diameter hose.

RUNNING BOARDS

The running boards will be fabricated of .125" bright aluminum tread plate and supported by structural steel angle assemblies bolted to the chassis frame rails.

Running boards will spaced away from the body .50".

A splash guard will be provided to keep road dirt or water from splashing up onto the pump panels.

The running boards will have a riser on the body to protect the painted surface from damage by stepping on the running boards.

The entire surface of the running boards will be covered with bright aluminum tread plate.

TURNTABLE STEPS

Steps to access the turntable from the driver side and passenger side will be provided just behind the compartmentation. The steps will be a swing-down design, with the stepping area made of Morton Tread-Grip® channel. The step height for the bottom step (the distance from the top surface of the step to the ground) will not exceed 24.00" with the step in its extended position. No step height (the distance between the top surfaces of any two (2) adjacent steps) will be greater than 14.00". The step well will be lined with bright aluminum tread plate to act as scuff plates. The steps will be connected to the "Do Not Move Truck" indicator. A handrail will be provided on each side of the access steps.

TOW EYES

Two (2) rear painted "tow" eyes will be located at the rear of the apparatus and will be mounted directly to the torque box. The inner and outer edges of the tow eyes will be radiused.

COMPARTMENTATION

All side compartment doors with be conventional door opening no roll up doors on side compartments. Compartmentation will be fabricated of .125" 5052 aluminum with a tensile strength of 38,000 pounds per square inch. The side compartments are an integral assembly with the rear fenders. Fully enclosed rear wheel housings will be provided to prevent rust pockets and for ease of maintenance. Due to the severe loading requirements of this aerial, a method of compartment body support suitable for the intended load will be provided.

The backbone of the support system will be the chassis frame rail, which is the strongest component of the chassis and is designed for sustaining maximum loads.

A support system will be used which will incorporate a floating substructure by using Neoprene Elastomer isolators to allow the body to remain rigid while the chassis goes through its natural flex. The isolators will have a broad range of proven viability in vehicular applications, be of a failsafe design, and allow for all necessary movement in three (3) transitional and rotational modes. This will result in 500 pound equipment rating for each lower compartment of the body.

The compartmentation in front of the rear axle will include a 3.00" steel support assemblies which are bolted to the chassis frame rails. A steel framework will be mounted to the body above these support assemblies connected to the support assemblies with isolators. There

will be one support assembly mounted to each chassis frame rail.

The compartment behind the rear axle will include 3.00" steel support assemblies which are bolted to the chassis frame rails and extend underneath to the outside edge of the body. The support assembly will be coated to isolate the dissimilar metals before it is bolted to the body. There will be one support assembly mounted to each chassis frame rail.

A design with body compartments hanging off of the chassis frame in an unsupported fashion will not be acceptable.

Compartment flooring will be of the sweep out design with the floor higher than the compartment door lip. All compartment floors shall contain Turtle Tile. The compartment door openings are framed by flanging the edges in 1.75" and bending out again .75" to form an angle. Drip protection is provided over all door openings by means of bright aluminum extrusion or formed bright aluminum tread plate.

Side compartment tops will be covered with bright aluminum tread plate with a 1.00" rolled over edge on the front, rear and outward side. The covers are fabricated in one piece and have the corners "Tungsten Inert Gas" welded. A bright aluminum tread plate cover will be provided on the front wall of each side compartment. All screws and bolts which protrude into a compartment will have acorn nuts at the ends to prevent injury.

The body design has been fully tested. Proven engineering and test techniques such as finite element analysis, model analysis, stress coating and strain gauging have been performed with special attention given to fatigue life and structural integrity of the compartment body and substructure.

AGGRESSIVE WALKING SURFACE

All exterior surfaces designated as stepping, standing, and walking areas will comply with the required average slip resistance of the current NFPA standards.

LOUVERS

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

REAR WALL

The entire rear surface of the apparatus and all the doors will be covered with smooth aluminum.

BODY WARRANTY

Limited Warranty

Except as provided below, and provided the vehicle will have been placed in service within 60 days after delivery to the original purchaser as established by our original invoice, for a period of **ten (10) years** after delivery to the original purchaser **or the first 100,000 miles** of

use, whichever first occurs, A copy of the warranty is included with this proposal. In addition, the door will also be warranted against corrosion perforation for a period of ten (10) years.

REAR BUMPER

An 8.00" rear bumper will be furnished. The bumper will be constructed of steel framework and will be covered with polished aluminum tread plate. The bumper will be spaced away from the body approximately 1.00". It will extend the full width of the body.

PULL OUT TOOL BOARD

Allowance for 2 pull out tool boards of which the location of to be decided prior to final build plan.

PULL-OUT TRAY

There will be four (4) slide-out trays with 2.00" sides and a capacity of 500 pounds provided and installed upon final compartment layout design. Capacity rating will be in the extended position.

Slides will be General Device ball bearing type for ease of operation and years of dependable service.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for it will be located at the front of the tray for ease of use with a gloved hand. Heavy-duty steel angle iron assembly will support the body under the compartment floor. It will be attached to the chassis frame for load transfer and to reduce stress on body.

SLIDE-OUT/TILT-DOWN TRAY

There will be two (2) slide-out trays provided and installed upon final compartment layout design. The capacity rating (in the extended position) will be 215 pounds minimum. Approximately two-thirds of the tray will slide-out from its stored position and will tilt 30 degrees down from horizontal. The vertical position within the compartment will be adjustable.

Construction will consist of .188" thick aluminum for the tray bottom and end, and special aluminum extrusions for the tray sides, front and tracks.

The tray will be equipped with ball bearing rollers for smooth operation.

Two spring loaded locks will be provided at the front of the tray, one on each end.

Rubber padded stops will be provided for both the in out tray position. The tray(s) will be located in compartments

ADJUSTABLE SHELVES

There will be five (5) shelves, with a minimum capacity of 215 pounds provided. The shelf construction will consist of .125" pan-shaped aluminum with 2.00" sides. Each shelf will be

infinitely adjustable by means of a threaded fastener, which slides in a track.

The location will be one each in compartments.

MOUNTING TRACKS
There will be a set of tracks for mounting shelf(s) in each compartment. These tracks will be installed vertically to support the adjustable shelf(s).

RUB RAIL
Bottom edge of the side compartments will be trimmed with a bright aluminum extruded rub rail.

Trim will be 2.12" high with 1.38" flanges turned outward for rigidity.

The rub rails will not be an integral part of the body construction, which allows replacement in the event of damage.

BODY FENDER CROWNS
Stainless steel fender crowns will be provided around the rear wheel openings.

A rubber welting will be provided between the body and the crown to seal the seam and restrict moisture from entering.

HANDRAILS
The handrails will be 1.25" diameter anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface.

All handrails shall be lit via LED backlighting

Chrome plated end stanchions will support the handrail. Plastic gaskets will be used between end stanchions and any painted surfaces.

Drain holes will be provided in the bottom of all vertically mounted handrails.

Two (2) handrails will be provided, one above each side pump panel.

AIR BOTTLE STORAGE (Single bottle)
A total of eight (8) air bottle compartments will be provided and located body fender panels. The air bottle compartment will be in the form of a round tube, 7.63" diameter, and will be of adequate depth to accommodate different size air bottles. The flooring will be rubber lined and have a drain hole. A stainless steel door with a chrome-plated latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

GROUND LADDER STORAGE
The ground ladders are stored within the torque box and are removable from the rear.

Ladders will be enclosed to prevent road dirt and debris from fouling or damaging the ladders.

The ladders rest in full length stainless steel slides and are arranged in such a manner that any one ladder can be removed without having to move or remove any other ladder.

A roll-up door will be provided at the rear, double faced, aluminum construction, an anodized satin finish. The latching mechanism will consist of a full length lift bar lock with latches on the outer extrusion of the door frame.

A stainless plate with a two bend flange and a stainless steel hinge will be provided to secure the aerial ladder complement. The plate assembly will be mounted to the bottom of the entrance of the torque box ladder storage area.

When the plate is vertical, it will secure the ladders and prevent them from migrating to the rear of the apparatus. When the plate is down and not securing the ladders, the roll-up door cannot close, which will activate the "Open Door Indicator Light" within the cab. The roll-up door together with hinge friction will secure the plate in place during driving operations.

A door guard will be provided to prevent tools inside the torque box from damaging the roll-up door.

HARD SUCTION HOSE
Hard suction hose will not be required.

PIKE POLES STORAGE
There will be tubular holders located in the ground ladder storage compartment for pike poles.

For pike poles reference Appendix A

STEPS
A bright finished folding type step will be provided on the front of each fender compartment.

Two (2) additional folding steps, will be located one each side front body bulkhead.

PUMP
Pump will be a Waterous 2250 gpm single (1) stage midship mounted centrifugal type.
Pump will be the class "A" type.
Pump will deliver the percentage of rated discharge at pressures indicated below:
- 100% of rated capacity at 150 psi net pump pressure.
- 70% of rated capacity at 200 psi net pump pressure.
- 50% of rated capacity at 250 psi net pump pressure.

-
Pump will be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping.

Pump case halves will be bolted together on a single horizontal face to minimize a chance of leakage and facilitate ease of reassembly. No end flanges will be used.

Discharge manifold of the pump will be cast as an integral part of the pump body assembly and will provide a minimum of three (3) 3.50" openings for flexibility in providing various discharge outlets for maximum efficiency.

The three (3) 3.50" openings will be located as follows: one (1) outlet to the right of the pump, one (1) outlet to the left of the pump, and one (1) outlet directly on top of the discharge manifold.

Impeller shaft will be stainless steel, accurately ground to size. It will be supported at each end by sealed, anti-friction ball bearings for rigid precise support. Impeller will have flame plated hubs assuring maximum pump life and efficiency despite any presence of abrasive matter in the water supply.

Bearings will be protected from water and sediment by suitable stuffing boxes, flinger rings, and oil seals. No special or sleeve type bearings will be used.

Pump will be equipped with a self-adjusting, maintenance-free, mechanical shaft seal.

The mechanical seal will consist of a flat, highly polished, spring fed carbon ring that rotates with the impeller shaft. The carbon ring will press against a highly polished stainless steel stationary ring that is sealed within the pump body.

In addition, a throttling ring will be pressed into the steel chamber cover, providing a very small clearance around the rotating shaft in the event of a mechanical seal failure. The pump performance will not deteriorate, nor will the pump lose prime, while drafting if the seal fails during pump operation.

Wear rings will be bronze and easily replaceable to restore original pump efficiency and eliminate the need to replace the entire pump casing due to wear.

PUMP TRANSMISSION

The pump transmission will be made of a three (3) piece, aluminum, horizontally split casing. Power transfer to pump will be through a high strength silent drive chain or equivalent.

Drive shafts will be 2.35" diameter hardened and ground alloy steel and supported by ball bearings. The case will be designed to eliminate the need for water cooling.

AIR PUMP SHIFT

Pump shift engagement will be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab.

Two (2) indicator lights will be provided adjacent to the pump shift inside the cab. One (1) green light will indicate the pump shift has been completed and be labeled "pump engaged". The second green light will indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light will be labeled "OK to pump".

Another green indicator light will be installed adjacent to the hand throttle on the pump panel and indicate either the pump is engaged and the road transmission is in pump gear, or the road transmission is in neutral and the pump is not engaged. This indicator light will be labeled "Warning: Do not open throttle unless light is on".

The pump shift control in the cab will be illuminated to meet NFPA requirements.

TRANSMISSION LOCK-UP

The direct gear transmission lock-up for the fire pump operation will engage automatically when the pump shift control, in the cab, is activated.

AUXILIARY COOLING SYSTEM

A supplementary heat exchange cooling system will be provided to allow the use of water from the discharge side of the pump for cooling the engine water. The heat exchanger will be cylindrical type and will be a separate unit. The heat exchanger will be installed in the pump or engine compartment with the control located on the pump operator's control panel.

Exchanger will be plumbed to the master drain valve.

INTAKE RELIEF VALVE

An Elkhart relief valve will be installed on the suction side of the pump preset at 125 psig.

Relief valve will have a working range of 75 psig to 250 psig.

Outlet will terminate below the frame rails with a 2.50" National Standard hose thread adapter and will have a "do not cap" warning tag.

Control will be located behind an access door at the right (passenger's) side pump panel.

PRESSURE CONTROLLER

A pressure governor will be provided. An electric pressure governor will be provided which is capable of automatically maintaining a desired preset discharge pressure in the water pump. When operating in the pressure control mode, the system will automatically maintain the discharge pressure set by the operator (within the discharge capabilities of the pump and water supply) regardless of flow, within the discharge capacities of the water pump and water supply.

A pressure transducer will be installed in the water discharge of the pump. The transducer continuously monitors pump pressure sending a signal to the Electronic Control Module (ECM).
The governor can be used in two (2) modes of operation, RPM mode and pressure modes. In the RPM mode, the governor can be activated after vehicle parking brake has been set. When in this mode, the governor will maintain the set engine speed, regardless of engine load (within engine operation capabilities).

In the pressure mode, the governor system can only operate after the fire pump has been engaged and the vehicle parking brake has been set. When in the pressure mode, the pressure controller monitors the pump pressure and varies engine speed to maintain a precise pump pressure. The pressure controller will use a quicker reacting database for engine control.

A preset feature allows a predetermined pressure or rpm to be set.

A pump cavitation protection feature is also provided which will return the engine to idle should the pump cavitate. Cavitation is sensed by the combination of pump pressure below 30 psi and engine speed above 2000 rpm for more than five (5) seconds.

The throttle will be a vernier style control, with a large control knob for use with a gloved hand. A throttle ready light will be provided adjacent to the throttle control. A large .75" RPM display will be provided to be visible at a glance.

Check engine, and stop engine indicator lights will be provided for easy viewing.

Large .75" push buttons will be provided for menu, mode, preset, and silence selections. The water tank level indicator will be incorporated in the pressure governor.
A fuel level indicator will be incorporated in the pressure controller. A pump hour meter will be incorporated in the pressure controller.

The pressure controller will incorporate monitoring for engine temperature, oil pressure, fuel level alarm, and voltage. Pump monitoring will include, pump gearcase temperature, error codes, diagnostic data, pump service reminders, and time stamped data logging, to allow for fast accurate trouble shooting. It will also notify the driver/engineer of any problems with the engine and the apparatus. Complete understandable messages will be provided in a 20-character display, providing for fewer abbreviations in the messages. An automatic dim feature will be included for night operations.

The pressure controller will include a USB port for easy software upgrades, which can be downloaded through a USB memory stick, eliminating the need for a laptop for software installations.

A complete interactive manual will be provided with the pressure controller.

PRIMER

An electric pump priming system will be furnished with the apparatus. It will consist of a rotary vane priming pump, driven by a 12 volt electric motor.

All rotating parts of the pump will be made of corrosion resistant aluminum, stainless steel, or laminated phenolic.

Pump cylinder will be made of aluminum alloy, hard anodized and Teflon coated, for corrosion resistance and long life.

The primer will be built by the manufacturer of the fire pump.

A control located at the pump control panel will operate the primer.

When dry, the pump system will be capable of taking suction through 20 feet of hard suction hose and discharging water in not more than the time allowed by current NFPA 1901 standard. Also, rated capacity of the pump will be achieved at the lift stated in current NFPA 1901 standard table.

PUMP WARRANTY

A five (5) year warranty will be provided for the pump.

PUMP MANUALS

Three (3) hard copy pump manuals from the pump manufacturer will be furnished with the apparatus. The manuals will cover pump operation, maintenance, and parts.

One (1) digital copy pump manual from the pump manufacturer will be furnished in compact disc format with the apparatus. The manuals will cover pump operation, maintenance, and parts.

PLUMBING

All inlet and outlet plumbing, 3.00" and smaller, will be plumbed with either stainless steel pipe or synthetic rubber hose reinforced with high-tensile polyester braid. Small diameter secondary plumbing such as drain lines will be stainless steel, brass or hose.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping will be equipped with victaulic or rubber couplings.

Plumbing manifold bodies will be ductile cast iron or stainless steel.

All lines will drain through a master drain valve or will be equipped with individual drain valves. All individual drain lines for discharges will be extended with a hose to drain below the chassis frame.

All water carrying gauge lines will be of flexible polypropylene tubing.

PUMP PLUMBING WARRANTY

Except as provided below, and provided the vehicle will have been placed in service within sixty (60) days after delivery to the original purchaser as established by our original invoice, for a period ending on the first to occur of the expiration of ten years or 100,000 miles of vehicle use after delivery to the original purchaser, A copy of the warranty is included with this proposal.

MAIN PUMP INLETS

A 6.00" pump manifold inlet will be provided on each side of the vehicle. The suction inlets will include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

The main pump inlets will have National Standard Threads with a long handle chrome cap.

The inlet will have a task force tips ball valve intake part # AB3ST-NX

VALVES

All ball valves will be heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve. Valves will have a ten (10) year warranty.

INLET (Left side)

On the left side pump panel will be one (1) 2.50" auxiliary suction, terminating in 2.50" National Standard Hose Thread. The auxiliary suction will be provided with a strainer, chrome swivel and plug.

The location of the valve for the one (1) inlet will be recessed behind the pump panel.

INLET CONTROL

Control for the side auxiliary inlet(s) will be located at the inlet valve.

INLET BLEEDER VALVE

A .75" bleeder valve will be provided for each side gated inlet. The valves will be located behind the panel with a swing style handle control extended to the outside of the panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. The water discharged by the bleeders will be routed below the chassis frame rails.

TANK TO PUMP

The booster tank will be connected to the intake side of the pump with heavy duty piping and a quarter turn 3.00" full flow line valve with the control remotely located at the operator's panel. Tank to pump line will run straight (no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling will be included in this line to prevent damage from vibration or chassis flexing.

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

TANK REFILL
A 1.50" combination tank refill and pump re-circulation line will be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

DISCHARGE OUTLETS (Left Side)
There will be two (2) discharge outlets with a 2.50" valve on the left side of the apparatus, terminating with a male 2.50" National Standard hose thread adapter.

DISCHARGE OUTLETS (Right Side)
There will be one (1) discharge outlet with a 2.50" valve on the right side of the apparatus, terminating with a male 2.50" National Standard hose thread adapter.

DISCHARGE OUTLET, 4.00"
There will be a 4.00" discharge outlet with a 4.00" Akron valve installed on the right side of the apparatus, terminating with male a 4.00" National Standard hose thread adapter. This discharge outlet will be actuated with a hand wheel control at the pump operator's control panel.

An indicator will be provided to show when the valve is in the closed position.

DISCHARGE CAPS
Chrome plated, rocker lug, caps with chains will be furnished for all side discharge outlets.

OUTLET BLEEDERS
A .75" bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

The valves will be located behind the panel with a swing style handle control extended to the outside of the side pump panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. Bleeders will be located at the bottom of the pump panel. They will be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders will be routed below the chassis frame rails.

ELBOWS, LEFT SIDE OUTLETS
The 2.50" discharge outlets, located on the left side pump panel, will be furnished with a 2.50"(F) National Standard hose thread x 2.50"(M) National Standard hose thread, chrome plated, 45 degree elbow.

ELBOWS, RIGHT SIDE OUTLETS
The 2.50" discharge outlets, located on the right side pump panel, will be furnished with a 2.50"(F) National Standard hose thread x 2.50"(M) National Standard hose thread, chrome

plated, 45 degree elbow.

ELBOW, 4.00" OUTLET
The 4.00" outlet will be furnished with a 4.00"(F) National Standard hose thread x 5.00" Storz elbow adapter with cap.

REAR TANK FILL
A rear 2.5" tank fill with ball valve will be provided with a 45 degree elbow.

DISCHARGE OUTLET CONTROLS
The discharge outlets will incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism will indicate the position of the valve.

If a hand wheel control valve is used, the control will be a minimum of a 3.9" diameter chrome plated hand wheel with a dial position indicator built in to the center of the hand wheel.

AERIAL OUTLET
The aerial waterway will be plumbed from the pump to the water tower line with 5.00" pipe and a 3.50" valve. The control for the waterway valve will be located at the pump operator's panel.

A pin indicator will be provided to show when the valve is in the "open" or "closed" position.

CROSSLAY HOSE BEDS
Two (2) crosslays with 1.50" outlets will be provided. Each bed will be capable of carrying 200 feet of 1.75" double jacketed hose and will be plumbed with 2.00" i.d. pipe and gated with a 2.00" quarter turn ball valve.

Outlets to be equipped with a 1.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay controls will be at the pump operator's panel.

The center crosslay dividers will be fabricated of .25" aluminum and will provide adjustment from side to side. The divider will be unpainted with a brushed finish. The remainder of the crosslay bed will be painted job color.

Vertical scuff plates, constructed of stainless steel, will be provided at the front and rear ends of the bed on each side of vehicle.

Crosslay bed flooring will consist of removable perforated brushed aluminum.

CROSSLAY HOSE BEDS, 2.50"

One (1) crosslay with 2.50" outlets will be provided. This bed will be capable of carrying 200 feet of 2.50" double jacketed hose and will be plumbed with 2.50" i.d. pipe and gated with a 2.50" quarter turn ball valve.

Outlet to be equipped with a 2.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay control will be at the pump operator's panel.

The center crosslay dividers will be fabricated of .25" aluminum and will provide adjustment from side to side. The divider will be unpainted with a brushed finish. The remainder of the crosslay bed will be painted job color.

Stainless steel vertical scuffplates will be provided at hose bed ends (each side of vehicle). Bottom of hose bed ends (each side) will also be equipped with a stainless steel scuffplate.

Crosslay bed flooring will consist of removable perforated brushed aluminum.

CROSSLAY COVER

A bi-fold aluminum treadplate cover will be installed over the crosslay hose beds. It will include a latch at each end of the cover to hold it securely in place, a chrome grab handle at each end for opening and closing the cover and a foam rubber gasket where the cover comes into contact to a painted surface.

PUMP COMPARTMENT

The pump compartment will be separate from the hose body and compartments so that each may flex independently of the other. It will be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards.

The pump compartment will be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist.

Pump compartment, pump, plumbing and gauge panels will be removable from the chassis in a single assembly.

PUMP MOUNTING

Pump will be mounted to a substructure which will be mounted to the chassis frame rail using rubber isolators. The mounting will allow chassis frame rails to flex independently without damage to the fire pump.

PUMP CONTROL PANELS (Left Side Control)

All pump controls and gauges will be located at the left (driver's) side of the apparatus and properly identified.

Layout of the pump control panel will be ergonomically efficient and systematically

organized.

The pump operator's control panel will be removable in two (2) main sections for ease of maintenance:

The upper section will contain sub panels for the mounting of the pump pressure control device, engine monitoring gauges, electrical switches, and foam controls (if applicable). Sub panels will be removable from the face of the pump panel for ease of maintenance. Below the sub panels will be located all valve controls and line pressure gauges.

The lower section of the panel will contain all inlets, outlets, and drains.

All push/pull valve controls will have 1/4 turn locking control rods with polished chrome plated zinc tee handles. Guides for the push/pull control rods will be chrome plated zinc castings securely mounted to the pump panel. Push/pull valve controls will be capable of locking in any position. The control rods will pull straight out of the panel and will be equipped with universal joints to eliminate binding.

IDENTIFICATION TAGS

The identification tag for each valve control will be recessed in the face of the tee handle.

All discharge outlets will have color coded identification tags, with each discharge having its own unique color. Color coding will include the labeling of the outlet and the drain for each corresponding discharge.

All line pressure gauges will be mounted directly above the corresponding discharge control tee handles and recessed within the same chrome plated casting as the rod guide for quick identification. The gauge and rod guide casting will be removable from the face of the pump panel for ease of maintenance. The casting will be color coded to correspond with the discharge identification tag.

All remaining identification tags will be mounted on the pump panel in chrome plated bezels. The pump panel on the right (passenger's) side will be removable with lift and turn type fasteners.

Trim rings will be installed around all inlets and outlets.

The trim rings for the side discharge outlets will be color coded and labeled to correspond with the discharge identification tag.

PUMP PANEL CONFIGURATION

The pump panel configuration will be arranged and installed in an organized manner that will provide user-friendly operation.

PUMP OPERATOR'S PLATFORM

A pull out platform will be provided at the pump operator's control panel.

The front edge and the top surface of the platform will be made of bright aluminum treadplate.

The platform will be 22.00" deep and 35.00" wide. The platform will lock in the retracted and the extended position.

The platform will be wired to the "step not stowed" indicator in the cab.

PUMP AND GAUGE PANEL

The pump and gauge panels will be constructed of polished aluminum, to allow easy identification of the gauges and controls and to eliminate glare.

A polished aluminum trim molding will be provided around each panel.

The passenger's side pump panel will be removable and fastened with swell type fasteners.

Engine monitoring graduated LED indicators will be incorporated with the pressure controller.

- Check Transmission Warning Indicator Light
- Stop Engine Warning Indicator Light
- Check Engine Warning Indicator Light.

GAUGES, VACUUM and PRESSURE

The pump vacuum and pressure gauges will be silicone filled.

The gauges will be a minimum of 4.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.

Gauge construction will include case with adhesive mounting gasket and threaded retaining nut.

The pump pressure and vacuum gauges will be installed adjacent to each other at the pump operator's control panel.

Test port connections will be provided at the pump operator's panel. One will be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They will have 0.25 in. standard pipe thread connections and non-corrosive polished stainless steel or brass plugs. They will be marked with a label.

This gauge will include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.

PRESSURE GAUGES

The individual "line" pressure gauges for the discharges will be Class 1 interlube filled.

They will be a minimum of 2.00" in diameter and have white faces with black lettering. Gauge construction will include a case with adhesive mounting gasket and threaded retaining nut.

Gauges will have a pressure range of 30"-0-400#.

The individual pressure gauge will be installed as close to the outlet control as practical. This gauge will include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.

WATER LEVEL GAUGE

An electric water level gauge will be incorporated in the pressure controller that registers water level by means of 9 LEDs. They will be at 1/8 level increments with a tank empty LED. The LEDs will be a bright type that is readable in sunlight, and have a full 180-degree of clear viewing. Water level gauges shall be located on driver side, officer side and rear of apparatus.

To further alert the pump operator, the gauge will have a warning flash when the tank volume is less than 25%, and will have "Down Chasing" LEDs when the tank is almost empty.

The level measurement will be ascertained by sensing the head pressure of the fluid in the tank or cell.

LIGHT SHIELD

The pump panel controls and gauges will be illuminated by incandescent lights installed under an aluminum diamond plate combination step/light shield. The stepping surface will be a minimum of 8.00" deep and properly reinforced to support a man's weight.

Illumination will be provided for controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus and the equipment provided on it. External illumination will be a minimum of five (5) foot-candles on the face of the device. Internal illumination will be a minimum of four (4) foot lamberts.

One (1) pump panel light will come on when the pump is shifted into gear from inside the cab. This will afford the operator some illumination when first approaching the control panel. The remaining lights will be actuated from a switch located on the pump panel.

One (1) Weldon, Model 9186-23882-30, step light will be provided. The step light will be installed as to illuminate the top of the step for night time vision. The step light will be activated by the pump panel light switch.

ELECTRICAL

All 12-volt electrical equipment installed by the apparatus manufacturer will conform to modern automotive practices. All wiring will be high temperature type. Wiring will be run in loom, where exposed, and have grommets where wire passes through sheet metal. Automatic

reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

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

(1) All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.

(2) Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.

(3) Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.

(4) Corrosion preventative compound will be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation (of the plug).

(5) All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.

(6) All electrical terminals in exposed areas will have silicon (1890) applied completely over the metal portion of the terminal. All emergency light switches will be mounted on a separate panel installed in the cab. A master warning light switch and individual switches will be provided to allow pre-selection of emergency lights. The light switches will be "rocker" type with an internal indicator light to show when switch is energized. All switches will be properly identified and mounted in a removable panel for ease in servicing.

Identification of the switches will be done by either printing or etching on the switch panel. The switches and identification will be illuminated.

All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

The results of the tests will be recorded and provided to the purchaser at time of delivery.

STEP LIGHTS

Six (6), step led lights will be provided on the aerial body. Two (2) of the lights will be provided one (1) each side at the front of body and two (2) at each set of the steps leading to the aerial turntable.

The two (2) lights on the front of the body will be actuated with the pump panel light switch. The rear step lights will be actuated by the aerial master switch in the cab.

REAR FMVSS LIGHTING

The rear stop/tail and directional lighting will consist of the following: Two (2) red LED stop/tail lights. Two (2), amber LED populated arrow turn light.
These lights will be installed at the rear of the truck in a polished housing.
Four (4) red reflectors will be provided.
A, license plate bracket will be mounted on the driver's side above the warning lights. A step lamp will illuminate the license plate.
Two (2) LED backup lights will be provided.

REAR ID/MARKER DOT LIGHTING

The three (3) identification lights located at the rear will be installed per the following: LED As close as practical to the vertical centerline. Centers spaced not less than six (6) inches or more than twelve (12) inches part. Red in color and all at the same height.

The four (4) clearance lights located at the rear will be installed per the following: LED To indicate the overall width of the vehicle. One (1) each side of the vertical centerline and all at the same height. As near the top as practical. To be visible from the rear and the side. One (1) each side, facing the side. One (1) each side, facing the rear.

Per FMVSS 108 and CMVSS 108 requirements.

LIGHTING BEZEL

Two (2), four (4) light aluminum housings will be provided for the rear stop/tail, directional, scene lights and warning.

MARKER LIGHTS

There will be 12 lights, LED, marker lights installed on this apparatus. The marker lights will be wired to the running lights of the vehicle.

The lights will be located two lights to be mounted in rub rails under the following compartments: D1, D4, P1, P4, and two in each running board. These lights will be installed either recessed or with metal flanges to protect them from most damage.

Yellow lights will be installed in any location forward of the rear most point of the vehicle.

A single red light will be installed at the rear most point only.

MARKER LIGHTS
There will be One (1) pair of amber and red LED marker lights with rubber arm, located at rear of apparatus one each side. The amber lens will face the front and the red lens will face the rear of the truck.

These lights will be activated with the running lights of the vehicle.

"DO NOT MOVE APPARATUS" INDICATOR
A flashing red indicator light (located in the driving compartment) will be illuminated automatically per NFPA (1996 edition, 9-11 or 1999 edition 11-11). The light will be labeled "Do Not Move Apparatus If Light Is On".

OPEN DOOR INDICATOR LIGHT
Two (2) red indicator lights will be provided and located in clear view of the driver, warning of an open passenger or equipment compartment door.

One (1) light will indicate status of doors on the driver's side of the vehicle and the other light will indicate the status of the passenger side and rear compartment doors.

SEATBELT WARNING SYSTEM
An Akron / Wheldon seatbelt warning system will be installed and shall monitor each seating postion. Display results on display module with audible and visual alarms.

COMPARTMENT LIGHTING
There shall be On Scene Solutions LED compartment light strips provided in eight (8) compartments located. Strips will be mounted vertically along the side of the door framing. There will be a minimum of one (1) light per compartment. The light strips will be centered along the vertical side of the doorframe.

Any remaining compartments will include 6.00" diameter, lights in each enclosed compartment.

Opening the compartment door will automatically turn the compartment lighting on.

PUMP COMPARTMENT LIGHT
A pump compartment light will be provided inside the right side pump enclosure and accessible through a door on the pump panel.

A .125" weep hole will be provided in each light lens, preventing moisture retention.

PERIMETER SCENE LIGHTS, CAB
There will be a 4.00", LED, grommets mount weatherproof light provided for each cab door.

Lighting will be designed to provide illumination on areas under the driver, officer, and crew cab riding area exits, which will be activated automatically when the exit doors are opened, by the door jam switch and by the same means as the body perimeter lights.

The lighting will be capable of providing illumination at a minimum level of two (2) foot-candles on ground areas within 30.00" of the edge of the apparatus in areas which personnel climb in or out of the apparatus or descend from the apparatus to the ground level.

PERIMETER SCENE LIGHTS, BODY

There will be a total of four (4) LED lights provided on the apparatus. Each light will consist of a 4.00" weatherproof LED light, rubber mount, and pigtail kit.

The lights will be mounted in the following locations:

- Two (2) lights will be provided under the rear step area.
- One (1) light will be provided each side under the pump panel running boards.

The lighting will be capable of providing illumination at a minimum level of two (2) foot-candles on ground areas within 30.00" of the edge of the apparatus in areas designed for personnel to climb onto the apparatus or descend from the apparatus to the ground level.

The lights will be activated by a parking brake.

WORK LIGHTS

Two (2)-6.00" Unity deck lights will be provided at the rear of the apparatus. The lights will be furnished with a halogen flood bulb.

AIR HORN SYSTEM

Two (2) round air horns with 6.00" bell will be provided and located, in the front bumper, recessed inboard of frame rails. The horn system will be piped to the air brake system wet tank utilizing .38" tubing. A pressure protection valve will be installed in-line to prevent the loss of air, in the air brake system.

AIR HORN CONTROL

The air horns will be actuated by a chrome push button located on the officer side of the engine tunnel and by the horn button in the steering wheel. The driver will have the option to control the air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

MECHANICAL SIREN

A Federal Q2B siren will be furnished. A siren brake button will be installed on the switch panel. The mechanical siren will be mounted on the bumper deck plate. It will be mounted on the left side. A reinforcement plate will be furnished to support the siren.

SWITCHES, MECHANICAL SIREN

The mechanical siren will be actuated by one (1) foot switch located on the driver's side and a push button switch on the officer's side of cab.

ELECTRONIC SIREN

Electric siren with noise cancelling microphone. Electronic siren will be controlled on the siren head.

WARNING LIGHT (Cab Roof)

Two (2) 24" LED lightbars will be mounted on the cab roof, one (1) on each side, above the driver's and passenger's door.

Each lightbar will include the following:

- One (1) forward facing clear LED flashing light.
- One (1) side facing red LED flashing light.
- Two (2) corner red LED flashing lights.

One (1) switch located in the cab on the switch panel will control these lights. The clear LED flashing lights will be disabled when the parking brake is set.

FRONT ZONE UPPER LIGHTING, PLATFORM

Eight (8) LED flashing lights will be located at the front of the platform basket.

Eight (8) Red flashing Super LED lights with clear lenses.

These lights are required to meet or exceed the NFPA Front upper zone optical warning light requirements.

The lights will be controlled by the same switch as the lightbars. The rocker switch will be provided on the cab instrument panel.

The lights will be provided with a flange.

ADDITIONAL WARNING LIGHTS

There will be one (1) pair of LED warning lights located on the basket, one (1) each side, on side of platform basket at each front corner mounted low. The color of these lights will be red Super LED/clear lens. These lights will be activated with the roof light. Note Amber may be used to the side or rear and be on at any time. If amber is added to the front, the Amber lights will only be on when the parking brake is engaged per NFPA.

HEADLIGHT FLASHER

The high beam headlights will flash alternately between the left and right side, with a control switch located on the cab instrument panel.

The flashing will automatically cancel when the headlight switch is activated or when the parking brake is set.

SIDE ZONE LOWER LIGHTING
Six (6) " LED lights will be located at the following positions:

Two (2) lights, one each side on the bumper extension - red LED/clear lens each side. Two (2) lights, one each side behind crew cab doors - red LED/clear lens each side. Two (2) lights, red LED/clear lens each side.

The lights will be controlled by a lighted switch on the cab instrument panel. These lights will be installed N/A.

REAR ZONE LOWER LIGHTING
Two (2), LED, red Super LED/clear lens lights will be located at the rear of the apparatus required to meet or exceed the lower level optical warning and optical power requirements of NFPA.

Each light will be mounted in a housing.

WARNING LIGHTS (Rear)
One (1) pair of LED/clear lens 90**5FR flashing Super LED lights will be provided. These lights will be located at the rear of the body each side high on rear compartment bulkheads, and activated with the rear upper warning switch.

These lights will be installed with a flange.

WARNING LIGHTS (Rear of Hose Bed)
Two (2) LED warning beacons will be provided at the rear of the truck, located one (1) each side.

These lights will be activated by a lighted switch on the instrument panel.

The color of the lights will be red LEDs with both domes clear.

TRAFFIC DIRECTING LIGHT
There will be one (1), amber LED traffic directing light installed at the rear of the apparatus. A switch box will be included with this installation. This traffic directing light will be mounted on top of the body below the turntable with a tread plate box at the rear of the apparatus. The traffic directing light control head will be located in the driver side overhead switch panel in the right panel position. 1 code 3 tricore arrowstick

ELECTRICAL SYSTEM GENERAL DESIGN for ALTERNATING CURRENT
The following guidelines will apply to the 120/240 VAC system installation:

General
Any fixed line voltage power source producing alternating current (ac) line voltage will produce electric power at 60 cycles plus or minus five (5) cycles.

Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures will conform to NFPA 70, National Electrical Code (herein referred to as the NEC).

Line voltage electrical system equipment and materials included on the apparatus will be listed and installed in accordance with the manufacturer's instructions. All products will be used only in the manner for which they have been listed.

Grounding

Grounding will be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems will not be used. Only stranded or braided copper conductors will be used for grounding and bonding. An equipment grounding means will be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC. The grounded current carrying conductor (neutral) will be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor will be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure will be bonded to the vehicle frame by a copper conductor. This conductor will have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements will be permitted to be used.

All power source system mechanical and electrical components will be sized to support the continuous duty nameplate rating of the power source.

Operation

Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, will be permanently attached to the apparatus at any point where such operations can take place.

Provisions will be made for quickly and easily placing the power source into operation. The control will be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train will be equipped with a means to prevent the unintentional movement of the control device from its set position.

A power source specification label will be permanently attached to the apparatus near the operator's control station. The label will provide the operator with the information detailed in Figure 19-4.10.

Direct drive (PTO) and portable generator installations will comply with Article 445 (Generators) of the NEC.

Overcurrent protection

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device will not exceed 144 inches. (3658 mm) in length

For fixed power supplies, all conductors in the power supply assembly will be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degrees Fahrenheit (90 degrees Celsius).

For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device will be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius).

Wiring Methods

Fixed wiring systems will be limited to the following:
Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius) or Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)

Electrical cord or conduit will not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring will be run as follows:

Separated by a minimum of 12 inches (305 mm), or properly shielded, from exhaust piping

Separated from fuel lines by a minimum of six (6) inches (152 mm) in distance

Electrical cord or conduit will be supported within six (6) inches (152 mm) of any junction box and at a minimum of every 24 inches (610 mm) of continuous run. Supports will be made of nonmetallic materials or corrosion protected metal. All supports will be of a design that does not cut or abrade the conduit or cable and will be mechanically fastened to the vehicle.

Wiring Identification

All line voltage conductors located in the main panel board will be individually and permanently identified. The identification will reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends will be labeled showing functions and wire size.

Wet Locations

All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, will be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC.

All receptacles located in a wet location will be not less than 24 inches (610 mm) from the ground. Receptacles on off-road vehicles will be a minimum of 30 inches (762 mm) from the ground.

The face of any wet location receptacle will be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle will be installed in a face up position.

Dry Locations

All receptacles located in a dry location will be of the grounding type. Receptacles will be not less than 30 inches (762 mm) above the interior floor height.

All receptacles will be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they will be so marked

Listing

All receptacles and electrical inlet devices will be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages will be rated for the appropriate service.

Electrical System Testing

The wiring and associated equipment will be tested by the apparatus manufacturer or the installer of the line voltage system.

The wiring and permanently connected devices and equipment will be subjected to a dielectric voltage withstand test of 900 volts for one (1) minute. The test will be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit(s) closed. This test will be conducted after all body work has been completed.

Electrical polarity verification will be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

Operational Test per Current NFPA 1901 Standards

The apparatus manufacturer will perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test will be witnessed and the results certified by Underwriters Laboratories.

The prime mover will be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating.

The power source will be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in the current NFPA 1901 standard.

Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in the current NFPA 1901 standard will be applied to the low voltage electrical system during the operational test.

GENERATOR

The apparatus will be equipped with a complete electrical power system. The generator will be a hydraulic unit. The wiring and generator installation will conform to the present National Electrical Codes Standards of the National Fire Protection Association. The installation will be designed for continuous operation without overheating and undue stress on components.

Generator Performance

- Continuous Duty Rating: 10,000 watts
- Nominal Volts: 120/240
- Amperage: 80 @ 120 volts, 40 @ 240 volts
- Phase: Single
- Cycles: 60 hertz
- Engine Speed at Engagement: Idle
- RPM range: 900 to 3,000 (hydraulic pump)

The output of the generator will be controlled by an internal hydraulic system. An electrical instrument gauge panel will be provided for the operator to monitor and control all electrical operations and output.

The generator will be driven by a transmission power take off unit, through a hydraulic pump and motor.

The generator will include an electrical control inside the cab. The hydraulic engagement supply will be operational at any time (no interlocks).

An electric/hydraulic valve will supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive.

Generator Instruments and Controls

To properly monitor the generator performance a digital meter panel will be furnished and mounted next to the circuit breaker panel. The meter will indicate the following items:

- Voltage
- Amperage for both lines
- Frequency
- Generator run hours
- Over current indication
- Over temperature indication
- "Power On" indication
- Two (2) fuse holders with two (2) amp fuses (for indicator light protection)

The meter and indicators will be installed near eye level in the compartment. Instruments will be flush mounted in an appropriate sized weatherproof electrical enclosure. All instruments used will be accurate within +/- two (2) percent.

Generator Wiring:

The system will be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. The wiring, electrical fixtures and components will be to the highest industry quality standards available on the domestic market. The equipment will be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage. The following electrical components will be the minimum acceptable quality standards for this apparatus:

Wiring:
All electrical wiring will be fine stranded copper type. The wire will be sized to the load and circuit breaker rating; ten (10) gauge on 30 amp circuits, 12 gauge on 20 amp circuits and 14 gauge on 15 amp circuits. The cable will be run in corner areas and extruded aluminum pathways built into the body for easy access.

Load Center:
The main load center with circuit breakers rated to load demand.

Circuit Breakers:
Individual breakers will be provided for all on-line equipment to isolate a tripped breaker from affecting any other on-line equipment.

GENERATOR LOCATION
The generator will be mounted in the above pump driver side. The flooring in this area will be either reinforced or constructed, in such a manner, that it will handle the additional weight
of the generator.

GENERATOR START
A switch will be located on the cab instrument panel to engage the generator.

CIRCUIT BREAKER PANEL
The circuit breaker panel will be located in compartment above front driver side stabilizer.

120 VOLT LIGHTING
A Fire Research Model OPA200-S75 light will be provided.

The light will be recessed in a cast aluminum housing.

The light fixture will be a single 750 watt, 120 volt, unit that draws 6.3 amps and provides 19,600 lumens.

There will be two (2) provided. One on each side behind each crew cab door as high as possible.

120 VOLT LIGHTING
A HIR flood light will be provided.

The light fixture will be a single 900 watt 240 volt lamphead that draws 3.75 amps. The light will provide a minimum of 32,000 lumens.

The lamp head will swivel 360 degrees left or right and tilt up and down. All wiring used up to the junction box will be a minimum of 14 gauge 3 wire cable that is properly supported and protected from damage.

A total of two (2) will be provided one each side above compartments

REMOTE SWITCH (Quartz Light)
A remote on/off actuation switch, with a 12VDC, green indicator light, will be provided to actuate a 120/240 volt solenoid switch for each quartz light.

The two (2) switches will be located in the cab. The switches will control the lights RECESSED LIGHTS BEHIND CREW CAB DOORS.

240 VOLT LIGHTING, FRONT OF PLATFORM
One (1), 1000 Watt, 240 volt light(s), will be provided at the front of the platform basket, facing forward on the passenger side only.
Light(s) will be 240 volts.
Light will be switched at the platform, turntable and cab

240 VOLT LIGHTING, UNDER PLATFORM
One (1, 1000 Watt, 240 volt light(s), will be provided under the platform near the center facing down.
Light(s) will be 240 volts.
Light(s) will be switched at the platform and turntable.

ELECTRIC CORD REEL
Furnished with the 120 volt AC electrical system will be provided with a 12-volt electric rewind switch, that is guarded to prevent accidental operation and labeled for its intended use. The switch will be protected with a fuse and installed at a height not to exceed 72 inches above the operators standing position.

A captive roller assembly shall be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the cord from being wound on the reel.

A label will be provided in a readily visible location adjacent to the reel. The label will indicate current rating, current type, phase, voltage and total cable length.

A total of one (1) cord reel will be provided passengers side cargo area. The cord reel will be configured with three (3) conductors.

CORD

Provided for electric distribution will be one (1) length installed on the reel of 200 feet of yellow 10/3 electrical cord, weather resistant 105 degree C to -50 degree C, 600 volt jacketed SOOW cord. A weatherproof lighted junction box with 4 20 amp 120 v recepticales will be installed on the end of the cord.

REEL ENCLOSURE

An aluminum tread plate enclosure will be installed over the reel. The enclosure will be provided with a stainless steel hinge that will allow the cover to be opened.

A captive roller assembly will be provided through the side sheet to assist with the pay out of the cord. A ball stop will be provided on the cord to stop the cord at the roller assembly

A total of one (1) will be installed passengers side cargo compartment side sheet.

AUTO EJECT FOR SHORELINE

One (1) shoreline receptacle will be provided to operate the dedicated 120-volt circuits on the truck without the use of the generator. The shoreline receptacle (s) will be provided with a NEMA 5-20, 120 volt, 20 amp, straight blade. The cover is spring loaded to close, preventing water from entering when the shoreline is not connected.

The unit is completely sealed to prevent road dirt contamination.

A solenoid wired to the vehicle's starter is energized when the engine is started. This instantaneously drives the plug from the receptacle.

An internal switch arrangement will be provided to disconnect the load prior to ejection to eliminate arcing of the connector contacts.
The shoreline will be connected to battery charger.

A mating connector body will also be supplied with the loose equipment.

The shoreline receptacle will be located on the driver side rear of the truck just above rub rail.

100 FOOT AERIAL PLATFORM

GENERAL INFORMATION

It is the intent of these specifications to describe a telescoping, elevating platform. The unit will consist of a ladder with a self-leveling basket attached, to the ladder fly section.

OPERATION ON GRADES

The aerial unit will be capable of operating safely, on any slope up to 10 degrees at full capacities. (Operation beyond this limit will be at the operator's discretion.)

CONSTRUCTION STANDARDS

The ladder will be constructed to meet all of the requirements as described in current NFPA 1901 standard.

These capabilities will be established in an unsupported configuration.

All structural load supporting elements of the aerial device that are made of a ductile material will have a design stress of not more than 50% of the minimum yield strength of the material based on the combination of the live load and the dead load. This 2.5:1 structural safety factor meets the current NFPA 1901 standard.

All structural load supporting elements of the aerial device that are made of non-ductile material will have a design stress of not more than 20% of the minimum ultimate strength of the material, based on the combination of the rated capacity and the dead load. This 5:1 safety factor meets the current NFPA 1901 standard.

The aerial device will be capable of sustaining a static load one and one-half times its rated tip load capacity (live load) in every position in which the aerial device can be placed when the vehicle is on a firm level surface.

The aerial device will be capable of sustaining a static load one and one-third times its rated tip load capacity (live load) in every position the aerial device can be placed when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning.

With the aerial device out of the cradle in the in the fully extended position at zero degrees elevation, a test load will be applied in a horizontal direction normal to the centerline of the ladder. The turntable will not rotate and the ladder will not deflect beyond what the product specification allows.

All welding will be in compliance with the American Welding Society standards. All welding personnel will be certified, as qualified under AWS welding codes.

All material and welds will have a fatigue life structural safety factor of 2.5:1. This will be derived from taking into account structure weight, payload, wind load, ice load, nozzle reactions, and dynamics.

The aerial device will be capable of operating with the maximum rated tip load in either of the two (2) following conditions:

- Conditions of high wind up to 50 mph
- Conditions of icing, up to a coating of .25" over the entire aerial structure

All of the design criteria must be supported by the following test data:

- Strain gage testing of the complete aerial device
- Analysis of deflection data taken while the aerial device was under test load

The following standards for materials are to be used in the design of the aerial device:

- Materials are to be certified by the mill that manufactured the material
- Materials that are certified or recertified by vendors other than the mill will not be acceptable

- Material testing that is performed after the mill test will be for verification only and not with the intent of changing the classification.

LADDER CONSTRUCTION

The ladder will extend to a nominal height, of 100 feet or higher above the ground, as measured by 1901 recommendations. The ladder (handrails, base rails, trusses, k-braces and rungs) will be constructed of welded, high strength material certified by the manufacturer as being a minimum of 70,000 pounds per square inch of yield strength.

Each section will be trussed diagonally, vertical and horizontally using round tubing. All critical points will be reinforced, for extra rigidity, and to provide a high strength-to-weight ratio. All ladder rungs will be round and welded to each section in two (2) places with "K" bracing for torsional rigidity.

Each rung will be covered with a secure, heavy-duty, fiberglass pultrusion that incorporates an aggressive, no-slip coating.

The rung covers will be glued to each rung, and will be easily replaceable should the rung cover become damaged.

Each rung cover edge will have 2.00" of photo-luminescent, aggressive, no-slip coating to assist in providing a light source for each rung during low light conditions.

The photo-luminescent coating will remain visible for up to 20 hours after exposure to light.

The rung covers will have a 10-year, limited warranty.

Each side of the ladder will be illuminated with full length blue LED rope lighting for rung illumination.

On the driver side of the aerial apparatus it will be equipped with a stokes basket mount, on the officer side of the aerial apparatus it will be equipped with an attic ladder mount.

HEIGHT

The height of the unit will extend to no less than 100', as measured by a plumb line from the top surface of the basket handrail assembly to the ground, with the basket raised to a 75 degree angle. The aerial device will be measured, in this manner, for accurate comparison.

TORQUE BOX

A "torsion box" sub frame will be installed between the two sets of stabilizers. The torque box will be constructed of .312" steel plate (50,000 pounds per square inch yield) with steel tubing reinforcement, on each side of the box, in the turntable area. The torque box sub frame assembly will be capable of withstanding all torsional and horizontal loads when the unit is on the stabilizers.

TURNTABLE

The turntable will be a 1.00" thick steel deck, coated with a non-skid, chemical resistant material in the walking areas. The stepping surfaces will meet the skid-resistance requirements of the current NFPA 1901 standard.

The turntable will be lighted by a minimum of two (2) lights activated by the aerial master switch.

The turntable will include an enclosure for the hydraulic valves and rotation motor, which will also serve as a step, for access to the ladder.

The turntable handrails will be a minimum 42.00" high and will not increase the overall travel height of the vehicle. The handrails will be constructed from 1.25" diameter extruded aluminum with a slip resistant knurled surface. The handrails will be anodized to resist corrosion.

ELEVATION SYSTEM

Two (2) double acting, lift cylinders will be utilized to provide smooth, precise elevation from 5 degrees below horizontal to 75 degrees above horizontal. The lift cylinder will be attached to each side of the base section. The lift cylinder rod will be chrome plated, to provide smooth operation of the aerial and reduce seal wear. The lift cylinders will be equipped with integral holding valves located in the cylinder, to prevent the unit from descending should the charged lines be severed, at any point within the hydraulic system and to maintain the ladder in the bedded position during road travel. The integral holding valves will NOT be located in the transfer tubes.

The elevation system will be controlled by the microprocessor. The micro processor will provide the following features:

- Envelope control of the elevation system to prevent accidental body damage
- Automatic deceleration when the aerial device is lowered into the cradle
- Automatic deceleration at the end of stroke, in maximum raise and lower positions
- Deceleration of the aerial device from 0 to -5 degrees

EXTENSION/RETRACTION SYSTEM

A hydraulically powered, extension and retraction system will be provided through dual hydraulic cylinders and wire ropes. Each set will be capable of operating the ladder in the event of a failure, of the other. For safety, systems that use only a single extension/retraction system will not be acceptable. The extension cylinder rod will be chrome plated to provide smooth operation of the aerial device and reduce seal wear. The extension/retraction cylinders will be equipped, with integral holding valves, to prevent the unit from retracting should the charged line be severed, at any point within the hydraulic system. The integral holding valves will NOT be located in the transfer tubes.

Wire ropes and attaching systems used to extend and retract the fly sections will have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of

safety for the wire rope will remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used will be 1:12. Wire ropes will be constructed of seven (7) strands over an inner wire for increased flexibility. The wire rope will be galvanized to reduce corrosion.

The extension/retraction system will be controlled by the microprocessor. The microprocessor will provide the following features:

Automatic deceleration at the end of stroke in maximum extend and retract positions

Controls the rate of retraction while flowing water

All sheaves will be greaseless and all sheave pins and pivot pins will be polished stainless steel.

ROTATION SYSTEM

A external tooth, monorace swing circle bearing will be used for the rotation system and will provide 360 degree continuous rotation. To insure proper bearing installation, both the open base bearing plate and the turntable bearing plate will be milled surfaces. The bearing will be bolted to the turntable and the base plate by a minimum of sixty grade 8, .88" bolts. Two (2) hydraulically driven, planetary gear boxes with drive speed reducers will be used to provide infinite and minute rotation control throughout the entire rotational travel. Two (2) spring applied, hydraulically released disc type swing brakes will be furnished to provide positive braking of the turntable assembly. Provisions will be made for emergency operation of the rotation system should complete loss of normal hydraulic power occur. The hydraulic system will be equipped with pressure relief valves which will limit the rotational torque to a nondestructive power.

The rotation system will be controlled by the microprocessor. The microprocessor will provide the following features:

- Envelope control of rotation system to prevent accidental body damage
- Prevent the aerial from being rotated into an unstable condition

MANUAL OVERRIDE CONTROLS

Manual override controls will be provided for all aerial and stabilizer functions.

LADDER SLIDE MECHANISM

Polyethylene wear pads will be used between the telescoping ladder sections, to provide greater bearing surface area for load transfer. Adjustable slide pads will also be used to control side play between the ladder sections.

BASKET LEVELING SYSTEM

A basket leveling system will be provided and so designed, that the basket with its rated load, can be supported and maintained level, relative to the turntable, regardless of the elevation or flexion of the ladder.

Basket leveling will be accomplished by hydraulic circuitry that is independent from the main hydraulic system. The leveling of the basket features a dual master/slave hydraulic cylinder system, with each side capable of supporting the load, while maintaining the basket level. Two (2) master cylinders are mounted between the turntable and the base ladder section, with two (2) slave cylinders mounted between the ladder fly section and the basket. The slave and master cylinders are 100% matched, so as the ladder is raised or lowered, exact amounts of hydraulic fluid are transferred between the master and slave cylinders thus maintaining the basket level.

The hydraulic circuitry includes pressure operated counter balance valves, on the load side of the slave cylinders, to prevent the basket from tipping should the hydraulic lines be severed.
A momentary switch is provided, on the cab instrument panel, to level the basket should this become necessary due to ambient temperature changes. It is not necessary to start the engine and activate the main hydraulic system to level the basket.

ROTATION INTERLOCK

The microprocessor will be used to prevent the rotation of the aerial device to the side in which the stabilizers have not been fully deployed (short-jacked). The microprocessor will allow full and unrestricted use of the aerial, in the 180 degree area, on the side(s) where the stabilizers have been fully deployed. The system will also have a manual override, to comply with NFPA 1901. This will consist of a switch, located in the lower control station, so that activation will require two (2) persons (one (1) at an aerial device control location and one (1) at the lower control station).

NOTE: SYSTEMS THAT PERMIT THE AERIAL TO ROTATE TO THE "SHORT JACK" SIDE, WITHOUT AUTOMATICALLY STOPPING THE ROTATION AND/OR WITHOUT ACTUATION OF THE "MANUAL OVERRIDE", WILL NOT BE ACCEPTED. SYSTEMS THAT ONLY INCLUDE AN ALARM ARE NOT CONSIDERED AN INTERLOCK AND WILL NOT BE ACCEPTED.

LOAD CAPACITIES

The following load capacities will be established with the stabilizers at full horizontal extension and placed in the down position to level the truck and to relieve the weight from the tires and axles. Capacities will be based upon full extension and 360 degree rotation.

A load chart, visible at the operator's station, will be provided. The load chart will show the recommended safe load at any condition of the aerial device's elevation and extension.

50 MPH WIND CONDITIONS/DRY

Degrees of Elevation	-5 to 29	30 to 39	40 to 49	50 to 75
Basket	1250	1250	1250	1250
Fly	-	-	250	500
Mid	-	250	500	750
Base	250	500	750	1000

WATER TOWER OPERATION

The following capacities will be based upon continuous 360 degree rotation and full extension.

50 MPH WIND CONDITIONS/WATER CHARGED

Degrees of Elevation	-5 to 29	30 to 39	40 to 49	50 to 75
Basket	500	500	500	500
Fly	-	-	250	500
Mid	-	250	500	500
Base	-	500	500	750

ELEVATION -5 To +75 DEGREES

The aerial device will be able to maintain the above load capacities while flowing up to 1500 GPM and a nozzle position of 0 to 90 degrees to either side of the ladder centerline, as far above and below horizontal to the platform as nozzle design allows.

While flowing 1500 to 2000 GPM the nozzle position will be limited to 45 degrees either side of the ladder centerline horizontal to the platform, 30 degrees above horizontal, and as far below horizontal to the platform as nozzle design allows.

Reduced loads in the basket can be redistributed in 250 lb. increments to the fly, mid, or base as needed.

LADDER CRADLE INTERLOCK SYSTEM

A ladder cradle interlock system will be provided through the microprocessor to prevent the lifting of the aerial device from the nested position until the operator places all the stabilizers in a load supporting configuration. A switch will be installed at the boom support to prevent operation of the stabilizers once the aerial has been elevated from the nested position.

BOOM SUPPORT

A heavy duty boom support, constructed of steel, is to be provided for support of the ladder in the travel position. The boom support will be bolted to the chassis frame as close to the front axle as design allows. On the base section of the ladder, a stainless steel scuff plate will be provided where the ladder comes into contact with the boom support.

EXTENSION INDICATOR

Extension markings and corresponding numerical indicators will be provided along each inside and outside top rail of the base section of the aerial every ten (10) feet. They will indicate various positions of extension up to full. Markings and indicators will be clearly visible to the console operator. To aid in visibility during hours of darkness, the markings and numerical indicators will be of a red reflective material.

The boom support will be located just to the rear of the chassis cab.

BASKET STRUCTURE

The complete basket structure will be constructed of welded high strength steel certified by the manufacturer to have a minimum of 46,000 pounds per square inch yield strength. Modular construction of the aerial platform basket will allow for easy component replacement should the basket become damaged during use. The aerial basket will be fully tested and independent third party certified.

The flooring and front decking of the basket will be of materials that will preventing the accumulation of water on the standing surface. The stepping surfaces will meet the skid-resistance requirements of current NFPA 1901 standard.

The outside basket steps used for transferring in and out of the basket will be at the same level as the basket floor. The steps on the front are approximately 16.00" deep. The front corners of the basket step will be mitered at 45 degrees to allow the basket to be maneuvered closer to buildings when approaching at an angle. A heavy extruded rubber bumper strip will be fastened to the outside edge of the step.

Four (4) stainless steel pompier belt safety loops will be attached to the inside of the basket. Two (2) lifting eyes will be provided on the bottom side of the basket support structure.

Platform rating shall be 1250lbs
Four (4) rubber bumpers are provided on the bottom side of the basket structure for damage protection when setting it down on a surface.

The basket interior will be fully illuminated using non-glare rope light. All hoses and wiring at the basket will be fully enclosed. Electrical sub-components will be mounted at the rear of the basket in a separate enclosure for easy servicing while maintaining an unobstructed basket interior.

Allowances for 2 custom tool boxes to be placed for tools accessories.

BASKET SIDES

The sides of the basket will be of solid single pan aluminum construction and, along with the basket doors, will form a continuous 42.00" high wall around the basket. The modular design of the basket will allow for easy replacement of components in case of damage. 8inch non skid tread walkway on basket sides.

BASKET ENTRANCES/EXITS

Two (2) swing-in, spring-loaded, self-closing double pan doors constructed of aluminum will be provided at the front of the basket. The impact release door latches will be provided on the basket doors. The door latches will allow the basket doors to be opened from outside the basket by applying pressure to the outside of the door, either with the foot or the hand. A tread plate scuff plate will be provided at the bottom exterior of the doors. The rear of the basket will be equipped with a stainless steel vertical self-closing gate for transfer to and from the basket's ladder device. Telescoping-type handrails will be provided as a banister to bridge the gap between the basket and the fly section at all elevations.

ACCESSORY MOUNTING RECEPTACLES

Two (2) universal accessory mounting receptacles will be permanently affixed on the front of the basket to receive rescue basket holders, rappelling arms, roof ladder brackets, winch, etc.

Complete interchangeability will be required without modification to the basket.

BASKET HEAT SHIELDS

A heat reflective shield will be provided on the front, sides and bottom of the basket.

The double pan basket access doors will form the heat shield at the front of the basket. The area between the access doors and behind the monitor(s) will be shielded with a horizontally hinged single pan aluminum fold down panel. The side heat shields will be formed by a single sheet of .090 aluminum. These heat shields will be painted to match the aerial device.

Full under the basket heat shield protection with a non-glare finish will be provided with dual swing-down doors for ease of servicing and clean out.

SPOTLIGHTS

Three (3) Unity, 12-volt, 20,000/50,000 candle power spot/floodlights will be furnished.

Power to the lights will be controlled by a master on/off switch at the turntable control operator's position.

Individual switches will also be provided on each light for on/off and spot/flood pattern selection.

The two (2) "tracking lights" will be mounted on the base section of the ladder, one (1) on each side.

One (1) "basket light" will be mounted on the front of the aerial basket.

The light will be mounted below the top edge of the platform so as not to increase the overall height of the unit.

The light will be easily positionable while remaining in the basket regardless of monitor and standpipe options.

There shall be (1) 110 volt fire and rescue 500 watt landing light. The light shall be installed and partially recessed into the underside of the platform. The light shall aid the operator when landing the platform on a surfaces by clearly, illuminating area under the basket.

ELECTRICAL SYSTEM

The 100' platform will consist of the following components:
A tethered stabilizer control will be provided. The tethered control will be weatherproof and oil resistant. It is preferred that the tethered cable is NOT fiber optical. A LED indicator

light will be labeled on a metal photo panel for each function. The electrical connection at the tethered control will be permanently attached by a strained relieved coil cord that will allow the operator to move 14ft away from the electrical connection for operation.

Remote Stabilizer Controls
Weatherproof and oil resistant
One (1) green "power" indicator light
One (1) red "stabilizer not stowed" indicator light
One (1) electric toggle switch for auto level assist
One (1) electric toggle switch for the emergency power unit
One (1) electric toggle switch for each stabilizer to control:

- Extend/retract function
- Raise/lower function

One (1) green "stabilizer fully extended" indicator light for each stabilizer
One (1) green "firm on ground" indicator light for each stabilizer

Each of the modules will be configured as follows:
Sealed to a NEMA 4 rating
Operating range from -40 degrees F to 185 degrees F (-40 degrees C to 85 degrees C)
Communicate using J1939 data link
Two (2) diagnostic LED lights
One (1) green light that illuminates when module has power (B+) and ground
One (1) red light that flashes to indicate the module is capable of communicating via the data link

INFORMATION CENTER

There will be an information center provided. The information center will operate in temperatures from -40 to 185 degrees Fahrenheit. The information center will employ an operating system and a LCD display. The LCD will be sunlight readable. There will be five (5), weather-resistant user interface switches provided.

OPERATION

The information center will be designed for easy operation in everyday use. There will be a page button to cycle from one screen to the next screen in a rotating fashion. A video button will allow an NTSC signal into the information center to be displayed on the LCD. If any button is pressed while viewing a video feed, the information center will return to the vehicle information screens. There will be a menu button to provide access to maintenance, setup, and diagnostic screens. All other button labels will be specific to the information being viewed.

GENERAL SCREEN DESIGN

Where possible, background colors will be used to provide vehicle information at a glance.

If the information provided on a screen is within acceptable limits, a green background color will be used. If the information provided on a screen is not within acceptable limits, an

amber background color will indicate a caution condition and a red background color will indicate a warning condition.

Every screen in the information center will include the aerial tip temperature, the time (12- or 24-hour mode) and a text Alert Center. The time will be synchronized between all color displays located on the vehicle. The Alert Center will display text messages for audible alarms. The text messages will identify any items causing the audible alarm to sound. If more than one (1) audible alarm is activated, the text message for each alarm will cycle every second until the problems have been resolved. The background for the Alert Center will change to indicate the severity of the warning message. Amber will indicate a caution condition and red will indicate a warning condition. If a warning and a caution condition occur simultaneously, the red background color will be shown for all Alert Center messages.

A label will be provided for each button. The label will indicate the function for each active button for each screen. If the button is not utilized on specific screens, it will have a button label with no text.

Symbols will accurately depict the aerial device type the information pertains to such as rear mount ladder, rear mount platform, mid-mount ladder or mid-mount platform.

PAGE SCREENS

The Information center will include the following pages:

The page will indicate the following information:

- Rungs Aligned and Rungs Not Aligned will be indicated with text and respective green or red colored ladder symbols.
- Ladder Elevation will be indicated via a fire apparatus vehicle with ladder symbol with the degree of elevation indicated between the vehicle and ladder.
- Water Flow (if applicable) will be indicated via a water nozzle symbol and text indicating flow / time.
- Breathing Air Levels will be indicated via an air bottle symbol and text indicating the percent (%) of air remaining. A green bar graphs shown inside the bottle will indicate oxygen levels above 20%. A red bar graph will indicate oxygen levels at or below 20%. When oxygen levels are at or below 10% the red bar graph will flash.
- The Aerial Load Chart will indicate the load limit on each section of the ladder based on actual ladder position and water flow (if applicable).
- The color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

The Aerial Reach and Hydraulic Systems page will indicate the following information:

- Aerial Hydraulic Oil Temperature will be indicated with symbol and text.
- Aerial Hydraulic Oil Pressure will be indicated with a symbol and text.
- The following calculations will be indicated on a representative vehicle symbol:
- Aerial Device Extension length.

- Aerial Device Height indicating the height of the aerial device tip from the ground.
- Aerial Device Reach indicating the horizontal distance the aerial reaches from the turntable.
- Aerial Device Angle indicating the angle from the vehicle which the device is at.
- Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

The Level Vehicle page will indicate the following information:

- The grade of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of grade shown in text format. The symbol will tilt dependent on the vehicle grade.
- The slope of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of slope shown in text format. The symbol will tilt dependent on the vehicle slope.
- Outriggers status will be indicated via a colored symbol for each outrigger present. Each outrigger status will be defined as one of the following:
- Outrigger stowed indicated with a silver pan located close to the vehicle
- Outrigger fully extended indicated with a fully deployed green outrigger
- Outrigger short-jacked indicated by a yellow outrigger partially deployed
- Outrigger not set indicated by a red outrigger that is not set on the ground
- A text box located on the vehicle symbol will be utilized to identify the overall status of the outrigger leveling system.

The following status will be indicated in the text box:

- Deployed status will indicate all outriggers are properly set on the ground at full extension
- Shortjacked status will indicate one or more outriggers are set on the ground but not fully extended.
- Not Set status will indicate one or more outriggers is not properly set on the ground.
- Stowed status will indicate all outriggers are stowed for vehicle travel.
- A bedding assist alert will indicate that the aerial device is being aligned by the system as the operator lowers the aerial device into the cradle with the joystick.
- The color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

MENU SCREENS

The following screens will be available through the Menu button:

The screen will display aerial device hours, aerial PTO hours, ladder aligned for stowing, aerial rotation angle, total water flow (if applicable), and aerial waterway valve status (if applicable).

The screen will allow brightness increase and decrease and include a default setting button.

The screen will allow setting of video contrast, video color and video tint.

The screen allows setting of the screen that will be active at vehicle power-up. The screen has a 12- or 24-hour format, and allows setting of the time and date.

The screen shows a list of all active alarms including the date and time of each alarm occurrence and shows all alarms that are silenced.

The System Diagnostics screen allows the user to view system status for each module and it's respective inputs and outputs. Viewable data will include the module type and ID number; the module version; and module diagnostics information including input or output number, the circuit number connected to that input or output, the circuit name (item connected to the circuit), status of the input or output, and other module diagnostic information.

Aerial Calibrations screen indicates items that may be calibrated by the user and instructions to follow for proper calibration of the aerial device.

Button functions and button labels may change with each screen.

LOWER CONTROL STATION

A lower control station will be located, at the rear of the apparatus, in an easily accessible area. The controls and indication labels will be illuminated, for nighttime operation. The following items will be furnished at the lower control station and will be clearly identified and conveniently located for ease of operation and viewing:

- Level assist switch
- Override switch to override microprocessor
- Emergency power unit switch

AERIAL DEVICE CONTROL STATIONS

There will be two (2) device control stations, one (1) will be referred to as the basket control station and the other as the turntable control station. All elevation, extension and rotation controls will operate from both of these locations. The controls will permit the operator to regulate the speed of the aerial functions, within the safe limits, as determined by the manufacturer and NFPA standards. The controls will be grouped and operate in an identical manner at both stations for similarity of operation. The controls will be clearly marked and lighted for nighttime operation.

Each control will be equipped, with a positive lock to hold the control in a neutral position, preventing accidental activation. In addition to the neutral lock, a console cover will be provided at the turntable control station. The controls will be so designed to allow the turntable control station to immediately override the basket controls, even if the ladder is being operated by the basket controls.

TURNTABLE CONTROL STATION

The turntable control station will be located, on the left side of the turntable, so the operator may easily observe the basket while operating the controls.

The following items will be installed at the turntable control station, clearly identified, lighted for nighttime operation and conveniently located for ease of operation and viewing:

- Electric controls for elevation, rotation, extension/retraction
- Intercom controls
- Tip tracking light switch
- Emergency power unit switch
- Operator's load chart
- A three (3) position switch for selecting aerial operational speed.

TURNTABLE WORK LIGHTS

There will be a minimum of two (2), 12-volt work lights installed on the turntable, to illuminate the surrounding area for nighttime operation. The work lights will be activated by the aerial master switch.

BASKET CONTROL CONSOLE

The basket instrument panel will be located at the front center, of the aerial platform. The following controls will be installed at the console and be clearly identified, illuminated for nighttime operation and conveniently located for ease of operation and viewing:

- Intercom controls
- Operator's load chart

AERIAL FUNCTION CONTROLS

The aerial function controls, elevation, rotation, extension/retraction will be mounted in a separate control box, which will be attached to the front of the platform control console, by means of an easily removable slide mechanism. The aerial function control box will have infinite positions along with three (3) fixed attachment points in the basket. The electrical connection will be by a permanently attached, strain relieved, coiled cord. The legend for the control lever functions will be illuminated. Aerial platform controls shall be of 3 function Joystick control.

HIGH IDLE

The high idle will be controlled by the microprocessor. The microprocessor will automatically adjust the engine rpm, to compensate for the amount of load placed upon the system. The system will include a safety device that allows activation of the high idle, only when the parking brake is set and the transmission is placed in neutral.

STABILIZERS

Two (2) sets of extendible, out and down, "H" type stabilizers will be provided for stability. The stabilizers will have a spread of no more than18 feet.

The stabilizers will be the double box design, with jack cylinders. The jack cylinders will be equipped with integral holding valves, which will hold the cylinder either in the stowed

position or the working position, should a charged line be severed at any point within the hydraulic system. For safety, the integral holding valves will be located in the cylinder base end, NOT in the transfer tube. Vertical jack cylinder rods will be fully enclosed by a telescoping inner box to protect the cylinder rods against damage which may occur.

The extension cylinders will be totally enclosed within the extension beams. The horizontal extension cylinders will be of the trombone type to eliminate wear and potential failure of hydraulic hoses.

The stabilizers will have the capability of 18.00" of ground penetration, for set-up on uneven terrain. Extension of the horizontal beams will be activated by an extension cylinder. The extension cylinders will be totally enclosed within the extension beams. The cylinders will be equipped with internal decelerators.

Each stabilizer leg will have attached to the end of the leg a steel shield. The shield will be of the split-pan design and will be a maximum so as to allow the extension of the stabilizer between parked cars. This plate will serve as a protective guard and a mounting surface for warning lights. The top, forward, and rear edges will be flanged back for added strength.

STABILIZER CONTROLS

A portable stabilizer control box will be provided. The control box will be weatherproof and oil resistant. Each function and indicator light will be labeled on a metal photo panel. The control box can be taken as far away as 15 feet from the vehicle with an extension cable.

The stabilizer control box will include the following:

- One (1) green power indicator light for stabilizer control which will be illuminated when the PTO is "ON" and the aerial is in the travel position.
- Four (4) electric toggle switches for stabilizers: each toggle switch will control the extend/retract and raise/lower of its respective stabilizer to allow vehicle set up in restricted areas and/or on uneven surfaces.
- Auto leveling assist switch: The outrigger control system will incorporate a computerized self leveling system in addition to the standard outrigger controls. The operator will have the option to manually or automatically set the outriggers. The computerized system will ensure full outrigger extension, proper jack penetration, and will level the vehicle within 1/2 a degree of level for safe operation of the aerial device.
- One (1) electric toggle switch for the engaging the emergency power unit.
- One (1) green "stabilizer not stowed" indicator light: this light will illuminate when the stabilizers are not in the fully stowed position.
- Four (4) fully extended beams green indicator lights: these lights will be illuminated when each of the respective stabilizer beams are fully extended.
- Four (4) firm on ground green indicator lights: each light will be illuminated when its respective stabilizer shoe is in the load supporting condition.

Each toggle switch will activate the engine fast idle automatically.

Manual override will be supplied for each stabilizer control valve.

A "Stabilizers Not Stowed" indicator light will be provided in the driver's compartment. It will illuminate automatically whenever the stabilizers are not fully stowed to prevent damage to the apparatus if moved. The stabilizer system will also be wired to the "Do Not Move Indicator Light", which will flash whenever the apparatus parking brake is not fully engaged and the stabilizers are not fully stowed.

STABILIZER PADS

A one (1) position, floating stabilizer pad will be provided on each stabilizer. The pads will require no operator adjustment during set up. The stabilizer pad will have the ability to pivot, in a 360 degree plane, for set up on uneven terrain.

AUXILIARY STABILIZER PADS

A set of four auxiliary plates with handles will be provided for additional load distribution on soft surfaces. Their size will be 24.00" x 24.00" and they will be constructed of a composite material. The ground contact area for each stabilizer will be such that a unit pressure not greater than 75 psi (500 kPa) will be exerted over the ground contact area when the apparatus is loaded to its maximum in-service weight and the aerial device is carrying its rated capacity in every position permitted by the manufacturer. Two (2) auxiliary plates will be stored on each side of the vehicle.

CRADLE INTERLOCK SYSTEM

A cradle interlock system will be provided, to prevent the lifting of the aerial from the nested position, until the operator has positioned all the stabilizers in a load supporting configuration. A switch will be installed at the cradle, to prevent operation of the stabilizers once the aerial has been elevated from the nested position.

STABILITY ALARM

An audible alarm will be provided at the control console, to alert the operator should the stability limitations of the ladder be exceeded. The alarm will only notify the operator of the condition, but in no way restrict further operation of the ladder. Two (2) amber strobe lights will be located at the tip of the base section, one (1) each side, wired to the load gauge to indicate an unsafe condition.

STABILIZER SCENE LIGHTS

A clear floodlight will be mounted at each stabilizer, to illuminate the surrounding area. The light will activate with the aerial master switch.

STABILIZER PINS

The stabilizer jacks will not have holes for the stabilizer pins.

AUXILIARY STABILIZER PADS STORAGE TOGETHER

Two (2) auxiliary stabilizer pads will be stored together in one (1) bracket. There will be one (1) bracket each side of the vehicle, behind the rear tandem. The bracket will be mounted as high as possible, not to effect angle of departure. The one (1) bracket on each side of the

apparatus stored together will be in place of a stacked configuration of two (2) separate brackets behind the rear tandem.

STABILIZER WARNING LIGHTS

Four (4) flashing LED warning light will be mounted on the stabilizer cover panel, one (1) for each panel.

Front stabilizer LEDs to be red LED/clear lens each side. Rear stabilizer LEDs to be red LED/clear lens each side.

These warning lights will be activated by the NFPA side zone switch. These lights will be provided with a flange.

STABILIZER BEAM WARNING LIGHTS

Two (2) red LED flashing lights will be mounted on each stabilizer, one (1) facing forward and one (1) facing rearward. The lights will LED lights. The lights will be recessed in the horizontal beam of the stabilizer. These warning lights will be activated with the aerial master switch.

HYDRAULIC SYSTEM

A **three (3) year** leak-free guarantee warrants seal connections to be leak-free for a period of three (3) years. Fittings shall exceed SAE vibration test and will withstand two (2) times the normal assembly torque. Abrasion resistant cover hose will be used extensively throughout the system. This hose has a minimum burst pressure on all sizes of 12,000 psi and one-half the required SAE bend radius. All fittings have minimum dynamic design strength of 36,000 psi on the smallest fittings to 14,000 psi on the largest fittings, well within the NFPA. 4:1 required safety factor.

Ball valves designed for hydraulic systems will be used to permit component servicing. No low cost, household plumbing type globe valves will be used.

A diagnostic manifold with connect under pressure nipples will be provided in one (1) convenient location. No user supplied equipment will be required. All pressures can be displayed on the panel with preconnected on-board equipment.

The efficient use of electric over hydraulic valves, along with microprocessed safety features, eliminates the need for a diverter valve and its associated circuitry.

Minimized unnecessary fittings and adapters, streamlining the system

Increased connector accessibility, making assembly and maintenance easier

Standardized the connector system

PRESSURE FILTER
The pressure filter will be made of a microglass medium, which has the highest capture efficiency, dirt holding capacity and life expectancy over other media such as cellulose and synthetic.

RETURN FILTER
The return filter will be made of a microglass medium which, has the highest capture efficiency, dirt holding capacity and life expectancy over other media such as cellulose and synthetic.

HYDRAULIC RESERVOIR
The hydraulic oil tank will have a capacity of about 65 gallons. Float switches will be provided to monitor the oil level. The oil level will be shown on the LCD display. The oil fill will be in an easily accessible area and be conspicuously marked "hydraulic oil". The oil fill will be furnished with a cap that will act as a ventilator, to provide clean fresh air into the oil tank and a 40 micron filter to provide positive protection from contaminates. The hydraulic tank fill is 1.50" and the drain hose line will terminate with a quarter turn valve.

The hydraulic oil tank will be furnished with two (2) suction outlets, one (1) outlet being used for normal operation and the other will be reserved for emergency operations. The emergency outlet is located further down in the oil tank, to provide some reserve oil in case a hydraulic line is broken. The normal operation outlet will have a 100 mesh filter. The tank will be supplied with a quarter turn ball valve in the suction line.

A sight level gauge for the hydraulic tank will be provided. The sight gauge will be located in the left front stabilizer well. A shutoff valve will be provided at the top and bottom ports on the sight gauge.

HYDRAULIC CYLINDERS
All hydraulic cylinders used on the aerial device will be produced by a manufacturer that specializes in the production of hydraulic cylinders.

Each hydraulic cylinder will have a structural warranty of not less than five (5) years, and a seal warranty of not less than two and one-half (2.5) years.

POWER TAKEOFF
The apparatus will be equipped with a power takeoff driven by the chassis transmission and actuated by an electric switch, located inside the cab. The power takeoff, which drives the hydraulic pump, will meet all the requirements for the operation of the aerial unit. The hydraulic system will operate at a nominal 45 gallons per minute, with flow and pressure up to 3,000 pounds per square inch. An amber indicator light will be installed, on the cab instrument panel, to notify the operator that the power takeoff is engaged.

An interlock will be provided that allows operation of the aerial power takeoff, only after the chassis spring brake has been set and the chassis transmission has either been placed in the neutral position or the transmission is in drive position with the driveline to the rear axle

disengaged.

HYDRAULIC PUMP

The hydraulic system will be supplied by a load sensing piston type pump. The pump will provide adequate fluid volume, to allow all ladder functions to operate simultaneously. The aerial will be operable (at reduced speed) at engine idle. The pump will supply oil only when the ladder is in motion, thereby preventing overheating of the hydraulic oil. When the hydraulic pressure reaches a preset level the pressure compensating feature of the pump discontinues any flow into the system.

A high pressure manifold block, with test ports, will be located at the turntable to allow testing of all aerial functions.

The hydraulic system will be protected from possible hydraulic pump malfunctions by a relief valve, which will route the excess oil into the oil tank, when the pressure in the hydraulic system exceeds 3,150 pounds per square inch.

EMERGENCY PUMP

The apparatus will be equipped with an emergency hydraulic pump that is electrically driven from the truck batteries. The emergency power unit will be capable of limited ladder functions, to stow the unit in case of a prime mover failure. A momentary control switch for the emergency pump will be installed at the lower (stabilizer) control panel and at the turntable control console. The control will be a spring loaded momentary switch. The pump will be capable of continuous operation for 30 minutes.

HYDRAULIC SWIVEL

The aerial ladder will be equipped with a three (3) port, high pressure hydraulic swivel which will connect the hydraulic lines from the hydraulic pump and reservoir through the rotation point to the aerial control bank. The hydraulic swivel will allow for 360 degree continuous rotation of the aerial.

ELECTRIC SWIVEL

The ladder will be equipped with an electric swivel to allow 360 degrees rotation of the aerial while connecting all electrical circuits through the rotation point. A minimum of 36 collector rings will be provided that are capable of supplying 20 amp continuous service. All collector rings will be enclosed and protected with desiccant plugs against condensation and corrosion. No oil or silicone will be used.

WATER SWIVEL

Water will be transferred to the aerial waterway by means of a 5.00" internal diameter waterway, through the swivel, permitting 360 degree continuous rotation.

BREATHING AIR

Breathing air will be supplied to the aerial platform. The air system will incorporate one (1), 444 cubic foot (minimum), and 6000 psi cylinder. To allow the turntable operator an unobstructed view of the platform, the cylinder will be mounted directly in front of the

turntable and below the ladders. The air cylinder will be interconnected through a pressure regulator located at the air cylinder. A shutoff valve with guard will be provided on the cylinder. The air will be routed to the basket using hose especially designed for use in breathing air systems. At the basket, the breathing air will be piped to two (2) air mask quick disconnects. The disconnects will be located one at the front and one at the rear of the aerial basket. A weather resistant storage compartment for the air masks will also be provided in the basket. A 50 foot recharge hose will be provided for refilling the air cylinder without having to remove the tank from it's mounting. Allowance for fittings and piping for integration with Scott Mobile air unit is required.

BREATHING AIR LEVEL AND WARNING SYSTEM

The level of breathing air remaining will be visible on the LCD display at all operating positions. The display will incorporate a low pressure warning circuit which activates an audible alarm when 20% maximum air cylinder capacity remains. A second, louder audible alarm will activate when the remaining air level drops to 10% of maximum air cylinder capacity.

RAISED AERIAL PEDESTAL

The aerial pedestal will be raised to accommodate the height of the cab.

HOSE BOX AT PLATFORM

A hose storage box with a hinged cover will be provided at the platform. The box will be constructed of smooth aluminum and will be painted to match the aerial device. The box will have a capacity of 100' of 1.75" hose and nozzle.

ROTATION BEARING COVER

An aluminum tread plate cover will be fitted over aerial rotation bearing area. The cover will be attached to the underside of the turntable deck.

BRACKETS

One (1) set of brackets will be supplied which will have the following three (3) options combined into one (1) set of brackets.

The brackets will be provided for use at the front of the platform basket to increase the safety of firefighters during fire ground and rescue operations. Brackets will be zinc coated and capable of holding up to a 20 foot roof ladder securely in place. The ladder will be secured through its beams and one (1) rung, by a bar capable of being latched in place and able to withstand a minimum of a 500 pound load while maintaining a minimum of a two to one (2.5:1) safety factor. The complete system will maintain and exceed these criteria as well. There will also be a latching pawl to keep the ladder in a vertical position at all times and will latch on a rung, at least two (2) rungs below the primary attachment point. There shall be appropriate strain gauging and testing completed on the system, (ladder and complete holding device), proving the above criteria has been satisfied.

The rappelling arms will be provided. The zinc coated brackets will mount to the front of the platform basket, one (1) each side centered over the monitor/s and will be held in place with

four (4) hardened 1.00" hitch pins, two (2) for each bracket. The brackets will be easily removable for storage. Each ***rappelling*** arm will have a capacity of 300#.

The rescue basket support brackets will be provided. The brackets will mount to the front of the platform basket, one (1) each side centered over the monitor/s and will be held in place with four (4) hardened 1.00" hitch pins, two (2) for each bracket. The ***brackets*** will be easily removable for storage. Two (2) quick clip basket straps will be used to secure the basket to the brackets.

PLATFORM DOOR LATCHES

The latches provided on the platform doors will be positive locking latches. This will be in place of the impact release latches.

BARS, AERIAL TURNTABLE

Safety bars will be installed at the aerial turntable. Padding and springloaded return required.

AERIAL WATERWAY

The aerial waterway will be capable of being supplied by either a midship mounted pump or an external water source through a 5.00" intake at the rear of the apparatus.

A 5.00" water swivel will be installed below the aerial turntable permitting the ladder to rotate 360 degrees continuously.

A 5.00" water swivel will be installed at the aerial heel pivot pin that will permit water tower operations of -5 degrees to 75 degrees. The heel pivot pin will not be integral with the waterway swivel at any point. The waterway design will allow complete servicing of the waterway swivel without disturbing the heel pivot pin.

A telescoping aluminum waterway will be installed beneath the center of the aerial ladder. The waterway will consist of a 5.00" diameter tube for the base section, 4.50" diameter tube for the mid-section and 4.00" diameter tube for the fly section.

An 1.50" drain will be provided for the waterway with the control at the rear of the unit.

WATERWAY SEALS

The waterway seals will be of type design, composed of nitroxile seal and a nitrile wiper, which together offer maximum stability and extrusion resistance on the waterway. The seal will be capable of withstanding pressures up to 2000 psi, temperatures in excess of 250 degrees Fahrenheit and have resistance to all foam generating solutions. The seals will be internally lubricated.

The waterway seals will have automatic centering guides constructed of synthetic thermalpolymer. The guides will provide positive centering of the extendible sections within each other and the base section to insure longer service life and smoother operation.

PLATFORM WATER SYSTEM

A 4.00" (internal diameter) water swivel will connect the fly section waterway to the platform waterway. The water swivel will permit water tower operations from -5 degrees to 75 degrees. The water will be routed from the swivel to a gear operated butterfly valve on the front of the platform using a tube. The deluge gun will be bolted onto the butterfly valve.

A preset pressure relief valve will be provided in the waterway system. It will be designed to protect the aerial waterway from excess pressure. It will dump water to the ground when operating.

A shower nozzle rated at 75 gpm will be provided beneath the platform for heat protection for the platform personnel. A direct linkage control for the shower nozzle will be provided.

One (1) - 2.50" preconnect will be provided at the front of the platform. The preconnect will be gated at the platform. The preconnect will be furnished with 2.50" NST threads and chrome plated cap.

AERIAL MONITOR

Two (2) monitors, one (1), manual with a 2000 gpm, nozzle and one (1), electric with a 2000 gpm, nozzle will be provided at the platform. The manual monitor will be double handwheel controlled. The controls for the electronic monitor will be located at the platform and the turntable control console. Taskforce tips monitor models hurricane and typhoon valve under monitor with manifold options for aux 1.5" connections on ball valves.

Waterway flow, including total water flowed, will be monitored by the microprocessor. An LCD display will be located at the upper and lower control stations.

REAR INLET

A 5.00" NST inlet to the aerial waterway will be provided at the rear of the apparatus. It will be furnished with a 5.00" adapter and a 5.00" long handle cap.

PIKE POLE STORAGE

All pike poles shall be stowed in tubes in the rear of the apparatus in a fully enclosed compartment. See Appendix A

LADDERS

There shall be enough ladders of various duty and lengths along with storage for the ladders to meet NFPA standard 1901. See Appendix A

WHEEL CHOCKS W/ BRACKETS

There shall be a pair of folding wheel check with chock holders mount on the apparatus body.

MANUALS

The aerial manufacturer will provide three (3) hard copy operator maintenance manuals and three (3) hard copy wiring diagrams, plumbing and hydraulic pertaining to the aerial device.

The aerial manufacturer will provide one (1) digital copy operator maintenance manuals and one (1) digital wiring diagrams, plumbing and hydraulic pertaining to the aerial device.

INITIAL INSTRUCTION

On initial delivery of the fire apparatus, the contractor will supply a qualified representative to demonstrate the apparatus and provide initial instruction to the fire department regarding the operation, care, and maintenance of the apparatus for a period up to three (3) days.

LOOSE EQUIPMENT

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.
- All other loose equipment listed in Appendix A.

SOFT SUCTION HOSE

Soft suction hose will be provided that meets required NFPA specifications as outlined under the general requirements of Chapters 5 - 12 at time of contract execution.

PAINT CHASSIS FRAME ASSEMBLY

The chassis frame assembly will be painted black before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc. Components that are included with the chassis frame assembly will be painted black are frame rails, cross members, axles, suspension, steering gear, fuel tank, body substructure supports, miscellaneous mounting brackets, etc.

WARRANTY - PAINT AND CORROSION

Limited Warranty

Except as provided below, and provided the vehicle has been placed in service within 60 days after delivery to the original purchaser as established by our original invoice, for a period of **ten (10) years** after delivery a copy will be included with this proposal.

Paint shall be two tone PPG white #2185 with lower color PPG# Cardinal Red 71528

WHEELWELL PAINT COLOR

The cab and body wheel well liners will be painted black.

PAINT, COMPARTMENT INTERIOR

The compartment interior will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

AERIAL DEVICE PAINT COLOR

All aerial device structural components above the rotation point that are not chrome plated or stainless steel will be painted. The ladder surfaces to be painted will be phosphatized to remove metal impurities, aid paint adhesion and inhibit rust. The components will be prime painted with an epoxy primer and finished painted with a durable, high gloss polyurethane

paint.

All the hydraulic hoses, wiring and non-ferrous metals will be masked off before painting. Paint color to be PPG White#2185

REFLECTIVE STRIPES

Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" white stripe at the top with a 1.00" gap then a 6.00" white stripe with a 1.00" gap and a 1.00" white stripe on the bottom. A 4.00" band will be provided at the rear of the apparatus.

The reflective band provided on the cab face will be located below the stainless steel trim band and the front bumper.

LADDER SIGNS

Two (2) 132" x 24" Painted metal Placards for Department identification signs shall be provided. One shall be installed on each side of the bed section of the ladder. Placards shall me made of smooth aluminum sheet metal and be securely fastened to ladder trussing. Paint color shall be PPG Cardinal red # 71528.

LETTERING AND STRIPING

Lettering and Striping allowance for genuine 22karat gold leaf with single color drop shadow.

Maximum of 140 Letters 3-4" in size. With additional allowance for ½" Gold leaf striping with black background full body length, Both sides. Additional allowances for 2 custom designed tiger emblems on crew cab doors, 2 custom unit numbers, with an additional 10 18" ScotchLite letters with 1" tracer strip for Ladders panels.

BASKET/CONSOLE REFLECTIVE STRIPE

A reflective stripe that matches the one on the body will be installed around the lower edge of the basket and the control console.

REFLECTIVE STRIPE ON STABILIZERS, IPOS

A 4.00" alternating red and yellow green fluorescent diamond grade reflective chevron stripes will be provided on the forward and rear facing sides of all four (4) aerial stabilizers in place of the standard yellow stripes. The stripes will be angled at a 45 degree angle.

CHEVRON/INVERTED "V" STRIPING ON REAR WALL

There will be alternating chevron striping located on the rear wall of the apparatus.

The striping will consist of the following colors:
The first color will be lime yellow diamond grade
The second color will be red diamond grade

The size of the striping will be 6.00".

CHEVRON/INVERTED "V" STRIPING ON REAR COMPARTMENT

There will be alternating chevron striping located on the torque box, ladder storage compartment roll up door.

The striping will consist of the following colors:
The first color will be red diamond grade
The second color will be lime yellow diamond grade

The size of the striping will be 6.00".
Overlaid Custom Tiger Logo centered on door

REFLECTIVE STRIPE, CAB DOORS

A 6.00" x 16.00" white reflective stripe will be provided across the interior of each cab door. The stripe will be located approximately 1.00" up from the bottom, on the door panel.

This stripe will meet the NFPA 1901 requirement.

UNDERCOATING, CAB & BODY

The apparatus will be properly treated by an authorized dealer.

The underside of the apparatus will be undercoated with an asphalt petroleum based material, dark in color.

The undercoating material utilized on the apparatus will be formulated to resist corrosion and deaden unwanted sound or road noise.

Coating texture will appear firm, flexible, and resistant to abrasion. Minimum dry film thickness will be in the range of 8.00 to 12.00mils.

The material will be applied to the following areas:

- Body and cab wheel well fender liners, on the back side only.
- Underside of body and cab sheet metal, and structural components.
- Underside and vertical sides of all sheet metal compartmentation, including support angles.
- Structural support members under running boards, rear platforms, battery boxes, walkways, etc.
- Inside surfaces of the pump heat enclosure, (when installed).
- Suspension mounts
- Transmission cooler fittings
- Engine mounts
- Bottom of torque boxes (if applicable)

Exclusions will be:

- Engine
- Transmission
- Drive lines

- PTO's
- Stabilizer controls (Aerials)
- Proximity Switches (Aerials)
- Schroeder valves and tank drains
- Intake valves
- Air Horns, sirens and back-up alarms

TRIP FOR ACCEPTACE OF MILESTONE(S)

List of trip(s) to manufacturing facility for review, acceptance and inspections should be listed out. These trips would include accommodations for 1 town manager and 3 Yorktown Fire Department designees. Dates at this time are not necessary simply an itemized list of the travel intentions set forth to monitor progress and inspections.

SERVICE AND MAINTENANCE FACILITIES

List name, address, and telephone number for the two closest maintenance facilities for servicing all aspects of this vehicle.