INVITATION TO BID

Bid Invitation Number: #73-2014

Date of Issue: 04/02/2014

Sealed bids will be received in the office of the Division of Central Purchasing, 200 East Main Street, Lexington, Kentucky, until **2:00 PM**, prevailing local time on **4/21/2014**. Bids must be received by the above-mentioned date and time. Mailed bids should be sent to:

Division of Central Purchasing
200 East Main Street, Room 338
Lexington, KY 40507, (859) 258-3320

The Lexington-Fayette Urban County Government assumes no responsibility for bids that are not addressed and delivered as indicated above. Bids that are not delivered to the Division of Central Purchasing by the stated time and date will be rejected.

All bids must have the company name and address, bid invitation number, and the commodity/service on the outside of the envelope.

Bids are to include all shipping costs to the point of delivery located at: 219 E. Third Street, Lexington KY

Bid Security Required: _X_Yes __No Performance Bond Required: _X_Yes __No
Cashier Check, Certified Check, Bid Bond (Personal checks and company checks will not be acceptable).

Quantity	Commodity/Service
Price Contract $877,712.00	**Rear Mounted Ladder Truck**

Check One:	**Proposed Delivery:**
____ Bid Specifications Met __X__ Exceptions to Bid Specifications. *Exceptions shall be itemized and attached to bid proposal submitted.*	275 days after acceptance of bid.

Procurement Card Usage

____ Yes
__X__ No

The Lexington-Fayette Urban County Government will be using Procurement Cards to purchase goods and services and also to make payments. Will you accept Procurement Cards?

Submitted by: Pierce Manufacturing Inc.
Firm

2600 American Drive
Address

Appleton, WI. 54914
City, State & Zip

Bid must be signed: (original signature)

John Baker
Signature of Authorized Company Representative – Title

John Baker
Representative's Name (Typed or printed)

859-233-0807 859-233-1167
Area Code - Phone – Extension *Fax #*

john@bluegrassfire.com
E-Mail Address

Bond No. Bid Bond

Fidelity and Deposit Company of Maryland

600 Red Brook Blvd Owings Mills, MD 21117

BID BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, Pierce Manufacturing Inc., as Principal, (hereinafter called the "Principal"), and Fidelity and Deposit Company of Maryland, a corporation duly organized under the laws of the State of MD, as Surety, (hereinafter called the "Surety") are held and firmly bound unto Lexington Fayette Urban County Government as Obligee, (hereinafter called the "Obligee"), in the sum of Five Percent of Amount Bid Dollars ($ 5%) for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for One (1) Pierce Custom 100' Aerial

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a contract with the Obligee in accordance with the terms of such bid and give such bond or bonds as may be specified in the bidding or contract documents with good and sufficient surety for the faithful performance of such contract, including the attached warranty of Pierce Manufacturing, Inc., or McNeilus Companies Inc., as applicable herein, and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter into such contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this 3rd day of April, 2014.

Witness: Jessie T. Llewellyn

Witness: Cathy Hutson

Pierce Manufacturing Inc.
Principal

By: Timothy W. Asuma
Timothy W. Asuma
Sr. Director of Finance
Name and Title

Fidelity and Deposit Company of Maryland
Surety

By: Lucy A. Hantzsch
Lucy A. Hantzsch
Attorney-in-Fact

ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **JAMES M. CARROLL, Vice President,** in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Daniel J. SAPIRO, Daniel J. KWIECINSKI, Wendy S. MILLER, Kathleen A. CRARY, Tracy K. MATTHEWS, Cathy HUTSON, Lisa M. SLAKES and Lucy A. HANTZSCH, all of Milwaukee, Wisconsin, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings,** and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 29th day of January, A.D. 2013.

ATTEST:

ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND

By: _____
Assistant Secretary
Eric D. Barnes

_____
Vice President
James M. Carroll

State of Maryland
City of Baltimore

On this 29th day of January, A.D. 2013, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **JAMES M. CARROLL, Vice President, and ERIC D. BARNES, Assistant Secretary,** of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposeth and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

_____
Constance A. Dunn, Notary Public
My Commission Expires: July 14, 2015

The Affidavit in this bid must be completed before your firm can be considered for award of this contract.

AFFIDAVIT

Comes the Affiant, Timothy W. Asuma, and after being first duly sworn under penalty of perjury as follows:

1. His/her name is Timothy W. Asuma and he/she is the individual submitting the bid or is the authorized representative of

Pierce Manufacturing Inc.,

the entity submitting the bid (hereinafter referred to as "Bidder").

2. Bidder will pay all taxes and fees, which are owed to the Lexington-Fayette Urban County Government at the time the bid is submitted, prior to award of the contract and will maintain a "current" status in regard to those taxes and fees during the life of the contract.

3. Bidder will obtain a Lexington-Fayette Urban County Government business license, if applicable, prior to award of the contract.

4. Bidder has authorized the Division of Central Purchasing to verify the above-mentioned information with the Division of Revenue and to disclose to the Urban County Council that taxes and/or fees are delinquent or that a business license has not been obtained.

5. Bidder has not knowingly violated any provision of the campaign finance laws of the Commonwealth of Kentucky within the past five (5) years and the award of a contract to the Bidder will not violate any provision of the campaign finance laws of the Commonwealth.

6. Bidder has not knowingly violated any provision of Chapter 25 of the Lexington-Fayette Urban County Government Code of Ordinances, known as "Ethics Act."

7. Bidder acknowledges that "knowingly" for purposes of this Affidavit means, with respect to conduct or to circumstances described by a statute or ordinance defining an offense, that a person is aware or should have been aware that his conduct is of that nature or that the circumstance exists.

Further, Affiant sayeth naught. Timothy W. Asuma

STATE OF Wisconsin

COUNTY OF Outagamie

The foregoing instrument was subscribed, sworn to and acknowledged before me by Timothy W. Asuma on this the 4th day of April, 2014.

My Commission expires: 02/26/17

Jessie F. Llewellyn
NOTARY PUBLIC, STATE AT LARGE

Please refer to Section II. Bid Conditions, Item "U" prior to completing this form.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 04/03/2014

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
Hays Companies of Wisconsin, Inc. 1-414-443-0000 1200 North Mayfair Road, Suite 100 Milwaukee, WI 53226	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	NAIC #
	INSURER A : NATIONAL FIRE & MARINE INS CO	20079
INSURED Pierce Manufacturing Inc. P.O. Box 2017 Appleton, WI 54912-2017	INSURER B : TRAVELERS PROPERTY CAS CO OF AMER	25674
	INSURER C : PHOENIX INS CO	25623
	INSURER D : BERKLEY NATL INS CO	38911
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** 39150097 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY	X		42-GLO-100190-01	04/01/14	04/01/15	EACH OCCURRENCE	$ 1,000,000
	X COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 500,000
	CLAIMS-MADE X OCCUR						MED EXP (Any one person)	$ Excluded
							PERSONAL & ADV INJURY	$ 1,000,000
							GENERAL AGGREGATE	$ 5,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG	$ 1,000,000
	X POLICY PRO-JECT LOC							$
	AUTOMOBILE LIABILITY	X		TJCAP118D2004TIL13	10/01/13	10/01/14	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	ALL OWNED AUTOS / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	HIRED AUTOS / NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
A	X UMBRELLA LIAB X OCCUR			42-UMO-100191-01	04/01/14	04/01/15	EACH OCCURRENCE	$ 15,000,000
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$ 15,000,000
	DED RETENTION $							$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY			TRJUB117D757713	10/01/13	10/01/14	X WC STATU-TORY LIMITS OTH-ER	
C	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N (Mandatory in NH)	N/A		TC2NUB117D756513	10/01/13	10/01/14	E.L. EACH ACCIDENT	$ 1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000
D	Excess Liability			CEX0960017401	04/01/14	04/01/15	Ea Occ/Agg	10,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Additional Insured when required by written contract.

One (1) Pierce Custom 100' Aerial

CERTIFICATE HOLDER

04/21/14

Lexington-Fayette Urban County Government

) East Main St.
Room 338
Lexington, KY 40507
USA

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

David J Lefis

Finley Fire Equipment Company is pleased to submit a proposal to The Lexington Fayette Urban County Government for a Pierce®105' Heavy Duty Aerial Ladder mounted on an "Arrow XT" custom chassis per your request for quotation. The following paragraphs will describe in detail the apparatus, construction methods, and equipment proposed; the apparatus will be constructed per the Pierce proposal.

PIERCE MANUFACTURING was founded in 1913. Since then we have been building bodies with one philosophy, **"BUILD THE FINEST"**. Our skilled craftsmen take pride in their work, which is reflected, in the final product. We have been building fire apparatus since the early "forties" giving Pierce Manufacturing over 60 years of experience in the fire apparatus market. Pierce Manufacturing has built and put into service more than 51,000 apparatus, including more than 27,000 on Pierce custom chassis designed and built specifically for fire and emergency applications. Our Appleton, Wisconsin facility has over 757,000 total square feet of floor space situated on approximately 97 acres of land. Our Bradenton, Florida facility has 300,000 square feet of floor space situated on approximately 38 acres of land.

Our beliefs in high ethical standards are carried through in our commitments to all with whom we do business and our ethical standards do not change. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we (nor our parent company) engage in or have been convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

Pierce has only one brand of fire apparatus "Pierce", ensuring you are receiving top of the line product that meets your specification.

In accordance with the current addition of NFPA 1901 standards, this proposal will specify whether the fire department, manufacturer, or apparatus dealership will provide required loose equipment.

Images and illustrative material in this proposal are as accurate as known at the time of publication, but are subject to change without notice. Images and illustrative material is for reference only, and may include optional equipment and accessories and may not include all standard equipment.

GENERAL DESIGN AND CONSTRUCTION

To control quality, ensure compatibility, and provide a single source for service and warranty, the custom cab, chassis, pump module and body will be entirely designed, assembled/welded and painted in Pierce owned manufacturing facilities. This includes, but not limited to the cab weldment, the pumphouse module assembly, the chassis assembly, the body and the electrical system.

QUALITY AND WORKMANSHIP

Pierce has set the pace for quality and workmanship in the fire apparatus field. Our tradition of building the highest quality units with craftsmen second to none has been the rule right from the beginning and we demonstrate that ongoing commitment by: Ensuring all steel welding follows American Welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding follows American Welding society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding follows American welding Society B2.1-2000 requirements for structural welding of sheet metal. Our flux core arc welding uses alloy rods, type 7000 and is performed to American Welding Society standards A5.20-E70T1. Furthermore, all employees classified as welders are tested and certified to meet the American welding Society codes upon hire and every three (3) years thereafter. Pierce also employs and American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

Pierce Manufacturing operates a Quality Management System under the requirements of ISO 9001. These standards sponsored by the International Organization for Standardization (ISO) specify the quality systems that are established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance is included with this proposal.

In addition to the Quality Management system, we also employ a Quality Achievement Supplier program to insure the vendors and suppliers that we utilize meet the high standards we demand. That is just part of our overall "Quality at the Source" program at Pierce.

To demonstrate the quality of our products and services, a list of at least two (2) fire departments/municipalities that have purchased vehicles for a second time is provided.

DELIVERY

The apparatus will be delivered under its own power to insure proper break-in of all components while the apparatus is still under warranty. A qualified delivery representative shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in proper operation, care and maintenance of the equipment delivered.

MANUAL AND SERVICE INFORMATION

At time of delivery, complete operation and maintenance manuals covering the apparatus will be provided. A permanent plate will be mounted in the driver's compartment specifying the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

SAFETY VIDEO

At the time of delivery Pierce will also provide one (1) 39-minute, professionally produced apparatus safety video, in DVD format. This video will address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus, including

the following: vehicle pre-trip inspection, chassis operation, pump operation, aerial operation, and safety during maintenance.

PERFORMANCE TESTS

A road test will be conducted with the apparatus fully loaded and a continuous run of no less than ten (10) miles. During that time the apparatus will show no loss of power nor will it overheat. The transmission drive shaft or shafts and the axles will run quietly and be free of abnormal vibration or noise. The apparatus when fully loaded will not have less than 25 percent nor more than 50 percent on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle. The apparatus will meet NFPA 1901 acceleration and braking requirements.

SERVICE AND WARRANTY SUPPORT

Pierce dealership support will be provided by Finley Fire Equipment Company by operating a Pierce authorized service center. The service center will have factory-trained mechanics on staff versed in Pierce fire apparatus. The service facility will be located within two hundred fifty (250) miles of the fire department.

In addition to the dealership, Pierce has service facilities located in both, Weyawega, Wisconsin and Bradenton, Florida. Pierce also maintains a dedicated parts facility of over 100,000 square feet in Appleton, Wisconsin. The parts facility stocks in excess of $5,000,000 in parts dedicated to service and replacement parts. The parts facility employs a staff dedicated solely for the distribution and shipment of service and replacement parts.

Service parts for the apparatus being proposed can be found via Pierceparts.com which, is an interactive online tool that delivers information regarding your specific apparatus as well as the opportunity to register for training classes.

As a Pierce customer you have the ability to view the complete bill of materials for your specific apparatus, including assembly drawings, piece part drawings, and beneficial parts notations. You will also have the ability to search the complete Pierce item master through a parts search function which offers all Pierce SKU's and descriptions offered on all Pierce apparatus. Published component catalogs, which include proprietary systems along with an extensive operators manual library is available for easy reference.

Pierce Manufacturing maintains a dedicated service and warranty staff of over 35 personnel, dedicated to customer support, which also maintains a 24 hour 7 day a week toll free hot line, four (4) on staff EVTs, and offers hands-on repair and maintenance training classes multiple times a year.

COMMERCIAL GENERAL LIABILITY INSURANCE

Certification of insurance coverage will be enclosed.

SINGLE SOURCE MANUFACTURER

Pierce Manufacturing, Inc. provides an integrated approach to the design and manufacture of our products that delivers superior apparatus and a dedicated support team. From our facilities, the chassis, cab weldment, cab, pumphouse (including the sheetmetal enclosure, valve controls, piping and operators panel) body and aerial device will be entirely designed, tested, and hand assembled to the customer's exact specifications. The electrical system either hardwired or multiplexed, will be both designed and integrated by Pierce Manufacturing. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) will be provided by Pierce as a single source manufacturer. Pierce's single source solution adds value by providing a fully engineered product that offers durability, reliability, maintainability, performance, and a high level of quality.

Your apparatus will be manufactured in Appleton, Wisconsin.

NFPA 2009 STANDARDS

This unit will comply with the NFPA standards effective January 1, 2009, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions.

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

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.

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

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

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".

VEHICLE INSPECTION PROGRAM CERTIFICATION

To assure the vehicle is built to current NFPA standards, the apparatus, in its entirety, will be third-party, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition of NFPA 1901. The certification will include: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus.

A placard will be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.

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.

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, Pierce Manufacturing will draw an air sample from the air system and certify that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection.*

INSPECTION TRIPS

The bidder will provide three (3) factory inspection trips for four (4) customer representatives. The inspection trips will be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs such as travel, lodging and meals will be the responsibility of the bidder.

AFTERMARKET SUPPORT WEBSITE

Pierceparts.com will provide Pierce authorized dealer access to comprehensive information pertaining to the maintenance and service of their customer's apparatus. This tool will provide the Pierce authorized dealer the ability to service and support their customers to the best of their ability with factory support at their fingertips.

Pierceparts.com is also accessible to the end user through the guest login. Limited access is available and vehicle specific parts information accessible by entering a specific VIN number. All end users should see their local authorized Pierce dealer for additional support and service.

The website will consist of the following screens at the dealer level:

My Fleet Screen

The My Fleet screen will provide access to truck detail information on the major components of the vehicle, warranty information, available vehicle photographs, vehicle drawings, sales options, applicable vehicle software downloads, etc.

Parts Screens

The Parts screens will provide parts look-up capability of Pierce Manufacturing sourced items, with the aid of digital photographs, part drawings and assembly drawings. The parts search application will permit the searching of parts by item description or function group (major system category). The parts application will provide the ability to submit electronically a parts order, parts quote, or parts return request directly to Pierce Manufacturing for processing.

Warranty Screen

The Warranty screens will provide dealers the ability to submit electronically warranty claims directly to Pierce Manufacturing for reimbursement.

My Reports Screens

The My Reports screens will provide access to multiple dealer reports to allow the dealership to maintain communication with the customer on the status of orders, claims, and phone contacts.

Technical Support Screens

The Technical Support screens will provide access to all currently published Operation and Maintenance and Service Publications. Access to Pierce Manufacturing Service Bulletins and Work Instructions, containing information on current service topics and recommendations will be provided.

Training

The Training screens will provide access to upcoming training classes offered by Pierce Manufacturing along with interactive electronic learning modules (Operators Guides) covering the operation of major vehicle components will be provided. Access to training manuals used in Pierce Manufacturing training classes will be provided.

About Pierce

Access to customer service articles, corporate news, quarterly newsletters, and key contacts within the Customer Service Department will be provided. The current Customer Service Policy and Procedure Manual, detailing the operation of the Customer Service group will also be accessible.

MANUFACTURER'S SPONSORED TRAINING

Factory level training will be provided by Pierce Manufacturing for the Lexington KY Division of Fire's Mechanical Bureau; training related to repair or maintenance on fire apparatus or apparatus components will be provided within one year from delivery. This training will be the equivalent of four days for two persons.

BID BOND

A bid bond as security for the bid in the form of a 5% bid bond will be provided with the proposal. This bid bond will be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond will be issued by an authorized representative of the Surety Company and will be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond will include language, which assures that the bidder/principal will give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract. A bid bond for 5% of the total amount of the proposal is enclosed.

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle will apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle will not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision will prevail.

PERFORMANCE BOND, 1 YEAR

The successful bidder will furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond will be

in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included within this proposal. Owner agrees that the penal amount of this bond will be simultaneously amended to 100% percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type will not exceed one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

APPROVAL DRAWING

A drawing of the proposed apparatus will be prepared and provided to the purchaser for approval before construction begins. The Pierce sales representative will also be provided with a copy of the same drawing. 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 by Pierce to the purchaser showing any changes made to the approval drawing.

ELECTRICAL WIRING DIAGRAMS

There will be three (3) compact discs containing "As-Built" electrical wiring diagrams specifically prepared for the apparatus provided. The diagrams will consist of information pertaining to the 12 volt DC systems only.

Due to the complexity of each custom unit built and possible changes that may occur, the design of the "As Built" electrical wiring diagrams will begin after the apparatus is shipped from the manufacturer's facility. The CD's will be shipped to the customer no more that 75 days after the apparatus is shipped from the manufacturer's facility. There will be two (2) CD's shipped to the customer and one (1) CD stored at the apparatus manufacturer's facility for future reference.

Each CD will include the following capabilities:

- The capability of viewing each separate diagram.
- The capability of zooming in on any section of each separate diagram.
- The capability of printing each separate diagram.
- The capability of printing each zoomed in area of each separate diagram.

Each CD will include the following items:

- Title page, identifying the job number and chassis model.
- Table of contents.
- Truck specific electrical compartment and instrument layouts for the chassis.
- Truck specific electrical compartment layouts for the body.
- Applicable drawings from the appropriate standard wiring diagrams.
- All truck specific wiring diagrams (special drawings).
- Harness drawings for all wiring harnesses used on the chassis.
- Harness drawings for all wiring harnesses used on the body.
- All truck input and output programming sheets (multiplexed trucks only).

There will be two (2) hard copies of these diagrams provided.

The spiral bound, clear plastic covered hard copies will included everything from the CD's printed on 11" x 17" white paper.

ARROW-XT™ CHASSIS

The Pierce Arrow-XT is the custom chassis developed exclusively for the fire service. Chassis provided will be a new, tilt type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. 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.

MAXIMUM OVERALL HEIGHT

The maximum overall height of the apparatus will be 11' - 4".

WHEELBASE

The wheelbase of the vehicle will be 245.50 inches.

GVW RATING

The gross vehicle weight rating will be 75,500 pounds.

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. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated .38" thick steel, with 3.50" wide flanges.

FRAME REINFORCEMENT

In addition, a mainframe inverted "L" liner will be provided. It will be heat-treated steel measuring 12.00" x 3.00" x .25". Each liner will have a section modulus of 7.795 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center will be 3,976,502 pounds per rail.

The frame liner will be mounted inside of the chassis frame rail and extend the full length of the frame.

FRONT AXLE

The front axle will be a reverse "I" beam type with inclined king pins. It will be a Meritor™ axle, Model FL-943, with a rated capacity of 21,500 pounds.

The turning angle will be 39 degrees to the right and 45 degrees to the left.

A viewing window will be provided on each side of the axle for checking the oil level.

FRONT SUSPENSION

Front springs will be a heavy-duty, taper leaf design, 54.00" long by 4.00" wide, with a ground rating of 21,500 pounds.

Kaiser spring pins will be provided, with double figure-eight grease grooves and a layer of electroless nickel plating, 1.0 mil thick around the entire pin. The bushing that holds the spring pin in place will also have a grease groove.

SHOCK ABSORBERS

To provide a smoother ride, the front axle will be furnished with heavy-duty (Monroe Magnum 65) telescoping shock absorbers.

FRONT OIL SEALS

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

FRONT TIRES

Front tires will be Michelin 425/65R22.50 radials, 20 ply all-position XZY3 wide base tread, rated for 22,800 pound maximum axle load and 65 mph maximum speed.

The tires will be mounted on Alcoa 22.50" x 12.25" polished aluminum disc-type wheels with a ten (10)-stud, 11.25" bolt circle.

REAR AXLE

The rear axle will be a Meritor™, Model RT-52-185, tandem axle assembly with a capacity of 54,000 pounds.

An inter-axle differential, which divides torque evenly between axles, will be provided with an indicator light mounted on the cab instrument panel.

DRIVER CONTROL DIFFERENTIAL LOCK (DCDL)

The rear tandem axle will be equipped with a driver controlled differential lock (DCDL). The control will be located within easy reach of the driver.

TOP SPEED OF VEHICLE

A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 60 MPH.

REAR SUSPENSION

Rear suspension will be a Hendrickson Model FMX 542 EX, air ride with a ground rating of 54,000 pounds. The suspension will have the following features:

- Outboard vertical mounted heavy-duty shock absorbers

- Utilizes track bars and torque rods to restrict lateral axle movement and maintain constant pinion angles

- Super heavy-duty transverse beam to help reduce axle stress while increasing roll stability or resistance to lean

- Low spring rate air springs for excellent ride quality

- Dual height control valves to maintain level vehicle from side to side

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

REAR TIRES
Rear tires will be eight (8) Michelin 12R22.50 radials, 16 ply all position XZE* tread, rated for 54,240 pound maximum axle load and 75 mph maximum speed.

The tires will be mounted on Alcoa 22.50" x 8.25" polished aluminum disc wheels with a ten (10)-stud 11.25" bolt circle.

TIRE BALANCE
All tires will be balanced with Counteract balancing beads. The beads will be inserted into the tire and eliminate the need for wheel weights.

TIRE PRESSURE MANAGEMENT
There will be a VECSAFE LED tire alert pressure management system provided that will monitor each tire's pressure. A chrome plated brass sensor will be provided on the valve stem of each tire for a total of 10 tires.

The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between 20 and 120 psi. The sensor will activate an integral battery operated LED when the pressure of that tire drops eight (8) psi.

Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start blinking.

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

HUB COVERS (REAR)
Stainless steel, high hat, hub covers will be provided on the rear axle hubs.

COVERS, LUG NUT, CHROME
Chrome lug nut covers will be supplied on front and rear wheels.

MUD FLAPS
Mud flaps with a Pierce logo will be installed behind the front and rear wheels.

WHEEL CHOCKS

There will be two (2) pairs of folding Ziamatic SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

WHEEL CHOCK BRACKETS

There will be two (2) pairs of Ziamatic SQCH-44-H style horizontal mounting wheel chock brackets provided for the Ziamatic SAC-44-E folding wheel chocks. The brackets will be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets will be mounted - locations determined at drawing approval.

ELECTRONIC STABILITY CONTROL

A vehicle control system will be provided as an integral part of the ABS brake system from Meritor Wabco.

The system will monitor and update the lateral acceleration of the vehicle and compare it to a critical threshold where a side roll event may occur. If the critical threshold is met, the vehicle control system will automatically reduce engine RPM, engage the engine retarder (if equipped), and selectively apply brakes to the individual wheel ends of the front and rear axles to reduce the possibility of a side roll event.

The system will monitor directional stability through a lateral accelerometer, steer angle sensor and yaw rate sensor. If spinout or drift out is detected, the vehicle control system will selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with a Wabco 6S6M, anti-lock braking system. The ABS will provide a six (6) channel anti-lock braking control on both the front and rear 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 wheel begins to lockup, a signal will be sent to the control unit. This control unit will then 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.

AUTOMATIC TRACTION CONTROL

An anti-slip feature will be included with the ABS. The Automatic Traction Control will be used for traction in poor road and weather conditions. The Automatic Traction Control will act as an electronic differential lock that will not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) will work with the engine ECU, sharing information concerning wheel slip. Engine ECU will use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. A "mud/snow" switch will be provided on the instrument

panel. Activation of the switch will allow additional tire slip to let the truck climb out and get on top of deep snow or mud.

BRAKES

The service brake system will be full air type by Meritor™.

The front brakes will be Meritor EX225 Disc Plus, disc type with automatic pad wear adjustment and 17.00" ventilated rotors for improved stopping distance.

The rear brakes will be Meritor™ 16.50" x 7.00" cam operated with automatic slack adjusters. Dust shields will be provided.

AIR COMPRESSOR, BRAKE SYSTEM

The air compressor will be a Cummins/Wabco with 18.7 cubic feet per minute output.

BRAKE SYSTEM

The brake system will include:

- Bendix dual brake treadle valve with vinyl covered foot surface
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 6,653 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 push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, will be provided with an automatic spring brake application at 40 psi

The air tank will be primed and painted to meet a minimum 750 hour salt spray test.

To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

- Wabco System Saver 1200 air dryer with spin-on coalescing filter cartridge
- 100 Watt Heater

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 FITTINGS, (SPECIAL)

All the air system fittings including the brake system shall be "compression type" fittings in place of the standard push to connect type.

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's side lower step well of the 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.

AIR OUTLET

One (1) air outlet will be installed with a female coupling and shut off valve, located in the driver's side lower step well of the cab. This system will tie into the "wet" tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air.

Female coupling and male fitting will be .25" thread.

A mating male fitting will be provided with the loose equipment.

ALL WHEEL LOCK-UP

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

AIR TANK, ADDITIONAL

An additional air tank with 1,454 cubic inch displacement will be provided to increase the capacity of the air system. This tank will be dedicated for air horn use.

The air tank will be primed and painted to meet a minimum 750 hour salt spray test. To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

The output flow of the engine air compressor varies with engine RPM. Full compressor output is only achieved at governed engine speed. Engine speed may be limited by generators, pumps and other PTO driven options.

AIR TANK, ADDITIONAL

An additional air tank with 1454 cubic inch displacement will be provided to increase the capacity of the main air brake system. This tank will be plumbed into the rear half of the brake system.

The air tank will be primed and painted to meet a minimum 750 hour spray test. To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

The output flow of the engine air compressor will vary with engine rpm. Full compressor output will only be achieved at governed engine speed. Engine speed will be limited by generators, pumps and other PTO driven options.

GUARD, FRONT WHEEL LOCK

A U-bolt type protective guard will be installed over the "Front Wheel Lock" knob to prevent accidental activation of the brake.

U-BOLT GUARD OVER PARKING BRAKE KNOB

There shall be two (2) U-bolt type protective guards installed over the "Parking Brake" knob to prevent accidental activation of the brake. The guards will be located on the driver's and passenger's side.

PARK BRAKE CONTROL (ADDITIONAL)

A second park brake control valve will be installed on the officer's side of the instrument panel. This valve will only activate the brakes if manually pulled out; low air pressure will not activate this valve.

ENGINE

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

Make: Cummins

Model:ISX12

Power: 500 hp at 1800 rpm

Torque: 1645 lb-ft at 1200 rpm

Governed Speed: 2100 rpm

Emissions Level: EPA 2013

Fuel: Diesel

Cylinders: Six (6)

Displacement: 729 cubic inches (11.9L)

Starter: Delco 39MT

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

Coolant Filter: Engine mounted spin-on style with shut-off valve.

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

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."

DRIVELINE RETARDER

A Telma inline-driveline retarder will be provided. The retarder will be the electro-magnetic type automatically actuated with application of the brake pedal. Cab dash mounted indicator lights will be provided to show retarder activation stages applied. The Telma retarder model that is suitable for the application, based on vehicle weight and axle ratio will be provided.

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

ENGINE BRAKE

A Jacobs 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 a high 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.

CLUTCH FAN

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

ENGINE AIR INTAKE

The air intake with an ember separator will be mounted high on the passenger's 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 include a diesel particulate filter (DPF) and a selective catalytic reduction (SCR) device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the SCR device and will be 5.00" in diameter. An insulation wrap will be provided on all exhaust pipe between the turbo and SCR to minimize the transfer of heat to the cab. 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. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

EXHAUST MODIFICATION

The exhaust pipe will be brought out from under the body at a 90 degree angle from the truck. The tail pipe will extend a minimum of 2.00" past the body, adaptable for the Plymovent system. The diameter of the pipe will be 7.00". There will be a clearance of 4.00" completely around the pipe once past the side of the body. A stop will be provided on the tail pipe that will prevent the nozzle from sliding too far on.

RADIATOR

The radiator and the complete cooling system will meet or exceed NFPA and engine manufacturer cooling system standards.

For maximum cooling performance, the radiator core will be made of copper fins having a serpentine design, soldered to brass tubes. The tubes will be welded to brass headers using the patented Beta-Weld process for increased strength, longer road life and solder-bloom corrosion protection. The radiator core will have a minimum frontal area of 1396 square inches. Steel supply and return tanks will be bolted to the core headers and steel side channels to complete the radiator assembly. The radiator will be compatible with commercial antifreeze solutions.

The radiator will be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly will be isolated from the chassis frame rails with rubber isolators.

The radiator will include an integral deaeration tank, with a remote-mounted overflow tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

A drain port will be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

A heavy-duty fan will draw in fresh, cool air through the radiator. Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Silicone hoses will be used for all engine coolant/heater lines installed by Pierce Manufacturing.

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.

FUEL TANK

A 65-gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of unpainted stainless steel. It will be equipped with swash partitions and a vent. To reduce the effects of corrosion, the fuel tank will be mounted with stainless steel straps.

A .75" drain plug will be provided in a low point of the tank for drainage.

A fill inlet will be located on the left hand side of the body and be covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only".

A .50" diameter vent will be provided running from top of tank to just below fuel fill inlet.

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

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

DIESEL EXHAUST FLUID TANK

A 4.5 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body forward of the rear axle. The tank will be constructed of 16-gauge type 304- L stainless steel.

A .50" drain plug will be provided in a low point of the tank for drainage.

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

The tank will meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing.

The tank will include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.

AUXILIARY FUEL PUMP

An auxiliary electric fuel pump will be added to the fuel line for priming the engine. A switch located on the cab instrument panel will be provided to operate the pump.

FUEL SHUTOFF

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

FUEL COOLER

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

FUEL SEPARATOR

The engine will be equipped with a Racor in-line spin-on fuel and water separator in addition to the engine fuel filters.

TRANSMISSION

An Allison 5th generation, Model EVS 4000P, electronic, torque converting, automatic transmission will be provided.

The transmission will be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display will indicate when service is due.

Two (2) PTO openings will be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock).

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

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.

The transmission ratio will be 1st - 3.51 to 1.00, 2nd - 1.91 to 1.00, 3rd - 1.43 to 1.00, 4th - 1.00 to 1.00, 5th - 0.75 to 1.00, 6th - 0.64 to 1.00, R- 4.80 to 1.00.

TRANSMISSION COOLER

A transmission oil cooler will be provided that is integral to the radiator and located at the bottom of the radiator. The cooler will use engine coolant to control the transmission oil temperature.

TRANSMISSION FLUID

The transmission will be provided with TranSynd heavy duty synthetic transmission fluid.

DRIVELINE

Drivelines will be a heavy-duty metal tube and be equipped with Spicer 1810 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

A Ross TAS-85 steering gear, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and an Eaton Model VN20F hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.

STEERING ASSIST CYLINDER ON FRONT AXLE

To aid in the steering of the apparatus, the front axle will be equipped with a Ross power assist cylinder.

STEERING WHEEL

The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a four (4)-spoke design.

LOGO AND CUSTOMER DESIGNATION ON DASH

The dash panel will have an emblem containing the Pierce logo and customer name. The emblem will have three (3) rows of text for the customer's department name. There will be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

The first row of text will be: TBD

The second row of text will be: TBD

The third row of text will be: TBD

BUMPER

A one (1) piece bumper manufactured from .25" formed steel with a .38" bend radius will be provided. The bumper will be a minimum of 10.00" high with a 1.50" top and bottom flange, and will extend 16.00" from the face of the cab. The bumper will be 95.28" wide with 45 degree corners and side plates. The bumper will be metal finished and painted job color.

To provide adequate support strength, the bumper will be mounted directly to the front of the C channel frame. The frame will be a bolted modular extension frame constructed of 50,000 psi tensile steel.

Documentation will be provided, upon request to show that the options selected have been engineered for fit-up and approval for this modular bumper extension. A chart will be provided to indicate the option locations and will include, but not be limited to the following options: air horns, mechanical sirens, speakers, hose trays (with hose capacities), winches, lights, discharge, and suction connections.

GRAVEL PAN

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

LIFT AND TOW MOUNTS

Mounted to the frame extension will be lift and tow mounts. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems.

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

TOW EYES

Two (2) Chicago style tow eyes will be mounted through the top of the bumper extension. The tow eyes will be designed and positioned to allow up to a 6,000 lb. straight horizontal pull in line with the centerline of the vehicle. 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 tow eyes will be chrome plated.

CAB

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

The cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

For reasons of structural integrity and enhanced occupant protection, the cab will be of heavy duty design, constructed to the following minimal standards.

The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts) and rear wall areas. The A-pillar will be constructed of solid A356-T5 aluminum. The B-pillar and C-pillar will be constructed from 0.25" heavy wall extrusions. The rear wall will be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 6.50" x 4.875" x 0.1875" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.36" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.25" thick gusset plate, covered with a 0.090" front skin (for a total thickness of 0.34"), and reinforced with a 95.00" wide x 11.13" deep x 0.50" thick cross-cab support located just below the windshield. The cross-cab support will run the full width of the cab and weld to each A-pillar, the 0.25" thick gusset plate and the front skin.

The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.50" thick cross-floor support providing a total thickness of 0.6875" of structural material at the front floor area. The front floor area will also be supported with one (1) 0.50" plate bolted to one (1) 0.78" plate that also provides the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.187" thick engine tunnel, creating the structure to support the forces created when lifting the cab.

The cab will be 94.75" wide (outside door skin to outside door skin) to maintain maximum maneuverability.

The forward cab section will have an overall height from the cab roof to the ground of approximately 103.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 113.00". The overall height listed will be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The cab roof will be provided with a 58.00" wide notch that lowers the center section of the cab roof by 4.00". The deep notch will continue from the front of the cab and extend full length to the rear of the cab. The deep notch will accommodate a low mount aerial device, and provide lower overall vehicle height.

The floor to ceiling height inside the crew cab will be 50.50" in the center above the forward facing seats and 69.25" in the outboard positions.

The crew cab floor will measure 40.12" from rear wall to the back side of engine tunnel.

The engine tunnel, at the rearward highest point (knee level), will measure 47.75" to the back wall.

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.

A three (3)-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

INTERIOR CAB INSULATION

The cab will include 1.50" insulation in the ceiling and side walls, and 2.00" insulation in the rear wall to maximize acoustic absorption and thermal insulation.

ENGINE TUNNEL

Engine hood side walls will be constructed of .50" aluminum. The top will be constructed of .19" aluminum and will be tapered at the 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.

FENDER LINERS

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

WINDSHIELD

A curved safety glass windshield will be provided with over 2,754 square inches of clear viewing area. The cab windshield will have bright trim inserts in the rubber molding holding the glass in place. Economical windshield replacement glass will be readily available from local auto glass suppliers.

All cab glass will be tinted.

SUNVISORS

Two (2) smoked Lexan sunvisors, 8.75" x 28.00" long, will be provided. The sunvisors will be located above the windshield with one (1) mounted on each side of the cab.

WINDSHIELD WIPERS

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

The washer reservoir will be able to be filled without raising the cab.

GLOVE BOX

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

CAB REAR WALL EXTERIOR COVERING

The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.

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.

The hydraulic pump will have a manual override for backup in the event of electrical failure.

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

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.

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.

For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the driver side between the chassis and cab frame when the cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.

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.

GRILLE

A bright finished aluminum mesh grille screen, inserted behind a bright finished grille surround, will be provided on the front center of the cab.

DOOR JAMB SCUFFPLATES

All cab door jambs will be furnished with a polished stainless steel scuffplate mounted on the striker side of the jamb.

MOLDING (ON SIDES OF CAB)

Chrome molding will be provided on both sides of cab.

MIRRORS

A Retrac Model 613423 dual vision, motorized, west coast style mirror, with chrome finish, will be mounted on each side of the front cab door with spring loaded retractable arms. The flat glass and convex glass will be heated and adjustable with remote control within reach of the driver.

FRONT CROSS VIEW MIRROR

There will be one (1) 8.00" diameter eyeball mirror provided on the passenger's side front corner of the cab. It will be mounted high, above the windshield. The mirror will provide the driver with a view of the front bumper and the front of the truck.

The mirror housing, tubing, clamps and hardware will be constructed of corrosion resistant stainless steel.

Mirror head will be K-10, EB50S-S, 8.00" stainless steel housing with three (3) arms.

DOORS - (BARRIER STYLE)

To enhance entry and egress to the cab, the forward cab doors will be a minimum of 37.50" wide x 61.75" high. The crew cab doors will be located on the sides of the cab and will be constructed in the same manner as the forward cab doors. The crew cab doors will measure a minimum of 34.88" wide x 71.75" high.

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

A flush mounted, chrome plated paddle type door handle will be provided on the exterior of each cab door. Each door will also be provided with an interior flush paddle handle.

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks as required by FMVSS 206. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.

A full length, heavy duty, stainless steel, piano-type hinge with a .38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

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

The cab steps at each door location will be located below the cab doors and will be exposed to the exterior of the cab.

DOOR PANELS

There will be a full height brushed stainless steel door panel installed on the inside of all cab doors. The cab door panels will be removable without disconnecting door and window mechanisms.

MANUAL CAB DOOR WINDOWS

All cab entry doors will contain a conventional roll down window.

CAB STEPS

The forward cab and crew cab access steps will be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps will be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps will be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps will be a minimum 24.75"

wide, and the crew cab steps will be 21.25" wide with an 8.00" minimum depth. The inside cab steps will not exceed 18.00" in height and be limited to two (2) steps. Three (3) step entrance designs will not be acceptable due to safety concerns. A slip-resistant handrail will be provided adjacent to each cab door opening to assist during cab ingress and egress.

STIRRUP STEPS WITH GRIP STRUT

Stirrup steps with grip strut will be provided below each cab and crew cab door.

The stirrup step will be lit by a white 12 volt DC LED light provided on the step.

The step light will be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body step lights.

STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there will be eight (8) white LED, step lights provided. The lights will be installed at each cab and crew cab door, two (2) per step, in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

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

FENDER CROWNS

Stainless steel fender crowns will be installed at the cab wheel openings.

CREW CAB WINDOW

One (1) fixed window with tinted glass will be provided on the passenger's side of the cab to the rear of the front cab door. The window will be sized to enhance light penetration into the cab interior. The window will measure 17.50" wide x 21.00" high.

WINDOW TINT

Crew cab windows will be provided with increased tint to 14 percent to reduce light transmission.

The following windows are included:

- Crew cab side windows

- Crew cab door, roll-up windows

- Top fixed window in crew cab doors

- Rear opera windows (If applicable)

STORAGE COMPARTMENTS

Provided under the forward facing crew cab seats will be a transverse compartment. The section above the floor riser will be 11.00" wide x 9.00" high x 94.50". The lower section on each side of the cab will have a willow area in the lower section and a small deeper section in the upper area. The lower section will be 11.25" wide x 13.00 deep for the first 16.50" of height while the remaining 5.75" of height of the non transverse section will be 27.50" deep on the driver's side and 23.50" deep on the passenger's side. The overall height of the compartment including the transverse area will be 32.00".

There will be an access door on both sides of the cab with reversed hinge double pan doors.

Doors will be latched with recessed, polished stainless steel D-ring handles. A rubber covered bumper will be used as a door stop.

The outside and inside of the cab side access doors will be painted to match the cab exterior. The drop down door inside the cab will be polished stainless steel.

The entire interior of the compartments will be painted with a gray spatter type paint.

EXTERIOR ACCESS LIGHTING

Exterior compartment access lighting will consist of four (4) white Amdor LED strip lights; one (1) mounted horizontally in each lower and upper exterior compartment.

PIKE POLE STORAGE

A rack will be provided for storage of two (2) pike poles. The rack will be located in the transverse section of the crew cab compartment below the seat box. The poles will be stored so that one (1) pole can be accessed out each side of the vehicle.

The size and brand of the pike poles stored will be determined at drawing approval.

ANTENNA ACCESS PANEL

Vinyl covered access panels will be provided in the headliner to allow access to the antenna mounts without removing the headliner. The panels will be covered to match the headliner. There will be three (3) access panels provided.

COMPUTER MOUNTING TRAY

There will be one (1) sliding stainless steel tray located forward of the officer. The tray will be as wide as possible in the dash panel recess.

CAB INTERIOR

The cab dash fascias will be a flat faced design to provide easy of maintenance and will be constructed out of aluminum sprayed with Line-X polyurethane/polurea elastomer abrasive resistant material.

The engine tunnel, air intake cowl, the horizontal window sills below the cab and crew cab door windows, the side wall panels below the crew cab windows, the side wall panels to the rear and above the crew cab windows, seat risers, wire raceway covers, modesty panels in front of the driver and officer, the power distribution box in front of the officer and behind the driver, and vertical door sills will be sprayed with Line-X polyurethane/polurea elastomer abrasive resistant material.

The entire interior rear wall will be covered with bright aluminum treadplate scuffplate.

The headliner will be installed in both forward and rear cab sections. Headliner material will be Turnout Tuff fabric. A sound barrier will be part of its composition. Material will be installed on aluminum sheet 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.

CAB INTERIOR UPHOLSTERY

The cab interior Line-X material will be black.

The cab interior upholstery will be black.

CAB FLOOR

The cab and crew cab floor areas will be covered with Polydamp™ acoustical 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 a .25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

CAB DEFROSTER

There will be a 41,000 BTU/hr defroster in the cab located under the engine tunnel.

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 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

A high-performance, customized air conditioning system will be furnished inside the cab and crew cab. A 19.1 cubic inch compressor will be installed on the engine.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 75 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of four 4 hours.

A roof-mounted condenser that meets and exceeds the performance specification will be installed on the cab roof. Mounting the condenser below the cab or body would reduce the performance of the system and will not be acceptable.

An evaporator unit that meets and exceeds the performance specification will be installed in the cab, located in the center of the cab ceiling over the engine tunnel. The evaporator will include two (2) high performance cores and plenums with multiple outlets, one plenum directed to the front and one plenum directed to the rear of the cab.

The evaporator unit will be provided with adjustable air outlets strategically located to direct air flow to the driver, officer and crew cab area.

All hose used will be class one (1) type to reduce moisture ingression into the air conditioning system.

The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

The air conditioner will be controlled by a single electronic control panel. For ease of operation, the control panel will include variable adjustment for temperature and fan control and be conveniently located on the dash in clear view of the driver. The control panel will include robust knobs for both fan speed and temperature adjustment.

GRAVITY DRAIN TUBES

Two (2) condensate drain tubes will be provided for the air conditioning evaporator. The drip pan will have two (2) drain tubes plumbed separately to allow for the condensate to exit the drip pan. The standard evaporator pumps will be disabled to provide a manual drain system.

GRAB HANDLE

A black 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.

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 .125" diameter hole in its lens to prevent moisture retention.

ACCESS TO ENGINE DIPSTICKS

For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface. The door will be 17.75" wide x 12.75" high and be flush with the wall of the engine tunnel.

The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling. An additional tube will be provided for filling the engine oil.

The door will have a rubber seal for thermal and acoustic insulation. One (1) flush latch will be provided on the access door.

CONDUIT FOR RADIO INSTALLATION

A section of 1.50" flexible conduit for radio installation will be provided.

The conduit will be installed from the radio enclosure located behind the driver's seat to overhead switch panel area above the driver.

CONDUIT FOR RADIO INSTALLATION

A section of 1.50" flexible conduit for radio installation will be provided. The conduit will be installed from the designated radio mounting area to the switch panel area on the engine tunnel.

CAB SAFETY SYSTEM

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

- A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll or frontal impact event.
- A slave SRS sensor will be installed in the ceiling of the cab to provide capacity for eight (8) crew cab seating positions.
- A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag 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 three (3)-point seat belt.

- A 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 three (3)-point seat belt.
- Air curtains will be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats will be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.
- Seat belts will be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

FRONTAL IMPACT PROTECTION

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

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

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

SIDE ROLL PROTECTION

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

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

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

SEATING CAPACITY

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

DRIVER'S SEAT

An HO Bostrom Sierra air suspension seat will be provided in the cab for the driver. For increased convenience, the seat will include a manual control to adjust the horizontal position (5..50" travel). To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 15 degrees back to 45 degrees forward. To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A suspension seat safety system will be included. When activated in the event of a side roll, this system will pretension the seat belt, then retract the seat to its lowest travel position.

The seat will be furnished with a three (3)-point, shoulder type seat belt. To provide quick, easy use for occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

OFFICER'S SEAT

An HO Bostrom Tanker 450 SCBA fixed seat will be provided in the cab for the officer. For optimal comfort, the seat will be provided with 17.00" deep cushion. To ensure safe operation, the seat will be equipped with a sensor in the seat cushion and belt receptacle that will activate an alarm indicating the seat is occupied but not buckled.

The seat back will be an SCBA back style with a five (5) degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.50" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system.

Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

A seat safety system will be included. When activated, this system will pretension the seat belt.

The seat will be furnished with a three (3)-point, shoulder type seat belt. To provide quick, easy use for occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

RADIO COMPARTMENT

A radio compartment will be provided under the officer's seat.

The inside compartment dimensions will be 14.50" deep x 14.00" across x 7.50" high.

A drop-down door with a chrome plated lift and turn latch will be provided for access.

The compartment will be constructed of smooth aluminum and painted to match the cab interior.

PPE COMPARTMENT

A rear facing PPE compartment will be provided in the crew cab at the driver's side outboard position.

The compartment will be 22.00" wide x 42.50" high x 26.00" deep measured from the interior of the cab The compartment will have access form the exterior only with one (1) Amdor roll up door, locking with a painted finish to match the primary color of the cab exterior. The clear door opening will be approximately 30.00" high x 14.63" wide.

The compartment will be constructed of smooth aluminum painted to match the cab interior.

COMPARTMENT LIGHT

There will be two (2) white Amdor LED strip lights installed; one (1) located each side of the compartment opening. The lights will be controlled by an automatic door switch.

REAR FACING PASSENGER'S SIDE OUTBOARD SEAT

There will be one (1) rear facing, HO Bostrom Tanker 450 SCBA seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep cushion. To ensure safe operation, the seat will be equipped with a sensor in the seat cushion and belt receptacle that will activate an alarm indicating the seat is occupied but not buckled.

The seat back will be an SCBA back style with a five (5) degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.50" increments, to accommodate different sized

SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system.

Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

A seat safety system will be included. When activated, this system will pretension the seat belt.

The seat will be furnished with a three (3)-point, shoulder type seat belt. To provide quick, easy use for occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING DRIVER'S SIDE OUTBOARD SEAT

There will be one (1) forward facing, HO Bostrom Tanker 400CT fold up SCBA seat provided at the driver side outboard position in the crew cab. For optimal comfort, and to maximize accessibility to the crew cab, the seat will be provided with 15.00" deep cushion. To ensure safe operation, the seat will be equipped with a sensor in the seat cushion and belt receptacle that will activate an alarm indicating the seat is occupied but not buckled.

The seat back will be an SCBA back style with a zero (0) degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.50" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system.

Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

A seat safety system will be included. When activated, this system will pretension the seat belt.

The seat will be furnished with a three (3)-point, shoulder type seat belt. To provide quick, easy use for occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt will be

furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING CENTER SEAT

There will be one (1) forward facing, HO Bostrom Tanker 400CT fold up SCBA seat provided at the center position in the crew cab. For optimal comfort, the seat will be provided with 15.00" deep cushion. To ensure safe operation, the seat will be equipped with a sensor in the seat cushion and belt receptacle that will activate an alarm indicating the seat is occupied but not buckled.

The seat back will be an SCBA back style with a zero (0) degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.50" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system.

Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

A seat safety system will be included. When activated, this system will pretension the seat belt.

The seat will be furnished with a three (3)-point, shoulder type seat belt. To provide quick, easy use for occupants wearing bunker gear, the seat belt will have a minimum 130.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING PASSENGER'S SIDE OUTBOARD SEAT

There will be one (1) forward facing, HO Bostrom Tanker 400CT fold up SCBA seat provided at the passenger side outboard position in the crew cab. For optimal comfort, and to maximize accessibility to the crew cab, the seat will be provided with 15.00" deep cushion. To ensure safe operation, the seat will be equipped with a sensor in the seat cushion and belt receptacle that will activate an alarm indicating the seat is occupied but not buckled.

The seat back will be an SCBA back style with a zero (0) degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.50" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system.

Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

A seat safety system will be included. When activated, this system will pretension the seat belt.

The seat will be furnished with a three (3)-point, shoulder type seat belt. To provide quick, easy use for occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

RADIO EQUIPMENT BOX

There will be one (1) compartment furnished to house radio equipment. The compartment will be located on top of the driver's side PPE cabinet.

The size will match the driver's side PPE cabinet - 8" deep. A bolt down lid will be provided with louvers to provide adequate ventilation.

The compartment will be constructed of smooth aluminum and painted to match the cab interior.

SEAT UPHOLSTERY

All seat upholstery will be black Dura-Wear, waterproof fabric.

AIR BOTTLE HOLDERS

There will be five (5) SCBA type seats in the cab with Bostrom SecureAll SCBA locking holder brackets installed directly into the Bostrom seats. The brackets will be compliant with NFPA 1901 Section 14.1.10.1.

BACK REST INSERTS

Provided with the Bostrum SCBA seats will be back rest inserts which covers the SCBA cavity.

The insert covers will be padded and covered with same material as the seat.

A total of five (5) inserts covers will be provided.

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 the cab and crew cab will have red seat belts.

SEAT BELT MONITORING SYSTEM

A seat belt monitoring system (SBMS) will be provided.

The SBMS will be capable of monitoring up to ten (10) seat positions indicating the status of each seat position with a green or red LED indicator as follows:

Seat OccupiedBuckledGreen

Seat OccupiedUnbuckledRed

No OccupantBuckledRed

No OccupantUnbuckledNot Illuminated

Audible Alarm

The SBMS will include an audible alarm that will be activated when a red illumination condition exists and the parking brake is released or a red illumination condition exists and the transmission is not in park.

HELMET HOLDER

There will be six (6) Zico UHH-1 helmet holder brackets provided in the cab. The brackets will provide quick access and secure storage of the helmets. The bracket locations will be determined at time of final inspection.

CAB INTERIOR LIGHTING

Auxiliary lights will be provided in the cab and consisting of:

Two (2) Weldon, Model 8080-7000-13, red/white LED dome lights with black bezels; one (1) located on the officer's side and one (1) located on the driver's 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.

Two (2) adjustable map lights with switches mounted on the cab ceiling.

CREW CAB DOME LIGHTS

There will be two (2) Weldon, Model 8080-7000-13 LED dome lights with black bezels installed in the crew cab; one (1) located each side controlled by the following:

- The forward, clear light will be controlled by the door switch and the lens switch.
- The rear, red light will be controlled by the lens switch only.

A courtesy light at each door opening, controlled by automatic door switches.

HAND HELD SPOTLIGHT

A Specialty Lighting, Model 2150-1, hand held spotlight will be installed officer's side cab dash panel - location determined at drawing approval. The light will be furnished with a 9 foot coil cord.

CAB INSTRUMENTATION

The cab instrument panel will include gauges, telltale indicator lamps, control switches, alarms, and a diagnostic panel. The function of the instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section, forward of the driver. The gauge assembly and switch panels are designed to be removable for ease of service and low cost of ownership.

GAUGES

The gauge panel will include the following ten (10) black faced gauges with black bezels to monitor vehicle performance:

Voltmeter Gauge (volts):

Low volts (11.8 VDC)

Amber telltale light on indicator light display with steady tone alarm

High volts (15.5 VDC)

Amber telltale light on indicator light display with steady tone alarm

Engine Tachometer (RPM)

Speedometer MPH

Fuel Level Gauge (Empty - Full in fractions):

Low fuel (1/8 full)

Amber telltale light on indicator light display with steady tone alarm

Engine Oil Pressure Gauge (PSI):

Low oil pressure to activate engine warning lights and alarms

Red telltale light on indicator light display with steady tone alarm

Front Air Pressure Gauges (PSI):

Low air pressure to activate warning lights and alarm

Red telltale light on indicator light display with steady tone alarm

Rear Air Pressure Gauges (PSI):

Low air pressure to activate warning lights and alarm

Red telltale light on indicator light display with steady tone alarm

Transmission Oil Temperature Gauge (Fahrenheit):

High transmission oil temperature activates warning lights and alarm

Amber telltale light on indicator light display with steady tone alarm

Engine Coolant Temperature Gauge (Fahrenheit):

High engine temperature activates an engine warning light and alarms

Red telltale light on indicator light display with steady tone alarm

Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):

Low fluid (1/8 full)

Amber telltale light on indicator light display

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps will be located on the instrument panel in clear view of the driver. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

Low coolant

Trac cntl (traction control) (where applicable)

Check engine

Check trans (check transmission)

Air rest (air restriction)

Driver's door open

Passenger's door open

DPF (engine diesel particulate filter regeneration)

HET (engine high exhaust temperature) (where applicable)

ABS (antilock brake system)

MIL (engine emissions system malfunction indicator lamp) (where applicable)

Regen inhibit (engine emissions regeneration inhibit) (where applicable)

Trans temp (transmission temperature)

SRS (supplemental restraint system) fault (where applicable)

Aux brake overheat (auxiliary brake overheat) (where applicable)

DEF (low diesel exhaust fluid level)

The following red telltale lamps will be present:

Parking brake

Stop engine

The following green telltale lamps will be present:

Left turn

Right turn

Battery on

Ignition

Aux brake (auxiliary brake engaged) (where applicable)

The following blue telltale lamps will be present:

High beam

ALARMS

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

INDICATOR LAMP AND ALARM PROVE-OUT

A system will be provided which automatically tests telltale indicator lights and alarms located on the cab instrument panel. Telltale indicators and alarms will perform prove-out when the ignition switch is held in the up position for three (3) to five (5) seconds to ensure proper performance.

CONTROL SWITCHES

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver. All switches will have backlit labels for low light applications.

Headlight/Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking and headlights. The second switch position will activate the parking lights. The third switch will activate the headlights.

Panel backlighting intensity control switch: A variable voltage control switch will be provided. The switch moved in the up direction increases the panel backlighting intensity to a maximum and the switch moved in a down direction decreases the panel backlighting intensity to a minimum level.

Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will perform prove-out on the telltale indicators and alarms when the ignition switch is held in the up position for three (3) to five (5) seconds to ensure proper performance. A green indicator lamp is activated with vehicle ignition.

Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

Hazard switch will be incorporated into the steering column.

Heater and defroster controls.

Turn signal arm: A self-canceling turn signal with high beam headlight controls.

Windshield wiper control will have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control.

Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

CUSTOM SWITCH PANELS

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator, thus improving safety. There will be positions for up to three (3) switch panels in the overhead console on the driver's side, up to five (5) switch panels in the engine tunnel console, and up to three (3) switch panels in the overhead console on the officer's side. All switches have backlit labels for low light applications.

High idle engagement switch: A maintained rocker switch with integral indicator lamp will be provided. The switch will activate and deactivate the high idle function. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

"Ok To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

Diesel particulate filter regeneration switch (where applicable).

Diesel particulate filter regeneration inhibit switch (where applicable).

DIAGNOSTIC PANEL

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

The diagnostic panel will include the following:

Engine diagnostic port

Transmission diagnostic port

ABS diagnostic port

SRS diagnostic port (where applicable)

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

ABS diagnostic switch (blink codes flashed on ABS telltale indicator)

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light (electronic) will be provided.

OFFICER'S SPEEDOMETER

A Class I digital display speedometer will be provided on the officer's side overhead position.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

The same circuit that activates the Do Not Move Apparatus indicator will activate a pulsing alarm when the parking brake is released.

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.

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.

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.

HOURMETER - AERIAL DEVICE

An hourmeter 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.

SPARE CIRCUIT

There will be three (3) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power.
- The negative wire will be connected to ground.
- Wires will be protected to 15 amps at 12 volts DC.
- Power and ground will terminate - locations determined at drawing approval.
- Termination will be with 15 amp, power point plug with rubber cover.

Wires will be sized to 125 percent of the protection.

The circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be two (2) sets of spare cables installed in the apparatus; one (1) located in the radio compartment on top of the driver's side PPE cabinet and; one (1) located behind the officer's seating position.

Each set will include the following:

- One (1) 60 amp 12 volt DC battery direct powered wire terminated with a red covered threaded stud.
- One (1) 40 amp 12 volt DC switch battery powered wire terminated with a red covered threaded stud.
- One (1) 60 amp 12 volt DC ignition powered wire terminated with a red covered threaded stud.
- One (1) ground terminated with a black covered threaded stud.

Wires will be sized to 125% of the protection.

These circuits may be load managed when the parking brake is applied.

RECESS, INSTRUMENT PANEL - FOR MDT MOUNT

The instrument panel across from the officer will be recessed to accommodate the mounting of miscellaneous items. The glove box will be replaced with a painted sheet metal mounting platform/shelf. The recess will be 2.00" down x 8.00" back and 17.00" wide.

VEHICLE DATA RECORDER

A vehicle data recorder (VDR) will be provided. The VDR will be capable of reading and storing vehicle information. The VDR will be capable of operating in a voltage range from 8VDC to 16VDC. The VDR will not interfere with, suspend, or delay any communications that may exist on the CAN data link during the power up, initialization, runtime, or power down sequence. The VDR will continue operation upon termination of power or at voltages below 8VDC for a minimum of 10ms.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A CD provided with the apparatus will include the programming to download the information from the VDR. A USB cable can be used to connect the VDR to a laptop to retrieve required information.

The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:

Vehicle Speed - MPH

Acceleration - MPH/sec

Deceleration - MPH/sec

Engine Speed - RPM

Engine Throttle Position - % of Full Throttle

ABS Event - On/Off

Seat Occupied Status - Yes/No by Position (7-12 Seating Capacity)

Seat Belt Buckled Status - Yes/No by Position (7-12 Seating Capacity)

Master Optical Warning Device Switch - On/Off

Time - 24 Hour Time

Date - Year/Month/Day

RADIO SPEAKER

There will be one (1) Motorola, Model HSN4031A, radio speaker provided and mounted - location determined at drawing approval. Cables will terminate behind the driver's seat .

RADIO ANTENNA MOUNT

There will be three (3) standard antenna-mounting bases, Model MATM, with 17 feet of coax cable and weatherproof cap provided for a two (2)-way radio installation. The standard mount will be located on the cab roof, just to the rear of the officer's seat and the additional mounts will be located - determined at drawing approval. The cables will be routed to the radio compartment behind the driver's seat.

VIDEO SYSTEM, REAR CAMERA & 7.00" LCD DISPLAY

A Safety Vision video system with color rear view camera with built in microphone, activated with the reverse signal, and 7.00" LCD display monitor with swivel mount located in view of the driver on the engine tunnel will be provided.

The following components will be supplied:

- One (1) SV-LCD70BA 7" Color LCD
- One (1) SV-620A Color camera
- All necessary cables

VEHICLE CAMERA GUARD

There will be one (1) aluminum treadplate guard fastened over the vehicle camera located over the back up camera .

A 5100D FireCom wireless intercom kit will be provided.

ELECTRICAL POWER CONTROL SYSTEM

A compartment will be provided in or under the cab to house the vehicle's 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.

POWER AND GROUND STUDS

There will be two (2) studs provided in the primary power distribution center for two-way radio equipment.

The studs will consist of the following:

12-volt 150-amp battery switched power

12-volt 75-amp direct battery power

There will also be two (2)12-volt ground studs located in or adjacent to the power distribution center.

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 ensure 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 two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI-RFI susceptibility.

ELECTRICAL HARNESSING INSTALLATION

To ensure rugged dependability, all 12-volt wiring harnesses installed by the apparatus manufacturer will conform to the following specifications:

SAE J1128 - Low tension primary cable

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

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

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

NFPA 1901 - Standard for automotive fire apparatus

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

SAE J1939 - Serial communications protocol

SAE J2030 - Heavy-duty electrical connector performance standard

SAE J2223 - Connections for on board vehicle electrical wiring harnesses

NEC - National Electrical Code

SAE J561 - Electrical terminals - Eyelet and spade type

SAE J928 - Electrical terminals - Pin and receptacle type A

Wiring will be run in loom where exposed, and have grommets or other edge protection where wires pass through metal. Automatic reset circuit breakers will be provided which conform to SAE standards. Wiring will be color, function and number coded. Wire colors will be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires and uses a single wire color for all wires will not be allowed. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. All wiring installed between the cab and into doors will be enclosed within an expandable rubber boot to protect the wiring. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

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

1. All wire ends not placed into connectors will be sealed with a heat shrink end cap. All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof. Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body. For low cost of ownership, electrical components designed to be removed for maintenance will be quickly accessible. For ease of use, a coil of wire will be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work. Corrosion preventative compound will be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation of the plug. Any lights containing non-waterproof sockets in a weather-exposed area will have corrosion preventative compound added to the socket terminal area. All electrical terminals in exposed areas will have DOW 1890 protective Coating applied completely over the metal portion of the terminal. Rubber coated metal clamps will be used to support wire harnessing and battery cables routed along the chassis frame rails. Heat shields will be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust will be protected by a heat shield.

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

BATTERY CABLE INSTALLATION

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

SAE J1127 - Battery Cable

SAE J561 - Electrical terminals, eyelets and spade type

SAE J562 - Nonmetallic loom

SAE J836A - Automotive metallurgical joining

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

NFPA 1901 - Standard for automotive fire apparatus

Battery cables and battery cable harnessing will be installed utilizing the following guidelines:

1. All battery cables and battery harnesses will have a permanent label attached for easy identification of the harness part number and fabrication date. For ease of identification and simplified use, battery cables will be color coded. All positive battery cables will be red in color or wrapped in red loom the entire length of the cable. All negative battery cables will be black in color. For ease of identification, all positive battery cable isolated studs throughout the cab and chassis will be red in color.

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

ELECTRICAL COMPONENT INSTALLATION

1. All lighting used on the apparatus will be, at a minimum, a two (2) wire light grounded through a wired connection to the battery system. All lights and reflectors, required to comply with Federal Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in 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.

CAB SWITCHING INSTALLATION

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.

BATTERY SYSTEM

Five (5) 12 volt Delphi batteries that include the following features will be provided:

- 950 CCA (cold cranking amps)

- 180 reserve capacity

- High Cycle

- Maintenance Free

- Group 31

- Rating of 3600 CCA at 0 degrees Fahrenheit

- 720 minutes of reserve capacity

- SAE posts

ISOLATED BATTERY

One (1) 12 volt, Delphi group 31 battery will be provided for voltage sensitive components. A battery isolator that is appropriately suited for the group 31 battery capacity will be supplied.

BATTERY SYSTEM

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 stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. 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.

BATTERY TRAYS

Formed fit heavy-duty roto-molded polyethylene battery trays with drain tubes will be provided for the batteries to sit in.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers will be installed on the bottom of the driver's side battery box. This will provide for easy jumper cable access.

BATTERY CHARGER

There will be a Kussmaul 1200, Model 091-187-12-Remote battery charger 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.

BATTERY CHARGER LOCATION

The battery charger will be located in the left body compartment, adjacent to the battery compartment, mounted on the inside wall as high as possible.

The battery charger indicator will be located near the driver's seat riser with special bracketry.

SHORELINE INLET

There will be one (1) shoreline receptacle provided to operate the dedicated 120 volt circuits on the truck without the use of a generator.

The shoreline receptacle will be provided with a NEMA 5-20, 120 volt, 20 amp, straight blade Kussmaul Super auto eject plug with a red weatherproof cover. 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 the battery charger.

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

The shoreline receptacle will be located in the driver's side lower step well of the cab.

ALTERNATOR

A C.E. Niehoff, Model C680-1, alternator will be provided. It will have a rated output current of 430 amp as measured by SAE method J56. It will also have a custom three (3)-set point voltage regulator, manufactured by C. E. Niehoff. 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 Kussmaul 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.

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 shape; one (1) pair mounted in each front trim housing.

The LED directional lights will wrap-around on the outside corners of the trim housing. The headlight and LED directional lights will be in the same assembly.

Five (5) LED clearance and marker lights will be installed across the leading edge of the cab.

REAR ID/MARKER DOT LIGHTING

The three (3) identification lights located at the rear will be installed per the following:

- LED light
- As close as practical to the vertical centerline.
- Centers spaced not less than six (6) inches or more than twelve (12) inches apart.
- Red in color.
- All at the same height.

The four (4) clearance lights located at the rear will be installed per the following:

- LED light
- To indicate the overall width of the vehicle.
- One (1) each side of the vertical centerline.
- 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.

MARKER LIGHTS

There will be one (1) pair of amber and red LED marker lights with rubber arm; one (1) located each side at the rear of the apparatus body. 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.

REAR FMVSS LIGHTING

There will be the following stop/tail and directional lighting provided at the rear of the truck:

- Two (2) Whelen, Model 60BTT*, red LED stop/tail lights with color lenses.
- Two (2) Whelen, Model 60A00TAR, amber LED directional lights.

These lights will be installed in a polished combination housing.

Four (4) red reflectors will be provided.

Two (2) Whelen, Model: 60C00VCR, LED backup lights will be provided.

LICENSE PLATE BRACKET

One (1) license plate bracket constructed of stainless steel will be provided at the rear of the apparatus.

One (1) white LED light will be provided to illuminate the license plate. A polished stainless steel light shield will be provided over the light that will direct illumination downward, preventing white light to the rear.

LIGHTING BEZEL

Two (2) Whelen, Model CAST4V, four (4) light aluminum housings will be provided for mounting four (4) Whelen 600 lights.

BACK-UP ALARM

A PRECO, Model 1040, 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 ten (10) dBA above surrounding environmental noise levels.

LIGHT, INTERMEDIATE

There will be one (1) pair, of Truck-Lite, Model: 60115Y, amber, LED, turn signal, marker lights furnished; one (1) located each side horizontally in the rear fender panels.

A stainless steel trim will be included with this installation.

CAB PERIMETER SCENE LIGHTS

There will be four (4) Amdor LumaBar H2O white LED strip lights provided; one (1) for each cab door and crew cab door.

- Two (2) Amdor LumaBar H2O, Model AY-9500-020, 20.00" LED strip lights; one (1) for each cab door.
- Two (2) Amdor LumaBar H2O, Model AY-9500-012, 12.00" LED strip lights; one (1) for each crew cab door.

These lights will be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body perimeter scene lights.

BODY PERIMETER SCENE LIGHTS

There will be a total of two (2) Amdor Luma Bar H2O, Model AY-9500-020, 20.00" LED weatherproof strip lights with brackets provided on the apparatus

The lights will be mounted in the following locations:

- Two (2) lights will be provided under the rear step area; one (1) each side.

The two (2) rear facing lights will be activated per the following and will not activate with the reverse gear:

- When the parking brake is applied.
- With a switch on the cab instrument panel.

Any additional side facing lights will be activated per the following:

- When the parking brake is applied.
- When the reverse gear is activated.
- With a switch on the cab instrument panel.

ADDITIONAL PERIMETER LIGHTS

There will be two (2) additional Amdor Luma Bar H2O, Model AY-9500-020, 20.00" LED perimeter light sticks provided; one (1) centered under the front bumper and one (1) centered under the rear step area below the ladder/pike pole storage area.

The lights will be activated by the same means as the body perimeter lights.

STEP LIGHTS

All steps on the apparatus will be illuminated per the current edition of NFPA 1901 and will match the turn table access step lights.

12 VOLT LIGHTING

There will be two (2) Fire Research, Model SPA260-Q15, 12 volt LED surface mounted scene lights with chrome trim bezel provided; one (1) located each side on the cab high behind the front cab doors.

The lights will be controlled in the following way:

A switch located at the driver's side cab switch panel

A switch located at the passenger's side cab switch panel

Opening the driver's side cab or crew cab doors

Opening the passenger's side cab or crew cab doors

The lights may be load managed when the parking brake is applied.

12 VOLT LIGHTING

There will be two (2) Whelen Model PFP1, 12 volt LED floodlights installed in semi-recessed housings, Model PBA103; one (1) located each side high on the rear bulkheads.

The lights selected above will be controlled by the following:

A switch located at the driver's side cab switch panel

A switch located at the passenger's side cab switch panel

These lights may be load managed when the parking brake is set

12 VOLT LIGHTING

There will be two (2) Whelen Pioneer Model PFP1, 12 volt LED floodlights provided on the front visor; one (1) located on the driver's side and one (1) located on the passenger's side.

The lights will be controlled in the following way:

A switch located at the driver's side cab switch panel

A switch located at the passenger's side cab switch panel

These lights may be load managed when the parking brake is applied.

DECK LIGHTS

Two (2) Hella, Model 74505, rectangular lights will be mounted; one (1) located each side at the rear of the apparatus body.

The lights will be activated by a control from a switch at the rear of the truck, which includes an indicator light.

MASTER SWITCH FOR CLEAR/WHITE WARNING LIGHTS

A master on/off switch will be provided for the clear/white, forward facing, warning lights. The switch will be in addition to the standard emergency master switch. The switch will be located in the cab instrument panel.

CARGO AREA

The cargo area will be fabricated of .125" 5052 aluminum with a tensile strength range of 31,000 to 38,000 psi.

The sides will not form any portion of the fender compartments.

The upper and rear edges of the side panels will have a double break for rigidity.

The cargo area will be located ahead of the ladder turntable.

Flooring of the cargo area will be aluminum treadplate.

TURNTABLE STEPS

Steps to access the turntable from the driver's side and passenger's 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 stepwell will be lined with bright aluminum treadplate to act as scuffplates. The steps will be connected to the "Do Not Move Truck" indicator. A handrail will be provided on each side of the access steps.

STEP LIGHTS

There will be three (3) white LED step lights provided for each set of aerial turntable access steps.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

The step lights will be actuated by the aerial master switch in the cab.

REAR WALL, SMOOTH ALUMINUM

The rear wall will be smooth aluminum.

TOW EYES

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

COMPARTMENTATION

Compartmentation will be fabricated of .125" 5052 aluminum. 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 fail safe design, and allow for all necessary movement in three (3) transitional and rotational modes. This will result in a 500 lb 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 (1) support assembly mounted to each chassis frame rail.

The compartmentation 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 (1) support assembly mounted to each chassis frame rail.

Compartment flooring will be of the sweep out design with the floor higher than the compartment door lip. 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 treadplate. Side compartment tops will be covered with bright aluminum treadplate with a 1.00" rolled over edge on the front, rear and outward side. The covers are fabricated in one (1) piece and have the corners welded. A bright aluminum treadplate 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.

COMPARTMENT IN PLACE OF PUMP

A roll-up door compartment will be installed in place of the pump and pump panel.

The compartment will be approximately 54.25" wide x 64.00" high x 24.50" deep in the lower area and transversed in the top portion of the compartment. The transversed area will be 46.50" wide x 47.00 high.

The door opening will be approximately 51.25" wide x 56.38" high.

The forward wall will be notched for the boom support.

DRIVER'S SIDE COMPARTMENTATION

A full height roll-up door compartment, ahead of the rear wheels, will be approximately 41.75" wide x 64.00" high x 24.25" deep inside with an clear door opening of approximately 38.75" wide x 56.38" high.

One (1) roll-up door compartment, above the fender compartments and over the rear axles, will be provided. The compartment will be approximately 72.13" wide x 33.25" high x 24.25" deep inside with a clear door opening of approximately 63.75" wide x 25.50" high.

A compartment with a single pan stainless steel door will be located above the front stabilizer. The compartment will be approximately 23.00" high x 18.00" wide x 24.25" deep with a door opening of approximately 15.75" high x 12.00" wide.

A full height roll-up door compartment, behind the rear wheels, will be approximately 43.75" wide x 49.25" high x 21.25" deep. The clear door opening will be approximately 40.75" wide x 41.62" high.

One (1) lift-up door compartment below the turntable will be provided. The compartment will be approximately 39.38" wide x 18.38" high x 21.25" deep inside with a door opening of approximately 35.00" wide x 14.88" high.

COMPARTMENTATION, PASSENGER'S SIDE

A full height roll-up door compartment, ahead of the rear wheels, will be 41.75" wide x 64.00" high x 24.25" deep inside with a clear door opening of 38.75" wide x 56.38" high.

One (1) roll-up door compartment will be provided above the fender compartments and over the rear axles. The compartment will be 72.13" wide x 33.25" high x 24.25" deep inside with a clear door opening of 63.75" wide x 25.50" high.

A compartment with a single pan stainless steel door will be located above the front stabilizer. The compartment will be 18.00" wide x 23.00" high x 24.25" deep with a door opening of 12.00" wide x 15.75" high.

A full height, roll-up door compartment, behind the rear wheels, will be 43.75" wide x 49.25" high x 21.25" deep. The clear door opening will be 40.75" wide x 41.62" high.

One (1) lift-up door compartment below the turntable will be provided. The compartment will be 39.38" wide x 18.38" high x 21.25" deep inside with a door opening of 35.00" wide x 14.88" high.

ROLL-UP DOOR, SIDE COMPARTMENTS

The compartment doors installed on the side compartments will be double faced, aluminum construction, painted one (1) color to match the lower portion of the body manufactured by AMDOR™ brand roll-up doors.

Door(s) will be constructed using 1.00" extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats will be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain will be done with a clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats will be mounted in reusable slat shoes with positive snap-lock securement.

Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second will serve as a wiping seal which will also allow for compression to prevent water ingression.

The doors will be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel are to be manufactured utilizing non-marring materials.

Bottom panel flange of roll-up door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.

A stainless steel lift bar to be provided for opening the door and located at the bottom of each door with latches on the outer extrusion of the door frame. A ledge to be supplied over lift bar for additional area to aid in closing the door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.

All injection molded roll-up door wear components will be constructed of Type 6 nylon.

Each roll-up door will have a 3.00 inch diameter balancer/tensioner drum to assist in lifting the door.

The header for the roll-up door assembly will not exceed 4.00".

A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

COMPARTMENT BLISTER

A blister in the compartment ahead of the rear wheels will be provided to clear the front bracket of the Firemaax suspension. This blister will take away some of the interior area of the compartment.

REAR BUMPER

A 4.50" stainless steel rear bumper will be furnished. Bumper will be highly polished with radiused ends and reinforcing ribs top and bottom. It will extend the full width of the body. A 4.00" formed steel channel will be mounted directly behind the bumper for additional strength.

DOOR GUARD

There will be ten (10) compartment doors that will include a guard/drip pan designed to protect the roll-up door from damage when in the retracted position and contain any water spray. The guard will be fabricated from stainless steel and installed each side body roll up compartment door.

ROLL-UP DOOR TRIM

The exterior of the aluminum trim around the door openings will be painted to match job color.

There will be ten (10) compartments with the trim painted.

COMPARTMENT LIGHTING

The compartments will be equipped with Amdor Model AY-9220 white 12 volt DC LED compartment light strips. The light strips will be held in place with Amdor clips.

There will be two (2) strip lights installed vertically in each compartment opening per the latest NFPA requirements.

The lights will be activated when the battery switch is on and the respective compartment door is opened.

MOUNTING TRACKS

There will be ten (10) sets of tracks for mounting shelves; one (1) set in each side body equipment compartment. These tracks will be installed vertically to support the adjustable shelves full height of the compartment. The tracks will be painted to match the compartment interior.

ADJUSTABLE SHELVES

There will be ten (10) shelves with a capacity of 500 pounds provided. The shelf construction will consist of .188" aluminum with 2.00" sides. Each shelf will be painted to match the compartment interior. Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track.

The shelves will be held in place by .12" thick stamped plated brackets and bolts.

The locations will be determined at drawing approval.

PULL-OUT TRAY

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

Slides (a minimum of two per tray) will be an undermount-roller bearing type rated at 500lbs per pair with a factor of safety of 2.

To ensure years of dependable service the slides will be coated with a finish that is tested to withstand a minimum of 1,000 hours of salt spray per ASTM B117.

To ensure years of easy operation, the slides will require no more than a 50 pound force for push-in or pull-out movement when fully loaded after having been subjected to a 40 hour vibration (shaker) test under full load. The vibration drive file will have been generated from accelerometer data collected from a heavy truck chassis driven over rough gravel roads in an unloaded condition. Proof of compliance will be provided upon request.

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.

The locations will be determined at drawing approval.

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.

LITTLE GIANT LADDER STORAGE

Storage will be provided in in the transverse compartment - location determined at drawing approval for a 17' Little Giant ladder. The ladder storage will be configured horizontal . There will be two (2) trough style brackets provided with dura surf slides and a Velcro strap to aid in restraint and removal of the Little Giant ladder.

UNDER BODY STORAGE COMPARTMENT

A storage area will be installed under the passenger's side compartment in place of the pump. The compartment will be fabricated from aluminum. A seal will go around the perimeter of the door to prevent the egress of dirt and water. A "D-ring" handle will be used on the compartment door to aid in opening and closing the compartment. The compartment will have

the capacity to hold up to 500 lb of equipment located under the passenger side compartment in place of pump. The interior dimensions of the compartment will be approximately 8.00" high x 36.00" wide x 23.00 deep. There will be a slide out tray installed in this compartment.

PVC STORAGE TUBE

A PVC storage tube will be provided for equipment storage in the transverse compartment - locations determined at drawing approval. The dimensions of the equipment will be square tube - 8" x 8" x 53" for rescue jacks.

A total of two (2) will be provided.

REAR WALL

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

RUB RAIL

The edge of the running boards and the bottom edge of the side compartments will be trimmed with a black 1.00" thick x 2.50" high plastic "UPF" rub rail. .50" rubber spacers will be included between the rubrail and the body.

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.

EQUIPMENT STORAGE AIR BOTTLE AREA

A total of two (2) compartments will be provided; one (1) located on the driver's side and one (1) located on the passenger's side centered between the tandem rear wheels. The compartments will be approximately 16.00" wide at the top x 8.00" wide at the bottom with tapered sides. The compartments will be approximately 12.00" high x 26.00".

Flooring will be rubber lined and have a drain hole. A drop down door with rubber bumpers and a flush mounted lift and turn latch will be provided for each compartment. The door will be polished stainless steel. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

CORNER FENDER PANEL DOUBLE AIR BOTTLE STORAGE

A total of two (2) air bottle compartments will be provided in the upper corners of the passenger's side fender panel. The compartments will be located on the passenger's side ahead of and behind the rear wheel. The air bottle compartments will be in the form of a round

tube (7.75" diameter maximum) and of adequate depth (26.00" maximum) to accommodate different size air bottles. The tubes will be mounted separately in a diagonal fashion; one above the other.

Flooring will be rubber lined and have a drain hole. A vertically hinged door with tapered corners and a flush mounted lift and turn latch will be provided for each compartment. The door will be polished stainless steel. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

AIR BOTTLE STORAGE (SINGLE)

A quantity of two (2) air bottle compartments, 7.75" in diameter x 26.00" deep, will be provided on the driver's side forward of the rear wheels and on the driver's side rearward of the rear wheels. A polished stainless steel door with a chrome plated flush lift & turn 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.

Inside the compartment, black rubber matting will be provided.

EXTENSION LADDER

There will be two (2) - 35', two (2) section, aluminum, Duo-Safety, Series 1200-A extension ladders provided.

EXTENSION LADDERS, AERIAL

There will be one (1) - 28', two (2) section, aluminum, Duo-Safety, Series 1200-A extension ladder provided.

ROOF LADDER

There will be two (2), - 16' aluminum, Duo-Safety, Series 875-A roof ladders provided.

ADDED ROOF LADDER

There will be one (1) - 10' aluminum roof ladder, Series 775-A, with roof hooks on both ends provided.

ADDED ROOF LADDER

There will be one (1) - 14' aluminum roof ladder, Duo-Safety series 775-A with a pair of 7/8" hooks at each end provided.

FOLDING LADDER, AERIAL

There will be one (1) - 10' aluminum, Duo-Safety, Series 585-A folding ladder provided.

GROUND LADDER STORAGE

The ground ladders will be stored in the torque box 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.

An AMDOR roll-up door will be provided at the rear, double faced, aluminum construction, painted one (1) color to match the lower portion of the body manufactured by AMDOR manufacturing. 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 can not 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.

One (1) - 17' aluminum, Super Duty Type 1AA Little Giant folding ladder will be provided. The stored dimensions will be 55.00" high x 25.00" wide x 8.00" deep. The weight will be 45 pounds. Capacity of 375 pounds.

The ladder will be located in the transverse compartment - location determined at drawing approval.

PIKE POLES

There will be two (2) - 12 foot pike poles with fiberglass I-beam handles provided. The pike poles will be stored in tubular holders located in the ground ladder storage compartment.

PIKE POLE 8 FT

There will be two (2) - 8 foot pike poles with fiberglass I beam handles provided. The pike poles will be stored in tubular holders located in the ground ladder storage compartment.

PIKE POLE 6 FT

There will be two (2) - 6 foot pike poles with fiberglass I beam handles provided. The pike poles will be stored in tubular holders located in the ground ladder storage compartment.

PIKE POLE 3 FT

There will be two (2) - 3 foot pike poles with fiberglass shaft and "D" handles shipped loose.

VELCRO® RETENTION STRAPS

There will be six (6) Velcro® retention straps threaded through footman loops installed to prevent the pike poles from sliding rearward into the door.

AIR HORN SYSTEM

Two (2) Grover Stuttertone air horns will be provided located in the front bumper, recessed one (1) each side. 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 loss of air in the air brake system.

AIR HORN CONTROL

Two (2) lanyard rope pull controls will be provided; one (1) within reach of the driver and one (1) within reach of the officer.

MECHANICAL SIREN

A Federal Q2B siren will be furnished. A siren brake button will be installed on the switch panel.

The siren will only operate when the Emergency master switch is in the "ON" position.

The mechanical siren will be mounted on the bumper deckplate. It will be mounted on the left side. A reinforcement plate will be furnished to support the siren.

The mechanical siren will be actuated by a foot switch on the officer's side and by the horn button in the steering wheel. The driver will have the option to control the siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

CAB ROOF LIGHTBARS

There will be two (2) - 24.00" Whelen Freedom, Model FNMINI LED light bars mounted on the cab roof; one (1) located on each side above the driver's and passenger's door.

Each light bar will include the following:

- One (1) forward facing white LED flashing light.
- One (1) side facing red LED flashing light.
- Two (2) corner red LED flashing lights.
- Clear lenses over each module.

One (1) switch located in the cab on the switch panel will control these lights.

The white LED flashing lights will be disabled when the parking brake is set.

WARNING LIGHTS (CAB FACE)

Two (2) pair of Whelen Model 60*00F*R 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.

There will be one (1) switch located in the cab on the switch panel to control both sets of lights.

DAYTIME RUNNING LIGHTS (HEADLIGHTS)

The high-beam headlights used as daytime running lights will be activated with the following measures:

- Ignition switch is turned on.
- Parking brake is released.

These lights will be deactivated with any one of the following measures:

- Headlight switch is turned on.
- High-beam flash is turned on.
- Parking brake is set.

HEADLIGHT FLASHER

The high beam headlights will flash alternately between the left and right side.

There will be a switch installed in the cab on the switch panel to control the high beam flash. This switch will be live when the battery switch and the emergency master switches are on.

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

SIDE ZONE LOWER LIGHTING

Six (6) Whelen Model 60*02F*R flashing "Super" LED lights will be located at the following positions:

Two (2) lights; one (1) located each side on the front bumper extension - red Super LED/clear lens each side.

Two (2) lights; one (1) located each side on the lower rear corners of the crew cab - red Super LED/clear lens each side.

Two (2) lights; one (1) located each side in the rear fender panels - red Super LED/clear lens each side.

The lights will be controlled by a lighted switch on the cab instrument panel.

These lights will be installed with polished trim flange kits.

REAR ZONE LOWER LIGHTING

There will be two (2) Whelen, Model 60*02F*R, LED, red Super LED/clear lens lights located at the rear of the apparatus.

Each light will be mounted in the Whelen housing.

There will be one (1) switch located in the cab on the switch panel to control the lights.

REAR/SIDE ZONE UPPER WARNING LIGHTS

There will be two (2) Whelen, Model L31H*FN, LED warning beacons provided at the rear of the truck; one (1) located each side.

There will be one (1) switch located in the cab on the switch panel to control the beacons.

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

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen, Model TACF85, 45.12" long x 2.35" high x 2.38" deep, amber LED traffic directing light installed at the rear of the apparatus.

A Whelen, Model TACTLD1, control head will be included with this installation.

The auxiliary warning mode will be activated with the control head only.

This traffic directing light will be mounted on top of the body below the turntable at the rear of the apparatus in an aluminum treadplate housing.

The traffic directing light control head will be located in a heavy duty swivel bracket centered between the driver and passenger.

This swivel bracket will enable the driver access as well as the passenger.

INTERIOR CAB DOOR WARNING LIGHTS

Four (4) Whelen 500 LED flashing lights will be provided. One (1) light will be located inside of each cab and crew cab door pan. Each light will be activated by the door jamb switch of the associated door. The color of the lights will be amber. The lights will alternately flash whenever the corresponding door is open. These lights will be mounted in a polished trim flange.

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) 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 function 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 Harrison Model 10.0MPC-16 10.0 kW 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: 83.3 @ 120 volts, 41.7 @ 240 volts

- Phase: Single

- Cycles: 60 hertz

- Engine Speed at Engagement: Idle

- RPM range: 1100 to 3,000

Generator Dimensions

- Length: 35 inches

- Width: 23 inches

- Height: 19.00 inches

- Weight: 475 pounds

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 meter panel will be furnished and mounted next to the circuit breaker panel. The unit will be a single phase, three (3)-wire, 120/240-volt series.

The following instruments will be installed in the panel if not specified on the generator:

- One (1) Voltmeter

- Two (2) Ammeters

- One (1) Frequency Meter

- One (1) Hour Meter on the Generator

- One (1) "PTO" Engagement Green Indicator Light

- One (1) "Power On" Green Indicator Light

- Two (2) Fuse Holders with Two (2) Amp Fuses (for gauge protection)

The gauges and controls 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. The load center will have a circuit breaker to assure overload protection. The breaker furnished will be properly sized to the generator output.

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 will be a Cutler Hammer 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 permanently mounted above the torque box - location will be determined at drawing approval.

GENERATOR START

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

CIRCUIT BREAKER PANEL - (CUTLER HAMMER)

The circuit breaker panel will be located - location determined at drawing approval.

GROUND FAULT CIRCUIT INTERRUPTER

The specified 120 volt options determined at drawing approval will be supplied with a ground fault circuit interrupter (GFCI) circuit breaker.

The total quantity will be ten (10) circuit breakers.

The GFCI breakers will only be used in the branch circuits and will not be used as a "master" circuit breaker.

240 VOLT LIGHTING

There will be Two (2) Fire Research Spectra, Model SPA570-J20, white 240 volt AC LED top mount fixed pedestal scene lights provided; two (2) located on the driver's side catwalk - locations will be determined at drawing approval.

The lights selected above will be controlled by the circuit breaker included in the AC breaker panel as well as following:

- A switch located at the driver's side cab switch panel
- A switch located at the rear of the apparatus on the driver's side

240 VOLT LIGHTING

There will be Two (2) Fire Research Spectra, Model SPA570-J20, white 240 volt AC LED top mount fixed pedestal scene lights provided; two (2) located on the passenger's side catwalk - locations will be determined at drawing approval.

The lights selected above will be controlled by the circuit breaker included in the AC breaker panel as well as following:

- A switch located at the driver's side cab switch panel
- A switch located at the rear of apparatus on the passenger's side

ELECTRIC CORD REELS

Furnished with the 120 volt AC electrical system will be a Hannay, series 1600, cord reel. The reel 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.

The exterior finish of the reels will be painted #269 gray from the reel manufacturer.

A Nylatron guide will 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 two (2) cord reels will be provided located in the cargo area behind the compartment over the forward stabilizer - locations verified at drawing approval.

The cord reel will be configured with three (3) conductors.

REEL ENCLOSURE

An aluminum treadplate enclosure will be installed over the reels. The enclosures will be provided with a stainless steel hinge that will allow the covers 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 two (2) will be installed in the rear wall of the compartment above the forward stabilizer - locations verified at drawing approval.

CORD

Provided for electric distribution will be two (2) lengths; one (1) for each reel - 200 feet of yellow 10/3 electrical cord, weather resistant 105 degree C to -50 degree C, 600 volt jacketed SOOW cord.

PORTABLE JUNCTION BOX

There will be two (2) Akron electrical junction boxes provided.

Each box will include the following:

- One (1) 20 amp 120 volt AC straight blade duplex receptacle with flip lid.
- Three (3) 20 amp 120 volt AC twist lock receptacles with flip lids.
- Faceplate's which are brightly backlit with a twenty-five watt lamp.

110 VOLT INTERIOR RECEPTACLE

Receptacles will be NEMA 5-15, 120 volt, 15 amp, three (3) wire duplex household type connected to the shoreline.

There will be two (2) receptacles provided.

One (1) located in the chassis cab and one (1) located in the apparatus body - locations determined at drawing approval.

20 AMP RECEPTACLE

Wired to the power supply will be two (2) receptacles - 120 volt 20 amp three wire twist-lock NEMA L5-20 type with weather resisting cover located - locations determined at drawing approval.

FOUR (4)-SECTION 105 FOOT AERIAL LADDER

CONSTRUCTION STANDARDS

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

The aerial device will be a true ladder type device; therefore ladders attached to booms will not be considered.

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 2:1 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 1901 NFPA standard.

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 core for increased flexibility. The wire rope will be galvanized to reduce corrosion.

The aerial base pivot bearings will be maintenance free type bearings and require no external lubrication.

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 and 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 of aerial components, including the aerial ladder sections, turntable, pedestal, and outriggers, will be in compliance with the American Welding Society standards. All welding personnel will be certified, as qualified under AWS welding codes.

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: (no exception)

- 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

- All welded structural components for the ladder will be traceable to their mill lots

LADDER CONSTRUCTION

The ladder will be comprised of four sections.

The ladder will have the capability to support a minimum of 750 pounds at the tip in the unsupported configuration, based upon 360 degree rotation, up to full extension and from -8 degrees to +75 degrees.

The ladder (handrails, baserails, trusses, K-braces and rungs) will be constructed of high strength low alloy steel, minimum 70,000 pounds per square inch yield, with full traceability on all structural members.

Each section will be trussed diagonally, vertically and horizontally using welded steel tubing.

8All ladder rungs will be round and welded to each section utilizing "K" bracing for torsional rigidity.

The inside width dimensions of the ladder will be:

- Base Section 39.00"

- Inner-Mid Section 32.25"

- Outer-Mid Section 26.62"

- Fly Section 21.62"

The height of the handrails above the centerline of the rungs will be:

- Base Section 26.75"

- Inner-Mid Section 22.87"

- Outer-Mid Section 20.25"

- Fly Section 17.50"

The ladder will be designed to provide continuous egress for firefighters and civilians from an elevated position to the ground. The end of the fly section will be constructed in a manner that aids personnel in climbing off the ladder.

The egress section will be designed to maintain the rated load of the aerial device. It will be bolted on for easy replacement.

VERTICAL HEIGHT

The ladder shall extend to a minimum height of 105' above the ground at full extension and elevation. The measurement of height shall be consistent with NFPA standards.

HORIZONTAL REACH

The rated horizontal reach shall be a minimum of 100'. The measurement of horizontal reach shall be consistent with NFPA standards.

TURNTABLE

The upper turntable assembly will connect the aerial ladder to the turntable bearing. The steel structure will have a mounting position for the aerial elevation cylinders, ladder connecting pins, and upper turntable operator's position.

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 platform will be 1.00" thick steel deck that is approximately 95.00" wide x 84.50" long.

The turntable will be lit to meet the current edition of NFPA 1901 requirements. Lights will be activated by the aerial master switch.

The turntable handrails shall be a minimum 42.00" high and shall not increase the overall travel height of the vehicle. The handrails shall be constructed from aluminum and have a slip resistant knurled surface.

ELEVATION SYSTEM

Two (2) double acting lift cylinders will be utilized to provide smooth precise elevation from 8 degrees below horizontal to 75 degrees above horizontal.

The lift cylinders will have a 6.00" internal diameter (bore), .50" wall thickness, 4.50" diameter cylinder rod and a 34.84" stroke.

The lift cylinders will be equipped with integral holding valves located on the cylinder to prevent the unit from falling should the charged lines be severed at any point within the hydraulic system.

The lift cylinders will be mounted utilizing maintenance free spherical bearings on both ends of the cylinders. The bearings will help reduce pin wear.

Ladder tip speed is automatically decelerated when the angle is above 60 degrees, reducing "tip-lash".

The pivot pins will be stainless steel with greaseless bushings and will be 2.25" in diameter. All elevation pins will be stainless steel.

EXTENSION/RETRACTION SYSTEM

A full hydraulic powered extension and retraction system will be provided using two (2) hydraulic cylinders and wire ropes.

Each cylinder is capable of operating the ladder in the event of a failure to the other.

The extension cylinder will have a 3.00" internal diameter (bore), 1.75" diameter rod and a 134.00" stroke.

Extension and retraction will be internally limited within the cylinders, eliminating excess strain on wire ropes, sheaves and the ladder structure.

Each of the cylinders, wire ropes and sheave assemblies will be completely independent of the other, so as to provide a safety factor wherein a failure of one assembly will not affect the function and operation of the other.

The extension cylinders will be equipped with integral holding valves to prevent the unit from retracting should the charged lines be severed at any point within the hydraulic system.

The extension cylinders will be mounted utilizing maintenance free spherical bearings.

The cylinders will also have internal deceleration valves to cushion the movement of the cylinder when approaching full extension or retraction.

The reeling of the wire rope will be such as to provide synchronized, simultaneous movement of all sections to full extension.

The extension/retraction cables will be 7-flex galvanized wire rope with stainless steel threaded ends and will possess the following characteristics:

- Inner Section .50" diameter with 26,200# nominal design strength

- Mid Section.38" diameter with 14,880# nominal design strength

- Fly Section.31" diameter with 10,380# nominal design strength

Wear pads made of polymer material will be used between the telescoping sections for maximum weight distribution, strength and smoothness of operation.

Adjustment screws will be provided on the wear pads to permit proper side alignment.

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

ROTATION SYSTEM

A 46.00" diameter, external tooth, monorace, slewing ring bearing will be used for the rotation system.

The gear teeth will be stub tooth form.

The bearing will provide 360 degree continuous rotation.

The turntable will be bolted to the bearing using 36 SAE Grade 8, .875" diameter bolts.

To secure the bearing to the torque box, 36 Grade 8, .875" diameter bolts will be used.

The turntable base and the torque box bearing plate will be machined flat, within .007" thereby providing even distribution of forces.

Two hydraulically driven planetary gear boxes shall be used to provide infinite and minute rotation control throughout the entire rotational travel.

Each planetary gearbox shall have a torque rating of 130,000 pounds per inch.

Each planetary gearbox shall have a spring applied, hydraulically released disc type swing brake shall be furnished to provide positive braking of the turntable assembly.

ROTATION INTERLOCK

A permanently installed prevention mechanism will be provided as part of the rotation system to prevent the rotation of the aerial device to the side in which the stabilizers have not been fully deployed or are short-jacked.

The mechanism will allow full and unrestricted use of the aerial in the 180 degree area on the sides 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 at an aerial device control location and one at the lower control station).

TORQUE BOX

A "torsion box" subframe will be installed between the two (2) 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 subframe assembly is capable of withstanding all torsional and horizontal loads when the unit is on the stabilizers.

The torque box will be bolted to the chassis frame rails using 20 SAE Grade 8, .750" bolts with nuts.

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. (no exception)

50 MPH WIND CONDITIONS/WATERWAY DRY

Degrees of Elevation	-8 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 75
Egress	750	750	750	750	750	750	750	750
Fly	-	-	-	-	-	-	250	750
Upper Mid	-	-	-	-	250	250	500	750
Lower Mid	-	-	-	250	250	500	1000	1000
Base	-	-	250	250	250	750	1000	1000

50 MPH WIND CONDITIONS/WATERWAY CHARGED

Degrees of Elevation	-8 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 75
Egress	500	500	500	500	500	500	500	500
Fly	-	-	-	-	-	250	500	750
Upper Mid	-	-	-	-	250	500	750	1000
Lower Mid	-	-	-	250	500	750	1000	1000
Base	-	-	250	500	750	1000	1000	1000

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

The tip capacity will be reduced to zero when flowing water with the nozzle above the waterway centerline.

BOOM SUPPORT

A heavy duty boom support will be provided for support of the ladder in the travel position. On the base section of the ladder, a stainless steel scuffplate will be provided where the ladder comes into contact with the boom support.

The boom support will be located just to the rear of the chassis cab, recessed into the transverse compartment in place of pump.

AERIAL BOOM PANEL

There will be one boom panel provided on each side of the aerial ladder base section. The boom panel will be painted RED to match the apparatus body.

The boom panels will be designed so no mounting bolts are in the face of the panel. This will keep the lettering surface free of holes.

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.

FOLDING STEPS

One (1) set of Eberhard folding steps will be provided at the tip of the ladder.

An additional set of Eberhard folding steps will be provided at the base of the fly section.

AERIAL DEVICE RUNG COVERS

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.

The center portion of each rung cover will be black and the outside 2.00" edge at each side will be photoluminescent to assist in providing a light source for each rung during low light conditions.

Under no circumstances will the rung covers be fastened to the rungs using screws or rivets.

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

LADDER STORAGE MOUNTING BRACKETS

Mounting will be provided on the right side of the aerial device while viewed from the turntable for storage of one (1) roof ladder. The brackets will be located inboard of the boom panel at the base section. The brackets will hold the boom panel as close to the base section as possible and include straps or latches to secure the ladder.

The mounting brackets will accommodate a 14' Duo-Safety 775-A roof ladder.

LADDER STORAGE MOUNTING BRACKETS

Mounting brackets for a single roof ladder will be provided on the left side of the aerial device while viewed from the turntable. A total of one (1) roof ladder will be stored on the aerial base section. The brackets will be located inboard of the boom panel at the base section.

The mounting brackets will accommodate a 10' Duo-Safety 775-A-DR roof ladder.

PIKE POLE MOUNTING BRACKETS

Mounting will be provided near the end of the fly section of the aerial ladder for one (1) pike pole.

The bracket will be sized to hold an Akron 12' pike pole.

AXE MOUNTING BRACKETS

Brackets will be provided near the end of the fly section of the aerial ladder for mounting a fire axe. The mounting plates will be D/A finished aluminum.

LADDER STORAGE MOUNTING BRACKETS

There will be D/A finished mounting brackets provided near the end of the fly section of the aerial for mounting a 10' Duo Safety 585A folding ladder.

STORAGE BOX AT TURNTABLE

A storage box with a hinged cover will be provided at the turntable. The box and cover will be constructed of aluminum treadplate.

ROTATION BEARING COVER

An aluminum treadplate cover will be fitted over the aerial rotation bearing and drive pinion gear(s). The cover will be attached to the underside of the turntable deck.

TURNTABLE CONTROL STATION

There will be a turntable control station located on the left hand side of the turntable so the operator will be able to easily observe the ladder tip while operating the controls. The controls will permit the operator to regulate the speed of the aerial functions within safe limits (as determined by the manufacturer and NFPA standards). The controls will be clearly marked and lighted for nighttime operation. A hinged aluminum cover will be provided. The momentary foot switch located at the turntable control station will activate the aerial function controls. They are capable of being operated independently or simultaneously.

The following controls and indicator lights will be clearly identified, illuminated, and conveniently located for ease of operation and viewing:

- Elevation, extension/retraction, and rotation controls
- High idle switch
- Rung alignment indicator light
- Tip/Tracking lights switch
- Hydraulic system pressure gauge
- Indicator/Alarm test switch
- EPU switch and light
- Operator's load chart
- Stabilizer Not Fully Extended indicator light
- Monitor controls
- Aerial waterway flow meter

There will also be a minimum of two (2) 12-volt LED 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.

STABILIZER CONTROL STATION

There will be two (2) easily accessible control stations; one (1) for driver's side stabilizers and one (1) for passenger's side stabilizers located at the rear of the apparatus.

The following controls and indicator lights will be clearly identified, illuminated, and conveniently located for ease of operation and viewing at each of the control stations except where otherwise noted:

- Left Rear Stabilizer Firm On Ground indicator light (driver side panel only)
- Left Rear Stabilizer Fully Extended Indicator light (driver side panel only)
- Left Rear Stabilizer In/Out switch (driver side panel only)
- Left Rear Stabilizer Up/Down switch (driver side panel only)
- Left Front Stabilizer Firm On Ground indicator light (driver side panel only)
- Left Front Stabilizer Fully Extended indicator light (driver side panel only)
- Left Front Stabilizer In/Out switch (driver side panel only)
- Left Front Stabilizer Up/Down switch (driver side panel only)
- Right Rear Stabilizer Firm On Ground indicator light (passenger side panel only)
- Right Rear Stabilizer Fully Extended indicator light (passenger side panel only)
- Right Rear Stabilizer In/Out switch (passenger side panel only)
- Right Rear Stabilizer Up/Down switch (passenger side panel only)
- Right Front Stabilizer Firm On Ground indicator light (passenger side panel only)
- Right Front Stabilizer Fully Extended indicator light (passenger side panel only)
- Right Front Stabilizer In/Out switch (passenger side panel only)
- Right Front Stabilizer Up/Down switch (passenger side panel only)
- Hydraulic emergency power switch
- High idle switch

REMOTE AERIAL CONTROL

A remote control will be provided whereby all ladder movements can be controlled at the ladder tip in addition to the control console.

The three (3) ladder functions (extension, rotation, elevation) will be controlled individually by means of spring loaded, return to center 12-volt proportional controls.

A momentary switch at the turntable control station will activate the controls at the ladder tip.

The remote control aerial speed will be set in accordance with the current NFPA 1901 standards.

STABILIZERS

The vehicle will come equipped with a stabilization system consisting of four (4) hydraulically operated out and down style stabilizers. This system will meet or exceed all requirements of the NFPA specifications related to stabilization and setup on sloped surfaces.

The stabilizer/leveling jacks will have a maximum spread of 16' measured from the centerline of the jack footpads when the beams are fully extended. The beams will be 6.88" wide x 9.00" high with 3/4" thick top and bottom plates and 3/4" thick sides of 100,000-PSI minimum yield strength steel. The cylinders will have pilot-operated check valves with thermal relief designed to insure that the beams will not drift out of the stowed position during travel. Wear pads will guide the stabilizers.

The horizontal extension cylinders will be totally enclosed within the beams and will incorporate telescoping hydraulic tubing to supply the jack cylinder hydraulic power. Stabilizer hydraulic hoses will remain stationary during operation of the stabilizers to prevent hose wear and potential failure. The cylinders will be equipped with decelerators to reduce the speed of extension and retraction when the beams are near the fully retracted and extended positions. The stabilizer extension hydraulic cylinders will have the following dimensions: 2.25" bore, 1.38" rod, and 51.25" stroke.

The vertical jack cylinders will be capable of 12.00" ground penetration. The cylinders will be supplied with pilot operated check valves on each jack cylinder to hold the cylinder in the stowed or working position, should a charged line be severed at any point in 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 from damage. The stabilizer jack hydraulic cylinders will have the following dimensions: 4.25" bore, 3.00" rod, and 28.88" stroke.

Each stabilizer jack will have a polished stainless steel shield. The stainless steel shield will be a maximum of 14.00" wide so as to allow the extension of the stabilizer between parked cars or other obstacles. 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 90 degrees for added strength. A 4.00" diameter clear work light will be provided to illuminate the stabilizer and the ground. Lighting will automatically activate with the aerial master switch.

STABILIZER PADS

The stabilizer footpad will be 12.00" in diameter. The footpad will be attached to the jack cylinder rod by means of a machined ball at the end of the jack cylinder rod which mates to a socket machined into the footpad. The footpad will have the ability to pivot 20 degrees from horizontal in any direction to allow setup on uneven terrain.

AUXILIARY STABILIZER PADS

An auxiliary ground pad will be supplied for each stabilizer to provide additional load distribution on soft surfaces. The pads will be 31" x 26" and made from a lightweight composite material. The ground pressure will not exceed 75 pounds per square inch when the ground pads are used and the apparatus is fully loaded and the aerial device is carrying its rated capacity in any position. The pads will be stored in a double stacked configuration, two (2) behind each rear tandem axle in a single bracket.

STABILIZER CONTROLS

An electrically controlled hydraulic valve will power stabilizer movement. The valve can also be manually controlled in the event of electrical malfunction. Hydraulic power override controls will be incorporated into the valve. The manual override mechanism will be completely sealed within the valve assembly to prevent any possibility of corrosion.

The stabilizer controls will be located to provide the operator with a full view of each stabilizer being positioned.

Each stabilizer control panel will include the following:

-In/out stabilizer beam control toggle switch

-Up/down stabilizer jack control toggle switch

-Emergency hydraulic power unit (EPU) control toggle switch

-High idle control toggle switch

-Stabilizer fully extended LED indicator lights

-Stabilizer planted LED indicator lights

As a safety device, an electrically actuated diverter valve will be provided. The hydraulic power will be diverted to the aerial ladder controls automatically the instant all stabilizer jacks are firmly planted on the ground. Once the aerial ladder is raised from the bedded position, the stabilizer hydraulic power is cut off so the stabilizers will not accidentally be moved while the aerial is being operated.

To aid in leveling the unit, two bubble type angle indicators will be located near the stabilizer controls. One indicator will show the angle of the truck from the front to rear and the other will

show the side to side angle of the truck. The indicators will be color coded green to show when the truck has been properly leveled allowing the aerial device to be operated at full capacity.

A stabilizer deployment audible warning alarm will be provided at each side of the body, activated by the stabilizer movement.

A "Stabilizers Not Stowed" indicator light will be provided in the cab within view of the driver. It will illuminate automatically whenever the stabilizers are not fully stowed to prevent damage to the vehicle if it is moved. The stabilizer system will also be wired to the "Do Not Move Truck" indicator light. This light will flash whenever the apparatus parking brake is not engaged and the stabilizers are not fully stowed.

STABILIZER PINS

The stabilizer jacks will have holes for the stabilizer pins.

STAINLESS STEEL DOORS, STABILIZER CONTROL BOX

Vertically hinged stainless steel doors will be provided over each stabilizer control box. The doors will be hinged inboard.

STABILIZER PANELS

The stabilizer panels will be painted aluminum in place of polished stainless steel.

HYDRAULIC SYSTEM

All hose assemblies will be assembled and crimped by the hose manufactures certified technician. An assembly cell will be located on the premises where the technician can perform audits of the final aerial assembly for proper fitting torque and hose routing.

All manufacturing employees responsible for the installation of hydraulic components will be properly trained. Training will include: proper handling, installation, torque requirements, cleanliness and quality control procedures for hydraulic components.

Hoses used in the aerial hydraulic system will be of a premium quality hose with a high abrasion resistant cover. All pressure hoses will have a working pressure of 4000 psi. and a burst pressure rating of 16,000 psi.

The hydraulic oil will be a premium Multi-Vis product that will have a leading edge additive package, provide oxidation stability, be extremely shear stable, and have maximum anti-wear properties. All oil delivered to the manufacturing site will have a minimum ISO cleanliness level of 18/15/13.

Each aerial will be evaluated as to the region and climate where it will be used to determine the optimum viscosity and proper oil grade. Oil viscosity will be based on an optimum range of

80 to 1000 SUS during normal aerial use. Before shipment of the unit, an oil sample will be taken and analyzed to confirm the oil is within the allowable ISO grade tolerance.

The aerial hydraulic system will have a minimum oil cleanliness level of ISO 18/15/13 based on the ISO 4406:1999 cleanliness standard. Each customer will receive a certificate of actual cleanliness test results and an explanation of the rating system.

Each aerial will include an oil sample port, identified with a yellow dust cap and a label, for subsequent customer testing.

Ball valves will be provided in the hydraulic suction and return lines to permit component servicing without draining the oil reservoir.

The system hydraulic pressure will be displayed on a 2.5" liquid filled gauge, located on the control console.

The hydraulic system will be additionally protected from excessive pressure by a secondary pressure relief valve set at 3150 psi. In the event the main hydraulic pump compensator malfunctions, the secondary relief will prevent system damage.

HYDRAULIC CYLINDERS

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

Each cylinder will include integral safety holding cartridges. No manifold or transfer tube mounted cartridges will be acceptable.

Each cylinder will be designed to a minimum safety factor of 4:1 to failure.

All safety holding cartridges will be installed at the cylinder manufacturer, in a controlled clean environment to avoid possible contamination and or failure.

HYDRAULIC PUMP

The hydraulic system will be supplied by a variable displacement, load and pressure compensating piston pump. The pump will meet the demands of all three (3) simultaneous aerial functions. The pump will provide proper flow for a single aerial function with the engine at idle speed. A switch will be provided on the control console to increase the engine speed for multiple function operation.

EMERGENCY PUMP

The aerial will be equipped with an emergency hydraulic pump, electrically driven from the truck batteries. The pump will be capable of running for 30 minutes for limited aerial functions to stow the unit in case of a main pump or truck system failure. A momentary switch will be located at the stabilizer and aerial control locations to activate the emergency pump.

AERIAL CONTROL VALVE

The aerial hydraulic control valve will be designed with special spool flows, limiting the oil flow for the designed function speed. The valve will be manually controlled and be located in the control console with the handles protruding through the operating surface for operation. The activation handles will be spaced a minimum of 3.5" for ease of operation.

OIL RESERVOIR

The oil reservoir will have a minimum capacity of 38 gallons. The oil fill location will be easily accessible and be labeled "Hydraulic Oil Only" and also indicate the grade of oil that is installed in the reservoir. The fill will have a desiccant breather filter with a water capacity of 4 fluid ounces and a 5 micron rating. A drain hose will be included and will terminate with a quarter turn ball valve. Two (2) suction ports will be provided, one (1) for the main hydraulic pump and one (1) for the emergency pump. The main suction will be slightly elevated off the bottom of the reservoir and include a 100 mesh suction strainer. The emergency suction port will be closer to the bottom of the reservoir to provide some reserve oil for emergency operation. A six (6) disc type magnetic drain will also be provided to collect any ferrous contaminants. A float type sending unit in the reservoir will provide an indication of oil level on an electric gauge mounted adjacent to the fill location.

HIGH PRESSURE FILTER

The pressure filter will be rated for 6,000 psi working pressure and generously sized for efficiency and capacity. A 90 psi bypass spring will be included to protect the element and hydraulic system during lower than normal system operating temperatures.

The 5Q filter element will be constructed of a micro glass medium, which has the highest capture efficiency, dirt holding capacity and life expectancy over other media such as cellulose and synthetic. The nominal rating will be 5 micron and have an efficiency rating of 99.3 % for 5 micron sized particles. The element will have a dirt holding capacity of not less than 35 grams.

RETURN FILTER

The return filter will be rated for 800 psi working pressure and generously sized for efficiency and capacity. A 25 psi bypass spring will be included to protect the element and hydraulic system during lower than normal system operating temperatures. The 5Q filter element will be constructed of a micro glass medium, which has the highest capture efficiency, dirt holding capacity and life expectancy over other media such as cellulose and synthetic. The nominal rating will be 5 microns and have an efficiency rating of 99.6% for 5 micron sized particles. The element will have a dirt holding capacity of not less than 40 grams.

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 32 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.

12-BIT ABSOLUTE ENCODER

The aerial ladder will be equipped with a 12-Bit Absolute Encoder which provides 4096 counts per shaft turn for position and direction reference.

The 12-Bit Absolute Encoder will provide a unique binary word to reference each position and direction for all 360 degrees of rotation.

If the power is interrupted for any reason, the 12-Bit Absolute Encoder will allow power to be returned to the system without having to re-zero the settings.

The 12-Bit Absolute Encoder will be an integral part of a micro-processor based control system.

ELECTRICAL SYSTEM

The aerial electrical system will be designed and manufactured in such a way that the power and signal protection and control compartments will contain circuit protection devices and power control devices. The power and signal protection and control components will be protected against corrosion, excessive heat, excessive vibration, physical damage, and water spray.

The aerial electrical system will be designed and manufactured to allow the following:

- All of the serviceable components will be readily accessible.

- Circuit protection devices 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) or Type-II (manual resetting) and conform to SAE requirements. When required, automotive type fuses conforming to SAE requirements will be utilized to protect electronic equipment.

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

The aerial electrical system will be designed and manufactured to allow the following:

- Toggle switches will be utilized that are certified for the outside conditions that fire apparatus experience.

- All wiring will be protected through conduit or loom.

- All wiring harnesses will be properly supported to eliminate harness damage through rubbing.

- An inductive proximity switch and illumination light will be incorporated into the boom support.

- The aerial master and aerial PTO can be engaged after the water pump has been engaged without having to bring the RPM back to idle.

- Standard cabling to the tip of the aerial will consist of one (1) 16/20 cable and one (1) 12/8 cable.

DRIVER SIDE TORQUE BOX POWER DISTRIBUTION PANEL

A fuse and relay panel, located behind the driver side stabilizer, will include the following:

- NEMA 4x rated weatherproof enclosure

- Relays, fuses, and circuit breakers for aerial and stabilizer interlocks and control switches

TURNTABLE LIGHTING

The turntable will be lighted for nighttime operation with a minimum of two (2) LED work lights activated by the aerial master switch. A foot switch will be located at the turntable console to allow hydraulic flow to the aerial device. The foot switch will be protected by a cover to prevent accidental activation. Activation of the foot switch is necessary for aerial device operation.

TURNTABLE CONSOLE

The following switches and indicator lights will be standard on the turntable console:

- High idle on/off switch

- Tip/Tracking light switch

- Indicator and alarm test switch

- Emergency hydraulic power switch

- STABILIZERS NOT FULLY EXTENDED amber indicator light

- Rung alignment green indicator light

The turntable console will be lighted for nighttime operation with one (1) work light activated by the aerial master switch. A fuse panel will be located in the turntable console.

TURNTABLE OVERRIDE CONTROLS

The aerial manual override controls will be located in the turntable control console.

MASTER OVERRIDE CONTROLS

An emergency power switch will be located at the rear of the apparatus. The switch will activate the emergency power unit and allow control of the aerial or stabilizers based on the direction the switch is toggled.

A work light will be provided to illuminate the master override controls when the battery switch is active and the master override door is open.

BOOM SUPPORT

A Turck inductive proximity switch will be provided on the boom support to detect if the aerial device is fully stowed within the boom support.

STABILIZER INDICATOR

A "Stabilizers Not Stowed" indicator 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.

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.

STABILIZER ALARM

An electronic warning device will be provided at each stabilizer to warn personnel that the stabilizers are being deployed. Each alarm will produce a fast pulsing 90 DBA signal and will cancel only when the stabilizer is put into a load bearing configuration.

STABILIZER SCENE LIGHTS

A 4.00" clear floodlight will be provided on each stabilizer to illuminate the surrounding area. The light will be actuated by the aerial master switch.

SPOTLIGHTS

Four (4) Collins, Model FX-12, 750,000 candle power, 12-volt spot/floodlights will be furnished. The two (2) "tracking lights" will be mounted on the base section of the ladder; one (1) each side. The two (2) "tip lights" will be mounted on the tip of the ladder; one (1) on each side. The lights will be mounted below the handrail height so as not to increase the overall height of

the unit. An individual master switch with appropriate identification labels will be provided for the "tracking lights" and "tip lights" in addition to the on/off switch located on the light itself.

LIGHTING ON AERIAL LADDER

There will be TecNiq, Model D02 LED rung lighting provided on both sides of the aerial ladder base, lower and upper mid, and fly sections. The lighting will be located adjacent to the ladder rungs along the lower rail of the ladder sections and will run the length of the ladder section.

The color of the sections will be:

- The base section of the ladder to be blue.
- The lower mid section of the ladder to be blue.
- The upper mid section of the ladder to be blue.
- The fly section of the ladder to be blue.

The LED rung lighting will be activated when a switch at the platform operator's panel is activated through the aerial master and a switch at the turntable operator's panel is activated through the master battery switch.

The lights may be load managed when the parking brake is applied.

STABILIZER WARNING LIGHTS

Four (4) Whelen Model 60*02F*R, flashing Super LED warning light will be mounted on the stabilizer cover panel; one (1) for each panel.

Front stabilizer LEDs will be red Super LED/red lens each side.

Rear stabilizer LEDs will be red Super LED/red lens each side.

These warning lights will be activated by the NFPA side zone switch.

These lights will be provided with a polished trim flange

STABILIZER BEAM WARNING LIGHTS

Two (2) 4.00" diameter red LED flashing lights will be mounted on each stabilizer; one (1) facing forward and one (1) facing rearward. The lights will be Grote Supernova 40 series 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.

120-VOLT RECEPTACLE AT TIP

A 120-volt, 15 amp, twist lock receptacle, with weatherproof cover will be provided at the tip of the aerial device.

240 VOLT TIP OF LADDER LIGHTING

There will be two (2) Fire Research Spectra, Model SPA570-J20, 240 volt AC white LED floodlights with pedestal mounting brackets provided at the tip of the ladder. The lights will be located on the driver's and passenger's sides.

Lights will be switched at the lighthead and turntable

3-WAY AERIAL COMMUNICATION SYSTEM

There will be a Fire Research Model ICA900-213 three-way intercom system provided. There will be two (2) control modules located, one (1) at the turntable operator console and one (1) at the pump panel. Each control module will have and an LED volume display and push-button volume control. A hands free module will be located at the aerial tip or platform and constantly transmit to the other module unless the push-to-talk button is pressed.

Each intercom unit will be weatherproof.

LIFTING EYE - ROPE RESCUE ATTACHMENT

Two (2) eyes will be welded; one (1) to each ladder beam at the ladder egress with a spreader bar to mounted between the eyes. This design will distribute a load evenly across the ladder beams because of a single lifting eye on the spreader bar. The bar is retained by two (2) locking pins; one (1) at each end outboard of each eye. Leveling is maintained by the bar rotating in the eyes.

COLLISION AVOIDANCE

The aerial device will be supplied with a collision avoidance control system. The collision avoidance control system will be calibrated so that the aerial device does not make contact with any part of the fire apparatus during normal operation.

The collision avoidance control system will consist of the following sensors:

Single axis sensor to determine aerial device elevation.

Angle sensors to determine turntable angle with reference to aerial device position.

Absolute encoder integral to the swivel to determine aerial device rotation.

The aerial ladder will be equipped with an absolute encoder for position and direction reference.

The absolute encoder will provide a unique binary word to reference each position and direction for all 360 degrees of rotation.

If the power is interrupted for any reason, the absolute encoder will allow power to be returned to the system without having to re-zero the settings.

The absolute encoder will be an integral part of a microprocessor based control system

The collision avoidance control system will be divided up to a maximum of nine (9) control zones. Each zone will have its own independent rotation and elevation parameters.

The collision avoidance control system will be equipped with a warning system that alerts the operator when the aerial device has reached the limits of each control zone. The warning system will sound when either the rotation or elevation movements reach the limits of the control zone.

The warning system alarm and red light will be active whenever the ladder is in a restricted area and will then prevent aerial device movement.

A green indicator light will activate when the aerial is in a position to be safely stowed.

SPECIAL COLOR, BOOM SUPPORT

The boom support will be painted job color.

CONTROL PANEL ILLUMINATION (IN PLACE OF STANDARD)

There will be one (1) Amdor LumaBar H2O, Model XX9927, 12.00" LED strip light provided in place of the standard panel mounted light.

The LED strip light will be mounted as to not interfere with the opening of the control panel door.

AERIAL STABILITY GAUGE

There will be a Class 1 Load Minder located in the turntable control station. The gauge and warning alarm will be clearly identified and conveniently located for ease of viewing.

There will be Preco Model 7414A amber LED lights provided at each side of the tip of the base section of the aerial device.

SPLASH GUARD FOR REAR CONTROLS

A splash guard will be provided at the rear of the apparatus under the body to protect the stabilizer control manifold from road splash and grime. The guard will go from the rear access step to rear access step and will be a maximum width to cover the entire manifold. The splash guard will be an "L" shape to protect the stabilizer control manifold. Tubing will be provided to extend the aerial drain and aerial relief to the side and below the splash guard.

MANSAVER™ BARS, AERIAL TURNTABLE

ManSaver™ bars will be installed at the aerial turntable.

WATER SYSTEM

A waterway system will be provided consisting of the following components and features:

A 5.00" pipe connected to the water supply on one end and to a water swivel at the rotation point of the turntable. The water swivel will allow the ladder to rotate 360 degrees continuously while flowing water.

A 4.00" waterway swivel is to be routed through the rotation point swivel up to the heel pin swivel. The heel pin swivel will allow the water to flow to the ladder pipe while elevating the aerial ladder from -5 degrees to 75 degrees. The heel pivot pin is not integral with the waterway swivel at any point. The design of the waterway will allow complete servicing of the waterway swivel without disturbing the heel pivot pin.

The integral telescopic water system will consist of a 4.50" diameter tube in the base section, a 4.00" diameter tube in the inner mid-section, 3.50" diameter tube in the outer mid-section and a 3.00" diameter tube in the fly section. The telescopic water pipes will be anodized aluminum.

The rotational torque will have adequate power to rotate the ladder into a full 1000 gallon per minute water stream directed at 90 degrees to the side while maintaining the 500 pound tip load.

The aerial will be capable of discharging up to 1000 gallons per minute at 100 pounds per square inch parallel to the ladder and 90 degrees to each side of center while maintaining the fully rated tip load.

An adjustable intake relief valve will be furnished to protect the aerial waterway from a pressure surge.

A 1.50" drain valve will be located at the lowest point of the waterway system.

WATERWAY SEALS

The waterway seals will be of type-B PolyPak 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.

AERIAL MONITOR - EXTENDED VERTICAL TRAVEL

An Akron, Model 3598 monitor with stow and deploy will be provided at the tip with an Akron 2000 GPM; Model 5178 nozzle. This monitor will allow for an additional 30 degrees of travel above horizontal at the aerial tip.

The monitor's functions will be controlled electrically from two (2) separate locations. One (1) control will be located at the control console and the other at the ladder tip.

There will be a courtesy light at the tip of the aerial to illuminate the controls.

If the aerial has a quick-lock waterway, a limit switch will be provided to disable the extended vertical travel when the monitor is locked to the lower ladder section.

FLOW METER (AERIAL WATERWAY)

A Class I Flow-Minder, with totalizer, will be provided for the aerial waterway. The flowmeter will be located at the turntable control station.

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" chrome plated adapter and a 5.00" chrome plated, long handle cap.

WATERWAY LOCKING SYSTEM

The aerial ladder waterway monitor will be capable of being positioned at either the fly section or at the next lower section of the ladder.

The monitor location will be changeable by the use of a single handle, located at the side of the ladder.

The handle, attached to a cam bracket, will simply be moved forward to lock the monitor at the fly section and back to lock it to the previous section.

There will be no pins to remove and reinstall.

The monitor will be operational at all times, regardless of its position, without connecting or disconnecting electrical lines.

WATERWAY SHUTOFF VALVE

A 5.00" electric operated butterfly valve will be installed in the aerial waterway. The switch for the valve will be located at the turntable console of the apparatus.

There will be a preset relief valve in the waterway between the butterfly valve and the monitor to protect the waterway when retracting.

TOOLS

The following tools will be provided for retorquing of all specified bolts as recommended by the manufacturer:

- Torque Wrench

- All Required Extensions, Sockets and Adapters

- 4-to-1 Multiplier

MANUALS

Two (2) operator maintenance manuals and two (2) wiring diagrams pertaining to the aerial device will be provided with the apparatus at time of pick-up.

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 of three (3) days.